DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

April 24, 2019

DAIM-ODB-LO

Mr. Rich Mayer
US Environmental Protection Agency
Federal Facilities Section R6
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Draft Record of Decision for LHAAP-29, Former TNT Production Area, Group 2, April 2019, Longhorn Army Ammunition Plant, Karnack, Texas

Dear Mr. Mayer,

The above-referenced document is being transmitted to you for review. In accordance with the FFA, please provide your comments by May 24, 2019.

The document was revised by HDR Environmental, Operations and Construction, Inc. (HDR) on behalf of the Army as part of HDR's contract for the facility. I ask that Phil Werner, HDR's Project Manager, be copied on any communications related to the project.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
A. Palmie, TCEQ, Austin, TX
P. Bruckwicki, Caddo Lake NWR, TX
P. Werner, HDR, Englewood, CO
A. Williams, USACE, Tulsa District, OK
A. Maly, USAEC, San Antonio, TX

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April 24, 2019

DAIM-ODB-LO

Ms. April Palmie
Texas Commission on Environmental Quality Superfund Section – MC-136
Remediation Division
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Draft Record of Decision for LHAAP-29, Former TNT Production Area, Group 2, April 2019, Longhorn Army Ammunition Plant, Karnack, Texas

Dear Ms. Palmie,

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DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

September 6, 2019

DAIM-ODB-LO

Mr. Rich Mayer
US Environmental Protection Agency
Federal Facilities Section R6
1201 Elm Street, Suite 500
Dallas, Texas 75270-2102

Re: Draft Record of Decision for LHAAP-18/24, Burning Ground No. 3 and Unlined Evaporation Pond, September 2019, Longhorn Army Ammunition Plant, Karnack, Texas

Dear Mr. Mayer,

The above-referenced document is being transmitted to you for review. In accordance with the FFA, please provide your comments by October 7, 2019.

The document was revised by HDR Environmental, Operations and Construction, Inc. (HDR) on behalf of the Army as part of HDR's contract for the facility. I ask that Phil Werner, HDR's Project Manager, be copied on any communications related to the project.

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A. Williams, USACE, Tulsa District, OK
A. Sherman, USAEC, Fort Sam Houston, TX
K.Nemmers, Bhate, Lakewood, CO (transmittal letter only)

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K. Nemmers, Bhate, Lakewood, CO (transmittal letter only)

Subject:	**Final Minutes, Monthly Managers' Meeting (MMM), Longhorn Army Ammunition Plant (LHAAP)**
Location of Meeting:	**Conference Call**
Date of Meeting:	**18 September 2019– 1:00PM Central Daylight Time (CDT)**

Attendees:

Army BRAC:	Rose Zeiler (RMZ)
EPA:	Rich Mayer (RM)
TCEQ:	April Palmie (AP)
USACE:	Aaron Williams (AW)
AEC:	Amanda Sherman
USGS:	Kent Becher
Bhate:	Kim Nemmers (KN)
USFWS:	Paul Bruckwicki
APTIM:	Praveen Srivastav (PS), Bill Foss (BF) and Susan Watson (SW)

Action Items

Bhate/APTIM: KN stated that the contract for the replacement of water line to extraction well 18WW17 repairs has been signed. KN said that she did not have the work scheduled but would let AW and RMZ know so that they would pass the information along.

Defense Environmental Restoration Program (DERP) Performance Based Remediation (PBR) Update

KN stated the groundwater treatment plant (GWTP) is operating properly. RM asked if the power was fully restored to which KN confirmed. KN stated that the sludge from the filter bed press was sampled and would be profiled for disposal in the coming weeks. KN explained that the last load of sludge was disposed in August 2017 prior to award of the current contract to Bhate.

BF stated that LHAAP-17 had just received rain and was currently shut-down due to lightning in the area with the stockpiles covered. BF explained that five trucks were onsite and that two rounds had been completed. However, BF was not sure much more would be completed with the weather coming into the area. BF explained that the USACE had approved an Ordinance Explosive Safety Specialist (OESS), Mr. Hank Domme, to provide construction support. BF stated that scrap metal and empty munitions debris had been found. RM asked what BF meant by empty to which BF explained that the munitions were verified to not have explosive material present within the item. RM asked what percent complete the project was considered. BF said that the project was more than 50-percent completed and stated that the areas remaining included the deeper excavation in Area H and J and then the three southern areas of G, M and N. Over-excavation was required in areas H and K also. BF stated that the initial planned excavation should be completed by the middle to end of the next week, weather dependent, but that over-excavation and loading of stockpiled material may continue beyond that.

BF discussed the injections at LHAAP-16, which will commence on 24 September 2019. BF explained that all eight pumps for the extraction wells were operational as of 4 September 2019. BF stated that the baseline sampling using select wells was being completed this week. BF explained that mobilization had commenced for the injections with some equipment and tanks being delivered to the site. BF stated that the crew was mobilizing the afternoon of Monday, 23 September 2019. BF stated that work would commence on 24 September at 6:30 am. BF noted that ReDox Tech was

contracted to complete the bayou barrier injections. BF stated that the water source for injection mixing was identified and access was being set up. RMZ asked what the water source was that APTIM had identified. BF stated that Leigh Water Supply in Karnack was being used and that an access point with a meter for the water was being provided. BF explained that the water would not be chlorinated from the access point. BF stated that cross-sections showing the lithology and screened intervals of the newly installed monitoring wells at LHAAP-16 had been sent out to the team. RMZ stated that she felt it was good to provide this information and to be aware of what the data represents. RM stated that the cross-sections appeared to show the wells were screened in the intermediate zone. KB stated that it looks like the silty-sand zone runs continuously through the area. RZ stated that remedial design (RD) was set and that the detection of trichloroethene in the groundwater east of Harrison Bayou was not all bad news because the concentrations will allow assessment of the intermediate aquifer's response to the injections.

BF asked everyone to refer to the Document and Issues Tracking Table dated September 18, 2019.

- **Task 1** (Project Management) -KN stated that the August 2019 MMM minutes were approved. The team discussed the change in date for the RAB and MMM to 23 October 2019 and when to have the MMM. KN stated that she needed to confirm that the RAB would be held at the Community Center. The team determined that having the MMM at 10:30 am on 23 October 2019 was the best choice and that having it at the LHAAP trailer was preferred.
- **Task 3** (LHAAP-03) – BF stated that there are no current documents.
- **Task 4** (LHAAP-04) – BF stated that there are no current documents.
- **Task 5** (LHAAP-12) – BF stated that the monitoring well was installed and developed in August 2019, and that the new monitoring well would be sampled in December 2019 during the annual Remedial Action Operations (RA[O]) event. BF explained that the data would then be provided at the February 2019 MMM and in the next RA(O) Report.
- **Task 6** (LHAAP-16) – BF stated that the baseline sampling data will be provided as soon as validated, which may be as early as the October 2019 MMM or may fall into the November MMM.
- **Task 7** (LHAAP-17) – BF stated that there are no current documents.
- **Task 9** (LHAAP-37) – BF stated that the year 2, 4th quarter quarterly sampling was completed and that validated data will be provided for the October 2019 MMM. The sampling will become semi-annual going forward.
- **Task 10** (LHAAP-46) – BF explained that the obstructed well (LHSMW23) was replaced at LHAAP-46 and not salvaged. The new monitoring well LHSMW23R was installed and developed and water was present. BF stated that the water from LHSMW23R was sampled and the validated data will be provided with the rest of the LHAAP-46 RA(O) data in the October MMM.
- **Task 11** (LHAAP-50) – BF stated that the Explanation of Significant Difference (ESD) was distributed the prior Friday. Everyone confirmed receipt. BF stated that the Draft RA(O) Report should be delivered to the Regulators in November 2019 and that the Draft Remedial Action Work Plan (RAWP)/RD is planned for distribution to the Regulators in October 2019.
- **Task 12** (LHAAP-58) – KN stated that the Year 5 RA(O) Report was just released to the Army and USACE for review and that the draft report should be provided in October 2019 to the Regulators. KN stated that the quarterly RA(O) sampling had been completed in September 2019 and that the validated data would be provided for the October 2019 MMM.

- **Task 13** (LHAAP-67) – BF stated that the two new monitoring wells had been installed and developed in August 2019. BF stated that the monitoring wells would be sampled in November 2019 during the Year 6 Annual sampling event. BF stated that the Draft Year 5 RA(O) Report was planned for submittal to the Regulators in November 2019.
- **Task 14** (LHAAP-001-R and –003-R) - KN stated that the Annual LTM Report was in Bhate's internal quality control (QC) review and was planned for submittal to the Army within the next week so that the draft report could be provided to the Regulators in October 2019.
- **Task 16** (GWTP) **–**KN indicated that the 2nd Quarter 2019 GWTP was under Bhate's internal QC and is anticipated for delivery to the Regulators in October 2019.
- **Task 17** (LHAAP-18/24) – KN stated that the 2nd Quarter 2019 GWTP Report would have the June and July 2019 groundwater data for LHAAP-18/24.
- **Task 18** (Surface Water) – No discussion.
- **Task 19** (LUC Management Plan) – KN stated that the LUC Management Plan Update was being completed and should be delivered to the Regulators in the next couple of weeks.
- **Administrative Record (AR) –** SW stated that everything through March 2019 will be included in the next distribution for the AR, which is planned for the next week.

Update on other DERP Sites

- **LHAAP 18/24** –AW stated that the Record of Decision (ROD) is with the Regulators. AP stated that she is likely to request an extension. RMZ stated that an extension is fine.
- **LHAAP-29** –AW stated that Proposed Plan (PP) was being included in the AR. AW stated that the ROD was submitted to the Regulators for EPA signature and TCEQ concurrence. AP stated that a letter was prepared, and she would scan and send a copy. RM stated that the EPA was ready to sign the ROD.
- **LHAAP-47** – AW stated that the Post-Screening Investigation (PSI) Report was being included in the next AR distribution. AW stated that the PSI Addendum would be included in the next AR update. AW stated that a modification to the HDR, Inc. contract had been completed and that HDR was preparing a Work Plan for 10 direct push technology (DPT) points around MW25R to a depth of approximately 40 feet below ground surface, with soil samples at three intervals in each well and that grab groundwater samples would be collected. AW stated that 1,4-dioxane would also be analyzed from the grab groundwater samples. AW explained that the HDR period of performance will end in December, so AW was requesting a quick review of the Work Plan. AP asked when the Regulators would receive the Work Plan. AW stated that the Army would receive it the following week and the plan was to have the Work Plan to the Regulators in early October. RMZ stated that she would like to try to find the DPT14 location. AW stated that John Doran will be onsite for the LHAAP-16 injections and has been asked to try to find the DPT14 location.
- **Five Year Review (FYR)** – RMZ asked RM about the answer to AP's question, which has not been addressed. RM stated that he has a meeting to discuss internally. RM said he had forwarded AP's email to his management and had not received a response. RMZ stated that finalizing the FYR and then changing it again is the concern. RMZ suggested that maybe EPA could address their concern in the letter instead of revising the Final document. RM stated that he is going to try to get something worked out.

Backfill Source Discussion

BF explained that backfill soil results had been sent in an email prior to the call. BF explained that while several of the metals exceeded for the potential leaching to groundwater that Synthetic Precipitation Leaching Procedure (SPLP) analysis had been run on the samples with the highest

detections of Arsenic, Chromium, and Lead, and the results were non-detect. BF also stated that the metals are not contaminants of concern (COCs) for the site.

AP asked how many locations were sampled. BF stated that one sample was collected per 1,000 cubic yards and that the composite sample locations had been surveyed using a global positioning system. AP stated that her question was why an alternative provider was not being considered. BF stated that another borrow source is being evaluated and that the plan is collect a sample from that source this week. BF stated that the current borrow provider has told them that the clays in the area naturally have elevated metals and suggested looking at more sandy soils to avoid the clay. AP stated that the ROD and Installation Wide Work Plan requires fill to meet the cleanup criteria that the soil needs to meet background values or the GWP-Ind (TCEQ soil MSC for industrial use based on groundwater protection) values. RM had not had a chance to look at the data.

Schedule Next Managers' Meeting
The next MMM will be held on October 23, 2019 at 10:30 am CDT in the Army trailer at LHAAP.

Meeting concluded at 2:50 pm CDT.

ACRONYM LIST

AP	April Palmie
APTIM	APTIM Federal Services, LLC
AR	Administrative Record
AS	Amanda Sherman
AW	Aaron Williams
BF	Bill Foss
Bhate	Bhate Environmental Associates, Inc.
BRAC	Base Realignment and Closure
CDT	Central Daylight Time
COC	Contaminents of Concern
DERP	Defense Environmental Restoration Program
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FBR	Fluidized Bed Reactor
FYR	Five Year Review
GWTP	Ground Water Treatment Plant
HDR	HDR, Inc.
KN	Kim Nemmers
LHAAP	Longhorn Army Ammunition Plant
MMM	Monthly Managers' Meeting
PBR	Performance-Based Remediation
PP	Proposed Plan
PS	Praveen Srivastav
PSI	Post-Screening Investigation
QC	Quality Control
RAB	Restoration Advisory Board
RA(O)	remedial action – operation
RAWP	Remedial Action Work Plan
RD	Remedial Design
RM	Rich Mayer
RMZ	Rose M. Zeiler

ROD	Record of Decision
RRS	Risk Reduction standards
SPLP	Synthetic Precipitation Leaching Procedure
SW	Susan Watson
TCEQ	Texas Commission on Environmental Quality
USACE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

LHAAP Data Validated
September MMM Validated Data

GWTP Effluent	*Weekly Perchlorate Sampling – August 2019* Perchlorate (6850)
GWTP Effluent	*Weekly, Bi-Weekly, and Monthly Sampling – August 2019* Ammonia (350.3) Ortho-Phosphate (365.3) Total Organic Carbon (SM5310C) VOC (8260C) Metals (6020A) Hexavalent Chromium (7196A) 1,4-Dioxane (8270D-SIM) Anions (9056)
GWTP Influent	*Monthly Sampling – August 2019* Metals (6020A) Perchlorate (6850) Hexavalent Chromium (7196A)
LHAAP-18/24	*Sampling – August 2019* Perchlorate (6850) Metals (6020A) VOCs (8260C) 1,4- Dioxane (8270D SIM)

GWTP Weekly/Effluent Perchlorate Sampling -August 2019

Location ID: Sample Date:	Units	Daily Maximum Conc	LH18/24-SP650_080619_BIX 8/6/19	LH18/24-SP650_081419_ BIX 8/14/19	LH18/24-SP650_081419_BIX 8/14/19	LH18/24-SP650_082019_BIX 8/20/19	LH18/24-SP650_082019_AIX 8/20/19	LH18/24-SP650_082719_AIX 8/27/19
Location Description			**Collected from a spigot on the discharge of effluent TK-650.**					
			Weekly	Monthly EFF	Weekly	Weekly	Weekly	Weekly
Perchlorate (6850)								
Perchlorate	µg/L	589	< 2.0 U	**12**	**10**	< 2.0 U	< 2.0 U	< 2.0 U

µg/L - micrograms per liter

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

BIX - before ion exchange

AIX - after ion exchange

GWTP Weekly Sampling - August 2019

Location ID: Sample Date:	Units	Daily Maximum Conc	LH18/24-SP650_080619 8/6/19	LH18/24-SP650_081419 8/14/19	LH18/24-SP650_082019 8/20/19	LH18/24-SP650_082719 8/27/19
Location Description			**GWTP–Collected from a spigot on the discharge of effluent TK-650. Sampled Weekly.**			
Ammonia as N (350.3)						
Ammonia as N	mg/L	NV	**11**	**11**	**8.9**	**1**
Ortho-Phosphate (365.3)						
Ortho-Phosphate	mg/L	NV	**3.16**	**2.25**	**2.53**	**2.04**
Organic Carbon (415.1)						
Total Organic Carbon (TOC)	mg/L	NV	**2.25**	**19**	**2.3**	**0.72**

mg/L - milligrams per liter

NV - No Value

GWTP Bi-Weekly Sampling - August 2019

Location ID: Sample Date:	Units	Daily Maximum Conc	LH18/24-SP650_080619 8/6/19	LH18/24-SP650_082019 8/20/19
Location Description			**GWTP – Collected from a spigot on the discharge of effluent TK-650. Sampled Biweekly.**	
Volatile Organic Compounds (8260C)				
1,1,1-Trichloroethane	µg/L	7,230	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	216.9	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	14,032	< 0.5 U	< 0.5 U
1,1-Dichloroethene	µg/L	253	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	181	**0.42 J**	**0.53 J**
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 0.5 U
Acetone	µg/L	2,395	< 1.0 U	< 1.0 U
Benzene	µg/L	181	< 0.5 U	< 0.5 U
Carbon tetrachloride	µg/L	181	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	47,180	< 0.5 U	< 0.5 U
Chloroform	µg/L	3,615	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	57,025	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	83.6	< 1.0 U	< 1.0 U
Methylene chloride	µg/L	1,699	**0.95 J**	< 1.0 U
o-Xylene	µg/L	83.6	< 0.5 U	< 0.5 U
Styrene	µg/L	5,987	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	180.7	< 0.5 U	< 0.5 U
Toluene	µg/L	4,189	< 0.5 U	< 0.5 U
Trichloroethene	µg/L	181	**0.75 J**	**1.2**
Vinyl chloride	µg/L	72	< 0.5 U	< 0.5 U
Anions (9056)				
Chloride	mg/L	NV	**338**	**444**
Sulfate	mg/L	NV	**37.6**	**36.7**

µg/L - micrograms per liter

mg/L - milligrams per liter

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

NV - No Value

J - estimated value between the detection limit and limit of quantitation and/or due to quality contol issues

GWTP Monthly Effluent Sampling - August 2019

Location ID: / Sample Date:	Units	Daily Maximum Conc	LH18/24-SP650_081419 8/14/19
Location Description			**GWTP – Collected from a spigot on the discharge of effluent TK-650. Sampled monthly**
Volatile Organic Compounds (8260C)			
1,1,1-Trichloroethane	µg/L	7,230	< 0.5 U
1,1,2-Trichloroethane	µg/L	216.9	< 0.5 U
1,1-Dichloroethane	µg/L	14,032	< 0.5 U
1,1-Dichloroethene	µg/L	253	< 0.5 U
1,2-Dichloroethane	µg/L	181	< 0.5 U
1,2-Dichloropropane	µg/L	5	< 0.5 U
Acetone	µg/L	2,395	**3.4**
Benzene	µg/L	181	< 0.5 U
Carbon tetrachloride	µg/L	181	< 0.5 U
Chlorobenzene	µg/L	47,180	< 0.5 U
Chloroform	µg/L	3,615	< 0.5 U
Ethylbenzene	µg/L	57,025	< 0.5 U
m,p-Xylene	µg/L	83.6	< 1.0 U
Methylene chloride	µg/L	1,699	< 1.0 U
o-Xylene	µg/L	83.6	< 0.5 U
Styrene	µg/L	5,987	< 0.5 U
Tetrachloroethene	µg/L	180.7	< 0.5 U
Toluene	µg/L	4,189	< 0.5 U
Trichloroethene	µg/L	181	**0.93 J**
Vinyl chloride	µg/L	72	< 0.5 U
Metals (6020A)			
Barium	mg/L	2	**0.138**
Lead	mg/L	0.0046	< 0.00100 U
Selenium	mg/L	0.012	< 0.00250 U
Silver	mg/L	0.003	< 0.000500 U
Hexavalent Chromium (7196A)			
Hexavalent Chromium	mg/L	0.1244	< 0.0100 U
Semi-Volatile Organic Compounds (8270D SIM)			
1,4-Dioxane	µg/L	134.2	**0.49**

µg/L - micrograms per liter

mg/L - milligrams per liter

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

J - estimated value between the detection limit and limit of quantitation and/or due to quality contol issues

GWTP Monthly Influent Sampling - August 2019

Location ID: Sample Date:	Units	LH18/24-SP140_081419 8/14/19
Location Description		**GWTP – Collected from a spigot on the influent to TK-140. Sampled Monthly.**
Metals (6020A)		
Selenium	mg/L	< 0.00250 U
Silver	mg/L	< 0.00050 U
Hexavalent Chromium (7196A)		
Hexavalent Chromium	mg/L	< 0.0100 U
Perchlorate (6850)		
Perchlorate	µg/L	**8,800**

mg/L - milligrams per liter

µg/L - micrograms per liter

U- Undetected: The analyte was analyzed for, but not detected and reported to the limit of detection.

LHAAP-18/24 Sampling Event - August 2019

Location ID: Sample Date:	Units	MCL/MSC/PCL	18WW19_080819 8/8/19	18WW20_080819 8/8/19
			Site 18/24-NE, outside the fence line. Outer region.	Site 18/24-N, outside the fence line. Outer region.
Lab Package			HS19080486	HS19080486
Well ID			18WW19	18WW20
Perchlorate	µg/L	17*	< 2.0 U	< 2.0 U
1,1,1,2-Tetrachloroethane	µg/l	110	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	µg/l	200	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/l	14	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/l	5	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/l	10,000	< 0.5 U	< 0.5 U
1,1-Dichloroethene	µg/l	7	< 0.5 U	< 0.5 U
1,1-Dichloropropene	µg/l	2.9	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	µg/l	310	< 0.5 U	< 0.5 U
1,2,3-Trichloropropane	µg/l	0.041	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	µg/l	70	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	µg/l	5,100	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/l	0.2	< 0.5 U	< 0.5 U
1,2-Dibromoethane	µg/l	0.05	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	µg/l	600	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/l	5	< 0.5 U	< 0.5 U
1,2-Dichloropropane	µg/l	5	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	µg/l	5,100	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	µg/l	3,100	< 0.5 U	< 0.5 U
1,3-Dichloropropane	µg/l	29	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	µg/l	75	< 0.5 U	< 0.5 U
2,2-Dichloropropane	µg/l	42	< 0.5 U	< 0.5 U
2-Butanone	µg/l	61,000	< 1.0 U	< 1.0 U
2-Chlorotoluene	µg/l	2,000	< 0.5 U	< 0.5 U
2-Hexanone	µg/l	6,100	< 1.0 U	< 1.0 U
4-Chlorotoluene	µg/l	2,000	< 0.5 U	< 0.5 U
4-Isopropyltoluene	µg/l	10,000	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	µg/l	8,200	< 1.0 U	< 1.0 U
Acetone	µg/l	92,000	< 1.0 U	< 1.0 U
Benzene	µg/l	5	< 0.5 U	< 0.5 U
Bromobenzene	µg/l	2,000	< 0.5 U	< 0.5 U
Bromochloromethane	µg/l	4,100	< 0.5 U	< 0.5 U
Bromodichloromethane	µg/l	4.6	< 0.5 U	< 0.5 U
Bromoform	µg/l	36	< 0.5 U	< 0.5 U
Bromomethane	µg/l	140	< 0.5 U	< 0.5 U
Carbon disulfide	µg/l	10,000	< 1.0 U	< 1.0 U
Carbon tetrachloride	µg/l	5	< 0.5 U	< 0.5 U
Chlorobenzene	µg/l	100	< 0.5 U	< 0.5 U
Chloroethane	µg/l	41,000	< 0.5 U	< 0.5 U
Chloroform	µg/l	1,000	< 0.5 U	< 0.5 U
Chloromethane	µg/l	220	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	µg/l	70	< 0.5 U	< 0.5 U
cis-1,3-Dichloropropene	µg/l	5.3	< 0.5 U	< 0.5 U
Dibromochloromethane	µg/l	34	< 0.5 U	< 0.5 U
Dibromomethane	µg/l	380	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	µg/l	20,000	< 0.5 U	< 0.5 U
Ethylbenzene	µg/l	700	< 0.5 U	< 0.5 U
Hexachlorobutadiene	µg/l	20	< 1.0 U	< 1.0 U

Isopropylbenzene	µg/l	10,000	< 0.5 U	< 0.5 U
m,p-Xylene	µg/l	10,000**	< 1.0 U	< 1.0 U
Methylene chloride	µg/l	5	< 1.0 U	< 1.0 U
Naphthalene	µg/l	2,000	< 0.5 U	< 0.5 U
n-Butylbenzene	µg/l	4,100	< 0.5 U	< 0.5 U
n-Propylbenzene	µg/l	4,100	< 0.5 U	< 0.5 U
o-Xylene	µg/l	10,000**	< 0.5 U	< 0.5 U
sec-Butylbenzene	µg/l	4,100	< 0.5 U	< 0.5 U
Styrene	µg/l	100	< 0.5 U	< 0.5 U
tert-Butylbenzene	µg/l	4,100	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/l	5	< 0.5 U	< 0.5 U
Toluene	µg/l	1,000	< 0.5 U	< 0.5 U
trans-1,2-Dichloroethene	µg/l	100	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	µg/l	29	< 0.5 U	< 0.5 U
Trichloroethene	µg/l	5	< 0.5 U	< 0.5 U
Trichlorofluoromethane	µg/l	31,000	< 0.5 U	< 0.5 U
Vinyl chloride	µg/l	2	< 0.5 U	< 0.5 U
Aluminum	mg/L	100	**0.327**	**0.0246**
Antimony	mg/L	0.006	< 0.005000 U	< 0.005000 U
Arsenic	mg/L	0.01	**0.000655 J**	< 0.005000 U
Barium	mg/L	2	**0.119**	**0.0929**
Beryllium	mg/L	0.004	< 0.005000 U	< 0.005000 U
Cadmium	mg/L	0.005	< 0.005000 U	< 0.005000 U
Calcium	mg/L	NV	**6.82**	**2.93**
Chromium	mg/L	0.1	**0.0100**	**0.000595 J**
Cobalt	mg/L	6.1	**0.000430 J**	**0.00504**
Copper	mg/L	1.3	< 0.00100 U	< 0.00100 U
Iron	mg/L	NV	**15.8**	**4.37**
Lead	mg/L	0.015	< 0.00100 U	< 0.00100 U
Magnesium	mg/L	NV	**3.17**	**2.08**
Manganese	mg/L	1.1*	**0.279**	**0.220**
Nickel	mg/L	0.49*	**0.00475 J**	**0.00749**
Potassium	mg/L	NV	**2.04**	**1.33**
Selenium	mg/L	0.05	< 0.00250 U	< 0.00250 U
Silver	mg/L	0.51	< 0.000500 U	< 0.000500 U
Sodium	mg/L	NV	**22.5**	**26.2**
Thallium	mg/L	0.002	< 0.000500 U	< 0.000500 U
Vanadium	mg/L	0.72	**0.00202 J**	**0.000822 J**
Zinc	mg/L	31	**0.0211**	**0.0191**
Mercury	mg/L	0.002	< 0.000100 U	< 0.000100 U
1,4-Dioxane	µg/l	9.1	NA	**0.25**

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected.

NV - No Value

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

Subject: Final Minutes, Quarterly Restoration Advisory Board (RAB) Meeting
Longhorn Army Ammunition Plant (LHAAP)
Location of Meeting: Karnack Community Center, Karnack, Texas
Date of Meeting: July 25, 2019, 6:00 PM Central Daylight Time (CDT)

Meeting Participants:

Army BRAC:	Rose M. Zeiler
USACE:	Aaron Williams
USAEC:	Amanda Sherman
USGS:	Kent Becher
Bhate:	Kim Nemmers
APTIM:	Susan Watson
USEPA Region 6:	Dorelle Harrison
TCEQ:	April Palmie
USFWS:	Paul Bruckwicki
RAB:	Present: Judy VanDeventer, Paul Fortune, Carol Fortune, John Fortune, Charles Dixon, Nigel R. Shivers, and Sharron McAvoy Absent: Richard LeTourneau; Terry Britt; John Pollard, Jr.; Tom Walker; and Deon Hall
Public:	Laura-Ashley Overdyke (Executive Director of the Caddo Lake Institute [CLI]), Brad Eskue, Robert Speight, and Vicki Pace

An agenda for the RAB meeting, a color copy of the Bhate Environmental Associates, Inc. (Bhate) slide presentation, and handouts (see list at end of meeting minutes) were provided for meeting attendees.

Welcome and Introduction

Mr. Paul Fortune, RAB Installation Co-Chair, called the RAB meeting to order at 6:05 pm CDT. Mr. Fortune welcomed everyone and asked if there was anyone present that had not attended before. Ms. Amanda Sherman stated that she is with the U.S. Army Environmental Command (USAEC). Ms. Rose Zeiler introduced the new RAB members and presented the RAB agenda.

Ms. Zeiler then reviewed the list of RAB members and asked Ms. Laura-Ashley Overdyke if there was any interest in the RAB from the public outreach. Ms. Overdyke stated that the previous outreach did not result in anyone signing up, but that there are three other events scheduled for August 6 and 7, 2019, in Marshall, Jefferson, and Karnack, where the same handouts will be shared. Ms. Zeiler explained the purpose of the RAB. Ms. Zeiler explained that the meeting is held every 3 months and then presented the mission for the RAB. Ms. Zeiler welcomed anyone that might be interested in joining the RAB to complete an application. Ms. Kim Nemmers explained that the RAB member application is available on the website or can be emailed. Ms. Zeiler then explained what information is available on the LHAAP website, including the Administrative Record (AR) updated through December 2018. Ms. Zeiler stated that the website also has a calendar of activities including field activities ongoing at LHAAP.

Open Items

Ms. Zeiler noted that the April 2019 RAB Meeting minutes had been sent out in May 2019. Ms. Judy VanDeventer made a motion to accept the April 2019 RAB Meeting minutes. Ms. Carol Fortune seconded the motion.

Defense Environmental Restoration

LHAAP-50

Ms. Susan Watson discussed the LHAAP-50 Explanation of Significant Difference (ESD). Ms. Watson explained that the Record of Decision (ROD) selects the remedy and that the ESD describes a change in that selected remedy. Ms. Zeiler pointed to where LHAAP-50 is located within the LHAAP. Ms. Watson explained the site history for LHAAP-50. Ms. Watson explained that the site had a 47,000 gallon aboveground storage tank that received industrial waste water from sumps throughout Longhorn AAP. This process continued from 1955 until 1988. Ms. Watson stated that the water, after solids were filtered, was discharged to Goose Prairie Creek. Ms. Watson stated that investigations were conducted and contamination was identified in the area. Specifically, Ms. Watson stated that the contaminants included chlorinated solvents and perchlorate in the groundwater and also perchlorate in the soil. In 2010, the ROD selected monitored natural attenuation (MNA) for the groundwater, excavation of soil contamination that could leach into the groundwater, and land use controls (LUCs). The ROD also had a contingency remedy of enhanced in-situ bioremediation (EISB) if the MNA was not effective.

Ms. Watson explained that the Remedial Action-Operation [RA (O)] evaluated the remedy beginning in 2013. The RA (O) is conducted to reevaluate the remedy. In 2018, MNA was found to be ineffective based upon lines of evidence in a process developed by the USEPA. Ms. Watson explained that the first line of evidence is contaminant concentrations that evaluate changes in concentrations over time and distance. Ms. Watson explained that the concentrations of trichloroethene (TCE) and perchlorate increased from 2013 to 2018. In addition, Ms. Watson explained that the TCE plume expanded. Ms. Watson noted that the perchlorate plume did not expand. Therefore, Ms. Watson explained that the Army, Texas Commission on Environmental Quality (TCEQ), and United States Environmental Protection Agency (USEPA) agreed that the contingency remedy was needed to enhance MNA and address the site plumes. Ms. Watson stated that initiation of the contingency remedy required an ESD to the ROD. Ms. Watson explained that approval is necessary before implementation of the contingency remedy. The draft ESD proposed EISB as the contingency remedy and was submitted in April 2019 for Regulator review. Ms. Watson stated that comment resolution is ongoing. Ms. Watson stated that the next step is then the Contingency Remedial Action Work Plan (RAWP), which is currently being prepared. Ms. Watson explained that, due to the expansion of the plume, an additional well is being installed. Ms. Watson stated that the RAWP will be finalized after the groundwater data from the new well is received. Ms. Watson stated that the remedy is anticipated to be implemented in the Fall of 2019. Ms. Watson pointed out that the additional monitoring well location is in pink on RAB slide 10. Ms. Watson stated that 18 monitoring wells are currently sampled. Ms. Zeiler stated that the schedule for the remedial implementation will be on the LHAAP website.

Ms. Overdyke asked if the plume data at LHAAP-50 was included in the RAB meeting handouts. Ms. Watson stated that the data to define the extent of the plume has not been collected and was not in the handouts. Ms. Watson said that once the remedial design and RAWP were approved the details would be presented at a RAB meeting. Ms. Zeiler also explained that historic results could be found in the AR within the Annual RA (O) Reports, and then Ms. Watson explained how to search the AR online. Ms. Watson stated that the best way to find a document is to search the index for the site, and then go to the year and volume within the AR based upon the site search. Ms. Watson pointed out that each of the volumes have bookmarks labeled with letters to help find documents.

Overview of Sites

Ms. Watson discussed the field work completed the previous 3 months. Ms. Watson stated that groundwater elevation measurements were completed at LHAAP-16 in May 2019 to evaluate groundwater flow. Ms. Watson stated that RA (O) sampling was completed at several sites in May 2019 (LHAAP-37, LHAAP-50, and LHAAP-67) and that RA (O) sampling was completed at LHAAP-58 and LHAAP-18/24 in June 2019. Ms. Watson stated that some repairs and maintenance were also completed at LHAAP-18/24.

Ms. Watson then discussed the documents in process currently. For LHAAP-03, the remedial design and RAWP for the excavation was approved in July 2019. Ms. Zeiler noted that the excavation at LHAAP-03 was planned for the Fall of 2019. Ms. Watson mentioned the ongoing ESD and Contingency RAWP previously discussed, the annual RA (O) Report for LHAAP-58, and the quarterly evaluation reports for the groundwater treatment plant (GWTP).

Excavation and Injection Field Work

Ms. Watson discussed the field work planned for the fall, which includes injections and excavations. Ms. Watson noted that the work plan for the soil excavation at LHAAP-03 is final. Ms. Watson explained that paperwork needs to be filed with the TCEQ for the EISB injections at LHAAP-04, which is in process. For LHAAP-16, Ms. Watson explained that there are monitoring wells that need to be installed, which have not been installed to date due to wet conditions. Ms. Watson stated that once the monitoring wells at LHAAP-16 are installed, baseline samples will be collected and then the EISB injections will be completed. At LHAAP-17, Ms. Watson explained that the site has an excavation component as well as groundwater extraction system installations. Ms. Watson stated that the contingency EISB injections for LHAAP-50 was also planned for implementation in the fall 2019. Ms. Zeiler noted that the field work is approximately 2 months in duration to which Ms. Watson concurred. Ms. Watson noted that the field work for LHAAP-16, LHAAP-17, and LHAAP-50 is behind schedule due primarily to the wet conditions over the past months. Ms. Zeiler pointed out that both LHAAP-16 and LHAAP-17 were sites under the dispute resolution so these sites are now moving forward with the remedy implementation. Ms. Zeiler also noted that LHAAP-03 and LHAAP-04 were also held up by the dispute, but now the remedies are being implemented at those sites. Mr. Nigel Shivers asked if the rain had held up many of these remedies being implemented. Ms. Zeiler responded that the rainfall had held up work especially at the sites near the creeks. Ms. Overdyke asked if the hope is for August to help dry the sites out to which Ms. Zeiler concurred.

Ms. Nemmers then discussed the 3 month look ahead for LHAAP field work. Ms. Nemmers stated that remedy implementation at LHAAP-03, LHAAP-04, LHAAP-16, LHAAP-17 and LHAAP-50 is the primary focus for the next 3 months along with groundwater monitoring to evaluate performance of remedies in place at sites. Ms. Nemmers stated that monitoring wells are planned for installation the following week to begin the implementation of the remedies. Ms. Nemmers stated that the current schedule is for the excavation work at LHAAP-17 and LHAAP-03 to be completed first followed by the injections in September. Ms. Nemmers stated that the field activities completed in the coming months would be presented at the October 2019 RAB meeting.

Ms. Nemmers stated that the RAWP for LHAAP-50 will be finalized once the new well is installed and the groundwater analytical results are received. Ms. Nemmers stated that the plan is also to complete the injections in the coming month at LHAAP-50. Ms. Nemmers indicated that LHAAP-58 was discussed at RAB meetings last year and that the remedy is in place. Currently, quarterly groundwater sampling of the western plume is ongoing. The RA (O) Report for LHAAP-58 will be prepared to evaluate the past year of sampling but Ms. Nemmers stated that the results look good so far. Ms. Nemmers stated that the quarterly evaluation reports for the GWTP are in process with the fourth quarter 2018 report having been issued. Ms. Nemmers noted that these GWTP reports also include the groundwater analytical results for LHAAP-16 and LHAAP-18/24, which is why they are listed in the site name next to the document on the slides.

Groundwater Treatment Plant

Ms. Nemmers stated that there were handouts with the information on the slides for the GWTP that provide more details. Ms. Nemmers pointed out that the chart depicts discharge of treated water that includes water from the INF Pond so the peaks and valleys of the chart do not necessarily represent problems with the GWTP. The increase in flow in a particular month is typically associated with discharge to the Bayou from the INF pond. Ms. Nemmers stated that there were no major issues with the GWTP since the RAB last met but repairs were made at LHAAP-18/24 for the water conveyance line. In addition, Ms. Nemmers noted that a pump for moving water to the air stripper needed to be repaired.

Surface Water Sampling

Ms. Nemmers presented the five locations sampled for surface water and stated that results are usually non-detect and well below the action level. Ms. Nemmers stated that there were no issues to note this past quarter. Ms. Nemmers stated that this information is also provided in a handout.

LHAAP-18/24, LHAAP-29, and LHAAP-47

Mr. Aaron Williams explained that HDR, Inc., has a separate contract for sites that do not have a ROD and is responsible for selection of the final remedy at three sites (LHAAP-18/24, LHAAP-29, and LHAAP-47). Mr. Williams explained that LHAAP-18/24 is now in the ROD phase. Mr. Williams stated that the draft ROD for LHAAP-18/24 is expected to go to the Regulators in September 2019 as the document is currently in Army review. Mr. Williams stated that the Draft Final ROD for LHAAP-29 was submitted to the Regulators on July 15, 2109. If the Regulators have no further

concerns, Mr. Williams indicated that the LHAAP-29 ROD will be ready for signatures on August 15, 2019. For LHAAP-47, Mr. Williams explained that an Addendum to the Post-Screening Investigation (PSI) Report was completed and submitted to the Regulators on July 1, 2019. Mr. Williams discussed that the four surface water samples, collected as part of the PSI Addendum, showed all results were below standards. Mr. Williams also noted that water levels were collected from monitoring wells sampled nearest the surface water samples to determine if the groundwater was contributing to Goose Prairie Creek, and that only one monitoring well had a groundwater elevation higher than the creek. Mr. Williams stated that the revised Draft ROD is planned for submittal to the Regulators in August 2019.

Mr. Williams stated that the Five Year Review (FYR) was completed in May 2019 and will be added to the AR. Mr. Williams stated that the FYR was completed to determine if the interim and final remedies at 12 LHAAP sites are or remain protective of human health and the environment. Mr. Williams stated that the conclusion of the FYR was that all of the remedies are protective or short-term protective. For sites that were short-term protective, recommendations were noted in the FYR. Mr. Williams stated that the recommendations are either being implemented or are in the process of being implemented. More specifically, Mr. Williams stated that the final remedy for LHAAP-16 is being implemented and the final ROD for LHAAP-18/24 is in process. Mr. Williams stated that many of the monitoring wells at LHAAP-46 are dry, but that the contractor is going to the site during heavy rain periods to determine if groundwater is present in the monitoring wells and sample, if so. This data collected, if able, will be used to evaluate declining trends during high recharge periods. Mr. Williams stated that the contingency remedy for LHAAP-50 is being implemented as discussed earlier in the meeting, and that the EISB remedy and performance monitoring at LHAAP-58 has already been completed. Mr. Williams stated that additional wells are being installed at LHAAP-12, LHAAP-50, and LHAAP-67 the following week if the sites remain dry. Mr. Williams pointed out the location for the new monitoring well at LHAAP-12, which is where monitoring well 12WW10 was previously located. The FYR pointed out that no well is located downgradient of the plume to evaluate if the plume is moving. Mr. Williams pointed out the two new monitoring well locations planned at LHAAP-67 to confine the plume boundary based upon 1,1-dichlorothene detections.

Mr. Shivers asked if the draft final ROD for LHAAP-29 had been submitted. Ms. April Palmie explained that the USEPA and TCEQ had issued comments and that if those comments were addressed satisfactorily, then the ROD will be routed for signature. Ms. Palmie explained that the ROD is within the middle of the 30-day review time frame for the regulators because the ROD was submitted on July 15, 2019. Mr. Shivers asked if there was a schedule for the signatures. Ms. Palmie explained that Ms. Zeiler usually obtains the signatures relatively quickly and that the USEPA is hoping the ROD will be finalized by September 30, 2019.

Next RAB Meeting Schedule and Closing Remarks

Ms. Zeiler then discussed the next meeting with the RAB members. It was decided that the next RAB Meeting will be held on **October 17, 2019,** with the **meeting starting at 6:00 pm CDT** at the Karnack Community Center. Ms. Zeiler requested public questions or topics to be discussed at the next RAB meeting.

Adjourn

Ms. VanDeventer made the motion to adjourn and Mr. Paul Fortune seconded the motion. The meeting adjourned at 5:41 pm CDT.

July 2019 Meeting Attachments and Handouts:

- Meeting Agenda
- Color Copy of Bhate Presentation Slides
- GWTP – Processed Groundwater Volumes Handout
- Surface Water Sampling Handout

Longhorn Army Ammunition Plant Quarterly Restoration Advisory Board Meeting

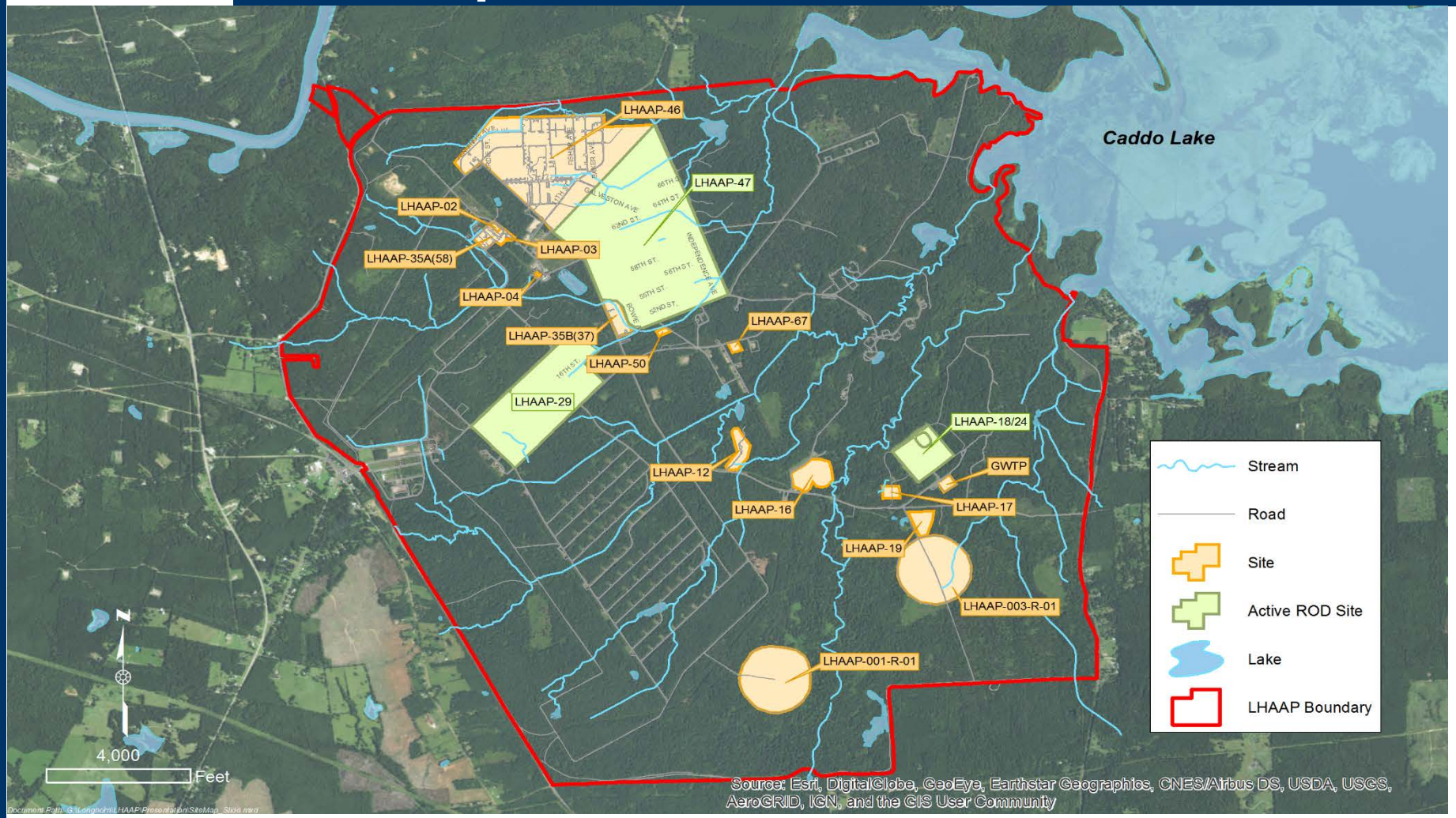
Karnack Community Center
July 25, 2019
6:00 PM CDT

APTIM

bhate

Restoration Advisory Board Meeting

Site Map



Abbreviations and Acronyms

µg/L	Micrograms per liter
DERP	Defense Environmental Restoration Program
ECP	Environmental Condition of Property
EISB	Enhanced In Situ Bioremediation
ESD	Explanation of Significant Differences
ft bgs	Feet below ground surface
GPW	Goose Prairie Creek Water Sample
GW-Res	Residential Groundwater
GWTP	Groundwater Treatment Plant
HBW	Harrison Bayou Water Sample
ISB	In-Situ Bioremediation
LHAAP	Longhorn Army Ammunition Plant
MNA	Monitored natural attenuation
PCL	Protective Concentration Level
PDI	Pre-Design Investigation
PSI	Pre-Screening Investigation
RAB	Restoration Advisory Board
RA(O)	Remedial Action Operation
RAWP	Remedial Action Work Plan
ROD	Record of Decision
TCE	Trichloroethylene
TCEQ	Texas Commission on Environmental Quality
TRRP	Texas Risk Reduction Program
USEPA	U.S. Environmental Protection Agency

Agenda

06:00 Welcome and Introduction
06:05 Open Items {RMZ}
- Purpose of the RAB Meeting
- Ongoing Outreach/Website
- RAB Administrative Issues
  - o Minutes (April 2019 RAB Meeting)

06:15 Defense Environmental Restoration Program (DERP) Update {Bhate}
- LHAAP-50 ESD to the September 2010 ROD
- Documents and Field Work Completed since last RAB
- Upcoming Excavation and Injection Field Work
- Three Month Look ahead
- Groundwater Treatment Plant (GWTP) Update

06:45 Other Defense Environmental Restoration Program (DERP) Update {RMZ}
- LHAAP-18/24 Record of Decision and Responsiveness Summary
- LHAAP-29 Record of Decision and Responsiveness Summary
- LHAAP-47 Record of Decision and Responsiveness Summary
- Five Year Review Update – Recommendations for Sites 12, 50 and 67

06:55 Next RAB Meeting Schedule and Closing Remarks {RMZ}

Purpose of the RAB Meeting

- Held every 3 months
- The mission of the Longhorn Army Ammunition Plant (LHAAP) RAB is to promote community awareness and obtain constructive community review and comments on environmental restoration activities at the former LHAAP

The Army Wants You to be Informed

- The Army is committed to protecting human health and the environment; key to that commitment is engaging the community and increasing public participation in environmental restoration at LHAAP

- You are encouraged to:
  - Attend RAB Meetings and/or become a member of the RAB
  - Visit the Longhorn environmental website at www.longhornaap.com
    - Website is regularly updated to indicate the upcoming field events at each site including groundwater sampling, monitoring well installations, soil sampling, or remediation activities
  - Make suggestions for improving communication – the Army welcomes and appreciates community feedback

RAB Administrative Issues

- Welcome our newest RAB Members
  - Sharron McAvoy
  - Deon Hall
  - John R. Fortune
- Current RAB Members
  - Judy VanDeventer
  - Tom Walker
  - Charles Dixon
  - Carol Fortune
  - Sharron McAvoy
  - Deon Hall
  - John R. Fortune
  - Paul Fortune
  - John Pollard, Jr.
  - Richard LeTourneau
  - Terry Britt
  - Nigel Shivers
- Discussion of April 2019 RAB Meeting minutes/motion to accept

Restoration Advisory Board Meeting

LHAAP-50 ESD to September 2010 ROD

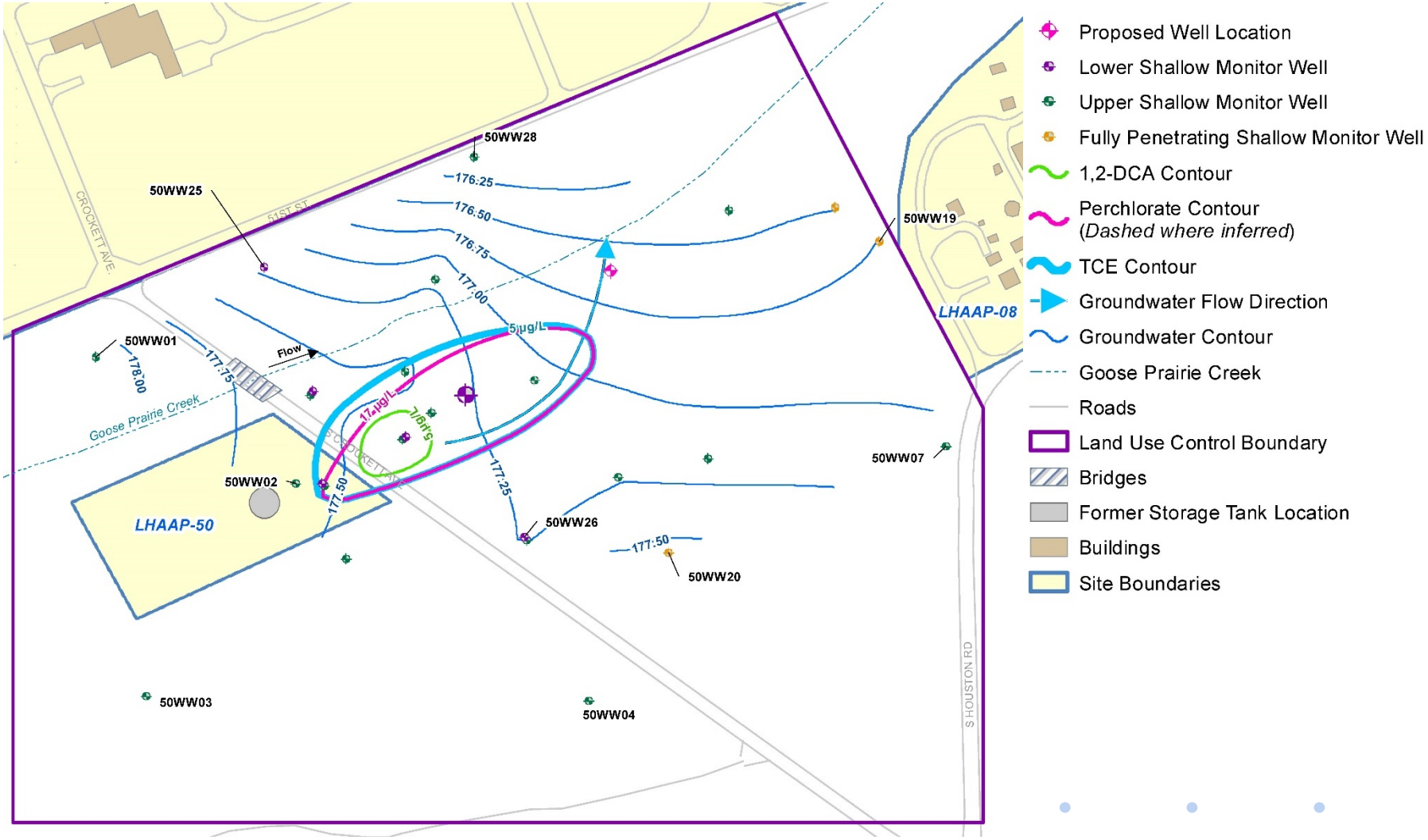
- **Site Background**
  - LHAAP-50 had a 47,000-gallon aboveground storage tank receiving industrial wastewater from various production sumps throughout LHAAP between 1955 and 1988
  - After solids were filtered, the water was discharged to Goose Prairie Creek
  - Constituents of concern at LHAAP-50 were chlorinated solvents and perchlorate in groundwater and perchlorate in soil
  - The selected remedy in the 2010 Record of Decision (ROD) was monitored natural attenuation (MNA), excavation of soil to eliminate groundwater contamination from contaminated soil, and land use controls as the remedy for groundwater. The ROD also included a contingency remedy for groundwater if MNA was not effective.
- **Groundwater Remedial Action Operation (RA[O]) Monitoring**
  - RA(O) groundwater Monitoring began in 2013
  - In 2018, MNA was found to be ineffective based on evaluation of several lines of evidence
  - The first line of evidence is based on contaminant concentrations
  - Concentrations of trichloroethylene (TCE) and perchlorate increased from 2013 to 2018, and the TCE plume has expanded beyond its baseline footprint

LHAAP-50 ESD to September 2010 ROD

- **Explanation of Significant Differences**
  - The Army, USEPA, and TCEQ agree that the contaminant plume has expanded in groundwater at LHAAP-50 and that a contingency remedy to enhance MNA is needed to address the chlorinated solvents and perchlorate in groundwater
  - To initiate the contingency remedy, an ESD to the approved ROD is required
  - The Draft ESD, proposing in situ bioremediation as a contingency remedy, was submitted for regulatory review in April 2018 and comment resolution is ongoing
  - A Contingency Remedial Action Work Plan (RAWP) is being prepared for the implementation of the contingency remedy
  - One additional shallow zone groundwater monitoring well is proposed to better define the plume as part of the contingency remedial action
  - Implementation of the Contingency RAWP is anticipated in Fall 2019

Restoration Advisory Board Meeting

LHAAP-50 New Well Location



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Completed Field Work Since Last RAB Meeting

Site	Activity
LHAAP-16	Groundwater Elevation Measurements – May 2019
LHAAP-37	RA(O) Sampling – May 2019
LHAAP-50	RA(O) Sampling – May 2019
LHAAP-58	RA(O) Sampling –June 2019
LHAAP-67	RA(O) Sampling – May 2019
LHAAP-18/24	RA(O) Sampling – June 2019 and maintenance/repairs

Restoration Advisory Board Meeting

Documents in Process

Site	Document
LHAAP-03	Remedial Design and RAWP (Approved July 2019)
LHAAP-50	ESD Contingency RAWP
LHAAP-58	Annual RA(O) Report
GWTP	Quarterly Evaluation 4th Quarter (October - December 2018) Quarterly Evaluation 1st Quarter (January – March 2019) Quarterly Evaluation 2nd Quarter (April – June 2019)

Excavation and Injection Field Work

- **Planned Major Remedial Field Work Activities for Summer/Fall 2019**
  - **LHAAP-03 Soil Excavation**
  - **LHAAP-04 ISB Injections**
  - **LHAAP-16 Well Installations and In Situ Bioremediation (ISB) Injections**
  - **LHAAP-17 Excavation and Groundwater Extraction System Installation**
  - **LHAAP-50 Contingency ISB Injections**
- **Challenges**
  - **Key LHAAP-16 well installations delayed by wet conditions along Harrison Bayou**
  - **LHAAP-17 excavation area requires dryer conditions to allow large trucks and equipment to access site**
  - **LHAAP-50 injection plan is dependent upon data from a new well, which cannot be installed until the site dries out**

Restoration Advisory Board Meeting

3 Month Look Ahead - Field Work by Bhate Team

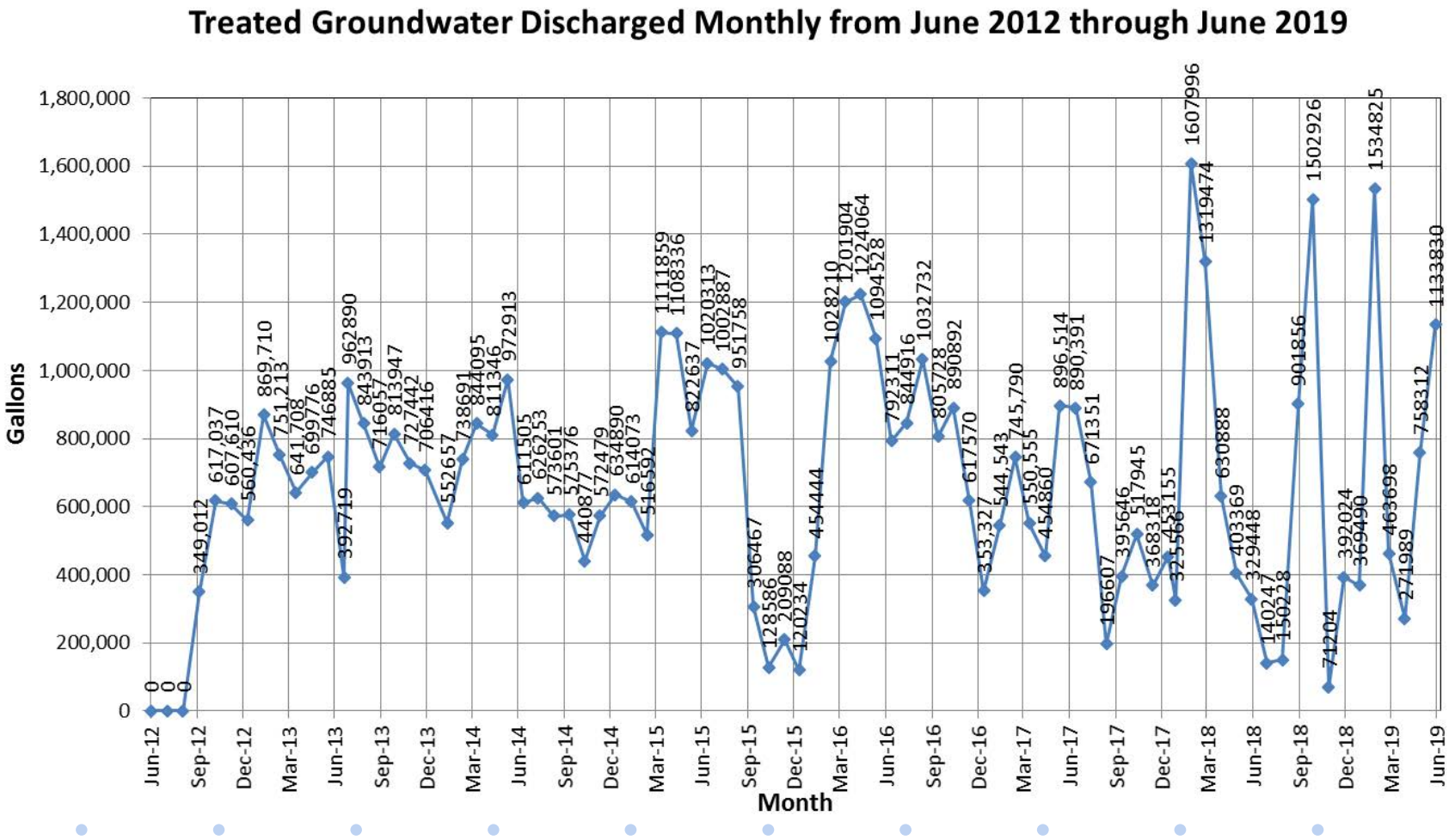
Site	Activity
LHAAP-03	Complete soil excavation
LHAAP-04	Complete ISB injections
LHAAP-16	Complete well installations and ISB injections
LHAAP-17	Complete soil excavation and extraction system installation
LHAAP-37	RA(O) Sampling – August 2019
LHAAP-58	RA(O) Sampling – September 2019

3 Month Look Ahead – Documents by Bhate Team

Site	Document
LHAAP-50	Explanation of Significant Differences Remedial Action Work Plan
LHAAP-58	RA(O) Report
GWTP, LHAAP-16, and LHAAP-18/24	Quarterly Evaluation Report: Fourth Quarter (October – December) 2018 Quarterly Evaluation Report: First Quarter (January – March 2019) Quarterly Evaluation Report: Second Quarter (April – June 2019)

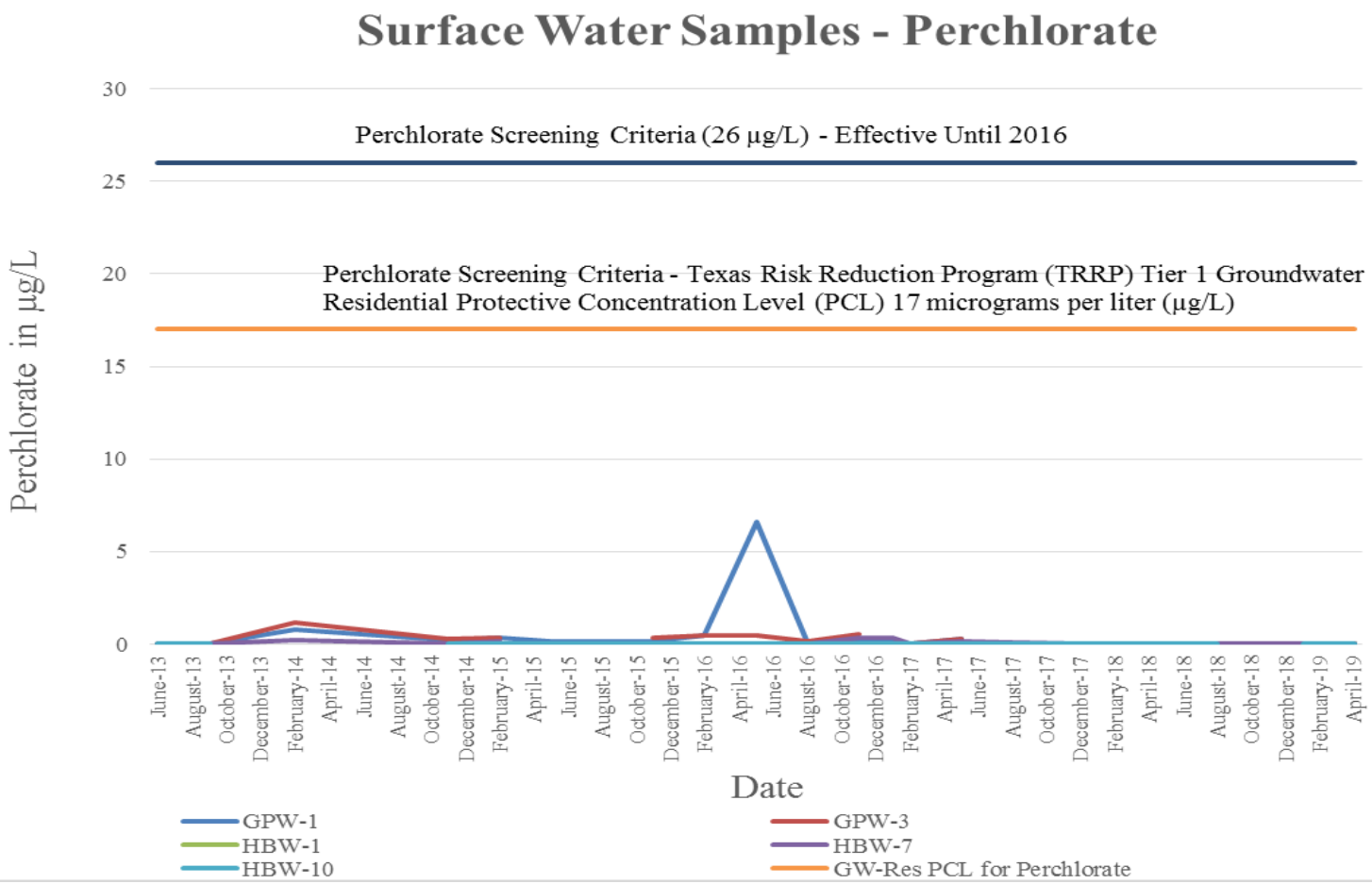
Restoration Advisory Board Meeting

GWTP Update

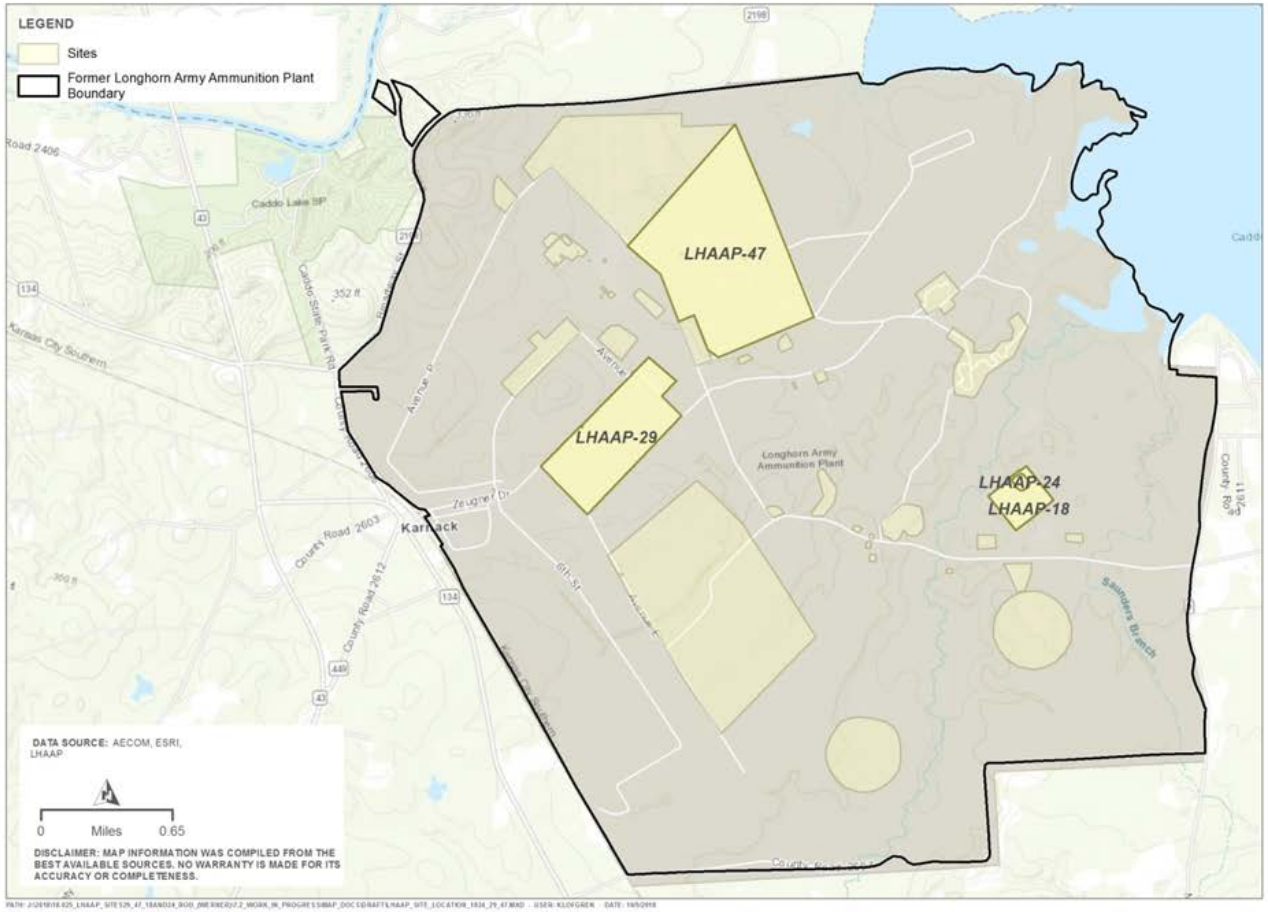


Restoration Advisory Board Meeting

Surface Water Sample Results

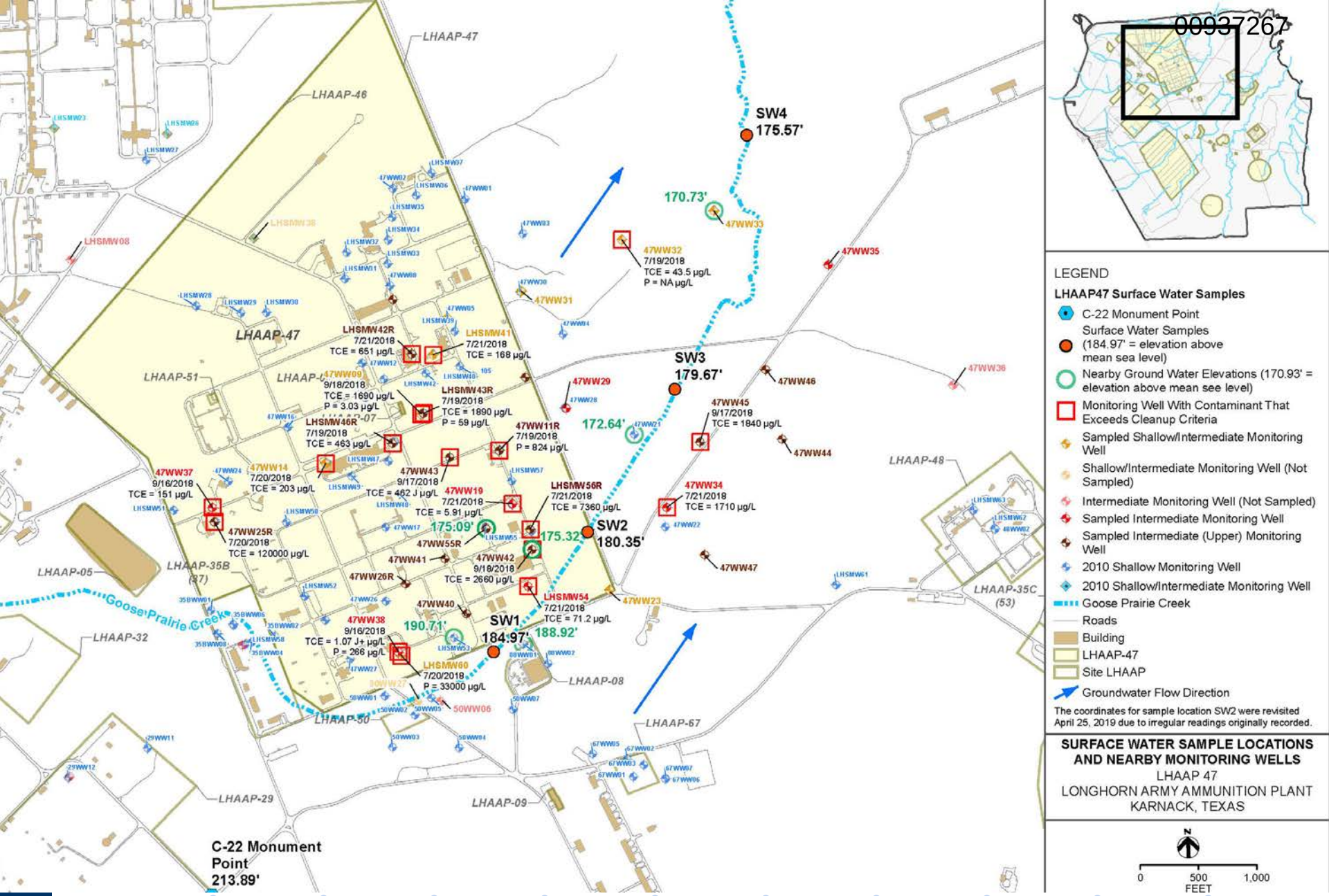


LHAAP-18/24, 29, 47 Status Update



LHAAP-18/24, 29 & 47 HDR Document Status

- **LHAAP-18/24**
  - **Draft Record of Decision submittal planned for September 2019**
- **LHAAP-29**
  - **Draft Final Record of Decision submitted to Regulators on July 15, 2019**
- **LHAAP-47**
  - **Draft Addendum Post Screening Investigation Report submitted to regulators on July 1, 2019**
  - **Revised Draft Final Record of Decision planned for August 2019**


00937267
LHAAP-47
LHAAP-46
LHAAP-51
LHAAP-07
LHAAP-05
LHAAP-35B (37)
LHAAP-32
LHAAP-50
LHAAP-29
LHAAP-09
LHAAP-08
LHAAP-67
LHAAP-48
LHAAP-35C (53)
Goose Prairie Creek
SW4
175.57'
SW3
179.67'
SW2
180.35'
SW1
184.97'
170.73'
172.64'
175.09'
175.32'
190.71'
188.92'
47WW32
7/19/2018
TCE = 43.5 µg/L
P = NA µg/L
LHSMW42R
7/21/2018
TCE = 651 µg/L
LHSMW41
7/21/2018
TCE = 168 µg/L
47WW09
9/18/2018
TCE = 1690 µg/L
P = 3.03 µg/L
LHSMW43R
7/19/2018
TCE = 1890 µg/L
P = 59 µg/L
LHSMW46R
7/19/2018
TCE = 463 µg/L
47WW11R
7/19/2018
P = 824 µg/L
47WW43
9/17/2018
TCE = 462 J µg/L
47WW37
9/16/2018
TCE = 151 µg/L
47WW14
7/20/2018
TCE = 203 µg/L
47WW25R
7/20/2018
TCE = 120000 µg/L
47WW19
7/21/2018
TCE = 5.91 µg/L
47WW55R
47WW41
47WW26R
47WW42
9/18/2018
TCE = 2660 µg/L
LHSMW56R
7/21/2018
TCE = 7360 µg/L
LHSMW54
7/21/2018
TCE = 71.2 µg/L
47WW40
47WW38
9/16/2018
TCE = 1.07 J+ µg/L
P = 286 µg/L
LHSMW60
7/20/2018
P = 33000 µg/L
47WW45
9/17/2018
TCE = 1840 µg/L
47WW34
7/21/2018
TCE = 1710 µg/L
C-22 Monument Point
213.89'
LEGEND
LHAAP47 Surface Water Samples
C-22 Monument Point
Surface Water Samples (184.97' = elevation above mean sea level)
Nearby Ground Water Elevations (170.93' = elevation above mean see level)
Monitoring Well With Contaminant That Exceeds Cleanup Criteria
Sampled Shallow/Intermediate Monitoring Well
Shallow/Intermediate Monitoring Well (Not Sampled)
Intermediate Monitoring Well (Not Sampled)
Sampled Intermediate Monitoring Well
Sampled Intermediate (Upper) Monitoring Well
2010 Shallow Monitoring Well
2010 Shallow/Intermediate Monitoring Well
Goose Prairie Creek
Roads
Building
LHAAP-47
Site LHAAP
Groundwater Flow Direction
The coordinates for sample location SW2 were revisited April 25, 2019 due to irregular readings originally recorded.
SURFACE WATER SAMPLE LOCATIONS AND NEARBY MONITORING WELLS
LHAAP 47
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS
N
0
500
1,000
FEET

LHAAP 2019 Five Year Review Summary

Purpose: Evaluate whether the Interim Remedial Action or Final Remedial Actions implemented at twelve LHAAP sites are or remain protective of human health and the environment

Sites Evaluated: LHAAP-12, LHAAP-16, LHAAP-18/24, LHAAP-37, LHAAP-46, LHAAP-49, LHAAP-50, LHAAP-58, LHAAP-67, LHAAP-001-R-01, LHAAP-003-R-01 and LHAAP-004-R-01

Conclusions: The remedial actions for all sites are either protective or short-term protective

For sites that were found to be short-term protective, issues were identified that could affect future protectiveness

Recommendations to address issues include: implement the final remedy (LHAAP-16 and LHAAP-18/24), evaluate declining trends during high recharge periods (LHAAP-46), implement contingency remedy (LHAAP-50), implement EISB performance monitoring (LHAAP-58), install additional well/wells (LHAAP-12 and LHAAP-67)

LHAAP Five Year Review Summary

LOCATION MAP

- Caddo Lake Wildlife Management Area
- Caddo Lake State Park
- Sites Under Review
- Former Installation Boundary
- Stream/Bayou

TITLE

Evaluated Sites in the 2019 Five Year Review

Longhorn Army Ammunition Plant
Figure 1

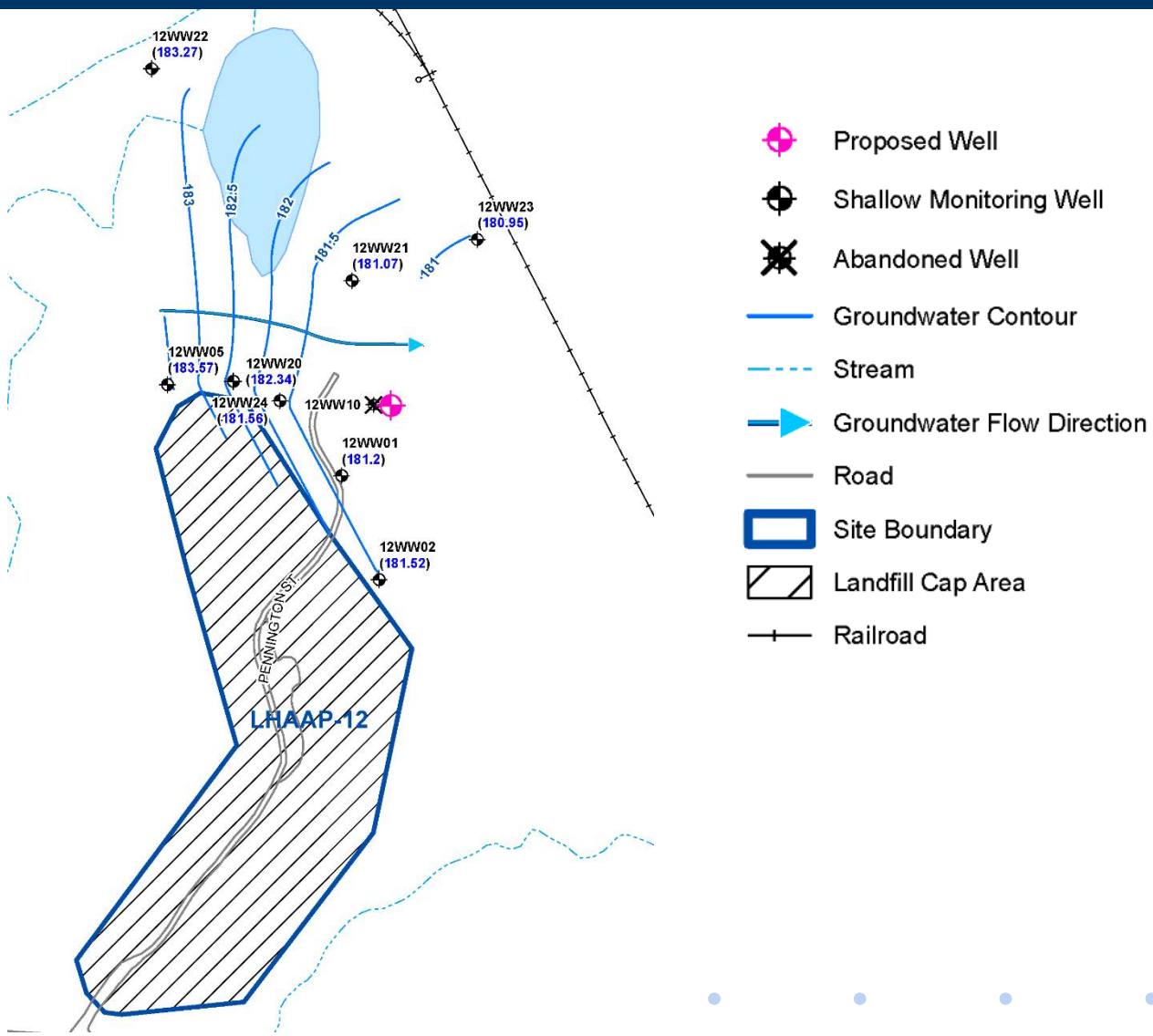
FIGURE 1

0 2,500 5,000

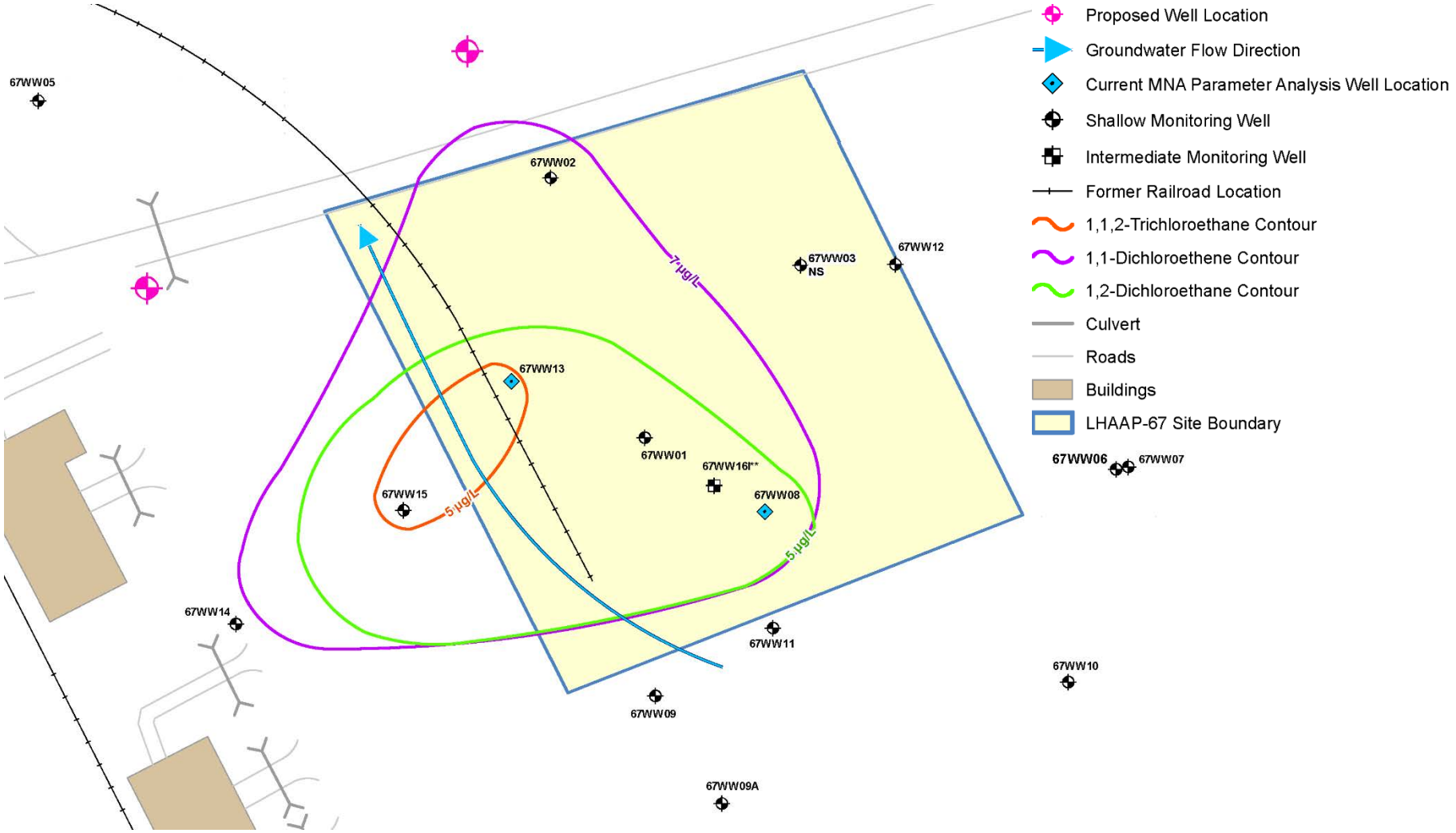
LHAAP-12, -50, and -67 Recommendations

- LHAAP-12 FYR Recommendation:
  - Establish a well network that captures seasonal and spatial variations in Chemical of Concern-impacted groundwater flow direction by adding a well to the southeast.
- LHAAP-50 FYR Recommendation:
  - Implement Enhanced In Situ Bioremediation (EISB) performance monitoring and assess if additional monitoring wells are required to delineate the plume to the south and southwest.
- LHAAP-67 Recommendation:
  - Evaluate data in the north area of the plume to determine if temporary exceedances indicate plume migration or require extension of the plume boundary well monitoring system

LHAAP-12 New Monitoring Well Location



LHAAP-67 New Monitoring Well Locations



Next RAB Meeting Schedule & Closing Remarks

- Schedule October 2019 RAB Meeting
- Other Issues/Remarks
- Thank you for coming

Groundwater Treatment Plant - Processed Groundwater Volumes

The amount of groundwater treated is determined by measuring the number of gallons of processed water discharged.

Processed Water Discharged Data

(in gallons)

Oct-07	Nov-07	Dec-07	Jan-08	Feb-08	Mar-08	Apr-08	May-08	Jun-08	Jul-08	Aug-08	Sep-08
1,041,491	848,356	804,822	792,148	665,883	818,872	791,306	568,812	776,904	748,377	690,052	617,199

Oct-08	Nov-08	Dec-08	Jan-09	Feb-09	Mar-09	Apr-09	May-09	Jun-09	Jul-09	Aug-09	Sep-09
655,059	619,274	726,118	552,299	598,144	433,800	488,807	526,958	387,644	0	414,853	735,716

Oct-09	Nov-09	Dec-09	Jan-10	Feb-10	Mar-10	Apr-10	May-10	Jun-10	Jul-10	Aug-10	Sep-10
808,322	636,306	727,492	391,898	695,343	802,656	894,731	962,121	1,257,977	1,314,924	1,041,495	1,136,547

Oct-10	Nov-10	Dec-10	Jan-11	Feb-11	Mar-11	Apr-11	May-11	Jun-11	Jul-11	Aug-11	Sep-11
956,567	705,805	849,712	811,679	668,281	1,090,348	817,325	900,338	916,552	784,369	652,524	733,456

Oct-11	Nov-11	Dec-11	Jan-12	Feb-12	Mar-12	Apr-12	May-12	Jun-12	Jul-12	Aug-12	Sep-12
748,102	658,250	684,903	865,453	725,000*	730,000*	980,000*	630,000*	0	0	0	349,012

Oct-12	Nov-12	Dec-12	Jan-13	Feb-13	Mar-13	Apr-13	May-13	Jun-13	Jul-13	Aug-13	Sep-13
617,037	607,610	560,436	869,710	751,213	641,708	699,776	746,885	392,719	962,890	843,913	716,057

Oct-13	Nov-13	Dec-13	Jan-14	Feb-14	Mar-14	Apr-14	May-14	Jun-14	Jul-14	Aug-14	Sep-14
813,974	727,442	706,416	552,657	738,691	844,095	811,346	972,913	611,505	626,253	573,601	575,376

Oct-14	Nov-14	Dec-14	Jan-15	Feb-15	Mar-15	Apr-15	May-15	Jun-15	Jul-15	Aug-15	Sep-15
440,877	572,479	634,890	614,073	516,592	1,111,859	1,108,336	822,637	1,020,313	1,002,887	951,758	306,467

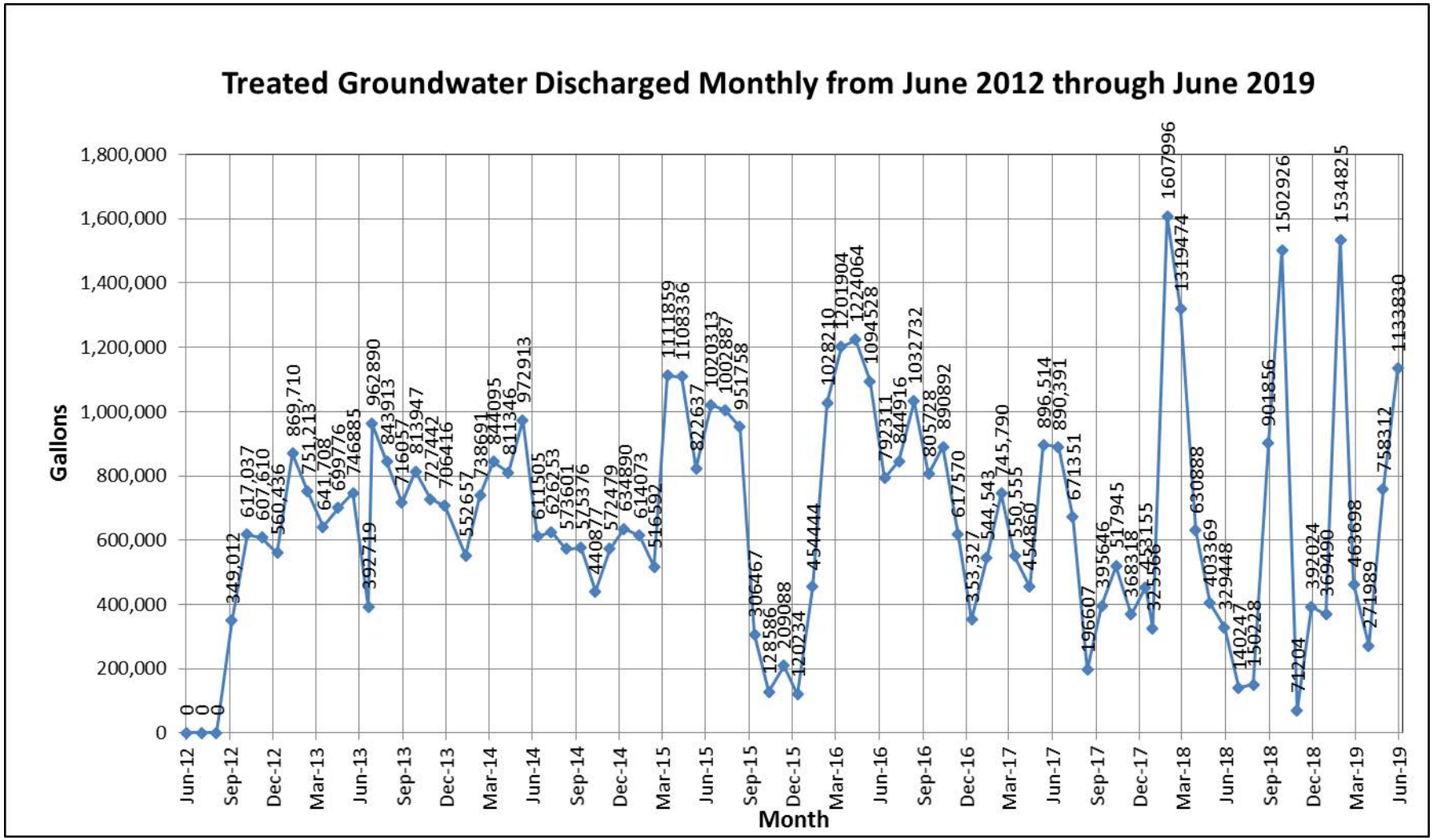
Oct-15	Nov-15	Dec-15	Jan-16	Feb-16	Mar-16	Apr-16	May-16	Jun-16	Jul-16	Aug-16	Sep-16
128,586	209,088	120,234	454,444	1,028,210	1,201,904	1,224,064	1,094,528	792,311	844,916	1,032,732	805,728

Oct-16	Nov-16	Dec-16	Jan-17	Feb-17	Mar-17	Apr-17	May-17	Jun-17	Jul-17	Aug-17	Sep-17
890,892	617,570	353,327	544,543	745,790	550,555	454,860	896,514	890,391	528,538	195,198	961,324

Oct-17	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul - 18	Aug-18	Sep-18
517,945	368,318	453,155	325,566	1,607,996	1,319,474	630,888	403,369	329,448	140,247	150,228	901,856

Oct-18	Nov-18	Dec-18	Jan-19	Feb-19	Mar-19	Apr-19	May-19	June-19
1,502,926	71,204	392,024	369,490	1,534,825	463,698	271,989	758,312	1,133,830

*Indicates Estimate


Treated Groundwater Discharged Monthly from June 2012 through June 2019
Gallons
Month
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Jun-12
Sep-12
Dec-12
Mar-13
Jun-13
Sep-13
Dec-13
Mar-14
Jun-14
Sep-14
Dec-14
Mar-15
Jun-15
Sep-15
Dec-15
Mar-16
Jun-16
Sep-16
Dec-16
Mar-17
Jun-17
Sep-17
Dec-17
Mar-18
Jun-18
Sep-18
Dec-18
Mar-19
Jun-19
0
0
0
349,012
617,037
607,610
560,436
869,710
751,213
641,708
699,776
746,885
392,719
962,890
843,913
716,057
813,947
727,442
706,416
552,657
738,691
844,095
811,346
972,913
611,505
626,253
573,601
575,376
440,877
572,479
634,890
614,073
516,592
1,111,859
1,108,336
822,637
1,020,313
1,002,887
951,758
306,467
128,586
209,088
120,234
454,444
1,028,210
1,201,904
1,224,064
1,094,528
792,311
844,916
1,032,732
805,728
890,892
617,570
353,327
544,543
745,790
550,555
454,860
896,514
890,391
671,351
196,607
395,646
517,945
368,318
453,155
325,566
1,607,996
1,319,474
630,888
403,369
329,448
140,247
150,228
901,856
1,502,926
71,204
392,024
369,490
1,534,825
463,698
271,989
758,312
1,133,830

Water Discharge Location and Volume (Gallons)

Month	Total Combined to Harrison Bayou	LHAAP-18/24 Sprinklers	GWTP To INF Pond	INF Pond to Harrison Bayou	Contract Hauled Off-Site
Dec-16	0	236,688	0	0	0
Jan-17	0	0	0	0	0
Feb-17	0	0	0	0	14,355
Mar-17	127,242	0	0	0	14,400
Apr-17	113,038	0	236,821	0	0
May-17	0	0	534,155	0	0
Jun-17	958,404	0	294,550	490,574	0
Jul-17	0	0	528,538	0	0
Aug-17	0	0	195,197	0	0
Sep-17	651,434	0	309,980	651,434	0
Oct-17	0	0	517,945	0	0
Nov-17	0	0	368,318	0	0
Dec-17	560,350	0	453,155	560,350	0
Jan-18	325,566	0	253,177	325,566	0
Feb-18	1,607,996	0	62,017	1,430,634	0
Mar-18	1,319,474	0	0	870,816	0
Apr-18	630,888	0	0	630,888	0
May-18	403,369	0	0	403,369	0
Jun-18	193,669	0	135,779	0	0
Jul -18	0	0	140,247	0	0
Aug -18	49,409	0	100,819	0	0
Sep-18	585,397	0	316,459	524,484	0
Oct-18	1,409,106	0	93,820	1,016,285	0
Nov-18	71,204	0	0	0	0
Dec-18	392,024	0	0	0	0
Jan-19	369,490	0	0	369,490	0
Feb-19	1,534,825	0	0	1,326,485	0
Mar-19	463,698	0	0	83,250	0
Apr-19	271,989	0	0	0	0
May-19	758,312	0	0	253,817	0

Month	Total Combined to Harrison Bayou	LHAAP-18/24 Sprinklers	GWTP To INF Pond	INF Pond to Harrison Bayou	Contract Hauled Off-Site
Jun-19	1,133,830	0	0	847,918	0

Harrison Bayou and Goose Prairie Creek – Perchlorate Data

Surface water samples are collected quarterly from each location in Harrison Bayou and Goose Prairie Creek, unless the sampling location is dry.

Surface Water Sample Data (in micrograms per liter)

Quarter	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st
Creek Sample ID	**Jul 1999**	**Sep 1999**	**Feb 2000**	**Apr 2000**	**Aug 2000**	**Dec 2000**	**Feb 2001**	**Apr 2001**	**July 2001**	**Oct 2001**	**Jan 2002**
GPW-1	<1.0U	-	4	<4.0 U	<4.0 U	<4.0 U	-	2.65	<4.0 U	<4.0 U	<4.0 U
GPW-3	<1.0U	<4.0 U	17	8	<4.0 U	<4.0 U	-	2.28	<4.0 U	<4.0 U	<4.0 U
HBW-1	-	<80.0 U	310	23	-	-	<4.0 U	-	<4.0 U	<4.0 U	<4.0 U
HBW-7	-	<8.0 U	370	110	-	-	<4.0 U	-	<4.0 U	<4.0 U	<4.0 U
HBW-10	-	<8.0 U	905	650	<4.0 U	-	<4.0 U	-	<4.0 U	-	-

Quarter	2nd	3rd	4th	1st	2nd	3rd	3rd	4th	2nd	3rd	4th
Creek Sample ID	**June 2002**	**Sept 2002**	**Dec 2002**	**Feb 2003**	**June 2003**	**Aug 2003**	**July 2004**	**Dec 2006**	**May 2007**	**Aug 2007**	**Dec 2007**
GPW-1	<4.0 U	<4.0 U	18.3	18.6	59.9	-	2.25	-	<1.0 U	<1.0 U	10.7
GPW-3	<4.0 U	<4.0 U	5.49	12.6	14.7	-	2.2	-	<1.0 U	<1.0 U	7.48
HBW-1	<4.0 U	<4.0 U	<4.0 U	-	<4.0 U	99.3	<0.2U	<1.0 U	<1.0 U	122	<1.0 U
HBW-7	<4.0 U	<4.0 U	<4.0 U	-	<4.0 U	<4.0 U	<0.2U	<1.0 U	<1.0 U	1.02	<1.0 U
HBW-10	<4.0 U	<4.0 U	<4.0 U	-	<4.0 U	-	<0.2U	<1.0 U	<1.0 U	<1.0 U	<1.0 U

Quarter	1st	2nd	3rd	4th	2nd	3rd	3rd	3rd	4th	1st	2nd
Creek Sample ID	**Mar 2008**	**Jun 2008**	**Sep 2008**	**Dec 2008**	**May 2009**	**Jul 2009**	**Aug 2009**	**Sep 2009**	**Dec 2009**	**Mar 2010**	**Jun 2010**
GPW-1	27	<0.5U	<0.5U	<0.22U	16	<4U	NS	<1.2U	3.7	1.3J	<0.6U
GPW-3	21.9	9.42	1.1	<0.22U	8.9	<4U	NS	<0.6U	2.8	1.8J	<0.6U
HBW-1	<0.5U	<0.5U	<0.5U	<0.22U	<0.55U	<4U	NS	<1.5U	<0.275U	1.5U	<0.6U
HBW-7	<0.5U	<0.5U	<0.5U	<0.22U	<0.55U	<4U	24	<1.2U	<0.275U	1.5U	<0.6U
HBW-10	<0.5U	<0.5U	<0.5U	<0.22U	<0.55U	<4U	NS	<1.5U	<0.275U	1.2U	<0.6U

Quarter	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st
Creek Sample ID	**Sep 2010**	**Dec 2010**	**Mar 2011**	**Jun 2011**	**Sep 2011**	**Dec 2011**	**Mar 2012**	**Jun 2012**	**Not Applicable**	**Jan & Feb 2013**	**Mar 2013**
GPW-1	dry	<0.1U	8.7	dry	dry	1.76	0.163J	dry	NS	1.65	0.735
GPW-3	dry	0.199J	0.673	dry	dry	1.31	0.261	dry	NS	1.74	0.754
HBW-1	dry	<0.1U	<0.2U	dry	dry	<0.1U	0.1U	dry	NS	<0.2U	<0.2U
HBW-7	dry	<0.1U	<0.2U	dry	dry	0.171J	0.1U	dry	NS	<0.2U	<0.2U
HBW-10	dry	<0.1U	<0.2U	dry	dry	<0.1U	0.1U	dry	NS	<0.2U	<0.2U

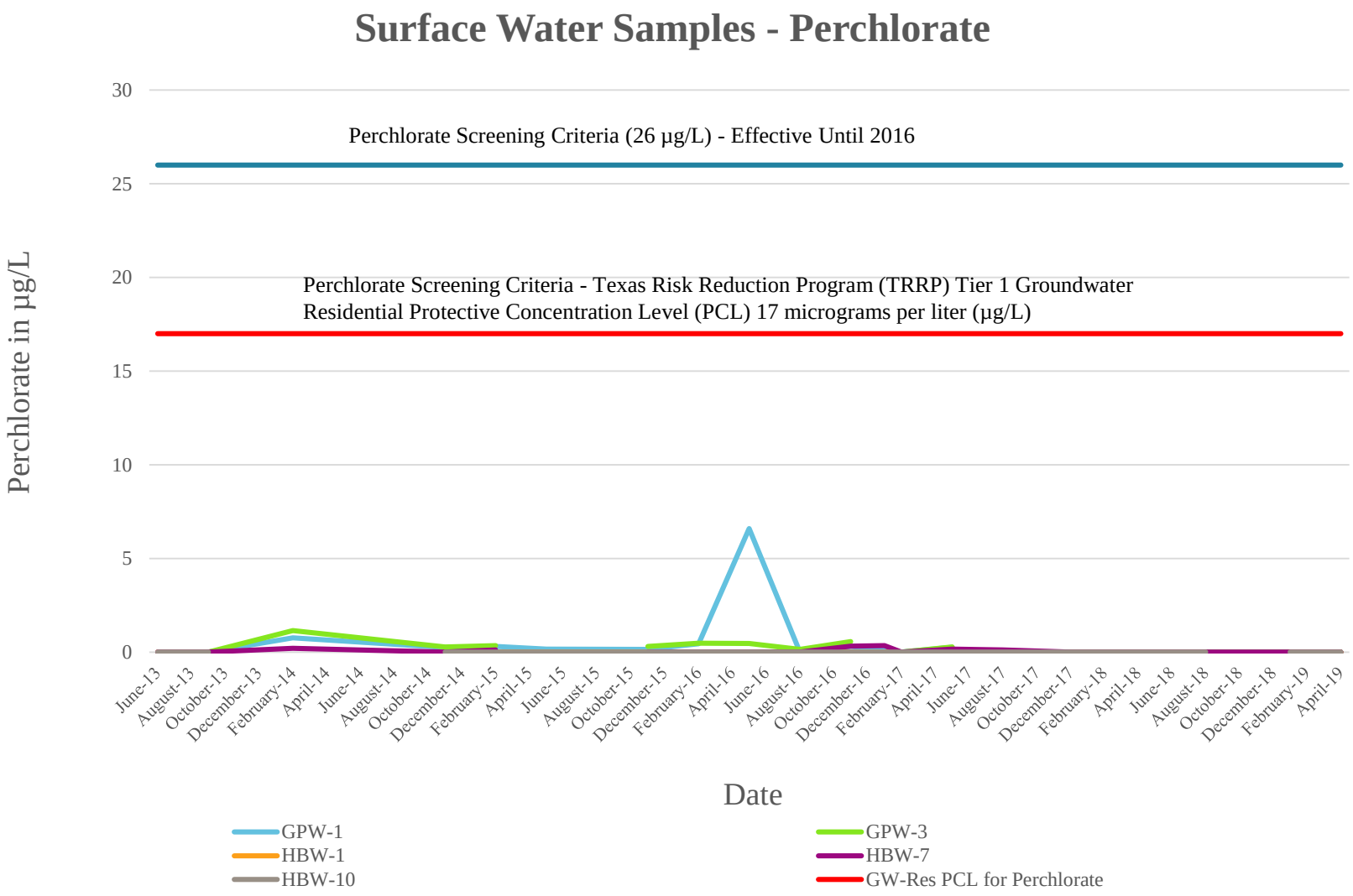
Quarter	2nd	3rd	4th	1st	2nd	3nd	4th	1st	2nd	3rd	4th
Creek Sample ID	**Jun 2013**	**Sept 2013**	**Dec 2013**	**Feb 2014**	**May 2014**	**Aug 2014**	**Nov 2014**	**Feb 2015**	**May 2015**	**Aug 2015**	**Nov 2015**
GPW-1	dry	<0.2 U	dry	0.766	dry	dry	0.244 J	0.311 J	0.156J	dry	0.142 J
GPW-3	dry	<0.2 U	dry	1.15	dry	dry	0.276 J	0.344 J	dry	dry	0.311 J
HBW-1	<0.2U	<0.2 U	dry	<0.2 U	dry	dry	<0.2 U	<0.2 U	dry	dry	<0.2 U
HBW-7	<0.2U	<0.2 U	dry	0.201 J	dry	dry	<0.2 U	0.124 J	dry	dry	<0.2 U
HBW-10	<0.2U	<0.2 U	dry	<0.2 U	dry	dry	<0.2 U	<0.2 U	dry	dry	<0.2 U

Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd
Creek Sample ID	**Feb 2016**	**May 2016**	**Aug 2016**	**Nov 2016**	**Feb 2017**	**May 2017**	**Aug 2017**	**Dec 2017**	**Mar 2018**	**June 2018**	**August 2018**
GPW-1	0.447	6.59	<0.2 U	0.301 J	<1 U	0.263	dry	<4.0 U	<4.0 U	dry	<2.0 U
GPW-3	0.474	0.457	0.141	0.563	<1 U	0.274	dry	<4.0 U	<4.0 U	dry	<2.0 U
HBW-1	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<1 U	<0.2 U	<0.2 U	1.1 J	<4.0 U	dry	<2.0 U
HBW-7	<0.2 U	<0.2 U	<0.2 U	0.318 J	<1 U	0.155	<0.2 U	<4.0 U	<4.0 U	dry	<2.0 U
HBW-10	<0.2 U	<0.2 U	<0.2 U	<0.2 U	<1 U	<0.2 U	0.111J	<4.0 U	<4.0 U	dry	<2.0 U

NS – not sampled U – non-detect J – Estimated Dry – no surface water

Quarter	4th	1st	2nd
Creek Sample ID	Oct 2018	Jan 2019	April 2019
GPW-1	<2.0 U	<2.0 U	<2.0 U
GPW-3	<2.0 U	<2.0 U	<2.0 U
HBW-1	<2.0 U	<2.0 U	<2.0 U
HBW-7	<2.0 U	<2.0 U	<2.0 U
HBW-10	<2.0 U	<2.0 U	<2.0 U

NS – not sampled U – non-detect J – Estimated Dry – no surface water


Surface Water Samples - Perchlorate
Perchlorate in µg/L
30
25
20
15
10
5
0
Perchlorate Screening Criteria (26 µg/L) - Effective Until 2016
Perchlorate Screening Criteria - Texas Risk Reduction Program (TRRP) Tier 1 Groundwater
Residential Protective Concentration Level (PCL) 17 micrograms per liter (µg/L)
June-13
August-13
October-13
December-13
February-14
April-14
June-14
August-14
October-14
December-14
February-15
April-15
June-15
August-15
October-15
December-15
February-16
April-16
June-16
August-16
October-16
December-16
February-17
April-17
June-17
August-17
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December-17
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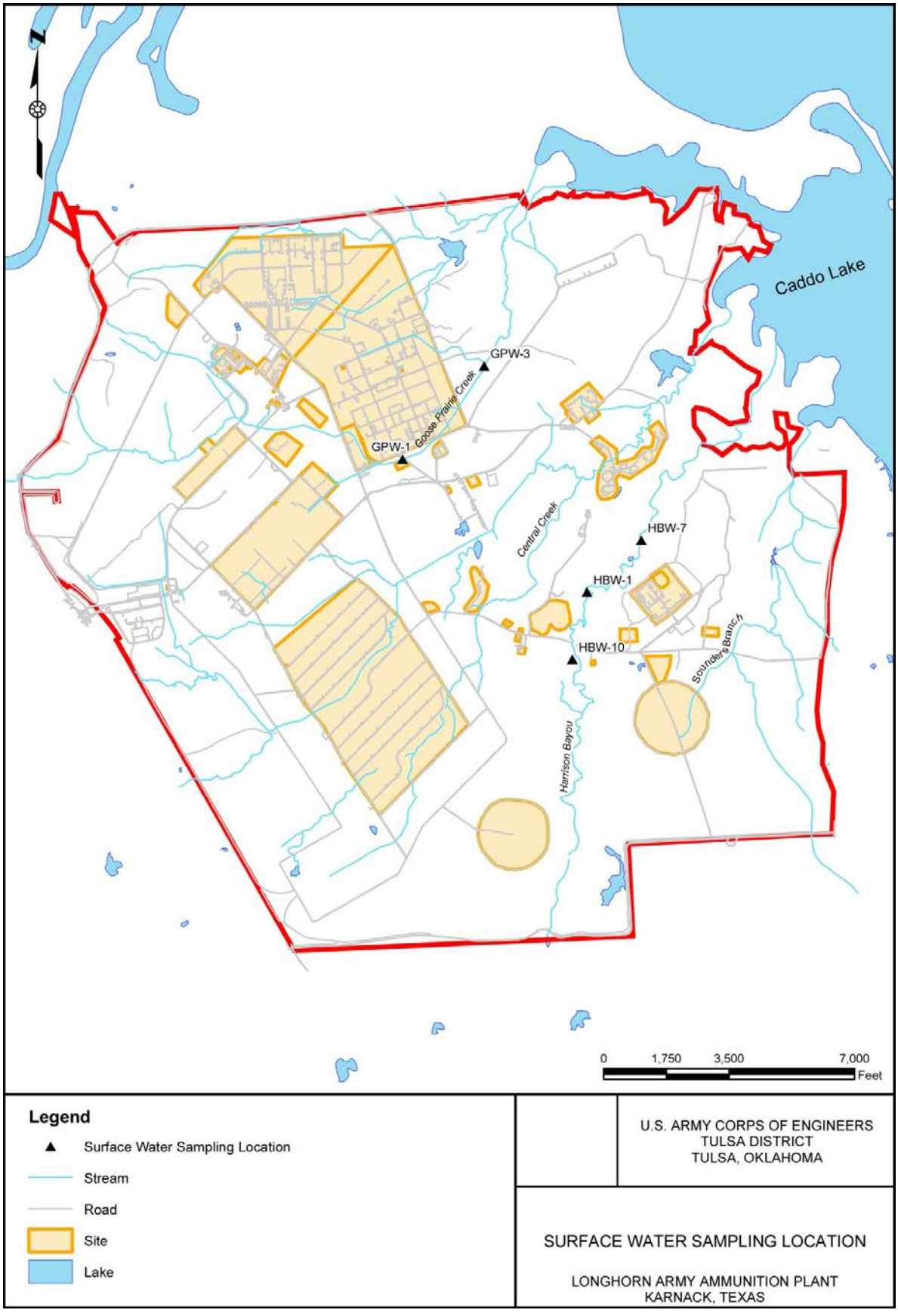
August-18
October-18
December-18
February-19
April-19
Date
GPW-1
GPW-3
HBW-1
HBW-7
HBW-10
GW-Res PCL for Perchlorate

Longhorn Army Ammuntion Plant Creek Sampling Locations



DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

October 29, 2019

DAIM-ODB-LO

Mr. Rich Mayer
U.S. Environmental Protection Agency
Federal Facilities Section R6
1445 Ross Avenue
Dallas, TX 75202-2733

Re: Draft Final Year 2 Long-Term Management Report for LHAAP-001-R-01 and LHAAP-003-R-01 Longhorn Army Ammunition Plant, Karnack Texas

Dear Mr. Mayer,

One hard copy and one compact disc (CD) of the above-referenced document is being transmitted to you for your records. As noted in your October 22, 2019, the Land Use Control Compliance Certification Form page was updated to include the Land Use Control Plan date of July 2008.

The document was prepared by Bhate Environmental Associates, Inc., (Bhate) team, on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility. I ask that Kim Nemmers, Bhate's Project Manager, be copied on any communications related to the project.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
A. Palmie, TCEQ, Austin, TX (1 hard copy and 1 CD)
P. Bruckwicki, Caddo Lake NWR, TX (1 hard copy and 1 CD)
A. Williams, USACE, Fort Worth, TX District (1 CD)
R. Smith, USACE, Fort Worth, TX District (Transmittal Letter)
A. Sherman, USAEC, San Antonio, TX (1 CD)
K. Nemmers, Bhate, Lakewood, CO (1 CD)

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

October 29, 2019

DAIM-ODB-LO

Ms. April Palmie
Texas Commission on Environmental Quality
Superfund Section, MC-136
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: Draft Final Year 2 Long-Term Management Report for LHAAP-001-R-01 and LHAAP-003-R-01 Longhorn Army Ammunition Plant, Karnack Texas

Dear Ms. Palmie,

One hard copy and one compact disc (CD) of the above-referenced document is being transmitted to you for your records.

The document was prepared by Bhate Environmental Associates, Inc., (Bhate) team, on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility. I ask that Kim Nemmers, Bhate's Project Manager, be copied on any communications related to the project.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
R. Mayer, USEPA Region 6, Dallas, TX (1 hard copy and 1 CD)
P. Bruckwicki, Caddo Lake NWR, TX (1 hard copy and 1 CD)
A. Williams, USACE, Fort Worth, TX District (1 CD)
R. Smith, USACE, Fort Worth, TX District (Transmittal Letter)
A. Sherman, USAEC, San Antonio, TX (1 CD)
K. Nemmers, Bhate, Lakewood, CO (1 CD)

DRAFT FINAL
YEAR 2 LONG-TERM MANAGEMENT REPORT FOR LHAAP-001-R-01 AND LHAAP-003-R-01 LONGHORN ARMY AMMUNITION PLANT

October 2019

Contract Number: W9128F-13-D-0012
Task Order Number: W912BV17F0150

Performance Based Remediation (PBR)
Longhorn Army Ammunition Plant
Karnack, Texas

Prepared For:

Longhorn Army Ammunition Plant
Karnack, Texas

Under Contract To:

U.S. Army Corps of Engineers
Tulsa District
Tulsa, Oklahoma

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Appendix A LTM Inspection and Maintenance Checklists and Land Use Control Compliance Certification Form
Appendix B Photograph Log

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ACRONYMS AND ABBREVIATIONS

§	Section
EODT	EOD Technology, Inc.
IRP	Installation Restoration Program
LHAAP	Longhorn Army Ammunition Plant
LTM	Long-Term Management
LUC(s)	Land use control(s)
MEC	Munitions and explosives of concern
MMRP	Military Munitions Response Program
MPPEH	Material potentially presenting explosive hazard
MRS	Munitions response site
RAO	Remedial action objective
ROD	Record of Decision
Shaw	Shaw Environmental & Infrastructure, Inc.
TAC	Texas Administrative Code
U.S.	United States
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
WP	White phosphorus

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1 INTRODUCTION

This document presents the monitoring of land use controls (LUCs) associated with the remedy set forth in the Final Longhorn Army Ammunition Plant (LHAAP) Record of Decision (ROD) (Shaw Environmental & Infrastructure, Inc. [Shaw], August 2016) for Military Munitions Response Program (MMRP) sites LHAAP-001-R-01 (South Test Area/Bomb Test Area) and LHAAP-003-R-01 (Ground Signal Test Area). This Year 2 LUC Monitoring Report was prepared for the United States (U.S.) Army under the Worldwide Environmental Remediation Services Contract No. W9128F-13-D-0012 managed by the U.S. Army Corps of Engineers (USACE), Tulsa District.

1.1 Facility Background

The LHAAP is an inactive, government-owned, formerly contractor-operated and maintained industrial facility located in central-east Texas, in the northeastern corner of Harrison County. The facility occupies approximately 1,200 of its former 8,416 acres located between State Highway 43 in Karnack, Texas, and the southwestern shore of Caddo Lake, as shown on **Figure 1-1**. The LHAAP was listed as a National Priorities List site on August 9, 1990, due to threatened releases of hazardous substances, pollutants, or contaminants. The U.S. Environmental Protection Agency (USEPA), the Texas Water Commission (now the Texas Commission on Environmental Quality), and the U.S. Army signed a Federal Facility Agreement on December 30, 1991, to address the contamination at LHAAP.

1.2 Munitions Response Sites LHAAP-001-R-01 and LHAAP-003-R-01 Site Descriptions

Munitions response site (MRS) LHAAP-001-R-01 (South Test Area/Bomb Test Area) is co-located with Installation Restoration Program (IRP) site LHAAP-27 and is situated in the southern portion of LHAAP and covers an area of approximately 79 acres (**Figure 1-2**). Site LHAAP-001-R-01 was constructed in 1954 and used for testing photoflash bombs produced at the facility until approximately 1956. During the late 1950s, illuminating signal devices were also demilitarized within pits excavated in the vicinity of the test pad. During the 1960s, leaking production items may have been demilitarized by detonation. Leaking white phosphorus (WP) munitions were supposedly disposed of, although no primary source documentation concerning this effort has been located. In 1984, a LHAAP Contamination Survey indicated that the area had been relatively inactive since the early 1960s and no disposal or testing activities have been carried out in this area since that time. LHAAP-001-R-01 was identified as a munitions and explosives of concern (MEC) area based on the visual confirmation of MEC.

Site LHAAP-003-R-01 (Ground Signal Test Area), is co-located with IRP site LHAAP-54 and is situated in the southeastern portion of LHAAP and covers an area of approximately 80 acres (**Figure 1-3**). Site LHAAP-003-R-01 was used intermittently in April 1963 for aerial and on-ground

testing and destruction of a variety of devices, including pyrotechnic signal devices, red phosphorus smoke wedges, infrared flares, illuminating mortar shells and cartridges, button bombs, and various types of explosive simulators. The site was also used intermittently over a 20-year period for testing and burn-out of rocket motors. From late 1988 through 1991, the site was also used for the burn-out of Pershing missile rocket motors. Occasionally, leaking WP munitions were burned at the site as a demilitarization activity. LHAAP-003-R-01 was identified as a MEC area based on the reported presence of MEC.

1.3 Land Use Controls

Following the 2008 non-time critical removal action surface clearance activities, LUCs were prepared and constructed for both sites (EOD Technology, Inc. [EODT], September 2009). LUCs were designed and constructed to promote ongoing protection of human safety against potential explosive hazards that may remain at the MMRP sites. The LUCs' performance objectives are to prohibit the development and use of the property for residential housing, elementary and secondary schools, child care facilities, and playgrounds; and to prohibit intrusive activities such as digging or any other activity which could result in explosive safety risks. The boundary of the LUCs encloses the site boundaries shown on **Figures 1-2 and 1-3**.

The 2008 LUCs included:

- Restriction against intrusive activities, including digging. A legal description survey and plat of the LUC boundaries and locations of MEC warning signs was prepared in accordance with 30 Texas Administrative Code (TAC) Section (§) 335.569, Appendix III, for recordation in the Harrison County Clerk's Office.
- Placement of MEC warning signage along the perimeter of LHAAP-001-R-01 and LHAAP-003-R-01 to serve as the physical demarcation of the controlled areas. The signs have visibility from one sign to the next, with a maximum spacing of 100 feet. The signs include warning of the potential presence of MEC, state the restriction against intrusive activities, and provide a contact number.
- Education program for future refuge visitors, staff, and volunteers. The program includes informational pamphlets and a safety video warning of the potential presence of MEC and presenting examples of MEC that were or may be found at the sites.

The LUC to prohibit residential land use will remain in place until it is demonstrated that the MEC no longer presents a threat to public/human safety. A LUC to prohibit intrusive subsurface activities, including digging, will remain in place until it is demonstrated that the MEC no longer presents an explosive hazard. However, intrusive subsurface activities may occur provided that the Army and the USEPA approve such intrusive subsurface activities before they are commenced and provided that they are undertaken by qualified personnel who are trained in explosives safety measures.

The Final ROD for LHAAP-001-R-01 and LHAAP-003-R-01 was issued in August 2016 and documents the final selected remedy for the sites (Shaw, August 2016). The ROD found that although the removal actions provided an effective solution for reducing risk of exposure by reducing the potential for any direct contact with MEC or material potentially presenting explosive hazard (MPPEH), there is the potential that some MEC remains. A summary of the LUC remedial action objective (RAO) and the selected remedy for LHAAP-001-R-01 and LHAAP-003-R-01, identified in the Final ROD, is presented in the following sections.

1.4 Land Use Control Remedial Action Objective

The LUC RAO developed for LHAAP-001-R-01 and LHAAP-003-R-01, as outlined in the ROD (Shaw, August 2016) is:

- Protection of human health and safety from explosive hazards that may have remained at the sites after the MEC removal action.

1.5 Land Use Control Selected Remedy

The LUC selected remedy for MEC at LHAAP-001-R-01 and LHAAP-003-R-01 is comprised of the following elements:

- LUC to prohibit residential use
- LUC to restrict land use to non-residential
- LUC to restrict intrusive activities (e.g., digging)
- Signage to convey MEC warning
- Education Program

The Educational Program materials, including pamphlets and video, were delivered to the U. S. Fish and Wildlife Service (USFWS) in hard copy and electronic form as part of the Site Specific Final Report for the MEC Removal Action (EODT, September 2009). There is no recurring requirement associated with this LUC and it will not be discussed further in this document.

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2 LAND USE CONTROL MONITORING

The RAO for LHAAP-001-R-01 and LHAAP-003-R-01 is protection of human health and safety from explosive hazards that may have remained at the sites after the MEC removal action. The duration for the LUCs specified in the MEC ROD for this purpose must remain in place until it is demonstrated that the MEC no longer presents a threat to public/human safety. Per the Final ROD, the LUCs' performance objectives are to:

- Prohibit the development and use of the property for residential housing, elementary and secondary schools, child care facilities, and playgrounds.
- Restrict land use to non-residential.
- Prohibit intrusive activities such as digging or any other activity which could result in explosive safety risk.
- Maintain existing MEC warning signs at the perimeter of each site to physically demarcate controlled areas.

For portions of LHAAP-001-R-01 and LHAAP-003-R-01 subject to LUCs that are not owned by the Army, the Army will monitor and report on the implementation, maintenance, and enforcement of LUCs, and coordinate with federal, state, and local governments and owners and occupants of properties subject to LUCs. The Army remains responsible for ensuring that the remedy remains protective of human health and safety. This section presents the maintenance and monitoring of the LUCs at both sites in accordance with the final LUC Remedial Design/Remedial Action Construction Report (U.S. Army, May 2018).

2.1 Maintenance of Existing MEC Warning Signs

MEC warning signs have been installed at the perimeter of LHAAP-001-R-01 and LHAAP-003-R-01 (64 signs at each site), that serve as a physical demarcation of the controlled areas. The signs have visibility from one sign to the next with a maximum spacing of 100 feet. The signs include warning of potential presence of MEC and state the restriction against intrusive activities. **Figures 1-2 and 1-3** present the location of the MEC warning signs. These signs are required to be visually inspected annually, or as needed, to ensure they remain intact, undamaged, and visible from one sign to the next. Maintenance is conducted, as needed, and may include the following activities:

- Mowing and brush clearing around MEC warning signs to ensure that they are visible from one sign location to the next sign location.
- Rehanging/affixing MEC warning sign(s) or replacing MEC warning sign(s), if they become damaged or illegible.
- Repairing existing MEC warning sign posts, which may require the reestablishment of the concrete base or post replacement.

2.2 Monitoring Activities

The [Long-Term Management] LTM Inspection and Maintenance Checklists for both LHAAP-001-R-01 and LHAAP-003-R-01, completed in 2019, are provided in **Appendix A**. No repairs were required. The checklists are the same as included in the LUC Remedial Design/Remedial Action Construction Report (U.S. Army, May 2018).

Appendix A also contains the annual certification from the remedial design to document that no LUC-restricted activities have been authorized and that LHAAP-001-R-01 and LHAAP-003-R-01 conditions and use are consistent with the LUCs. **Appendix B** contains a photograph log of the LUCs at each site.

3 CONCLUSIONS

The LUCs are being maintained and managed in accordance with the ROD and the LUC Remedial Design/Remedial Action Construction Report as follows:

- Neither site is being developed or used for residential housing, elementary and secondary schools, child care facilities, and playgrounds.
- Land use is non-residential.
- No digging or any other activity which could result in explosive safety risk was noted during the LUC inspections completed.
- Existing MEC warning signs at the perimeter of each site to physically demarcate controlled areas are being maintained per the ROD.

Mowing and brush clearing around MEC warning signs was completed on July 31, 2019, to ensure that they are visible from one sign location to the next sign location. No repairs to signage were needed for either site during the LUC inspections.

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4 REFERENCES

EODT. September 2009. *Final Site Specific Final Report for the MEC Removal Action at the Former Longhorn Army Ammunition Plant LHAAP-001-R (Site 27) and LHAAP-003-R (Site 54) Karnack, Texas*.

Shaw. August 2016. *Final Record of Decision LHAAP-001-R (South Test Area/Bomb Test Area) and LHAAP-003-R (Ground Signal Test Area) Longhorn Army Ammunition Plant, Karnack, Texas*.

U.S. Army. April 2004. *Memorandum of Agreement Between the Department of the Army and the Department of the Interior for the Interagency Transfer of Lands at the Longhorn Army Ammunition Plant for the Caddo Lake National Wildlife Refuge, Harrison County, Texas.*

U.S. Army. May 2018. *Final Land Use Control Remedial Design/Remedial Action Construction Report LHAAP-001-R-01 and LHAAP-003-R-01, Longhorn Army Ammunition Plant.*

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FIGURES

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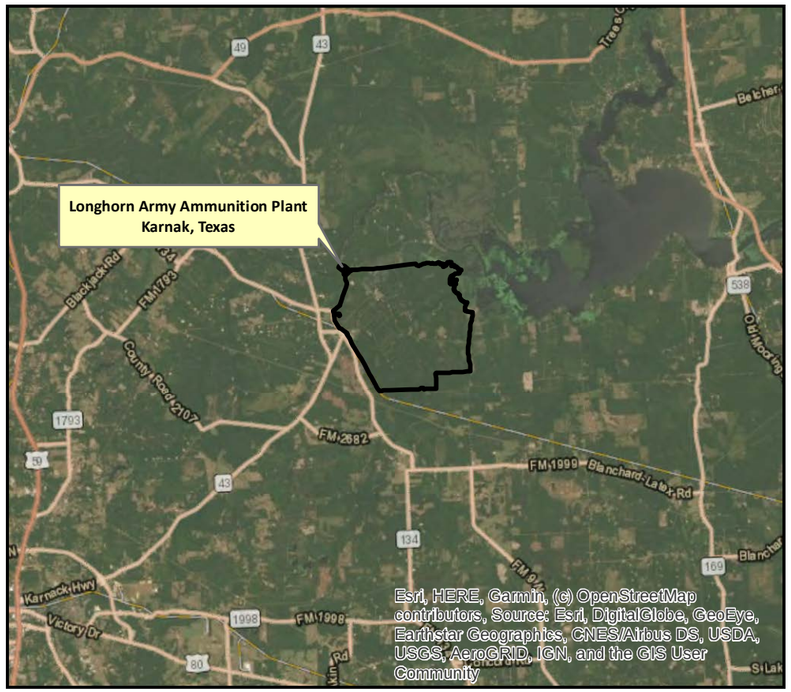
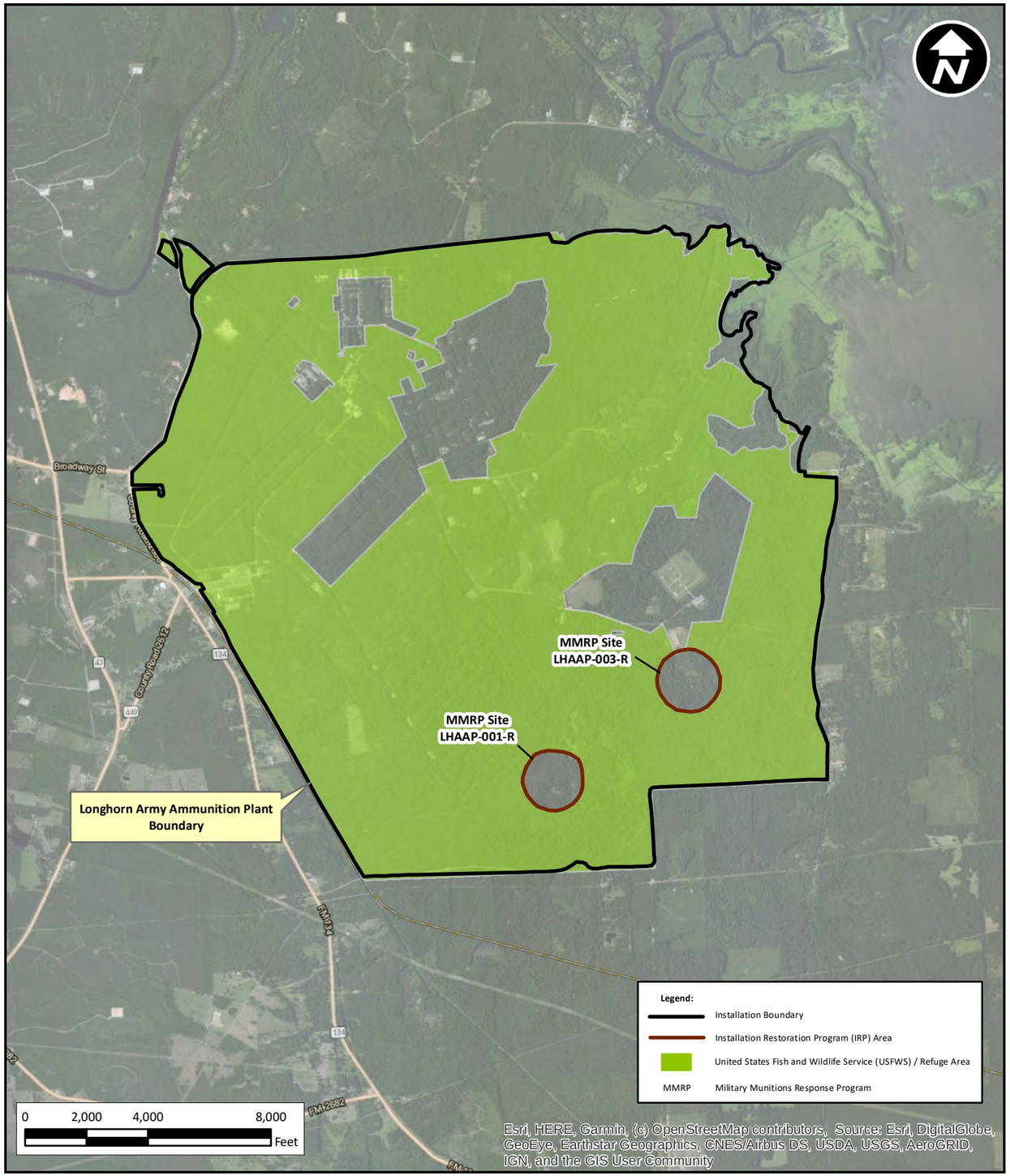
Figures

00937302





LHAAP Site Map

Figure 1-1

Year 2 Land Use Control Monitoring Report for
LHAAP-001-R-01 AND LHAAP-003-R-01
Longhorn Army Ammunition Plant
Karnack, Texas

DRAWN BY: MRM

DATE: 9/19/2019

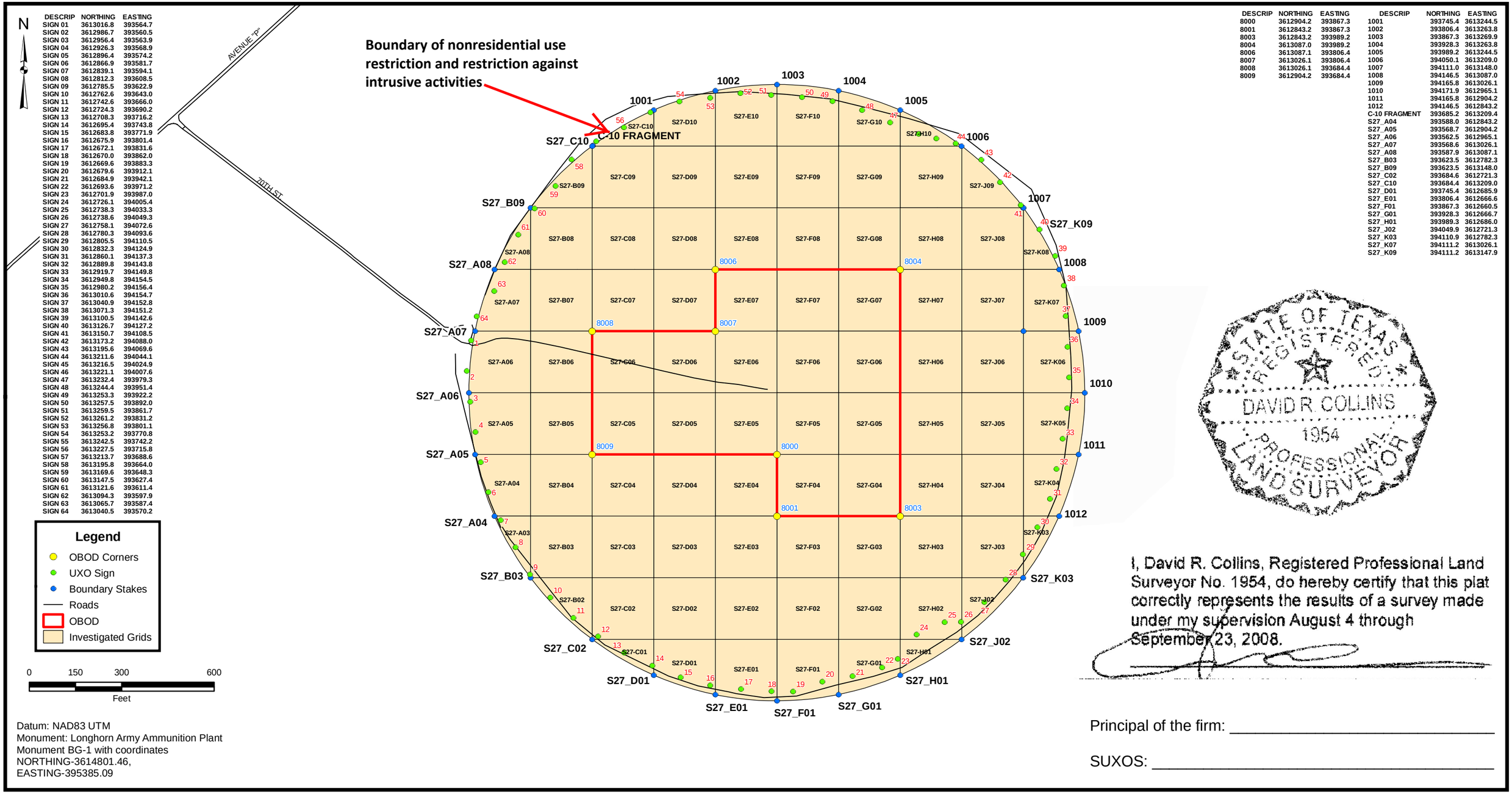
SCALE: As Shown

PROJECT NO: NWO13 12.0150. 014.0001.04

bhate

www.bhate.com

Figure 1-2. LHAAP-001-R-01 Site Location Map with LUC Boundaries
Longhorn Army Ammunition Plant, Karnack, Texas



DESCRIP	NORTHING	EASTING
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SIGN 02	3612986.7	393560.5
SIGN 03	3612956.4	393563.9
SIGN 04	3612926.3	393568.9
SIGN 05	3612896.4	393574.2
SIGN 06	3612866.9	393581.7
SIGN 07	3612839.1	393594.1
SIGN 08	3612812.3	393608.5
SIGN 09	3612785.5	393622.9
SIGN 10	3612762.6	393643.0
SIGN 11	3612742.6	393666.0
SIGN 12	3612724.3	393690.2
SIGN 13	3612708.3	393716.2
SIGN 14	3612695.4	393743.8
SIGN 15	3612683.8	393771.9
SIGN 16	3612675.9	393801.4
SIGN 17	3612672.1	393831.6
SIGN 18	3612670.0	393862.0
SIGN 19	3612669.6	393883.3
SIGN 20	3612679.6	393912.1
SIGN 21	3612684.9	393942.1
SIGN 22	3612693.6	393971.2
SIGN 23	3612701.9	393987.0
SIGN 24	3612726.1	394005.4
SIGN 25	3612738.3	394033.3
SIGN 26	3612738.6	394049.3
SIGN 27	3612758.1	394072.6
SIGN 28	3612780.3	394093.6
SIGN 29	3612805.5	394110.5
SIGN 30	3612832.3	394124.9
SIGN 31	3612860.1	394137.3
SIGN 32	3612889.8	394143.8
SIGN 33	3612919.7	394149.8
SIGN 34	3612949.8	394154.5
SIGN 35	3612980.2	394156.4
SIGN 36	3613010.6	394154.7
SIGN 37	3613040.9	394152.8
SIGN 38	3613071.3	394151.2
SIGN 39	3613100.5	394142.6
SIGN 40	3613126.7	394127.2
SIGN 41	3613150.7	394108.5
SIGN 42	3613173.2	394088.0
SIGN 43	3613195.6	394069.6
SIGN 44	3613211.6	394044.1
SIGN 45	3613216.5	394024.9
SIGN 46	3613221.1	394007.6
SIGN 47	3613232.4	393979.3
SIGN 48	3613244.4	393951.4
SIGN 49	3613253.3	393922.2
SIGN 50	3613257.5	393892.0
SIGN 51	3613259.5	393861.7
SIGN 52	3613261.2	393831.2
SIGN 53	3613256.8	393801.1
SIGN 54	3613253.2	393770.8
SIGN 55	3613242.5	393742.2
SIGN 56	3613227.5	393715.8
SIGN 57	3613213.7	393688.6
SIGN 58	3613195.8	393664.0
SIGN 59	3613169.6	393648.3
SIGN 60	3613147.5	393627.4
SIGN 61	3613121.6	393611.4
SIGN 62	3613094.3	393597.9
SIGN 63	3613065.7	393587.4
SIGN 64	3613040.5	393570.2

Legend

- OBOD Corners
- UXO Sign
- Boundary Stakes
- Roads
- OBOD
- Investigated Grids

DESCRIP	NORTHING	EASTING
8000	3612904.2	393867.3
8001	3612843.2	393867.3
8003	3612843.2	393989.2
8004	3613087.0	393989.2
8006	3613087.1	393806.4
8007	3613026.1	393806.4
8008	3613026.1	393684.4
8009	3612904.2	393684.4

DESCRIP	NORTHING	EASTING
1001	393745.4	3613244.5
1002	393806.4	3613263.8
1003	393867.3	3613269.9
1004	393928.3	3613263.8
1005	393989.2	3613244.5
1006	394050.1	3613209.0
1007	394111.0	3613148.0
1008	394146.5	3613087.0
1009	394165.8	3613026.1
1010	394171.9	3612965.1
1011	394165.8	3612904.2
1012	394146.5	3612843.2
C-10 FRAGMENT	393685.2	3613209.4
S27_A04	393588.0	3612843.2
S27_A05	393568.7	3612904.2
S27_A06	393562.5	3612965.1
S27_A07	393568.6	3613026.1
S27_A08	393587.9	3613087.1
S27_B03	393623.5	3612782.3
S27_B09	393623.5	3613148.0
S27_C02	393684.6	3612721.3
S27_C10	393684.4	3613209.0
S27_D01	393745.4	3612685.9
S27_E01	393806.4	3612666.6
S27_F01	393867.3	3612660.5
S27_G01	393928.3	3612666.7
S27_H01	393989.3	3612686.0
S27_J02	394049.9	3612721.3
S27_K03	394110.9	3612782.3
S27_K07	394111.2	3613026.1
S27_K09	394111.2	3613147.9

I, David R. Collins, Registered Professional Land Surveyor No. 1954, do hereby certify that this plat correctly represents the results of a survey made under my supervision August 4 through September 23, 2008.

Datum: NAD83 UTM
Monument: Longhorn Army Ammunition Plant Monument BG-1 with coordinates NORTHING-3614801.46, EASTING-395385.09

Principal of the firm: _____

SUXOS: _____

Figure 1-3. LHAAP-003-R-01 Site Location Map with LUC Boundaries
Longhorn Army Ammunition Plant, Karnack, Texas

DESCRIP	NORTH	EAST	DESCRIP	NORTHIN	EASTING
SIGN 1	3614179.4	395143.2	1013	395068.6	3613625.2
SIGN 10	3613984.2	394959.8	1014	395005.1	3613686.2
SIGN 11	3613954.6	394952.4	1015	394997.4	3614072.1
SIGN 12	3613924.6	394947.4	1016	395058.4	3614135.6
SIGN 13	3613894.1	394947	1017	395180.3	3614195.0
SIGN 14	3613863.7	394949.6	1018	395241.3	3614203.9
SIGN 15	3613833.8	394955.1	1019	395302.2	3614200.9
SIGN 16	3613803.8	394959.8	1020	395363.2	3614185.9
SIGN 17	3613774.4	394967.8	1021	395392.4	3614173.9
SIGN 18	3613745.2	394976.7	1022	395424.1	3614156.7
SIGN 19	3613718.3	394991.2	1023	395480.2	3614112.9
SIGN 2	3614163.4	395117.3	1024	395485.1	3614108.0
SIGN 20	3613694.6	395010.3	1025	395528.9	3614051.9
SIGN 21	3613672.4	395031.1	1026	395546.1	3614020.2
SIGN 22	3613651.1	395052.8	1027	395558.0	3613991.0
SIGN 23	3613632.6	395077	1028	395573.1	3613930.0
SIGN 24	3613616.8	395103.1	1029	395576.0	3613869.1
SIGN 25	3613602.8	395130	1030	395567.2	3613808.1
SIGN 26	3613591	395158.1	1031	395507.7	3613686.2
SIGN 27	3613583.5	395187.6	1032	395444.2	3613625.2
SIGN 28	3613579.1	395217.8	S54_A04	394967.3	3613747.1
SIGN 29	3613578.7	395248.2	S54_A06	394936.8	3613869.1
SIGN 3	3614147.8	395091.2	S54_A07	394939.8	3613930.0
SIGN 30	3613579.6	395278.7	S54_A08	394954.8	3613991.0
SIGN 31	3613584.2	395308.8	S54_A09	394983.9	3614051.9
SIGN 32	3613591.4	395336.3	S54_B03	394997.4	3613696.4
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SIGN 6	3614087.5	395022.9			
SIGN 60	3614191.9	395286.4			
SIGN 61	3614192.1	395255.9			
SIGN 62	3614190.3	395225.5			
SIGN 63	3614185.9	395195.4			
SIGN 64	3614182	395167.9			
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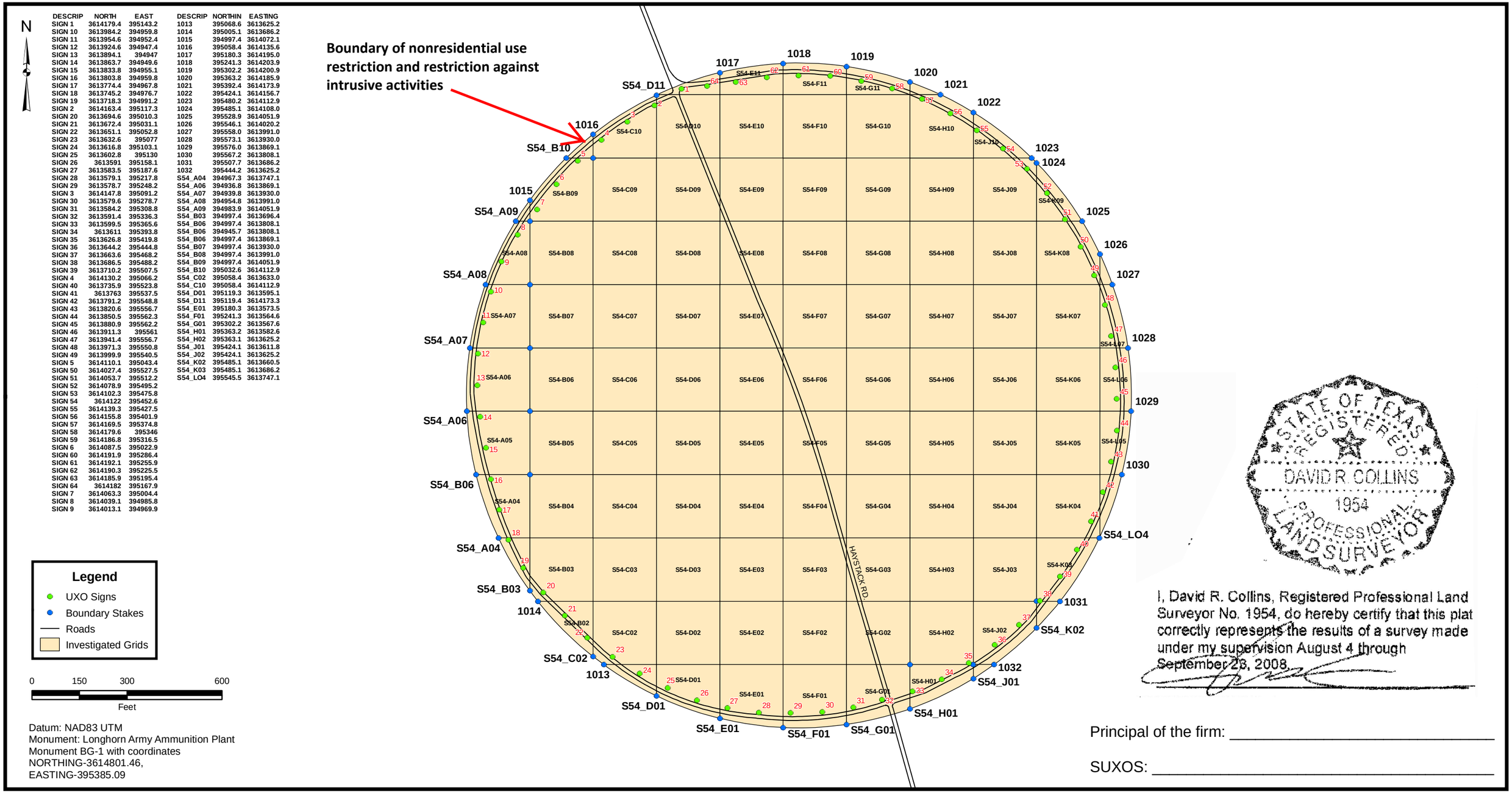
SIGN 8	3614039.1	394985.8			
SIGN 9	3614013.1	394969.9			



Legend

- UXO Signs
- Boundary Stakes
- Roads
- Investigated Grids

0 150 300 600

Feet

Datum: NAD83 UTM
Monument: Longhorn Army Ammunition Plant
Monument BG-1 with coordinates
NORTHING-3614801.46,
EASTING-395385.09

I, David R. Collins, Registered Professional Land Surveyor No. 1954, do hereby certify that this plat correctly represents the results of a survey made under my supervision August 4 through September 28, 2008.

Principal of the firm: _____

SUXOS: _____

APPENDIX A

LTM INSPECTION AND MAINTENANCE CHECKLISTS AND LAND USE CONTROL COMPLIANCE CERTIFICATION FORM

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LTM Inspection and Maintenance Checklist

General Information	
Project Name	LTM Inspection and Maintenance, LHAAP-001-R and LHAAP-003-R MMRP, Longhorn Army Ammunition Plant, Karnack, TX
Contractor	BHATE ENVIRONMENTAL
Inspector's Name	SCOTT BEESINGER
Inspector's Title	SENIOR FIELD TECH
Inspector's Signature	Scott Beesinger
Inspector's Contact Number	903-930-6193
Inspection Date	7/31/19
Type of Inspection	☐ Quarterly ☐ Semiannual ☒ Annual ☐ Prior to forecast rain ☐ After rain event ☐ Other_____

	Description	Yes	No	N/A	Comments (Attach photos/location sketches)	Corrective Action (Attach photos)
A. Perimeter Signage						
A.1	Are there any damaged signs?		X			
A.2	Are there any missing signs?		X			
A.3	Are all signs legible?	X				
A.4	Is perimeter boundary mowed?	X				

A.5	Are signs visible from one sign to the next sign?	X				
B. LUC Boundary						
B.1	Is the LUC Boundary identifiable?	X				
C. Dig and Intrusive Activities restriction						
C.1	Any observed digging activities or similar intrusive activities within the site boundaries?		X			

Note: Annual compliance inspections shall be conducted no later than March 1 of each year for the previous calendar year and filed onsite.

LAND USE CONTROL COMPLIANCE CERTIFICATION FORM

In accordance with the LUC Plan dated July 2008 for LHAAP-001-R and LHAAP-003-R, an inspection of the sites was conducted by BHATE ENVIRONMENTAL on 7/31/19

A summary of land use control mechanisms is as follows:

- Land use restrictions - restrict land use to non-residential.
- Integrity of LUC signage by ensuring signs are present, legible and have visibility from one sign to the next.

A summary of compliance with land use and restriction covenants is as follows:

- The posted signs are properly maintained at LHAAP-001-R and LHAAP-003-R.
- No digging or intrusive activities have taken place within the boundaries identified for LHAAP-001-R and LHAAP-003-R.
- No land use other than non-residential.
- Pamphlets and safety awareness video are being used to educate visitors.

I, the undersigned, do document that the inspections were performed as indicated above, and that the above information is true and correct to the best of my knowledge, information, and belief.

Date: 7/31/19

Name: Scott Beesinger

Signature:

Completed annual compliance inspections shall be conducted no later than March 1 of each year for the previous calendar year and filed on site.

APPENDIX B

PHOTOGRAPH LOG

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Longhorn Army Ammunition Plant Sites LHAAP-001-R-01 and LHAAP-003-R-01
Photograph Log August 2019

Photo 1: LHAAP-001-R-01 Signage in place and readable

Photo 2: LHAAP-001-R-01 Pathway around the site

Longhorn Army Ammunition Plant Sites LHAAP-001-R-01 and LHAAP-003-R-01
Photograph Log August 2019

Photo 3: LHAAP-003-R-01 Signage in place and readable

Photo 4: LHAAP-003-R-01 Pathway around the site

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

October 31, 2019

DAIM-ODB-LO

Mr. Rich Mayer
U.S. Environmental Protection Agency
1201 Elm Street, Suite 500
Dallas, TX 75270-2002

Re: Draft Remedial Design/Remedial Action Work Plan, LHAAP-50 Former Sump Water Tank, Longhorn Army Ammunition Plant, Karnack, Texas, October 2019

Dear Mr. Mayer,

The above-referenced document is being transmitted to you for your review. Review comments are requested by November 30, 2019.

The document was prepared by Bhate Environmental Associates, Inc., (Bhate) team, on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility. I ask that Kim Nemmers, Bhate's Project Manager, be copied on any communications related to the project.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
A. Palmie, TCEQ, Austin, TX (1 hard copy and 1 CD)
P. Bruckwicki, Caddo Lake NWR, TX (1 hard copy and 1 CD)
R. Smith, USACE, Tulsa District, OK (Electronic only)
A. Williams, USACE, Tulsa District, OK (1 CD)
N. Smith, USAEC, San Antonio, TX (1 CD)
K. Nemmers, Bhate, Lakewood, CO (1 CD)
P. Srivastav, APTIM, Houston, TX

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

October 31, 2019

DAIM-ODB-LO

Ms. April Palmie
Texas Commission on Environmental Quality
Superfund Section, MC-136
12100 Park 35 Circle, Bldg. D
Austin, TX 78753

Re: Draft Remedial Design/Remedial Action Work Plan, LHAAP-50 Former Sump Water Tank, Longhorn Army Ammunition Plant, Karnack, Texas, October 2019

Dear Ms. Palmie,

The above-referenced document is being transmitted to you for your review. Review comments are requested by November 30, 2019.

The document was prepared by Bhate Environmental Associates, Inc., (Bhate) team, on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility. I ask that Kim Nemmers, Bhate's Project Manager, be copied on any communications related to the project.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Copies furnished:
R. Mayer, USEPA Region 6, Dallas, TX (1 hard copy and 1 CD)
P. Bruckwicki, Caddo Lake NWR, TX (1 hard copy and 1 CD)
R. Smith, USACE, Tulsa District, OK (Electronic only)
A. Williams, USACE, Tulsa District, OK (1 CD)
N. Smith, USAEC, San Antonio, TX (1 CD)
K. Nemmers, Bhate, Lakewood, CO (1 CD)
P. Srivastav, APTIM, Houston, TX

QUARTERLY EVALUATION REPORT
2ND QUARTER (APRIL - JUNE) 2019
GROUNDWATER TREATMENT PLANT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

November 2019

Prepared For:

U.S. Army Corps of Engineers
Tulsa District

Contract No. W9128F-13-D-0012
Task Order No. W912BV17F0150
Bhate Project No. NWO1312.0150.016.0001.03

Prepared By:

bhate

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Birmingham, Alabama 35205
1-800-806-4001 • www.bhate.com

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Appendix C Laboratory Analytical Results for LHAAP-18/24 (Provided on CD Only)
Appendix D Isopleth Contour Maps
Appendix E Monitoring Well Trend Charts
Appendix F GWTP Water Sampling Laboratory Analytical Results (Provided on CD Only)
Appendix G Quality Control Summary Report
Appendix H Air Monitoring Analytical Laboratory Report (Provided on CD Only)
Appendix I Protocol for Discharging GWTP Effluent
Appendix J Air Data Tables, PID Readings, and Calibration Logs

ACRONYMS AND ABBREVIATIONS

AMCV(s)	Air Monitoring Comparison Value(s)
amsl	Above mean sea level
bgs	Below ground surface
Bhate	Bhate Environmental Associates, Inc.
CD	Compact disc
COC(s)	Chemical(s) of concern
COD	Chemical oxygen demand
DCE	Dichloroethene
ESD	Explanation of Significant Difference
ESL(s)	Effects Screening Level(s)
FBR	Fluidized bed reactor
ft	Feet or foot
gpd	Gallons per day
gph	Gallons per hour
gpm	Gallons per minute
GWTP	Groundwater Treatment Plant
HCl	Hydrochloric acid
HDPE	High density polyethylene
ICT(s)	Interception-collection trench(es)
IRA	Interim Remedial Action
J	Estimated concentration
lbs/hr	Pounds per hour
LHAAP	Longhorn Army Ammunition Plant
MCL(s)	Maximum Contaminant Level(s)
µg/L	Micrograms per liter
$Mg(OH)_2$	Magnesium hydroxide
MSC(s)	Medium Specific Concentration(s)
mV	Millivolts
NA	Not applicable
NaOH	Sodium hydroxide

No.	Number
ORP	Oxidation-reduction potential
PCL(s)	Protective Concentration Level(s)
PID	Photoionization detector
ppmv	Parts per million by volume
psi	Pounds per square inch
ROD	Record of Decision
TAC	Texas Administrative Code
TCE	Trichloroethene
TCEQ	Texas Commission on Environmental Quality
tpy	Tons per year
UEP	Unlined Evaporation Pond
USEPA	United States Environmental Protection Agency
VC	Vinyl chloride
VOC(s)	Volatile Organic Compound(s)

EXECUTIVE SUMMARY

The operation of the Groundwater Treatment Plant (GWTP) is part of the Interim Remedial Action (IRA) at Burning Ground Number (No.) 3, also referred to as Longhorn Army Ammunition Plant (LHAAP)-18/24. A historical pilot test for nearby landfill LHAAP-16 resulted in the installation of eight extraction wells which also contribute groundwater to the GWTP. Groundwater extraction, treatment, and monitoring activities consist of:

- Continuous extraction of groundwater from multiple interception-collection trenches (ICTs) and extraction wells at both LHAAP-18/24 and LHAAP-16;
- Treatment of extracted groundwater for heavy metals, chlorinated compounds, and perchlorate using precipitation, air stripping, and biological methods, respectively;
- Evaluation of the hydraulic effectiveness of the extraction system by groundwater monitoring;
- Monitoring of treated groundwater to ensure compliance with the discharge limits; and
- Discharge of treated water to Harrison Bayou, or to a holding pond (INF Pond), or the treated water may be released as irrigation water on LHAAP-18/24.

The location of the extraction wells and ICTs are shown on **Figure A-1** in **Appendix A**. The process flow diagram of the GWTP is shown on **Figure A-2** in **Appendix A**.

Figure ES-1 depicts the monthly total volume of groundwater that was extracted from the ICTs and extraction wells at LHAAP-18/24 and LHAAP-16 between September 2012 and June 2019.

The GWTP was not operational during June, July, and August 2012. This was related to meltdown of the scrubber system, associated with the catalytic oxidizer, due to system overheating. Overheating occurred when the blower became inoperable after the bearing on the scrubber blower unit was shattered and damaged the blower. This occurred around 1:00 PM on 21 May 2012.

After developing an interim air monitoring plan and obtaining concurrence from the Texas Commission on Environmental Quality (TCEQ) and the United States Environmental Protection Agency (USEPA) to operate the GWTP without use of air abatement equipment, a pilot run of the GWTP was conducted on 6 September 2012. In that first pilot run, 85,170 gallons of water that had been stored in the influent equalization tank (TK-140) were treated. The treated water was re-circulated through the fluidized bed reactor (FBR) to revive the FBR after 3 months of dormancy. Treated groundwater and air samples were collected and analyzed respectively for perchlorate, metals, and Volatile Organic Compounds (VOCs); and VOCs only. On 19 September 2012, a second pilot run was performed at the GWTP and 107,264 gallons of water were treated. Based on the successful re-start of the GWTP, continuous groundwater extraction began again on 24 September 2012. While groundwater extraction occurs on a continuous basis, operation of the GWTP occurs intermittently due to the low volume of water available for treatment with respect to the design capacity of the GWTP. During the 3rd quarter of 2012, groundwater extraction occurred only from LHAAP-18/24. Groundwater extraction from LHAAP-16 was not

performed due to equipment failure. However, extraction from LHAAP-16 began in October 2012 and the extraction volumes increased steadily throughout the 4th quarter of 2012, as pumping equipment was gradually repaired/replaced. The GWTP operated under normal conditions until September 2015.

On 14 September 2015, at 11:15 AM, the blower on the air stripper (BL-340) malfunctioned during routine operation. The wiring on the blower was repaired and the blower operated for less than 2 hours on 17 September 2015, when the blower malfunctioned again. It was determined that the blower needed to be replaced, and groundwater extraction and operation of the GWTP ceased beginning 18 September 2015, as the influent equalization tank (TK-140) became full. Beginning on 2 October 2015, it was determined that the GWTP could operate without the blower at a reduced extraction rate. The operation of the GWTP allowed extraction of groundwater from ICTs 12E, 13A, 13B, and 13C (13C was changed to ICT 13E on 12 October 2015), which were considered critical ICTs to prevent migration of contaminants to Harrison Bayou. Groundwater extraction was switched frequently between ICTs 12E, 13A, 13B, and 13E to ICTs 14B, 14C, and 14D beginning on 14 December 2015.

On 12 December 2016, flange bolts at TK-380 failed and allowed hydrochloric acid (HCl) to drain into the sump. The containment area was washed down and the sump contents were transferred into the equalization tank (TK-140). Because of the acid release, extraction of groundwater from the ICTs was halted, and the GWTP was put into recycle mode (effluent sent back as influent) until the acid was neutralized and perchlorate, metals, and VOCs were below discharge criteria on 17 March 2017.

On 12 August 2017, severe storms caused a power outage at LHAAP-18/24. When electrical service was restored, the main transformer failed due to a manufacturing defect. A portable emergency generator was brought on-site on 21 August 2017, to allow the FBR to operate in full recycle mode. After a replacement transformer was installed on 12 September 2017, extraction began from ICT-13B, 13C, 13D, 13E, 13F, 7, and EW01 and the FBR was put into normal operation. Beginning on 21 September 2017, groundwater was extracted from all of the ICTs.

On 27 December 2018, severe storms caused a power outage in Karnack, Texas including LHAAP. When electrical service was restored, the main transformer failed due to a manufacturing defect. A portable emergency generator was brought on-site on 28 December 2018, to allow the FBR to operate in full recycle mode. After a temporary generator was connected to the well field on 11 February 2019, extraction began from LHAAP-18/24, and the GWTP was put into normal operation. No extraction from LHAAP-16 occurred during the 2nd Quarter 2019 due to the main transformer being down.

On 13 June 2019, the P-320 pump (Air Stripper Feed Pump) locked up and was not repaired until 2 July 2019. The GWTP was last run on 13 June 2019. As a result, sampling was not conducted during the last 2 weeks of June 2019.

On 11 June 2019, Smith Energy was on site to repair a double walled pipe in the burning grounds. They returned to finish the repair on 17 June 2019. Currently, the line to 18WW17 is still down because of another leak in the double walled pipe and the ground has been too wet to dig.

As shown on **Figure ES-1**, the total extracted groundwater volume from LHAAP-18/24 during the 2nd quarter of 2019 was 2,215,494 gallons. The extracted groundwater volume was measured on a monthly basis as the sum of the difference between the flow meter totalizer reading at each ICT between the beginning and end of each month. Extraction quantities in LHAAP-18/24 were 681,206 gallons in April 2019, 1,087,813 gallons in May 2019, and 446,475 gallons in June 2019.

No groundwater was extraction from LHAAP-16 in 2nd Quarter 2019. Approximately 2,215,494 gallons of groundwater were extracted from LHAAP-18/24 during the 2nd quarter of 2019 compared to approximately 1,873,388 gallons extracted during the 2nd quarter 2018 (year prior).

No treated water was returned to ICTs 6 and 9 during the 2nd quarter of 2019 because this practice was discontinued after system restart in September 2012.

The typical discharged flowrate from the GWTP was calculated as 11 gallons per minute (gpm) during the 2nd quarter of 2019. Water discharge from the INF Pond averaged to 77 gpm. Approximately 1,062,336 gallons of groundwater was discharged from the GWTP to the Harrison Bayou, and 1,101,795 gallons was discharged from the INF Pond to the Harrison Bayou (see **Figure ES-2** below).

Grab perchlorate samples from the GWTP influent were collected monthly on 10 April, 7 May, and 4 June 2019, and the following concentrations were reported: 5,600 micrograms per liter (µg/L), 4,200 µg/L, and 6,800 µg/L, respectively. In addition, a quarterly influent sample was collected and analyzed for perchlorate on 29 May 2019, with a result of 4,900 µg/L. The average perchlorate concentration using these four values from the GWTP influent during the quarter was 5,375 µg/L. No perchlorate was detected in the effluent (TK-650) samples during the 2nd quarter of 2019.

As shown in **Table ES-1**, treated water was discharged directly from the GWTP to Harrison Bayou in 2nd Quarter 2019. In addition, 1,101,795 gallons of treated water was discharged from the INF Pond to Harrison Bayou.

The groundwater volume extracted for treatment at LHAAP-18/24 increased from 681,206 gallons in April 2019 to 1,087,813 in May 2019, and then decreased to 446,475 in June 2019. The totals were lower for June because the GWTP did not operate after 13 June 2019. No groundwater was extracted from LHAAP-16 during the 2nd quarter of 2019. The total water extracted for treatment by the GWTP for the 2nd quarter of 2019 was approximately 2,215,494 gallons. The water quantities treated each month since June 2012 are shown on **Figure ES-2**. The total volume of water extracted from LHAAP-18/24 in the 2nd quarter of 2019 (2,215,494 gallons) is higher than the volume of water discharged to the Harrison Bayou from the GWTP (1,062,336 gallons). Typically the reason for the difference is identified as the change in volume stored in the GWTP, the amount of water lost with the removed metals precipitation sludge, and the amount of evaporative water lost in the air stripper (which is included in the volume processed, but not in the volume discharged). However, piping leaks were identified along the 14 ICTs and out to 18WW17. The line associated with the 14 ICTs has since been repaired but the line to 18WW17 has not yet been repaired. The line out to 18WW17 was capped and is not currently connected to the extraction system at LHAAP-18/24.

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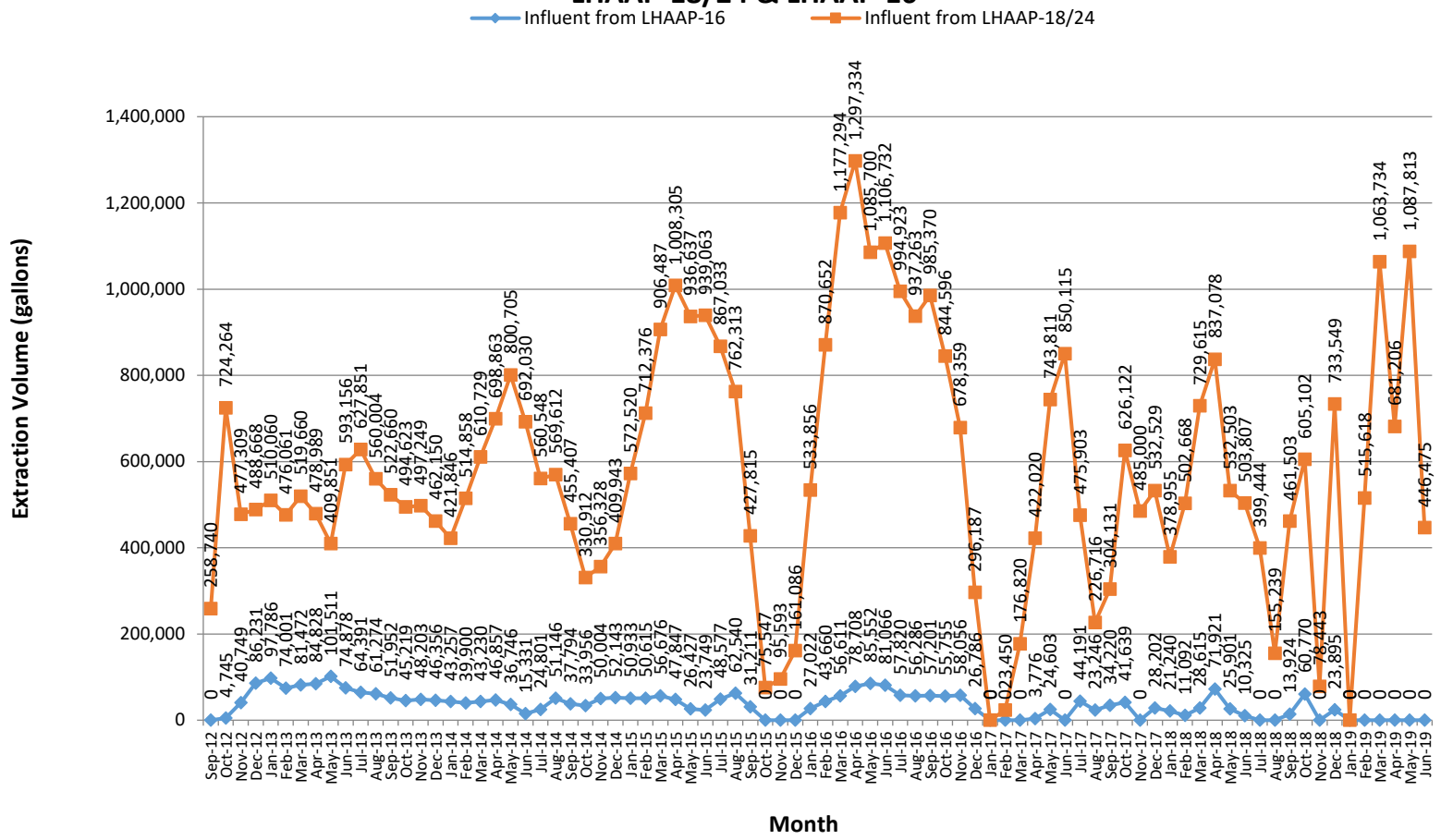
Figure ES-1: Groundwater Recovery Between September 2012 & June 2019
LHAAP-18/24 & LHAAP-16



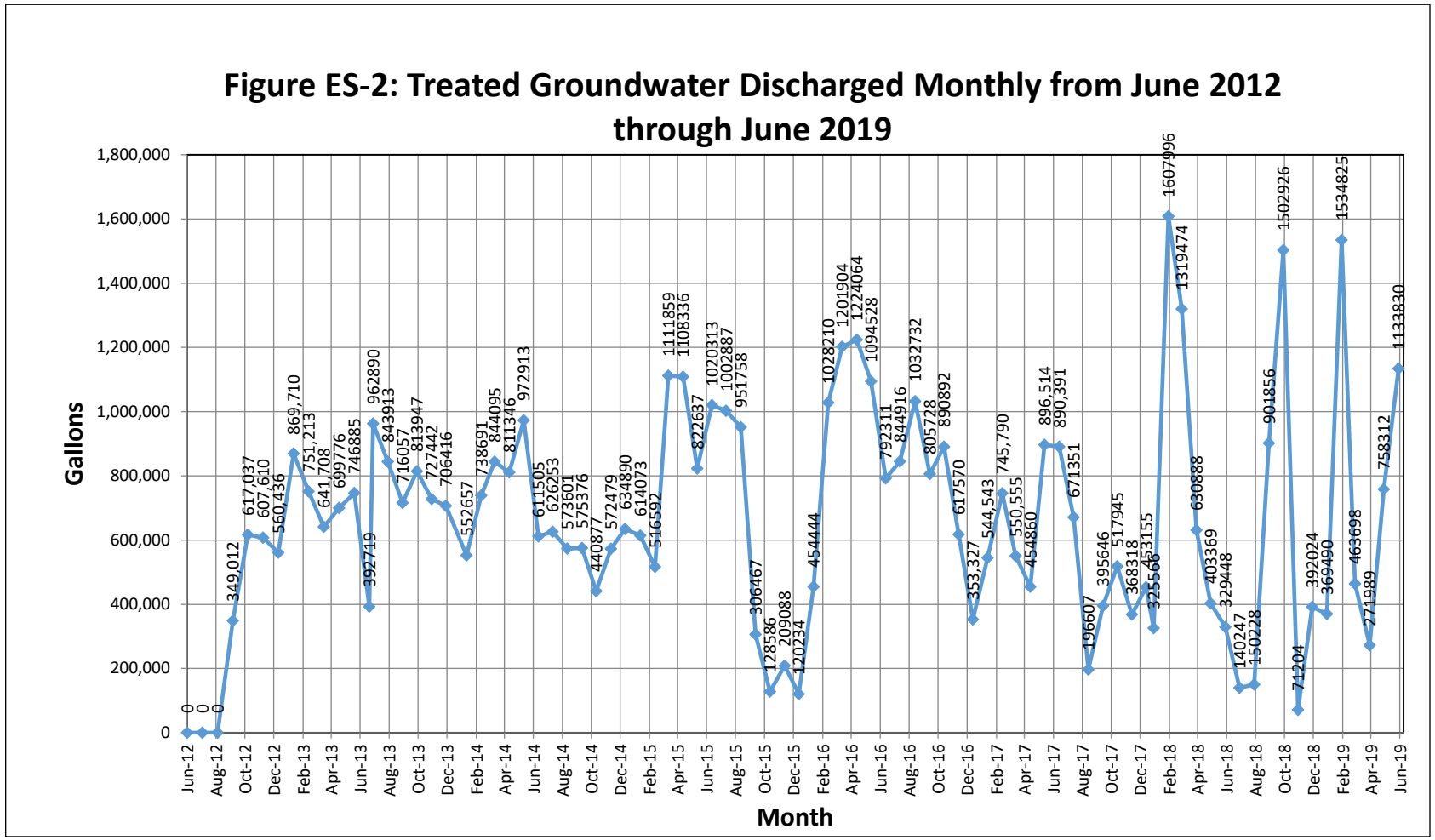


Figure ES-2: Treated Groundwater Discharged Monthly from June 2012 through June 2019
Gallons
Month
1,800,000
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
Jun-12
Aug-12
Oct-12
Dec-12
Feb-13
Apr-13
Jun-13
Aug-13
Oct-13
Dec-13
Feb-14
Apr-14
Jun-14
Aug-14
Oct-14
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1094528
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517945
368318
325568
1607996
1319474
630888
403369
329448
140247
150228
901856
1502926
71204
392024
369490
463698
1534825
271989
758312
1133830

Table ES-1: Discharge Information to Harrison Bayou During 2nd Quarter 2019

DATE	Harrison Bayou Flow (GPM)	Calculated Maximum Rate Allowable (GPM)	Released From GWTP To Harrison Bayou	Released From INF Pond to Harrison Bayou	Released From GWTP to INF Pond	Combined Total Released from GWTP	Combined Total Released to Harrison Bayou	INF Pond Staff Reading (6.20 = 3 ft. Freeboard)
04/01/2019	5,096	1,489	2,731	0	0	2,731	2,731	2.59
04/02/2019	4,387	1,282	10,042	0	0	10,042	10,042	2.58
04/03/2019	3,767	1,100	12,251	0	0	12,251	12,251	2.58
04/04/2019	3,137	916	11,571	0	0	11,571	11,571	2.57
04/05/2019	5,937	1,734	11,289	0	0	11,289	11,289	2.57
04/06/2019	5,123	1,485	0	0	0	0	0	2.57
04/07/2019	FLOOD STAGE	MAXIMUM	0	0	0	0	0	2.75
04/08/2019	FLOOD STAGE	MAXIMUM	37,932	0	0	37,932	37,932	3.46
04/09/2019	FLOOD STAGE	MAXIMUM	15,102	0	0	15,102	15,102	3.46
04/10/2019	FLOOD STAGE	MAXIMUM	12,608	0	0	12,608	12,608	3.45
04/11/2019	FLOOD STAGE	MAXIMUM	12,358	0	0	12,358	12,358	3.45
04/12/2019	32,529	9,505	11,428	0	0	11,428	11,428	3.45
04/13/2019	FLOOD STAGE	MAXIMUM	0	0	0	0	0	3.50
04/14/2019	FLOOD STAGE	MAXIMUM	0	0	0	0	0	4.08
04/15/2019	FLOOD STAGE	MAXIMUM	46,815	0	0	46,815	46,815	4.08
04/16/2019	FLOOD STAGE	MAXIMUM	11,952	0	0	11,952	11,952	4.08
04/17/2019	FLOOD STAGE	MAXIMUM	12,522	0	0	12,522	12,522	4.07
04/18/2019	FLOOD STAGE	MAXIMUM	12,033	0	0	12,033	12,033	4.07
04/19/2019	FLOOD STAGE	MAXIMUM	8,208	0	0	8,208	8,208	4.48
04/20/2019	FLOOD STAGE	MAXIMUM	0	0	0	0	0	4.48
04/21/2019	FLOOD STAGE	MAXIMUM	0	0	0	0	0	4.47
04/22/2019	28,975	8,466	38,525	0	0	38,525	38,525	4.47

DATE	Harrison Bayou Flow (GPM)	Calculated Maximum Rate Allowable (GPM)	Released From GWTP To Harrison Bayou	Released From INF Pond to Harrison Bayou	Released From GWTP to INF Pond	Combined Total Released from GWTP	Combined Total Released to Harrison Bayou	INF Pond Staff Reading (6.20 = 3 ft. Freeboard)
04/23/2019	No Release	NA	0	0	0	0	0	4.46
04/24/2019	No Release	NA	0	0	0	0	0	4.45
04/25/2019	No Release	NA	0	0	0	0	0	4.86
04/26/2019	No Release	NA	0	0	0	0	0	4.85
04/27/2019	No Release	NA	0	0	0	0	0	4.83
04/28/2019	No Release	NA	0	0	0	0	0	4.81
04/29/2019	No Release	NA	0	0	0	0	0	4.80
04/30/2019	4,621	1,350	4,622	0	0	4,622	4,622	4.79
05/01/2019	3,936	1,150	13,445	0	0	13,445	13,445	4.78
05/02/2019	7,368	2,153	14,393	0	0	14,393	14,393	4.97
05/03/2019	FLOOD STAGE	MAXIMUM	10,904	0	0	10,904	10,904	4.96
05/04/2019	FLOOD STAGE	MAXIMUM	0	0	0	0	0	5.08
05/05/2019	FLOOD STAGE	MAXIMUM	0	0	0	0	0	5.07
05/06/2019	22,920	6,697	43,253	0	0	43,253	43,253	5.06
05/07/2019	14,834	4,334	12,393	0	0	12,393	12,393	5.05
05/08/2019	FLOOD STAGE	MAXIMUM	12,032	0	0	12,032	12,032	5.04
05/09/2019	FLOOD STAGE	MAXIMUM	11,328	0	0	11,328	11,328	5.74
05/10/2019	FLOOD STAGE	MAXIMUM	11,064	0	0	11,064	11,064	5.78
05/11/2019	FLOOD STAGE	MAXIMUM	0	0	0	0	0	6.04
05/12/2019	FLOOD STAGE	MAXIMUM	0	0	0	0	0	6.03
05/13/2019	FLOOD STAGE	MAXIMUM	37,841	0	0	37,841	37,841	6.02
05/14/2019	FLOOD STAGE	MAXIMUM	11,270	0	0	11,270	11,270	6.01
05/15/2019	FLOOD STAGE	MAXIMUM	12,397	0	0	12,397	12,397	6.00
05/16/2019	FLOOD STAGE	MAXIMUM	12,039	0	0	12,039	12,039	5.99

DATE	Harrison Bayou Flow (GPM)	Calculated Maximum Rate Allowable (GPM)	Released From GWTP To Harrison Bayou	Released From INF Pond to Harrison Bayou	Released From GWTP to INF Pond	Combined Total Released from GWTP	Combined Total Released to Harrison Bayou	INF Pond Staff Reading (6.20 = 3 ft. Freeboard)
05/17/2019	FLOOD STAGE	MAXIMUM	9,821	0	0	9,821	9,821	5.98
05/18/2019	FLOOD STAGE	MAXIMUM	0	0	0	0	0	5.97
05/19/2019	FLOOD STAGE	MAXIMUM	0	0	0	0	0	6.63
05/20/2019	FLOOD STAGE	MAXIMUM	47,380	0	0	47,380	47,380	6.62
05/21/2019	FLOOD STAGE	MAXIMUM	24,309	0	0	24,309	24,309	6.61
05/22/2019	FLOOD STAGE	MAXIMUM	26,501	0	0	26,501	26,501	6.74
05/23/2019	FLOOD STAGE	MAXIMUM	24,989	0	0	24,989	24,989	6.71
05/24/2019	FLOOD STAGE	MAXIMUM	16,366	0	0	16,366	16,366	6.68
05/25/2019	4,156	1,206	0	0	0	0	0	6.67
05/26/2019	3,568	1,035	0	0	0	0	0	6.65
05/27/2019	3,155	915	0	0	0	0	0	6.63
05/28/2019	2,595	758	74,502	0	0	74,502	74,502	6.62
05/29/2019	2,269	663	28,909	0	0	28,909	28,909	6.60
05/30/2019	2,087	609	28,174	165,172	0	28,174	193,346	6.35
05/31/2019	1,784	521	21,125	88,705	0	21,125	109,830	6.18
06/01/2019	1,523	441	0	0	0	0	0	6.14
06/02/2019	1,396	404	0	0	0	0	0	6.13
06/03/2019	7,126	2,082	71,295	0	0	71,295	71,295	6.22
06/04/2019	24,416	7,134	21,045	0	0	21,045	21,045	6.32
06/05/2019	21,146	6,179	21,493	132,525	0	21,493	154,018	6.15
06/06/2019	FLOOD STAGE	MAXIMUM	21,821	117,260	0	21,821	139,081	5.96
06/07/2019	FLOOD STAGE	MAXIMUM	20,197	119,475	0	20,197	139,672	5.82
06/08/2019	18,543	5,377	0	0	0	0	0	5.80
06/09/2019	10,698	3,102	0	0	0	0	0	5.78

DATE	Harrison Bayou Flow (GPM)	Calculated Maximum Rate Allowable (GPM)	Released From GWTP To Harrison Bayou	Released From INF Pond to Harrison Bayou	Released From GWTP to INF Pond	Combined Total Released from GWTP	Combined Total Released to Harrison Bayou	INF Pond Staff Reading (6.20 = 3 ft. Freeboard)
06/10/2019	6,091	1,779	70,519	0	0	70,519	70,519	5.76
06/11/2019	5,347	1,562	22,245	0	0	22,245	22,245	5.75
06/12/2019	3,804	1,111	20,421	85,137	0	20,421	105,558	5.55
06/13/2019	3,304	965	16,876	46,081	0	16,876	62,957	5.38
06/14/2019	2,300	103,501	0	114,751	0	0	114,751	5.18
06/15/2019	NA	NA	0	0	0	0	0	5.16
06/16/2019	NA	NA	0	0	0	0	0	5.15
06/17/2019	9,679	435,587	0	0	0	0	0	5.24
06/18/2019	7,980	359,129	0	122,800	0	0	122,800	5.06
06/19/2019	5,812	261,554	0	109,889	0	0	109,889	4.80
06/20/2019	NA	NA	0	0	0	0	0	4.86
06/21/2019	NA	NA	0	0	0	0	0	4.84
06/22/2019	NA	NA	0	0	0	0	0	4.82
06/23/2019	NA	NA	0	0	0	0	0	4.80
06/24/2019	NA	NA	0	0	0	0	0	5.10
06/25/2019	NA	NA	0	0	0	0	0	5.18
06/26/2019	NA	NA	0	0	0	0	0	5.16
06/27/2019	NA	NA	0	0	0	0	0	5.14
06/28/2019	NA	NA	0	0	0	0	0	5.12
06/29/2019	NA	NA	0	0	0	0	0	5.42
06/30/2019	NA	NA	0	0	0	0	0	5.40
			1,062,336	1,101,795	0	1,062,336	2,164,131	

1 EVALUATION OF GROUNDWATER TREATMENT PLANT

The Groundwater Treatment Plant (GWTP) was constructed as part of the Interim Remedial Action (IRA) at Burning Ground Number (No.) 3, also referred to as Longhorn Army Ammunition Plant (LHAAP)-18/24, to treat groundwater extracted from interception-collection trenches (ICTs) and extraction wells. **Figure A-1** located in **Appendix A** presents the layout of the ICTs and extraction wells at LHAAP-18/24. The groundwater contamination at LHAAP-18/24 likely resulted from infiltration from an Unlined Evaporation Pond (UEP) that was used to store manufacturing wastewater, and from burning trenches and other industrial processes used to flash pyrotechnic, propellant, and explosive waste streams. The groundwater at LHAAP-18/24 is contaminated mainly with chlorinated ethenes and perchlorate, with lesser concentrations of 1,4-dioxane.

The GWTP also receives flow from eight extraction wells installed at LHAAP-16 as part of a historical treatability study. The extraction wells were installed in 1996 and 1997. The wells are located between the landfill at LHAAP-16 and Harrison Bayou. The groundwater at LHAAP-16 is also contaminated mainly with chlorinated ethenes and perchlorate.

1.1 Treatment Configuration

The process flow diagram for the GWTP is presented in **Appendix A, Figure A-2**. The GWTP was not operational between 24 May 2012, and 6 September 2012, due to malfunction of the scrubber unit associated with the catalytic oxidizer. Since 6 September 2012, the GWTP has operated without air abatement equipment. Although major repairs were conducted on the GWTP (e.g., replacement of level alarms, repair of the hydrochloric acid [HCl] tank, replacement of TK-650, replacement of malfunctioning valves and flow meters, replacement of metering pumps, repair or replacement of various system pumps, rust removal and repainting of various tanks, and replacement and repair of various extraction pumps, motors, and level switches), the GWTP treatment configuration has remained unchanged.

Malfunction of the blower on the air stripper (BL-340) on 14 September 2015, and on 17 September 2015, disrupted continuous extraction and routine operations of the GWTP, which lasted through 7 January 2016. Prior to this occurrence, the GWTP performed as designed and the GWTP was operated on an as needed basis (i.e., semi-continuous operational basis). During the 4th quarter of 2015, groundwater was extracted from a limited number of ICTs (ICTs 12E, 13A, 13B, 13C, and/or 13E, or ICTs 14B, 14C, and 14D). Operation of the GWTP occurred on a batch basis through the fluidized bed reactor (FBR). After replacement of the blower, attempts were made to restore continuous operations to the FBR but remained predominantly on a batch basis throughout January 2016.

In December 2016, an HCl spill caused plant operations to shut down until the issue could be properly addressed. The FBR performance was challenged by the increased chlorides in the neutralized wastewater, but performance gradually returned to normal in the 1st quarter of 2017. Groundwater extraction was gradually increased to full rates during the 2nd quarter of 2017.

On 12 August 2017, severe storms caused a power outage at LHAAP-18/24. When electrical service was restored, the main transformer failed due to a manufacturing defect. A portable emergency generator was brought on-site on 21 August 2017, to allow the FBR to operate in full recycle mode. After a replacement transformer was installed on 12 September 2017, extraction began from ICT-13B, 13C, 13D, 13E, 13F, 7, and EW01 and the FBR was put into normal operation. Beginning on 21 September 2017, groundwater was extracted from all of the ICTs.

On 27 December 2018, severe storms caused a power out in Karnack, Texas. When electrical service was restored, the main was determined to have failed. A portable emergency generator was brought on-site on 28 December 2018, to allow the FBR to operate in full recycle mode. On 5 February 2019, the smaller generator mobilized in December 2018 was replaced with a larger generator capable of powering the LHAAP-18/24 well field as well as the entire GWTP. On 8 February 2019, the transformer at the GWTP was tested to ensure that it could handle backfeeding necessary to power the LHAAP-18/24 well field due to the necessary step-down in power from the generator. Following additional system modifications based upon the testing, the well field at LHAAP-18/24 had power restored on 11 February 2019, using the generator and transformer at the GWTP.

On 13 June 2019, the P-320 pump (Air Stripper Feed Pump) locked up and was not repaired until 2 July 2019. The GWTP was last run on 13 June 2019. As a result, sampling was not conducted during the last 2 weeks of June 2019.

On 11 June 2019, Smith Energy was on site to repair a double walled pipe in the burning grounds. They returned to finish the repair on 17 June 2019. Currently, the line to 18WW17 is still down because of another leak in the double walled pipe and the ground has been too wet to dig.

Flow rates for the treatment processes for metals and Volatile Organic Compounds (VOCs) ranged between 180 and 200 gallons per minute (gpm) with an average of approximately 190 gpm for the operating hours (i.e., this flow rate does not represent continuous flows). The GWTP operated for 113.75 hours during the quarter. The treatment configuration of the plant at these rates (with minor variations) is as follows:

GWTP Metals Precipitation Operating Parameters

Pretreatment Settings	Tank 200-A $Mg(OH)_2$ Mixing	Tank 200-B NaOH Mixing	Tank 200-C Polymer Mixing	Tank 300 feed line to Air Stripper
pH Adjustment	9.0	10.5	NA	5.0 to meet ≤ 8.0 release from stripper
Feed Pump Settings	Speed 100% Stroke 100% 10 gph $Mg(OH)_2$	Speed 100% Stroke 100% 9.0 gph NaOH	Speed 90% Stroke 100% 40 gph water	Speed 80% Stroke 80% 10 gph HCl
Notes: gph - gallons per hour, NaOH - sodium hydroxide, $Mg(OH)_2$ - magnesium hydroxide, NA - not applicable				

GWTP Air Compressors Operating Parameters

Air Compressors	K-700A	K-700B	K-701
Air Pressure Settings	88 psi	88 psi	105 psi
Note: psi - pounds per square inch			

GWTP Stripper Operating Parameters

pH Setting	7.4
Inlet Pressure Gauge	Not operational
Stripper Pressure Gauge	Not operational
Air Flow Rate	Not operational

GWTP Fluidized Bed Reactor Operating Parameters

Carbon Bed Height	12 feet & 8 to 11 inches
Recycle Flow Rate	200 gpm
pH	7.1 to 7.4
Recycle oxidation-reduction potential (ORP)	<-430 mV
Note: mV – millivolts	

1.2 Work Performed at the GWTP

Work performed at the GWTP during the 2nd quarter of 2019 is described in the following subsections.

1.2.1 Major Maintenance

The major maintenance items that were completed at the GWTP during this quarterly reporting period are:

- 9 April 2019: Bloc Design was on site to repair a problem with panel #3 in the burning grounds
- 29 April 2019: Ark-La-Tex Electric was on site to replace broken power poles in the burning grounds
- 16 May 2019: Bloc Design was on site to repair broken underground electrical wires by panel #3 in the burning grounds
- 11 June 2019: Smith Energy was on site to repair double walled pipe in the burning grounds
- 13 June 2019: Pump P-320 locked up and the pump was removed and taken to the repair shop
- 17 June 2019: Smith Energy was on site to finish repairing double walled pipe in the burning grounds

1.2.2 Routine Maintenance

The following routine maintenance items were completed at the GWTP during this quarterly reporting period:

- Performed bush-hogging and weed eating activites around monitoring wells in Site 18/24
- Cleared fallen trees throughout Site 18/24
- Collected quarterly surface water samples and annual ICT well samples
- Completed sampling at Site 18/24 with the exception of wells 18WW19 and 18WW20 due to fallen trees making the entrance to these wells impassable
- Cut and removed fallen tree from power lines on Avenue P at Central Creek
- Installed repaired electric motor on P-101A
- Mowed grass around GWTP, GWTP office, Army trailer, decon pad, and storage conex boxes
- Performed housekeeping in GWTP office, Army trailer, GWTP Shop, and around GWTP and containment area
- Rebuilt one grundfos pump
- Repaired leaking 1-inch potable water pipe in GWTP
- Repaired sign at entrance of GWTP
- Replaced broken water spigot in GWTP
- Replaced bad check valve on suction tubing of P-104 as well as O-ring in sensitivity switch
- Replaced Woods #8 coupling on 3-inch piping, check valve, and ball valve on discharge on P-320
- Uncovered double walled pipe between ICTs 14C and 14D to find leak

1.2.2.1 Safety

The GWTP Operators, Mr. Scott Beesinger and Mr. Kennie Moore, did not have any safety incidents. Both GWTP Operators completed their annual 8-hour Hazardous Waste Operations and Emergency Response refresher course on 8 April 2019.

1.2.2.2 Lubrication

No lubrication maintenance was conducted during the reporting period.

1.2.2.3 Air Compressors

No maintenance activities were completed on the air compressor in the 2nd quarter 2019.

1.2.2.4 Belt Press and Waste Disposal

No belt press or waste disposal was conducted during the reporting period.

1.2.2.5 Sand Filter

No maintenance or repairs were conducted on the sand filter during the reporting period.

1.2.2.6 Well Field at LHAAP-18/24

- Cleaned level probes on ICTs 8, 12C, 13C, 13D, and 14C
- Collected monthly flow meter readings
- Collected monthly water levels
- Replaced flow meters on ICTs 13F and 12A
- Replaced low level probe on ICT 13D
- Replaced a bad relay in ICT 14E and 12D

1.2.2.7 Miscellaneous Activities

- 7 April 2019: The acetic acid feed pump lost prime and the nutrient pump shut off. The acetic acid feed pump was primed and nutrient pump was restarted.
- 20 April 2019: The acetic acid pump was not pumping and it was discovered that the suction tubing was plugged. The plug was removed and acetic acid pump was restarted.
- 12 May 2019: The acetic acid feed shut off and the nutrient pump shut off. Both pumps were restarted.
- 19 May 2019: The acetic acid pump shut off and it was restarted.
- 29 June 2019: The acetic acid feed shut off. The pump was restarted and primed.

1.2.3 Routine Maintenance at LHAAP-16

- Checked site daily
- Collected monthly water levels

1.2.4 Routine Maintenance (Potable Water Wells)

- Flushed potable water lines.

1.3 Filter Cake Operations and Management

No filter cake operations took place during this reporting period.

1.4 Fluidized Bed Reactor Operations

The operating parameters for the GWTP FBR are presented in **Table 1**. With the exception of ORP on 11 June 2019 and the pH from 25 April 2019 through 2 May 2019, and again from 19 June 2019 through 30 June 2019, none of the operating parameters were outside of the optimal ranges in the 2nd quarter of 2019. The ORP ranged between -429 mV and -596 mV, and the pH ranged between 7.0 and 7.4 standard units. The ORP was just outside of optimal range on one day only.

Table 1. Enhanced Fluidized Bed Reactor Operating Parameters – 2nd Quarter 2019

Date	pH (7.1-7.4)	ORP (<-430 mV)	Temperature (Degrees Fahrenheit)
4/1/2019	7.4	-525	62
4/2/2019	7.4	-529	63
4/3/2019	7.4	-503	63
4/4/2019	7.3	-521	62
4/5/2019	7.4	-525	63
4/6/2019	7.3	-526	64
4/7/2019	7.3	-523	64
4/8/2019	7.3	-525	66
4/9/2019	7.2	-522	68
4/10/2019	7.2	-523	70
4/11/2019	7.2	-525	70
4/12/2019	7.2	-500	68
4/13/2019	7.2	-510	67
4/14/2019	7.2	-513	67
4/15/2019	7.2	-514	67
4/16/2019	7.4	-524	68
4/17/2019	7.3	-528	68
4/18/2019	7.2	-522	67
4/19/2019	7.3	-527	67
4/20/2019	7.3	-528	68
4/21/2019	7.2	-525	68
4/22/2019	7.2	-537	70
4/23/2019	7.1	-540	72
4/24/2019	7.1	-536	73
4/25/2019	7.0	-531	73
4/26/2019	7.0	-527	74
4/27/2019	7.0	-534	75
4/28/2019	7.0	-529	75
4/29/2019	7.0	-540	78
4/30/2019	7.0	-497	77
5/1/2019	7.0	-515	75
5/2/2019	7.0	-524	75
5/3/2019	7.1	-526	75
5/4/2019	7.1	-530	75
5/5/2019	7.1	-531	75
5/6/2019	7.1	-527	75

Date	pH (7.1-7.4)	ORP (<-430 mV)	Temperature (Degrees Fahrenheit)
5/7/2019	7.1	-531	76
5/8/2019	7.2	-539	75
5/9/2019	7.1	-543	75
5/10/2019	7.1	-545	74
5/11/2019	7.1	-538	73
5/12/2019	7.1	-540	72
5/13/2019	7.1	-522	73
5/14/2019	7.1	-535	73
5/15/2019	7.2	-529	74
5/16/2019	7.2	-545	75
5/17/2019	7.2	-557	74
5/18/2019	7.2	-543	76
5/19/2019	7.1	-545	77
5/20/2019	7.1	-541	77
5/21/2019	7.1	-535	77
5/22/2019	7.1	-504	77
5/23/2019	7.1	-533	78
5/24/2019	7.1	-532	78
5/25/2019	7.1	-547	80
5/26/2019	7.1	-553	80
5/27/2019	7.1	-556	80
5/28/2019	7.2	-531	79
5/29/2019	7.3	-530	79
5/30/2019	7.3	-537	78
5/31/2019	7.3	-545	78
6/1/2019	7.3	-558	78
6/2/2019	7.3	-563	79
6/3/2019	7.3	-495	79
6/4/2019	7.4	-481	79
6/5/2019	7.2	-525	79
6/6/2019	7.2	-530	77
6/7/2019	7.2	-521	77
6/8/2019	7.2	-541	79
6/9/2019	7.2	-541	80
6/10/2019	7.2	-457	79
6/11/2019	7.3	-429	79
6/12/2019	7.4	-433	79
6/13/2019	7.4	-458	81

Date	pH (7.1-7.4)	ORP (<-430 mV)	Temperature (Degrees Fahrenheit)
6/14/2019	7.4	-460	81
6/15/2019	7.4	-567	84
6/16/2019	7.3	-570	82
6/17/2019	7.1	-596	83
6/18/2019	7.1	-568	84
6/19/2019	7.0	-558	85
6/20/2019	7.0	-530	85
6/21/2019	7.0	-552	86
6/22/2019	7.0	-533	86
6/23/2019	7.0	-547	86
6/24/2019	7.0	-549	87
6/25/2019	7.0	-544	87
6/26/2019	7.0	-542	87
6/27/2019	7.0	-543	88
6/28/2019	7.0	-542	88
6/29/2019	7.0	-539	88
6/30/2019	7.0	-536	87

1.5 Process Chemical Usage at GWTP

Approximate chemical consumption and the quantity delivered during the 2nd quarter of 2019 are shown in **Table 2**.

Table 2. Process Chemicals Delivered and Used

Chemical	Usage 2nd Quarter 2019	Quantity Delivered 2nd Quarter 2019
Hydrochloric acid	345 gallons	0
Sodium hydroxide (35%)	575 gallons	0
Acetic acid (50%)	4 drums = 220 gallons	0
Phosphoric acid (75%)	47.7 liters	0
Magnesium hydroxide	170 gallons	0
Urea	353.5 pounds	0
Polymer (magnafloc 110-L)	5.8 liters	0

2 EVALUATION OF LHAAP-18/24 ICT EFFECTIVENESS

The ICT system at Burning Ground No. 3 is composed of 14 sections ranging in length from 100 feet (ft) to 1,300 ft. A total of approximately 5,000 linear ft of trench was installed within and around three sides of Burning Ground No. 3. The trench sections extend approximately 22 ft to 45 ft below ground surface (bgs). Most, but not all of the trenches are as deep as the confining clay layer of the shallow groundwater zone. High density polyethylene (HDPE) liners were installed in ICTs 12 and 13, located on the western and northern boundaries of LHAAP-18/24, respectively. The locations of the liners are shown on **Figure A-1** in **Appendix A**. **Table A-1** in **Appendix A** presents the depths of the ICTs.

2.1 Groundwater Elevation

Water levels from 94 monitoring wells and 11 piezometers (piezometer 12 was damaged and plugged and abandoned in May 2013) are measured monthly to generate potentiometric surface maps that assist in monitoring the effectiveness of the groundwater extraction system on plume containment. The groundwater contours are generated using the water levels from the shallow zone and Wilcox Formation wells. The water level data are presented in **Table 3**. No reinjection of treated groundwater or reapplication to LHAAP-18/24 grounds via the existing irrigation system occurred during the 2nd quarter of 2019. Potentiometric surface maps are presented in **Appendix B** and groundwater elevations from the 2nd quarter of 2019 are discussed in Section 2.2.

2.2 Performance of Plume Capture

The intent of the ICTs is to control groundwater gradients, prevent off-site migration of contaminated groundwater, extract the most highly contaminated groundwater, and reduce the mass of contaminants in groundwater. Liners were installed in the ICTs on the northern (ICT 13) and western (ICT 12) site boundaries to limit migration of contaminated water from the site towards Harrison Bayou. At the same time, the liners reduce or prevent removal of contaminated groundwater that is outside the containment zone, between the site and Harrison Bayou. The ICTs are installed within the shallow subsurface at the site and capture primarily shallow groundwater (e.g., < 40 ft bgs).

In 2007 and 2008, in consultation with the Texas Commission on Environmental Quality (TCEQ) and the United States Environmental Protection Agency (USEPA), the Army ceased operations of ICTs 1, 3, 5, 10, and 12A for groundwater extraction (note that extraction from ICT 12A was resumed after pump replacement in December 2012). Two other ICTs (ICT 6 and ICT 9) were changed from extraction ICTs to re-injection ICTs. Groundwater extraction from well EW-1 located in the northeast central portion of the site began in October 2008 and well 18WW17 located to the northeast of the ICT containment area began in January 2008. **Table B-1** in **Appendix B** presents a summary of extraction equipment replacement since 2011, as dictated by poor extraction performance (malfunctioning pumps, poor pump positioning with respect to

groundwater, non-operational level probes, scale build up, etc.). Further discussion of extraction performance of various ICTs and extraction wells is presented in Section 2.3.

Potentiometric surface maps of the shallow zone groundwater in the vicinity of LHAAP-18/24, based on groundwater elevations measured on 26 April, 29 May, and 28 June 2019, are shown on **Figures B-1, B-2, and B-3 in Appendix B**, respectively. The potentiometric surface maps of the shallow zone were contoured using the Kriging geostatistical interpolation method included in the Golden Software Surfer® data analysis software.

The HDPE liners in the ICTs, where present, were interpreted as groundwater flow barriers. The potentiometric surface maps for April through June 2019 continue to reflect high groundwater elevations in the northern/northwestern portion of the site with groundwater flow occurring radially from groundwater highs at monitoring well AWD-2 (175.01 feet above mean sea level [amsl] in April 2019, 175.23 feet amsl in May 2019, and 175.42 feet amsl in June 2019) inside the ICT containment area. An additional high point in June 2019 was 18CPTMW19 where the level measured 175.14.

The elevated potentiometric surface contours within the ICTs compared to the lower potentiometric surface contours on the outside of the ICTs is likely due to a no flow boundary condition caused by the ICT liners and groundwater extraction along the ICTs. From the groundwater high at monitoring well AWD-2, groundwater flows radially towards the surrounding ICTs which include ICT 13 to the north and northwest, and ICT 12 to the west and southwest.

Groundwater extraction rates from the ICTs were 681,206 gallons in April 2019; 1,087,813 gallons in May 2019; and 446,475 gallons in June 2019. Rainfall amounts recorded at the GWTP were 13.00 inches in April 2019, 13.14 inches in May 2019, and 12.29 inches in June 2019. This amount of rainfall resulted in 287,504 gallons of additional water treated and discharged but not metered with the influent totals.

During the reporting period, approximately 2.1-million gallons of treated groundwater was discharged to Harrison Bayou from either the GWTP or the INF Pond. No treated groundwater from the GWTP was returned to LHAAP-18/24 via the sprinkler system. Overall groundwater levels increased between April and May 2019 with an average shallow zone groundwater elevation rise of 0.2 ft. Groundwater levels also increased between May and June 2019 with an average shallow groundwater elevation rise of 0.4 ft.

Groundwater levels in Wilcox Formation wells (generally > 40 to 50 ft bgs) were measured during the 2nd quarter of 2019 groundwater gauging events. Wilcox Formation wells correspond generally to those wells previously identified as “Intermediate” and “Deep” wells. “Intermediate” wells are designated as Upper Wilcox Formation wells and “Deep” wells are designated as Lower Wilcox Formation wells. Generally, groundwater in the Upper and Lower Wilcox Formation wells are in hydraulic communication and so can be treated as a single hydrogeologic unit. Therefore, the groundwater elevations in Upper Wilcox wells were used to construct the potentiometric surface maps for the Wilcox Formation. **Figures B-4, B-5, and B-6** in **Appendix B** show the locations of the Wilcox Formation monitoring wells and the

potentiometric surface of the Wilcox Formation, based on static water levels measured during the April, May, and June 2019 gauging events, respectively. Groundwater in the Wilcox Formation generally flows in a north-northeasterly direction, towards Caddo Lake and there is a downward vertical gradient between the overlying shallow zone and the Wilcox Formation. However, a groundwater high in the Wilcox Formation occurs in the area of MW-14.

2.3 Quantity of Water Extracted from LHAAP-18/24

The average daily extraction rates from the ICTs were 22,707 gallons per day (gpd) in April 2019, 35,091 gpd in May 2019, and approximately 14,883 gpd in June 2019.

The volume of groundwater removed from LHAAP-18/24 during the 2nd Quarter 2019 measured approximately 2,215,494 gallons, based on total flow measured from the extraction wells and ICT wells. However, the influent totalizer (FIT-140) readings, as presented on **Figure 2-1,** only indicate 1,077,523 gallons were extracted. No groundwater was extracted from LHAAP-16 during the 2nd quarter of 2019 due to the main transformer not being operational. **Figure 2-1** shows the historical trends of extracted volumes by quarter based upon the influent totalizer (FIT-140). It is noted that there is a significant difference between the totalizer readings at FIT-140 and the total obtained from the individual units observed this quarter, which has been further evaluated this quarter. Two leaks were found and one has been repaired. The second leak will be repaired when the ground is dry enough to dig.

In contrast to the approximate total extracted volume based on total flow measured at the GWTP, the total estimated volume discharged to Harrison Bayou following treatment by the GWTP (FIT-686) was 271,989 gallons in April 2019; 504,435 gallons in May 2019; and 285,912 gallons in June 2019 for a total of 1,062,0336 gallons discharged in 2nd Quarter 2019 (**Table 4**). However, this volume does not account for water present in the decant tank at the end of June or the influent that was not treated after the GWTP last ran on 13 June 2019. The difference between the influent volume determined from the individual meters on the ICTs and extraction wells and effluent volume determined from FIT-686 is approximately 70%. As of 28 June 2019, the total volume of water within the GWTP from tanks TK-300, TK-140, and TK-630 was approximately 360,000 gallons. However, considering the volume of unprocessed water within the treatment plant as of the end of the 2nd quarter, this percent difference is closer to 43% variation, which is contributable to variations in the flow meter recordings and the leak identified and repaired in the 2nd quarter. The 3rd quarter evaluation of influent versus effluent will allow for further determination of the effects of these leaks.

As indicated by Table 5, 23 of 27 ICTs and wells produced water during the 2nd quarter of 2019. ICTs 13A and 13D did not operate in May or June 2019 due to iron fouling of the pumps. Due to line leak repairs noted previously, ICTs 14A, 14B, and 14C did not operate in June 2019.

2.4 Sampling Activities at LHAAP-18/24

Groundwater sampling was completed at LHAAP-18/24 in accordance with the requirements documented in the Final Revised Installation-Wide Work Plan (Bhate Environmental Associates, Inc. [Bhate], May 2018). The following 79 monitoring wells were sampled for the 2nd quarter 2019: AWD-1, AWD-3, AWD-4, MW-1, MW-2, MW-3, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-12, MW-13, MW-14, MW-16, MW-17, MW-18, MW-19, MW-20, MW-21, MW-22, MW-

23, 102, 109, 120, 125, 126, 129, 130, C-01, C-02, C-03, C-04, C-06, C-08, C-09, 17WW08, 18WW02, 18WW03, 18WW06, 18WW08, 18WW09, 18WW10, 18WW14, 18WW16, 18WW17 18WW18, 18WW19, 18WW20, 18WW22, 18WW24, 18WW25, 18CPTM01SW, 18CPTMW01DW, 18CPTMW03SW, 18CPTMW04, 18SPTMW04SW, 18CPTMW06, 18CPTM07, 18CPTMW08SW, 18CPTM08DW, 18CPTMW10SW, 18CPTMW10DW, 18CPTMW12SW, 18CPTMW12DW, 18CPTMW14, 18CPTM15, 18CPTMW16, 18CPTM18, 18CPTMW19, 18CPTMW19SW, 18CPTMW22SW, 18CPTMW22R, 18CPTMW22DW, 18CPTMW23, 18CPTMW23SW, 18CPTM24, and 18CPTMW26SW. The ICTs sampled in the 2nd quarter 2019 included ICT-2, 4, 7, 8, 11, 12B, 12C, 12D, 12E, 13A, 13B, 13D, 13E, 13F, 14B, 14C, and 14D. Due to access issues, wells 18WW19 and 18WW20 were sampled on 8 August 2019, whereas the other 77 monitoring wells were sampled in June 2019. Similarly ICT-13A was sampled on 11 July 2019 due to access issues where as the other 16 ICTs were sampled in June 2019. Note also that monitoring well 123 was not sampled based upon the response to comments for the LHAAP-17 Pre-Design Investigation Report. Monitoring well 18WW10 replaced 123 per the response to comments.

The analytical results are presented in **Table 6**. Laboratory data packages are provided within **Appendix C**. Parameters exceeding their respective Maximum Contaminant Levels (MCLs), Medium Specific Concentrations (MSCs), or Protective Concentration Levels (PCLs) are as follows: perchlorate; 1,1,2-trichloroethane; 1,1-dichloroethene (DCE); 1,2,3-trichloropropane; 1,2-dichloroethane; benzene; carbon tetrachloride; cis-1,2-DCE; trans-1,2-DCE; methylene chloride; tetrachloroethene; trichloroethene (TCE); vinyl chloride (VC); arsenic; barium; cadmium; chromium; lead; manganese; and nickel.

Groundwater chemicals of concern (COCs) maps depicting the results of the June 2019 groundwater sampling event for perchlorate, TCE, and methylene chloride are presented as **Figures D-1 through D-6** in **Appendix D**.

2.4.1 LHAAP-18/24 Analytical Results

The highest perchlorate concentrations in the shallow zone are observed in MW23, MW5, MW7, MW21, 18WW17, 120, and MW3, with concentrations in these wells ranging between 11,000 µg/L in MW3 and 85,000 µg/L in 18WW17 (**Figure D-1**). Perchlorate in groundwater has migrated off-site in all directions. The perchlorate concentration in 18CPTMW23, which is located northwest just outside of the LHAAP-18/24 boundary, was reported at 2,500 µg/L in June 2019 which is comparable the detection of 4,200 µg/L in December 2018. Typically, the December detections are more than 10 times lower but, with the higher rainfall over the past 9 months, the December 2018 detection was elevated. Historical data demonstrates the more typical fluctuation with measurements of perchlorate as follows: 140 µg/L in December 2017, 3,220 µg/L in June 2017, 91.3 µg/L in December 2016, and 2,310 µg/L in June 2016. These changes in concentration are likely influenced by groundwater level fluctuations, rain amounts, and performance of the ICTs.

Perchlorate in the Wilcox Formation was detected in monitoring well 18CPTMW08SW at a concentration of 23,000 µg/L (**Figure D-2**), which is comparable to the concentration reported in December 2018 (22,000 µg/L). Perchlorate concentration decreases rapidly away from this well.

Another area where perchlorate in the Wilcox Formation was identified at an elevated concentration is in MW-14, with a reported concentration of 240,000 µg/L (primary sample) / 230,000 µg/L (duplicate sample) compared to 76,000 µg/L in December 2018. Monitoring well 18CPTMW22SW also contained an elevated concentration of perchlorate with 590 µg/L in June 2019, which is significantly less than the detection of 1,900 µg/L in December 2018 and historical detections in this monitoring well.

The TCE plume in the shallow zone remained stable compared to that depicted in December 2018. However, the highest TCE detection was 15,000 µg/L in monitoring well MW-1 (**Figure D-3**), which was not sampled in December 2018. Monitoring well 120 was sampled in both December 2018 and June 2019. In December 2018, monitoring well 120 had the highest concentration of TCE at 22,000 µg/L and this concentration decreased to 7,900 µg/L in June 2019. This observed fluctuation of TCE within well 120 is likely due to fluctuations in groundwater elevations coupled with the increased and continued rainfall over the prior 9 months.

TCE in the Wilcox Formation is generally present at low concentrations (**Figure D-4**). The highest concentration of 11,000 µg/L was observed in MW-14. This concentration increased from a concentration of 9,000 µg/L in December 2018. In December 2017, 13,000 µg/L was measured at this well. A concentration of 32 µg/L was reported in 18CPTMW01SW in June 2019, which is less than half of what was measured in June 2018 (81 µg/L).

The concentrations of methylene chloride in the shallow zone remain centered on MW-2 with a concentration of 510,000 µg/L which is double the concentration of 170,000 µg/L detected in December 2018 and more than triple the 140,000 µg/L detected in December 2017, but lower than the detection of 604,000 µg/L measured in June 2017. The extent of methylene chloride in the shallow formation is depicted on **Figure D-5**.

Methylene chloride in the Wilcox Formation is present at a concentration of 100 µg/L identified in 18CPTMW01SW in June 2019, which is lower than the concentration reported in December 2018 of 1,600 µg/L and December 2017 of 1,500 µg/L. This fluctuation is similar to that observed in June 2017 which had a detection of 913 µg/L and a detection of 1,590 µg/L in December 2016. Methylene chloride in MW-14 was not detected (< 20 µg/L) in June 2019, December 2018, or June 2018. The extent of methylene chloride in the Wilcox Formation is depicted on **Figure D-6**.

2.4.2 LHAAP-18/24 Trend Analysis

Time-series graphs for the shallow zone and Wilcox Formation wells are presented in **Appendix E**. Graphs for shallow zone wells C-08, MW-2, MW-7, MW-8, MW-16, MW-17, MW-20, MW-21, MW-22, MW-23, 18WW08, 109, 120, 126, and AWD-3 are included. Graphs for Wilcox wells C-03 and MW-14 are also included. The following observations were made, based on the June 2019 groundwater monitoring results:

- MW-2 is located inside the containment in the shallow zone. Methylene chloride increased to 510,000 µg/L (duplicate) in June 2019 compared to a detection of 170,000 µg/L in December 2018. The concentration of methylene chloride is within the recent range of detections in MW-2 (detected at 604,000 µg/L in June 2017). The TCE

concentration in June 2019 decreased to 1,400 µg/L from 2,300 µg/L in December 2018. Perchlorate was non-detected in both June 2019 and December 2018.

- The perchlorate concentration in MW-21 remained relatively stable in June 2019 with a detection of 24,000 µg/L compared to 23,000 µg/L in December 2018. TCE in MW-21 decreased to 6,300 µg/L in June 2019 from 9,800 µg/L in December 2018. Methylene chloride remained below the detection limit.
- The TCE concentration in MW-22 (230 µg/L) was approximately 50-percent lower than the December 2018 result of 680 µg/L. Methylene chloride remained below the detection limit. Perchlorate remained stable with a detection of 95 µg/L in June 2019 and a detection of 84 µg/L in December 2018. In addition, these detections remain lower when compared to concentrations greater than 200 µg/L in prior sampling events at MW-22.
- Perchlorate detected in groundwater at MW-23 increased slightly to 67,000 µg/L in June 2019, from 52,000 µg/L in December 2018. TCE decreased to 2,600 µg/L from 4,800 µg/L in December 2018.
- Perchlorate in monitoring well 120 decreased from 47,000 µg/L in December 2018 to 13,000 µg/L in June 2019. TCE also decreased from 22,000 µg/L in December 2018 to 7,900 µg/L in June 2019.
- Methylene chloride and perchlorate remained below the detection limits in C-08, to the northeast of the containment area. TCE decreased slightly to 1.1 µg/L in June 2019 from 2.2 µg/L in December 2018.
- The northeastern well, 109, saw an increase in perchlorate from the December 2018 detection of 3,200 µg/L to 10,000 µg/L in June 2019. The recent detection is within the historical range and is less than the detection of 19,000 µg/L in December 2017. TCE detected in monitoring well 109 decreased from 420 µg/L in December 2018 to 130 µg/L in June 2019. Methylene chloride remained below the detection limit.
- Wells to the southwest of the containment area include MW-7, MW-8, and MW-17. Perchlorate increased in MW-7 to 26,000 µg/L in June 2019 from 14,000 µg/L December 2018. This well has seen a decreasing trend in TCE that continued from the December 2018 sampling (2,000 µg/L) to the June 2019 sampling (1,300 µg/L). Perchlorate increased in MW-8 to 7,100 µg/L from 6,700 µg/L in December 2018. This well's decreasing trend in TCE has continued with a detection of 480 µg/L in December 2018 and a detection of 120 µg/L in June 2019. The perchlorate concentration in MW-17 has remained below the detection limit since June 2016. Methylene chloride remained below the detection limit in each of these three monitoring wells.
- Perchlorate in MW-16 increased to 2,900 µg/L in June 2019 from 90 µg/L in December 2018. While this detection is within the historical range, this is the highest detected concentration of perchlorate since June 2015. As presented in Table 5, ICT-13A is the nearest extraction point to MW-16, and it was not operational in May or June 2019, which could have resulted in the increased perchlorate detection during the June 2019 sampling event. TCE also increased to 1,200 µg/L in June 2019

2019 from 780 µg/L in December 2018. This variability in the TCE detection has been observed since 2014. However, this detection of TCE is the highest observed in this monitoring well. Methylene chloride remained below the detection limit.

- Perchlorate in AWD-3 decreased from 6.9 µg/L in December 2018 to 1.8 J (estimated concentration) µg/L in June 2019. TCE increased from 160 µg/L in December 2018 to 580 µg/L in June 2019. Methylene chloride remained below the detection limit.
- C-03 is a Wilcox Formation well located northeast of the containment area, which has remained non-detect for TCE and methylene chloride since December 2014. Perchlorate increased from 15 µg/L in December 2018 to 54 µg/L in June 2019.
- The concentration of perchlorate in Wilcox Formation well MW-14 increased from 76,000 µg/L in December 2018 to 240,000 µg/L in June 2019. These detections of perchlorate in MW-14 are consistent with those results obtained from December 2013 through June 2016. The concentration of TCE also increased from 9,000 µg/L in December 2018 to 11,000 µg/L in June 2019. Methylene chloride remained below the detection limit.
- The concentration of methylene chloride and TCE continue to be non-detect for 18WW08. Perchlorate decreased from 130 µg/L in June 2018 to 45 µg/L in December 2018 and then non-detect in June 2019.

Monitoring wells MW-20 and 126 continue to have no or low level detections of methylene chloride, TCE, and perchlorate. These wells should be considered for removal from the monitoring program.

In general, other than the changes observed above in perchlorate, TCE, and methylene chloride concentrations, the COC concentration trends indicate that the plumes are stable, suggesting that the extraction system is effective in containing the plumes. The increase in perchlorate detections in MW-16, which is a shallow monitoring well near the Harrison Bayou, need to be monitored and evaluated compared to the surface water detections.

2.5 Groundwater Treatment Plant Sampling and Analysis

Sampling and analysis is completed in accordance with the requirements documented in the Final Revised Sampling and Analysis Plan (AECOM Technical Services, Inc., September 2017). Besides the Record of Decision (ROD) sampling requirement, additional sample analyses are typically performed on the influent and effluent samples to monitor the effectiveness of the perchlorate treatment (FBR and/or ion exchange vessels) process. Sections 2.5.1 through 2.5.4 present the results of analyses conducted during the 2nd quarter of 2019. The complete laboratory results are provided on a compact disc (CD) (**Appendix F**).

2.5.1 Perchlorate Sampling

Table 7 presents the weekly effluent perchlorate results for the 2nd quarter of 2019. Due to the repairs being completed on pump P-320, the GWTP was not operated from 13 June 2019 until

early July 2019. Therefore, the last effluent sample for the 2nd quarter 2019 was collected on 12 June 2019. The effluent results were non-detect for perchlorate in the 2nd Quarter 2019.

2.5.2 VOC Sampling

Tables 8, 9, and 10 present the effluent VOC results for April, May, and June 2019. Sampling of the effluent for VOCs was conducted on a biweekly basis. The results, where applicable, were below the discharge limits. The tables also provide monthly influent concentrations for VOCs and perchlorate.

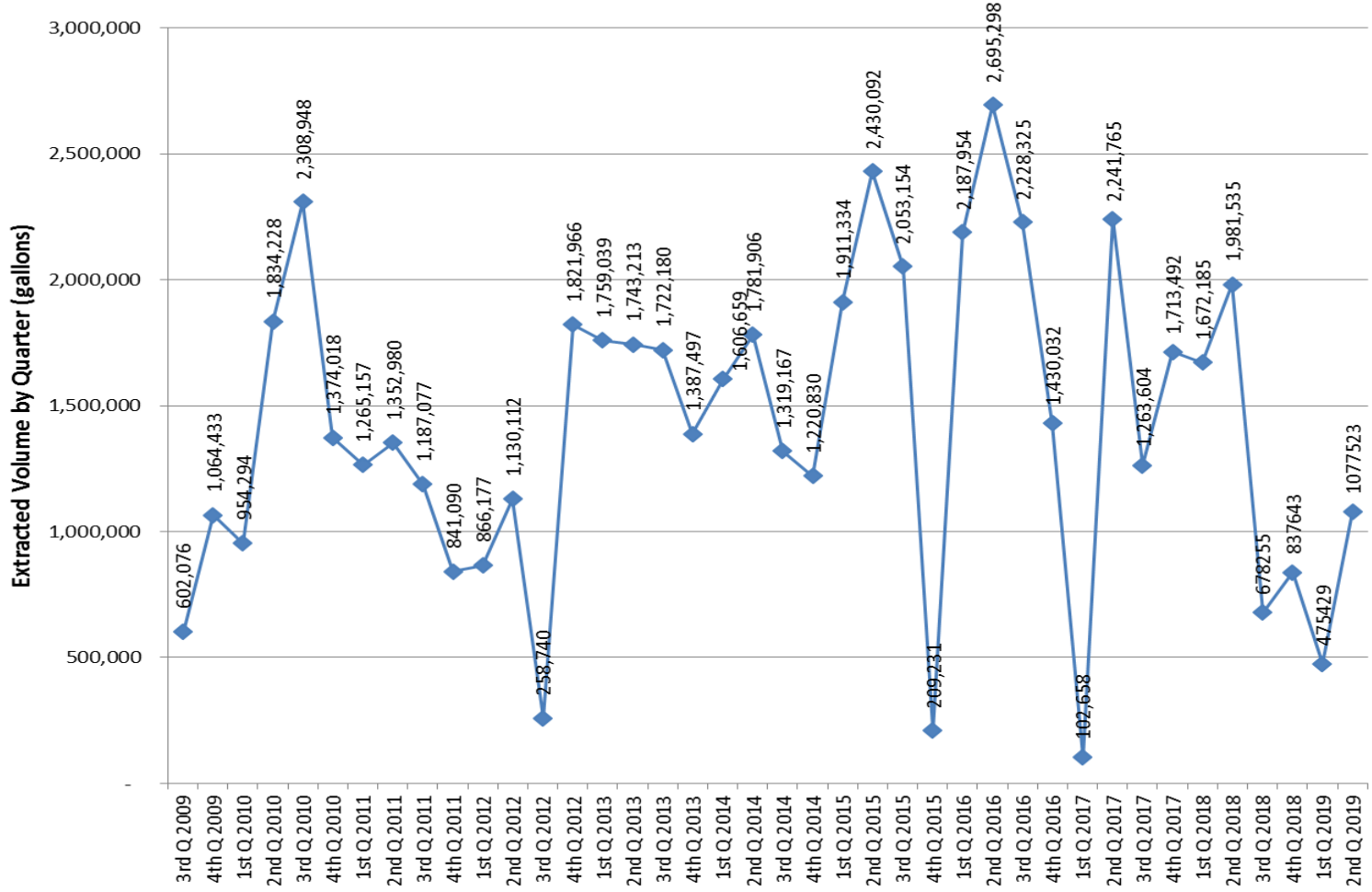
2.5.3 Monthly Metals Sampling

As per the Final Installation-Wide Work Plan (Bhate, May 2018), the monthly metals sampling is reported in **Tables 8, 9, and 10**. None of the metals exceeded the effluent discharge limits.

2.5.4 Quarterly Sampling

Sampling of the effluent for VOCs, anions, chemical oxygen demand (COD), oil and grease, perchlorate, and metals was conducted during this quarter and the results were below the discharge limits. **Table 11** presents the analytical results for the 2nd quarter of 2019.

Figure 2-1
Quarterly Extraction Rate



Extraction rate beginning at 3rd Q 2013 is based in FIT-140 (influent totalizer)

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Table 3: Groundwater Elevations at LHAAP-18/24 Piezometers, Monitoring Wells, and Surface Water

Location Identification	Type	Reference Elevation (feet amsl)	Depth to Water (feet) 4/26/2019	Groundwater Elevation (feet amsl) 4/26/2019	Depth to Water (feet) 5/29/2019	Groundwater Elevation (feet amsl) 5/29/2019	Depth to Water (feet) 6/28/2019	Groundwater Elevation (feet amsl) 6/28/2019
BGPZ-1	Piezometer	184.99	4.63	180.36	4.77	180.22	4.59	180.40
BGPZ-2	Piezometer	184.39	12.70	171.69	12.58	171.81	12.50	171.89
BGPZ-3	Piezometer	180.35	6.37	173.98	6.30	174.05	6.35	174.00
BGPZ-4	Piezometer	177.77	6.29	171.48	6.17	171.60	6.08	171.69
BGPZ-5	Piezometer	180.76	10.27	170.49	10.14	170.62	10.05	170.71
BGPZ-6	Piezometer	197.82	26.69	171.13	26.45	171.37	26.31	171.51
BGPZ-7	Piezometer	195.96	26.30	169.66	26.07	169.89	25.90	170.06
BGPZ-8	Piezometer	197.08	28.50	168.58	28.22	168.86	28.04	169.04
BGPZ-9	Piezometer	196.45	27.08	169.37	26.82	169.63	26.60	169.85
BGPZ-10	Piezometer	197.00	27.15	169.85	26.87	170.13	26.65	170.35
BGPZ-11	Piezometer	196.99	27.20	169.79	26.93	170.06	26.75	170.24
BGPZ-12	Piezometer	188.17	NA	Plugged	NA	Plugged	NA	Plugged
AWD-1	Monitoring Well	182.27	8.75	173.52	8.45	173.82	7.74	174.53
AWD-2	Monitoring Well	186.78	11.77	175.01	11.55	175.23	11.36	175.42
AWD-3	Monitoring Well	200.13	27.16	172.97	26.91	173.22	26.38	173.75
AWD-4	Monitoring Well	193.89	23.73	170.16	23.40	170.49	19.57	174.32
MW-1	Monitoring Well	199.22	26.32	172.90	26.00	173.22	25.50	173.72
MW-2	Monitoring Well	196.73	25.75	170.98	25.37	171.36	25.18	171.55
MW-3	Monitoring Well	196.54	25.62	170.92	25.29	171.25	24.64	171.90
MW-4	Monitoring Well	197.27	25.92	171.35	25.60	171.67	24.96	172.31
MW-5	Monitoring Well	194.97	24.43	170.54	24.10	170.87	22.61	172.36
MW-6	Monitoring Well	192.18	22.70	169.48	22.40	169.78	20.38	171.80

Location Identification	Type	Reference Elevation (feet amsl)	Depth to Water (feet) 4/26/2019	Groundwater Elevation (feet amsl) 4/26/2019	Depth to Water (feet) 5/29/2019	Groundwater Elevation (feet amsl) 5/29/2019	Depth to Water (feet) 6/28/2019	Groundwater Elevation (feet amsl) 6/28/2019
MW-7	Monitoring Well	188.47	17.80	170.67	17.53	170.94	16.89	171.58
MW-8	Monitoring Well	187.13	16.50	170.63	16.12	171.01	14.62	172.51
MW-9	Monitoring Well	184.73	13.44	171.29	13.15	171.58	11.98	172.75
MW-10	Monitoring Well	178.12	6.95	171.17	6.88	171.24	6.32	171.80
MW-11	Monitoring Well	184.65	12.81	171.84	12.72	171.93	12.59	172.06
MW-12	Monitoring Well	178.33	6.96	171.37	6.81	171.52	6.02	172.31
MW-13	Monitoring Well	176.72	6.21	170.51	6.03	170.69	5.10	171.62
MW-14	Monitoring Well	186.19	12.45	173.74	12.26	173.93	11.33	174.86
MW-16	Monitoring Well	178.59	6.93	171.66	7.08	171.51	6.32	172.27
MW-17	Monitoring Well	179.03	8.41	170.62	8.15	170.88	7.30	171.73
MW-18	Monitoring Well	178.58	7.94	170.64	7.67	170.91	6.87	171.71
MW-19	Monitoring Well	178.60	7.98	170.62	7.70	170.90	7.00	171.60
MW-20	Monitoring Well	186.64	8.69	177.95	8.42	178.22	8.52	178.12
MW-21	Monitoring Well	198.70	29.12	169.58	28.85	169.85	29.61	169.09
MW-22	Monitoring Well	197.51	26.85	170.66	26.52	170.99	27.30	170.21
MW-23	Monitoring Well	198.79	26.50	172.29	26.19	172.60	27.10	171.69
101	Monitoring Well	197.53	5.79	191.74	5.71	191.82	5.60	191.93
102	Monitoring Well	193.94	18.91	175.03	18.77	175.17	18.11	175.83
109	Monitoring Well	197.02	26.65	170.37	26.32	170.70	27.48	169.54
120	Monitoring Well	184.19	11.31	172.88	11.03	173.16	10.48	173.71
123	Monitoring Well	186.21	11.49	174.72	11.22	174.99	11.09	175.12
125	Monitoring Well	196.28	24.51	171.77	24.30	171.98	22.03	174.25
126	Monitoring Well	199.37	28.73	170.64	28.45	170.92	28.41	170.96
129	Monitoring Well	197.24	25.40	171.84	25.05	172.19	24.76	172.48

Location Identification	Type	Reference Elevation (feet amsl)	Depth to Water (feet) 4/26/2019	Groundwater Elevation (feet amsl) 4/26/2019	Depth to Water (feet) 5/29/2019	Groundwater Elevation (feet amsl) 5/29/2019	Depth to Water (feet) 6/28/2019	Groundwater Elevation (feet amsl) 6/28/2019
130	Monitoring Well	177.73	5.31	172.42	5.17	172.56	5.42	172.31
C-01	Monitoring Well	193.89	22.92	170.97	22.59	171.30	22.37	171.52
C-02	Monitoring Well	175.95	4.89	171.06	5.02	170.93	3.72	172.23
C-03	Monitoring Well	196.34	25.63	170.71	25.30	171.04	24.96	171.38
C-04	Monitoring Well	194.64	24.00	170.64	23.81	170.83	22.96	171.68
C-04A	Monitoring Well	194.61	23.78	170.83	23.56	171.05	22.67	171.94
C-05	Monitoring Well	180.74	11.05	169.69	10.92	169.82	10.49	170.25
C-06	Monitoring Well	192.22	22.90	169.32	22.75	169.47	22.92	169.30
C-07	Monitoring Well	196.80	26.28	170.52	26.02	170.78	26.10	170.70
C-08	Monitoring Well	193.10	23.54	169.56	23.24	169.86	23.65	169.45
C-09	Monitoring Well	202.35	32.22	170.13	32.01	170.34	31.91	170.44
C-10	Monitoring Well	201.86	31.50	170.36	31.28	170.58	31.19	170.67
17WW08	Monitoring Well	179.72	7.81	171.91	7.69	172.03	8.40	171.32
18WW01	Monitoring Well	201.31	30.69	170.62	30.40	170.91	30.29	171.02
18WW02	Monitoring Well	179.30	7.71	171.59	7.62	171.68	7.47	171.83
18WW03	Monitoring Well	195.59	25.40	170.19	25.15	170.44	24.93	170.66
18WW04	Monitoring Well	183.74	14.43	169.31	14.21	169.53	14.05	169.69
18WW05	Monitoring Well	189.59	19.40	170.19	19.22	170.37	19.18	170.41
18WW06	Monitoring Well	179.70	8.25	171.45	8.13	171.57	8.18	171.52
18WW07	Monitoring Well	183.67	NM	NM	NM	NM	NM	NM
18WW08	Monitoring Well	177.77	5.97	171.80	6.09	171.68	5.77	172.00
18WW09	Monitoring Well	177.51	6.33	171.18	6.30	171.21	5.95	171.56
18WW10	Monitoring Well	182.26	9.91	172.35	9.82	172.44	10.08	172.18
18WW11	Monitoring Well	182.29	11.39	170.90	11.27	171.02	11.39	170.90

Location Identification	Type	Reference Elevation (feet amsl)	Depth to Water (feet) 4/26/2019	Groundwater Elevation (feet amsl) 4/26/2019	Depth to Water (feet) 5/29/2019	Groundwater Elevation (feet amsl) 5/29/2019	Depth to Water (feet) 6/28/2019	Groundwater Elevation (feet amsl) 6/28/2019
18WW14	Monitoring Well	186.47	15.75	170.72	15.44	171.03	14.60	171.87
18WW15	Monitoring Well	186.24	15.01	171.23	14.79	171.45	14.23	172.01
18WW16	Monitoring Well	201.88	31.57	170.31	31.25	170.63	31.62	170.26
18WW18	Monitoring Well	196.82	26.44	170.38	26.17	170.65	25.72	171.10
18WW19	Monitoring Well	179.56	10.58	168.98	10.40	169.16	10.20	169.36
18WW20	Monitoring Well	180.42	11.39	169.03	11.19	169.23	11.03	169.39
18WW21	Monitoring Well	195.20	25.21	169.99	24.95	170.25	24.83	170.37
18WW22	Monitoring Well	195.37	24.82	170.55	24.53	170.84	23.81	171.56
18WW24	Monitoring Well	176.40	4.15	172.25	4.25	172.15	4.10	172.30
18WW25	Monitoring Well	175.15	3.90	171.25	4.08	171.07	4.01	171.14
18CPTMW01SW	Monitoring Well	198.20	26.77	171.43	26.58	171.62	25.72	172.48
18CPTMW01DW	Monitoring Well	197.92	26.74	171.18	26.53	171.39	26.94	170.98
18CPTMW03SW	Monitoring Well	198.53	27.69	170.84	27.40	171.13	27.15	171.38
18CPTMW04	Monitoring Well	196.60	23.35	173.25	23.03	173.57	22.37	174.23
18CPTMW04SW	Monitoring Well	196.42	26.10	170.32	25.81	170.61	24.85	171.57
18CPTMW06	Monitoring Well	198.12	26.85	171.27	26.55	171.57	26.87	171.25
18CPTMW07	Monitoring Well	197.32	26.20	171.12	25.96	171.36	26.03	171.29
18CPTMW08SW	Monitoring Well	196.38	26.09	170.29	25.79	170.59	24.65	171.73
18CPTMW08DW	Monitoring Well	196.59	26.45	170.14	26.17	170.42	25.15	171.44
18CPTMW10SW	Monitoring Well	186.98	16.25	170.73	16.04	170.94	15.35	171.63
18CPTMW10DW	Monitoring Well	187.38	17.18	170.20	16.97	170.41	16.22	171.16
18CPTMW12SW	Monitoring Well	190.90	19.81	171.09	19.54	171.36	19.65	171.25
18CPTMW12DW	Monitoring Well	190.25	19.63	170.62	19.37	170.88	19.07	171.18
18CPTMW14	Monitoring Well	196.69	25.80	170.89	25.49	171.20	26.50	170.19

Location Identification	Type	Reference Elevation (feet amsl)	Depth to Water (feet) 4/26/2019	Groundwater Elevation (feet amsl) 4/26/2019	Depth to Water (feet) 5/29/2019	Groundwater Elevation (feet amsl) 5/29/2019	Depth to Water (feet) 6/28/2019	Groundwater Elevation (feet amsl) 6/28/2019
18CPTMW15	Monitoring Well	179.79	7.19	172.60	7.03	172.76	7.90	171.89
18CPTMW16	Monitoring Well	175.37	3.98	171.39	4.20	171.17	4.00	171.37
18CPTMW18	Monitoring Well	194.53	26.67	167.86	26.39	168.14	26.82	167.71
18CPTMW19	Monitoring Well	193.59	23.90	169.69	23.62	169.97	18.45	175.14
18CPTMW19SW	Monitoring Well	193.29	24.34	168.95	24.01	169.28	21.65	171.64
18CPTMW22SW	Monitoring Well	187.79	17.33	170.46	17.07	170.72	16.96	170.83
18CPTMW22R	Monitoring Well	187.23	4.89	182.34	5.05	182.18	6.27	180.96
18CPTMW22DW	Monitoring Well	188.00	17.29	170.71	16.98	171.02	17.00	171.00
18CPTMW23	Monitoring Well	177.47	5.91	171.56	5.82	171.65	5.81	171.66
18CPTMW23SW	Monitoring Well	177.43	5.80	171.63	5.69	171.74	6.12	171.31
18CPTMW24	Monitoring Well	194.89	25.51	169.38	25.23	169.66	26.00	168.89
18CPTMW26	Monitoring Well	182.60	14.09	168.51	14.15	168.45	14.29	168.31
18CPTMW26SW	Monitoring Well	182.00	11.25	170.75	11.12	170.88	10.81	171.19
1824HBSW7	Surface Water Sample	167.92	5.62	162.30	2.18	165.74	3.56	164.36

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Table 4: Treated Groundwater Discharged –April through June 2019

Date	Harrison Bayou Flow (GPM)	Calculated Maximum Rate Allowable (GPM)	Released From GWTP To Harrison Bayou	Released From INF Pond to Harrison Bayou	Released From GWTP to INF Pond	Combined Total Released from GWTP	Combined Total Released to Harrison Bayou	INF Pond Staff Reading (6.20 = 3 ft. Freeboard)
04/01/2019	5,096	1,489	2,731	0	0	2,731	2,731	2.59
04/02/2019	4,387	1,282	10,042	0	0	10,042	10,042	2.58
04/03/2019	3,767	1,100	12,251	0	0	12,251	12,251	2.58
04/04/2019	3,137	916	11,571	0	0	11,571	11,571	2.57
04/05/2019	5,937	1,734	11,289	0	0	11,289	11,289	2.57
04/06/2019	5,123	1,485	0	0	0	0	0	2.57
04/07/2019	Flood Stage	Maximum	0	0	0	0	0	2.75
04/08/2019	Flood Stage	Maximum	37,932	0	0	37,932	37,932	3.46
04/09/2019	Flood Stage	Maximum	15,102	0	0	15,102	15,102	3.46
04/10/2019	Flood Stage	Maximum	12,608	0	0	12,608	12,608	3.45
04/11/2019	Flood Stage	Maximum	12,358	0	0	12,358	12,358	3.45
04/12/2019	32,529	9,505	11,428	0	0	11,428	11,428	3.45
04/13/2019	Flood Stage	Maximum	0	0	0	0	0	3.50
04/14/2019	Flood Stage	Maximum	0	0	0	0	0	4.08
04/15/2019	Flood Stage	Maximum	46,815	0	0	46,815	46,815	4.08
04/16/2019	Flood Stage	Maximum	11,952	0	0	11,952	11,952	4.08
04/17/2019	Flood Stage	Maximum	12,522	0	0	12,522	12,522	4.07
04/18/2019	Flood Stage	Maximum	12,033	0	0	12,033	12,033	4.07
04/19/2019	Flood Stage	Maximum	8,208	0	0	8,208	8,208	4.48
04/20/2019	Flood Stage	Maximum	0	0	0	0	0	4.48
04/21/2019	Flood Stage	Maximum	0	0	0	0	0	4.47
04/22/2019	28,975	8,466	38,525	0	0	38,525	38,525	4.47
04/23/2019	No Release	NA	0	0	0	0	0	4.46
04/24/2019	No Release	NA	0	0	0	0	0	4.45
04/25/2019	No Release	NA	0	0	0	0	0	4.86
04/26/2019	No Release	NA	0	0	0	0	0	4.85
04/27/2019	No Release	NA	0	0	0	0	0	4.83
04/28/2019	No Release	NA	0	0	0	0	0	4.81
04/29/2019	No Release	NA	0	0	0	0	0	4.80
04/30/2019	4,621	1,350	4,622	0	0	4,622	4,622	4.79
05/01/2019	3,936	1,150	13,445	0	0	13,445	13,445	4.78
05/02/2019	7,368	2,153	14,393	0	0	14,393	14,393	4.97
05/03/2019	Flood Stage	Maximum	10,904	0	0	10,904	10,904	4.96
05/04/2019	Flood Stage	Maximum	0	0	0	0	0	5.08

Date	Harrison Bayou Flow (GPM)	Calculated Maximum Rate Allowable (GPM)	Released From GWTP To Harrison Bayou	Released From INF Pond to Harrison Bayou	Released From GWTP to INF Pond	Combined Total Released from GWTP	Combined Total Released to Harrison Bayou	INF Pond Staff Reading (6.20 = 3 ft. Freeboard)
05/05/2019	Flood Stage	Maximum	0	0	0	0	0	5.07
05/06/2019	22,920	6,697	43,253	0	0	43,253	43,253	5.06
05/07/2019	14,834	4,334	12,393	0	0	12,393	12,393	5.05
05/08/2019	Flood Stage	Maximum	12,032	0	0	12,032	12,032	5.04
05/09/2019	Flood Stage	Maximum	11,328	0	0	11,328	11,328	5.74
05/10/2019	Flood Stage	Maximum	11,064	0	0	11,064	11,064	5.78
05/11/2019	Flood Stage	Maximum	0	0	0	0	0	6.04
05/12/2019	Flood Stage	Maximum	0	0	0	0	0	6.03
05/13/2019	Flood Stage	Maximum	37,841	0	0	37,841	37,841	6.02
05/14/2019	Flood Stage	Maximum	11,270	0	0	11,270	11,270	6.01
05/15/2019	Flood Stage	Maximum	12,397	0	0	12,397	12,397	6.00
05/16/2019	Flood Stage	Maximum	12,039	0	0	12,039	12,039	5.99
05/17/2019	Flood Stage	Maximum	9,821	0	0	9,821	9,821	5.98
05/18/2019	Flood Stage	Maximum	0	0	0	0	0	5.97
05/19/2019	Flood Stage	Maximum	0	0	0	0	0	6.63
05/20/2019	Flood Stage	Maximum	47,380	0	0	47,380	47,380	6.62
05/21/2019	Flood Stage	Maximum	24,309	0	0	24,309	24,309	6.61
05/22/2019	Flood Stage	Maximum	26,501	0	0	26,501	26,501	6.74
05/23/2019	Flood Stage	Maximum	24,989	0	0	24,989	24,989	6.71
05/24/2019	Flood Stage	Maximum	16,366	0	0	16,366	16,366	6.68
05/25/2019	4,156	1,206	0	0	0	0	0	6.67
05/26/2019	3,568	1,035	0	0	0	0	0	6.65
05/27/2019	3,155	915	0	0	0	0	0	6.63
05/28/2019	2,595	758	74,502	0	0	74,502	74,502	6.62
05/29/2019	2,269	663	28,909	0	0	28,909	28,909	6.60
05/30/2019	2,087	609	28,174	165,172	0	28,174	193,346	6.35
05/31/2019	1,784	521	21,125	88,705	0	21,125	109,830	6.18
06/01/2019	1,523	441	0	0	0	0	0	6.14
06/02/2019	1,396	404	0	0	0	0	0	6.13
06/03/2019	7,126	2,082	71,295	0	0	71,295	71,295	6.22
06/04/2019	24,416	7,134	21,045	0	0	21,045	21,045	6.32
06/05/2019	21,146	6,179	21,493	132,525	0	21,493	154,018	6.15
06/06/2019	Flood Stage	Maximum	21,821	117,260	0	21,821	139,081	5.96
06/07/2019	Flood Stage	Maximum	20,197	119,475	0	20,197	139,672	5.82
06/08/2019	18,543	5,377	0	0	0	0	0	5.80
06/09/2019	10,698	3,102	0	0	0	0	0	5.78

Date	Harrison Bayou Flow (GPM)	Calculated Maximum Rate Allowable (GPM)	Released From GWTP To Harrison Bayou	Released From INF Pond to Harrison Bayou	Released From GWTP to INF Pond	Combined Total Released from GWTP	Combined Total Released to Harrison Bayou	INF Pond Staff Reading (6.20 = 3 ft. Freeboard)
06/10/2019	6,091	1,779	70,519	0	0	70,519	70,519	5.76
06/11/2019	5,347	1,562	22,245	0	0	22,245	22,245	5.75
06/12/2019	3,804	1,111	20,421	85,137	0	20,421	105,558	5.55
06/13/2019	3,304	965	16,876	46,081	0	16,876	62,957	5.38
06/14/2019	2,300	103,501	0	114,751	0	0	114,751	5.18
06/15/2019	NA	NA	0	0	0	0	0	5.16
06/16/2019	NA	NA	0	0	0	0	0	5.15
06/17/2019	9,679	435,587	0	0	0	0	0	5.24
06/18/2019	7,980	359,129	0	122,800	0	0	122,800	5.06
06/19/2019	5,812	261,554	0	109,889	0	0	109,889	4.80
06/20/2019	NA	NA	0	0	0	0	0	4.86
06/21/2019	NA	NA	0	0	0	0	0	4.84
06/22/2019	NA	NA	0	0	0	0	0	4.82
06/23/2019	NA	NA	0	0	0	0	0	4.80
06/24/2019	NA	NA	0	0	0	0	0	5.10
06/25/2019	NA	NA	0	0	0	0	0	5.18
06/26/2019	NA	NA	0	0	0	0	0	5.16
06/27/2019	NA	NA	0	0	0	0	0	5.14
06/28/2019	NA	NA	0	0	0	0	0	5.12
06/29/2019	NA	NA	0	0	0	0	0	5.42
06/30/2019	NA	NA	0	0	0	0	0	5.40
			1,062,336	1,101,795	0	1,062,336	2,164,131	

Table 5: Monthly Groundwater Extraction Quantities

ICT or Well Number	April 2019 (gallons)	May 2019 (gallons)	June 2019 (gallons)	Total
1	0	0	0	0
2	33,789	74,910	32,618	141,317
3	0	0	0	0
4	45,598	49,562	5,106	100,266
5	0	0	0	0
EW-1	10	0	0	10
7	14,013	32,516	29,556	76,085
8	80,978	162,327	130,095	373,400
18WW17	8,213	6,977	0	15,190
10	0	0	0	0
11	30,038	29,681	2,542	62,261
12A	4,218	8,212	2,976	15,406
12B	19,027	39,747	14,417	73,191
12C	21,578	56,536	20,809	98,923
12D	45,145	6,028	294	51,467
12E	22,909	47,400	14,363	84,672
13A	35,200	0	0	35,200
13B	98,131	225,648	116,824	440,603
13C	51,729	137,235	30,722	219,686
13D	1,469	0	0	1,469
13E	17,131	25,788	5,349	48,268
13F	13,612	10,557	777	24,946
14A	1,952	1,650	0	3,602
14B	18,771	9,917	0	28,688
14C	53,507	44,805	0	98,312
14D	33,243	69,665	25,410	128,318
14E	30,945	48,652	14,617	94,214
Total LHAAP-18/24	***681,206***	***1,087,813***	***446,475***	***2,215,494***
LHAAP-16	0	0	0	
Total LHAAP-16	***0***	***0***	***0***	***0***
TOTAL	***681,206***	***1,087,813***	***446,475***	***2,215,494***

Table 6. LHAAP-18/24 Analytical Results - June 2019

Location Identification: / Sample Date:	Units	MCL/MSC/ PCL	AWD1_062019 6/20/19	AWD3_062119 6/21/19	AWD4_062619 6/26/19	AWD4_062619_a 6/26/19	18CPTMW01DW_061919 6/19/19	18CPTMW01SW_061919 6/19/19	18CPTMW03SW_062119 6/21/19	18CPTMW04_061919 6/19/19	18CPTMW04SW_061919 6/19/19	18CPTMW06_062119 6/21/19	18CPTMW06_062119_a 6/21/19	18CPTMW07_062519 6/25/19	18CPTMW08SW-061819 6/18/19	18CPTMW08DW-061819 6/18/19	18CPTMW10SW_062019 6/20/19	18CPTMW10DW_062019 6/20/19	18CPTMW12SW_061719 6/17/19	18CPTMW12SW_061719_a 6/17/19
Lab Package:			HS19061164	HS19061210	HS19061482	HS19061482	HS19061083	HS19061083	HS19061210	HS19061083	HS19061083	HS19061210	HS19061210	HS19061383	HS19060986	HS19060986	HS19061157	HS19061157	HS19060929	HS19060929
Well Identification:			AWD-1	AWD-3	AWD-4	AWD-4	18CPTMW01DW	18CPTMW01SW	18CPTMW03SW	18CPTMW04	18CPTMW04SW	18CPTMW06	18CPTMW06	18CPTMW07	18CPTMW08SW	18CPTMW08DW	18CPTMW10SW	18CPTMW10DW	18CPTMW12SW	18CPTMW12SW
Perchlorate (6850)																				
Perchlorate	µg/L	17*	NA	**1.8 J**	**23**	**27**	< 2.0 U	< 2.0 U	**9.9**	**620**	< 2.0 U	**1.7 J**	< 2.0 U	**1.4 J**	**23,000**	**4,300**	< 2.0 U	**9.1**	< 2.0 U	< 2.0 U
Volatile Organic Compounds (8260C)																				
1,1,1,2-Tetrachloroethane	µg/L	110	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	µg/L	200	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	5	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	10,000	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**2.1**	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethene	µg/L	7	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloropropene	µg/L	2.9	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	µg/L	310	NA	< 5.0 U	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichloropropane	µg/L	0.041	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	µg/L	70	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	µg/L	5,100	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	NA	< 5.0 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 12 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromoethane	µg/L	0.05	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	µg/L	600	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	5	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	**1.3**	**0.75 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloropropane	µg/L	5	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	µg/L	5,100	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	µg/L	3,100	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichloropropane	µg/L	29	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	µg/L	75	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2,2-Dichloropropane	µg/L	42	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Butanone	µg/L	61,000	NA	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Chlorotoluene	µg/L	2,000	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Hexanone	µg/L	6,100	NA	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	µg/L	2,000	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Isopropyltoluene	µg/L	10,000	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	µg/L	8,200	NA	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acetone	µg/L	92,000	NA	< 10 U	< 1.0 U	**6.8**	5.1 UB	< 25 U	**5.2**	4.6 UB	5.0 UB	**3.1**	< 1.0 U	< 1.0 U	2.7 UB	NA	5.4 UB	3.3 UB	2.9 UB	3.0 UB
Benzene	µg/L	5	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromobenzene	µg/L	2,000	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromochloromethane	µg/L	4,100	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromodichloromethane	µg/L	4.6	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromoform	µg/L	36	NA	< 5.0 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 12 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromomethane	µg/L	140	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Carbon disulfide	µg/L	10,000	NA	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon tetrachloride	µg/L	5	NA	**35**	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	100	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroethane	µg/L	41,000	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroform	µg/L	1,000	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloromethane	µg/L	220	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	µg/L	70	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	**1.7**	**16**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**11**	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,3-Dichloropropene	µg/L	5.3	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromochloromethane	µg/L	34	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromomethane	µg/L	380	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	µg/L	20,000	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	700	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Hexachlorobutadiene	µg/L	20	NA	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 25 U	< 0.5 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isopropylbenzene	µg/L	10,000	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	10,000**	NA	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 12 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Methylene chloride	µg/L	5	NA	< 10 U	< 1.0 U	< 1.0 U	**1.1 J**	**100**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Naphthalene	µg/L	2,000	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Butylbenzene	µg/L	4,100	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Propylbenzene	µg/L	4,100	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
o-Xylene	µg/L	10,000**	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
sec-Butylbenzene	µg/L	4,100	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Styrene	µg/L	100	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
tert-Butylbenzene	µg/L	4,100	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	5	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Toluene	µg/L	1,000	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,2-Dichloroethene	µg/L	100	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	µg/L	29	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichloroethene	µg/L	5	NA	**580**	< 0.5 U	< 0.5 U	< 0.5 U	**32**	**19**	**510**	< 0.5 U	**0.98 J**	**0.88 J**	**0.66 J**	**40**	NA	< 0.5 U	**1.2**	**0.65 J**	**0.60 J**
Trichlorofluoromethane	µg/L	31,000	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Vinyl chloride	µg/L	2	NA	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 12 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**5.0**	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U

Table 6. LHAAP-18/24 Analytical Results - June 2019

Location Identification: / Sample Date:	Units	MCL/MSC/ PCL	AWD1_062019 6/20/19	AWD3_062119 6/21/19	AWD4_062619 6/26/19	AWD4_062619_a 6/26/19	18CPTMW01DW_061919 6/19/19	18CPTMW01SW_061919 6/19/19	18CPTMW03SW_062119 6/21/19	18CPTMW04_061919 6/19/19	18CPTMW04SW_061919 6/19/19	18CPTMW06_062119 6/21/19	18CPTMW06_062119_a 6/21/19	18CPTMW07_062519 6/25/19	18CPTMW08SW-061819 6/18/19	18CPTMW08DW-061819 6/18/19	18CPTMW10SW_062019 6/20/19	18CPTMW10DW_062019 6/20/19	18CPTMW12SW_061719 6/17/19	18CPTMW12SW_061719_a 6/17/19
Metals (6020A)																				
Aluminum	mg/L	100	NA	**0.157**	**20.1 J**	**9.41 J**	**0.110**	**0.0504**	**0.0446**	NA	**0.0645**	NA	NA	NA	NA	NA	NA	**0.611**	**0.0204**	**0.0248**
Antimony	mg/L	0.006	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	**0.000408 J**	< 0.000500 U	< 0.000500 U	NA	< 0.000500 U	NA	NA	NA	NA	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U
Arsenic	mg/L	0.01	NA	< 0.000500 U	**0.00257 J**	**0.00158 J**	**0.00152 J**	**0.00871**	**0.00272 J**	NA	**0.00326 J**	NA	NA	NA	NA	NA	NA	**0.00262 J**	**0.000866 J**	**0.00106 J**
Barium	mg/L	2	NA	**0.0352**	**0.267**	**0.239**	**0.412**	**1.07**	**0.172**	NA	**0.911**	NA	NA	NA	NA	NA	NA	**0.108**	**0.803**	**0.825**
Beryllium	mg/L	0.004	NA	< 0.000500 U	**0.000982 J**	**0.000691 J**	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	< 0.000500 U	NA	NA	NA	NA	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U
Cadmium	mg/L	0.005	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	**0.000345 J**	< 0.000500 U	**0.000367 J**	NA	< 0.000500 U	NA	NA	NA	NA	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U
Calcium	mg/L	NV	NA	**0.817**	**11.3**	**10.7**	**40.3**	**32.9**	**21.0**	NA	**30.3**	NA	NA	NA	NA	NA	NA	**6.74**	**58.5**	**58.7**
Chromium	mg/L	0.1	NA	**0.0808**	**0.387 J**	**0.193 J**	**0.0949**	**0.00638**	**0.0163**	NA	**0.0219**	NA	NA	NA	NA	NA	NA	**0.00736**	**0.0159**	**0.0160**
Cobalt	mg/L	6.1	NA	**0.000846 J**	**0.0121 J**	**0.00828 J**	**0.00121 J**	**0.000511 J**	**0.00263 J**	NA	**0.00473 J**	NA	NA	NA	NA	NA	NA	**0.000393 J**	**0.00248 J**	**0.00304 J**
Copper	mg/L	1.3	NA	< 0.00100 U	**0.0215 J**	**0.0140 J**	0.00332 UB	< 0.00100 U	< 0.00100 U	NA	< 0.00100 U	NA	NA	NA	NA	NA	NA	0.00188 UB	< 0.00100 U	< 0.00100 U
Iron	mg/L	NV	NA	**0.430**	**22.3 J**	**11.0 J**	**1.65**	**51.3**	**1.75**	NA	**10.4**	NA	NA	NA	NA	NA	NA	**2.80**	**0.540**	**0.669**
Lead	mg/L	0.015	NA	< 0.00100 U	**0.00842 J**	**0.00448 J**	**0.00104 J**	< 0.00100 U	< 0.00100 U	NA	< 0.00100 U	NA	NA	NA	NA	NA	NA	**0.000967 J**	< 0.00100 U	< 0.00100 U
Magnesium	mg/L	NV	NA	**0.586**	**5.94**	**5.31**	**11.7**	**22.6**	**7.22**	NA	**18.3**	NA	NA	NA	NA	NA	NA	**5.34**	**38.8**	**39.2**
Manganese	mg/L	1.1*	NA	**0.00771**	**0.0703**	**0.0536**	**0.115**	**0.635**	**0.0478**	NA	**0.455**	NA	NA	NA	NA	NA	NA	**0.0448**	**0.181**	**0.232**
Nickel	mg/L	0.49*	NA	**0.0253**	**0.240**	**0.227**	**0.00669**	**0.00112 J**	**0.00956**	NA	**0.00641**	NA	NA	NA	NA	NA	NA	**0.00202 J**	**0.00382 J**	**0.00361 J**
Potassium	mg/L	NV	NA	**0.746**	**1.29 J**	**0.827 J**	**147**	**18.4**	**233**	NA	**108**	NA	NA	NA	NA	NA	NA	**111**	**75.5**	**75.0**
Selenium	mg/L	0.05	NA	**0.00434 J**	**0.00245 J**	**0.00328 J**	< 0.00250 U	< 0.00250 U	< 0.00250 U	NA	< 0.00250 U	NA	NA	NA	NA	NA	NA	< 0.00250 U	< 0.00250 U	< 0.00250 U
Silver	mg/L	0.51	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	< 0.000500 U	NA	NA	NA	NA	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U
Sodium	mg/L	NV	NA	**30.1**	**62.6**	**62.3**	**370**	**115**	**265**	NA	**130**	NA	NA	NA	NA	NA	NA	**184**	**234**	**229**
Thallium	mg/L	0.002	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	< 0.000500 U	NA	NA	NA	NA	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U
Vanadium	mg/L	0.72	NA	0.00191 UB	**0.0366 J**	**0.0207 J**	0.00102 UB	< 0.00100 U	0.00183 UB	NA	< 0.00100 U	NA	NA	NA	NA	NA	NA	0.00163 UB	0.00102 UB	0.00150 UB
Zinc	mg/L	31	NA	**0.0177**	**0.0883 J**	**0.0588 J**	**0.0266**	**0.0209**	**0.0987**	NA	**0.0400**	NA	NA	NA	NA	NA	NA	**0.0244**	**0.0181**	**0.0159**
Mercury	mg/L	0.002	NA	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	NA	< 0.000100 U	NA	NA	NA	NA	NA	NA	< 0.000100 U	< 0.000100 U	< 0.000100 U
1,4-Dioxane (8270D SIM)																				
1,4-Dioxane	µg/L	9.1	**0.99**	NA	< 0.010 U	< 0.010 U	**0.27**	< 0.010 U	**0.67**	**1.3**	< 0.010 U	**0.46 J**	**0.052 J**	**0.077**	**1.7**	**0.38**	< 0.010 U	NA	**0.073 J**	**0.18 J**

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

a - duplicate sample

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected. Value presented is the limit of detection.

NV - No Value

UB - considered a non-detect due to blank contamination

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

Table 6. LHAAP-18/24 Analytical Results - June 2019

Location Identification: / Sample Date:	Units	MCL/MSC/ PCL	18CPTMW12DW _061719 6/17/19	18CPTMW14 _062519 6/25/19	18CPTMW15 _062119 6/21/19	18CPTMW16 _062719 6/27/19	18CPTMW18 _062619 6/26/19	18CPTMW19 _062019 6/20/19	18CPTMW19SW _062019 6/20/19	18CPTMW22R_ 061319 6/13/19	18CPTMW22SW_ 061319 6/13/19	18CPTMW22DW_ 061319 6/13/19	18CPTMW23 -061719 6/17/19	18CPTMW23SW -061719 6/17/19	18CPTMW24 _062519 6/25/19	18CPTMW26SW_ 061319 6/13/19	17WW08 _062519 6/25/19	18WW02 _062019 6/20/19	18WW03 _062419 6/24/19	18WW03 _062419_a 6/24/19	18WW06 _062019 6/20/19
Lab Package:			HS19060929	HS19061383	HS19061210	HS19061547	HS19061486	HS19061157	HS19061157	HS19060835	HS19060835	HS19060835	HS19060929	HS19060929	HS19061383	HS19060835	HS19061386	HS19061157	HS19061279	HS19061279	HS19061157
Well Identification:			18CPTMW12DW	18CPTMW14	18CPTMW15	18CPTMW16	18CPTMW18	18CPTMW19	18CPTMW19SW	18CPTMW22R	18CPTMW22SW	18CPTMW22DW	18CPTMW23	18CPTMW23SW	18CPTMW24	18CPTMW26SW	17WW08	18WW02	18WW03	18WW03	18WW06
Perchlorate (6850)																					
Perchlorate	µg/L	17*	**1.2 J**	**1,300**	**410**	<2.0 U	<2.0 U	**4.1**	**39**	<2.0 U	**590**	<2.0 U	**2,500**	< 2.0 U	**89**	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U
Volatile Organic Compounds (8260C)																					
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	µg/L	200	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethene	µg/L	7	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloropropene	µg/L	2.9	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichloropropane	µg/L	0.041	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5 U	< 0.5 U	< 0.5 UJ	NA	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromoethane	µg/L	0.05	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	µg/L	600	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	5	< 0.5 U	**2.1**	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**150**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichloropropane	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	µg/L	75	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2,2-Dichloropropane	µg/L	42	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Butanone	µg/L	61,000	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Hexanone	µg/L	6,100	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Isopropyltoluene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	µg/L	8,200	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acetone	µg/L	92,000	3.2 UB	< 1.0 U	**5.0**	NA	**5.6**	4.8 UB	< 1.0 U	< 1.0 U	**3.4**	**2.8**	< 10 U	2.7 UB	5.1 UB	**4.2**	< 1.0 U	5.4 UB	**4.2**	**2.4**	3.0 UB
Benzene	µg/L	5	< 0.5 U	**1.3**	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromobenzene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromochloromethane	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromodichloromethane	µg/L	4.6	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromoform	µg/L	36	< 0.5 U	< 0.5 U	< 0.5 UJ	NA	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromomethane	µg/L	140	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Carbon disulfide	µg/L	10,000	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon tetrachloride	µg/L	5	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroethane	µg/L	41,000	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroform	µg/L	1,000	< 0.5 U	**6.7 J**	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloromethane	µg/L	220	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	µg/L	70	< 0.5 U	**51**	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**150**	< 0.5 U	**26**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,3-Dichloropropene	µg/L	5.3	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromochloromethane	µg/L	34	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromomethane	µg/L	380	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	µg/L	20,000	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	700	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Hexachlorobutadiene	µg/L	20	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isopropylbenzene	µg/L	10,000	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	10,000**	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Methylene chloride	µg/L	5	< 1.0 U	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Naphthalene	µg/L	2,000	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Propylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
o-Xylene	µg/L	10,000**	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
sec-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Styrene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
tert-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	5	< 0.5 U	**1.1**	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Toluene	µg/L	1,000	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,2-Dichloroethene	µg/L	100	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	µg/L	29	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichloroethene	µg/L	5	< 0.5 U	**700**	**2.3**	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**2,900**	< 0.5 U	**9.1**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichlorofluoromethane	µg/L	31,000	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Vinyl chloride	µg/L	2	< 0.5 U	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U

Table 6. LHAAP-18/24 Analytical Results - June 2019

Location Identification: / Sample Date:	Units	MCL/MSC/ PCL	18CPTMW12DW _061719 6/17/19	18CPTMW14 _062519 6/25/19	18CPTMW15 _062119 6/21/19	18CPTMW16 _062719 6/27/19	18CPTMW18 _062619 6/26/19	18CPTMW19 _062019 6/20/19	18CPTMW19SW _062019 6/20/19	18CPTMW22R_ 061319 6/13/19	18CPTMW22SW_ 061319 6/13/19	18CPTMW22DW_ 061319 6/13/19	18CPTMW23 -061719 6/17/19	18CPTMW23SW -061719 6/17/19	18CPTMW24 _062519 6/25/19	18CPTMW26SW_ 061319 6/13/19	17WW08 _062519 6/25/19	18WW02 _062019 6/20/19	18WW03 _062419 6/24/19	18WW03 _062419_a 6/24/19	18WW06 _062019 6/20/19
Metals (6020A)																					
Aluminum	mg/L	100	**0.0201**	**0.427**	NA	NA	0.0122 UB	NA	**0.0745**	**1.54**	**0.284**	**0.133**	NA	NA	NA	NA	0.0212 UB	**1.56**	0.0156 UB	0.0175 UB	NA
Antimony	mg/L	0.006	**0.000406 J**	0.000513 UB	NA	NA	< 0.000500 U	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	NA	NA	< 0.005000 U	< 0.005000 U	< 0.005000 U	< 0.005000 U	NA
Arsenic	mg/L	0.01	**0.00401 J**	**0.00240 J**	NA	NA	**0.00127 J**	NA	**0.00543**	**0.00317 J**	**0.00358 J**	**0.00316 J**	NA	NA	NA	NA	**0.00576**	**0.000675 J**	**0.000834 J**	**0.000750 J**	NA
Barium	mg/L	2	**0.133**	**6.03**	NA	NA	**0.608**	NA	**0.198**	**0.0493**	**0.0799**	**0.0930**	NA	NA	NA	NA	**0.539**	**0.0506**	**0.194**	**0.185**	NA
Beryllium	mg/L	0.004	< 0.000500 U	< 0.000500 U	NA	NA	< 0.000500 U	NA	< 0.000500 U	**0.000337 J**	< 0.000500 U	< 0.000500 U	NA	NA	NA	NA	< 0.005000 U	< 0.000500 U	< 0.005000 U	< 0.005000 U	NA
Cadmium	mg/L	0.005	< 0.000500 U	**0.000243 J**	NA	NA	< 0.000500 U	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	NA	NA	< 0.005000 U	< 0.000500 U	< 0.005000 U	< 0.005000 U	NA
Calcium	mg/L	NV	**9.65**	**466**	NA	NA	**281**	NA	**11.2**	**0.683**	**24.5**	**12.4**	NA	NA	NA	NA	**129**	**7.84**	**8.98**	**8.70**	NA
Chromium	mg/L	0.1	**0.0136**	**0.00598**	NA	NA	**0.00200 J**	NA	**0.00171 J**	**0.00400 J**	**0.0486**	**0.000531 J**	NA	NA	NA	NA	**0.438**	**0.00851**	**0.0540 J**	**0.0356 J**	NA
Cobalt	mg/L	6.1	**0.000115 J**	**0.0142**	NA	NA	**0.0139**	NA	**0.0104**	**0.00659**	< 0.000500 U	**0.000402 J**	NA	NA	NA	NA	**0.0156**	**0.000341 J**	**0.000142 J**	< 0.005000 U	NA
Copper	mg/L	1.3	< 0.00100 U	**0.00130 J**	NA	NA	< 0.00100 U	NA	< 0.00100 U	0.00172 UB	< 0.00100 U	< 0.00100 U	NA	NA	NA	NA	**0.00484 J**	0.00663 UB	< 0.00100 U	< 0.00100 U	NA
Iron	mg/L	NV	**1.14**	**2.89**	NA	NA	**1.06**	NA	**16.1**	**2.90**	**0.0723 J**	**0.832**	NA	NA	NA	NA	**29.0**	**2.46**	**5.60**	**5.40**	NA
Lead	mg/L	0.015	< 0.00100 U	< 0.00100 U	NA	NA	< 0.00100 U	NA	< 0.00100 U	**0.000894 J**	< 0.00100 U	< 0.00100 U	NA	NA	NA	NA	< 0.00100 U	**0.00123 J**	< 0.00100 U	< 0.00100 U	NA
Magnesium	mg/L	NV	**4.67**	**157**	NA	NA	**194**	NA	**5.98**	**0.800**	**2.20**	**6.18**	NA	NA	NA	NA	**85.6**	**1.44**	**6.34**	**6.12**	NA
Manganese	mg/L	1.1*	**0.0329**	**0.793**	NA	NA	**2.21**	NA	**0.477**	**0.0807**	**0.0223**	**0.0603**	NA	NA	NA	NA	**1.62**	**0.0988**	**0.117**	**0.112**	NA
Nickel	mg/L	0.49*	**0.000995 J**	**0.00836**	NA	NA	**0.0131**	NA	**0.00246 J**	**0.00370 J**	**0.00100 J**	**0.000918 J**	NA	NA	NA	NA	**0.370**	**0.00574**	**0.00325 J**	**0.00335 J**	NA
Potassium	mg/L	NV	**108**	**17.5**	NA	NA	**2.98**	NA	**1.68**	**0.542**	**379**	**2.85**	NA	NA	NA	NA	**2.12**	**2.12**	**1.97**	**1.85**	NA
Selenium	mg/L	0.05	< 0.00250 U	< 0.00250 U	NA	NA	< 0.00250 U	NA	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	NA	NA	NA	NA	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	NA
Silver	mg/L	0.51	< 0.000500 U	< 0.000500 U	NA	NA	< 0.000500 U	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA
Sodium	mg/L	NV	**184**	**605**	NA	NA	**746**	NA	**28.1**	**20.8**	**313**	**234**	NA	NA	NA	NA	**527**	**25.4**	**111**	**106**	NA
Thallium	mg/L	0.002	< 0.000500 U	< 0.000500 U	NA	NA	< 0.000500 U	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA
Vanadium	mg/L	0.72	0.00169 UB	**0.00212 J**	NA	NA	< 0.00100 U	NA	0.00184 UB	**0.00954**	0.00200 UB	0.00216 UB	NA	NA	NA	NA	**0.00169 J**	0.00394 UB	0.00237 UB	0.00240 UB	NA
Zinc	mg/L	31	**0.0198**	**0.0184**	NA	NA	**0.0225**	NA	**0.0247**	**0.0183**	**0.0294**	**0.0220**	NA	NA	NA	NA	**0.0291**	**0.0147**	**0.0171**	**0.0163**	NA
Mercury	mg/L	0.002	< 0.000100 U	< 0.000100 U	NA	NA	< 0.000100 U	NA	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	NA	NA	NA	NA	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	NA
1,4-Dioxane (8270D SIM)																					
1,4-Dioxane	µg/L	9.1	**0.11**	**0.13**	**0.43**	**0.048**	**0.021**	**0.068**	< 0.010 U	< 0.010 U	**0.95**	**0.15**	**8.1**	< 0.010 U	< 0.010 U	**0.024**	NA	< 0.010 U	< 0.010 U	< 0.010 U	< 0.010 U

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

a - duplicate sample

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected. Value presented is the limit of detection.

NV - No Value

UB - considered a non-detect due to blank contamination

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

Table 6. LHAAP-18/24 Analytical Results - June 2019

Location Identification: / Sample Date:	Units	MCL/MSC/ PCL	18WW08 _062719 6/27/19	18WW09 _062719 6/27/19	18WW10 _062519 6/25/19	18WW10 _062519-a 6/25/19	18WW14 _061719 6/17/19	18WW16 _062619 6/26/19	18WW17 _062419 6/24/19	18WW18 _062419 6/24/19	18WW19 _080819 8/8/19	18WW20 _080819 8/8/19	18WW22 _062019 6/20/19	18WW24 _062619 6/26/19	18WW25 _062719 6/27/19	C01_062119 6/21/19	C02_062519 6/25/19	C03_062619 6/26/19	C04_062019 6/20/19	C06_062619 6/26/19	C08_062119 6/21/19
Lab Package:			HS19061547	HS19061547	HS19061386	HS19061386	HS19060929	HS19061486	HS19061279	HS19061279	HS19080486	HS19080486	HS19061157	HS19061482	HS19061547	HS19061210	HS19061386	HS19061486	HS19061157	HS19061486	HS19061210
Well Identification:			18WW08	18WW09	18WW10	18WW10	18WW14	18WW16	18WW17	18WW18	18WW19	18WW20	18WW22	18WW24	18WW25	C-01	C-02	C-03	C-04	C-06	C-08
Perchlorate (6850)																					
Perchlorate	µg/L	17*	< 2.0 U	< 2.0 U	<2.0 U	<2.0 U	< 2.0 U	**4.4**	**85,000**	< 2.0 U	< 2.0 U	< 2.0 U	<2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	< 2.0 U	**54**	< 2.0 U	< 2.0 U	< 2.0 U
Volatile Organic Compounds (8260C)																					
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	µg/L	200	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	5	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	10,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloroethene	µg/L	7	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,1-Dichloropropene	µg/L	2.9	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5 U	NA	< 0.5 UJ	< 0.5 UJ	NA	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U
1,2,3-Trichloropropane	µg/L	0.041	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5 U	NA	< 0.5 UJ	< 0.5 UJ	NA	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ
1,2-Dibromoethane	µg/L	0.05	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	µg/L	600	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	5	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,2-Dichloropropane	µg/L	5	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,3-Dichloropropane	µg/L	29	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	µg/L	75	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2,2-Dichloropropane	µg/L	42	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Butanone	µg/L	61,000	< 1.0 U	NA	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
2-Chlorotoluene	µg/L	2,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
2-Hexanone	µg/L	6,100	< 1.0 U	NA	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	µg/L	2,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Isopropyltoluene	µg/L	10,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	µg/L	8,200	< 1.0 U	NA	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Acetone	µg/L	92,000	2.1 UB	NA	**3.9 J**	**2.0 J**	NA	**11**	< 1.0 U	**2.4**	< 1.0 U	< 1.0 U	9.1 UB	< 1.0 U	2.3 UB	< 1.0 U	**5.1**	**5.7**	4.8 UB	< 1.0 U	< 1.0 U
Benzene	µg/L	5	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromobenzene	µg/L	2,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromochloromethane	µg/L	4,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromodichloromethane	µg/L	4.6	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Bromoform	µg/L	36	< 0.5 U	NA	< 0.5 UJ	< 0.5 UJ	NA	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ
Bromomethane	µg/L	140	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Carbon disulfide	µg/L	10,000	< 1.0 U	NA	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Carbon tetrachloride	µg/L	5	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	100	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroethane	µg/L	41,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloroform	µg/L	1,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Chloromethane	µg/L	220	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	µg/L	70	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
cis-1,3-Dichloropropene	µg/L	5.3	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromochloromethane	µg/L	34	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dibromomethane	µg/L	380	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	µg/L	20,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	700	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Hexachlorobutadiene	µg/L	20	< 1.0 U	NA	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Isopropylbenzene	µg/L	10,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	10,000**	< 1.0 U	NA	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Methylene chloride	µg/L	5	< 1.0 U	NA	< 1.0 U	< 1.0 U	NA	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U
Naphthalene	µg/L	2,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Butylbenzene	µg/L	4,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
n-Propylbenzene	µg/L	4,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
o-Xylene	µg/L	10,000**	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
sec-Butylbenzene	µg/L	4,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Styrene	µg/L	100	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
tert-Butylbenzene	µg/L	4,100	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	5	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Toluene	µg/L	1,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,2-Dichloroethene	µg/L	100	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	µg/L	29	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Trichloroethene	µg/L	5	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	**34**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**1.1**
Trichlorofluoromethane	µg/L	31,000	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U
Vinyl chloride	µg/L	2	< 0.5 U	NA	< 0.5 U	< 0.5 U	NA	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U

Table 6. LHAAP-18/24 Analytical Results - June 2019

Location Identification: / Sample Date:	Units	MCL/MSC/ PCL	18WW08 _062719 6/27/19	18WW09 _062719 6/27/19	18WW10 _062519 6/25/19	18WW10 _062519-a 6/25/19	18WW14 _061719 6/17/19	18WW16 _062619 6/26/19	18WW17 _062419 6/24/19	18WW18 _062419 6/24/19	18WW19 _080819 8/8/19	18WW20 _080819 8/8/19	18WW22 _062019 6/20/19	18WW24 _062619 6/26/19	18WW25 _062719 6/27/19	C01_062119 6/21/19	C02_062519 6/25/19	C03_062619 6/26/19	C04_062019 6/20/19	C06_062619 6/26/19	C08_062119 6/21/19
Metals (6020A)																					
Aluminum	mg/L	100	NA	**0.0863**	NA	NA	**0.138**	**0.649**	0.0219 UB	0.0389 UB	**0.327**	**0.0246**	**0.213**	**0.482**	**0.255**	NA	NA	0.00694 UB	NA	**0.0222**	NA
Antimony	mg/L	0.006	NA	< 0.005000 U	NA	NA	< 0.005000 U	**0.00244 J**	< 0.005000 U	< 0.005000 U	< 0.005000 U	< 0.005000 U	< 0.000500 U	< 0.00500 U	< 0.00500 U	NA	NA	< 0.00500 U	NA	< 0.00500 U	NA
Arsenic	mg/L	0.01	NA	**0.00754**	NA	NA	**0.000663 J**	**0.00640**	**0.00328 J**	**0.00567**	**0.000655 J**	< 0.005000 U	**0.00175 J**	**0.000998 J**	**0.00770**	NA	NA	**0.00318 J**	NA	**0.00101 J**	NA
Barium	mg/L	2	NA	**0.239**	NA	NA	**1.19**	**0.141**	**4.13**	**1.34**	**0.119**	**0.0929**	**0.145**	**0.0582**	**0.316**	NA	NA	**1.39**	NA	**1.03**	NA
Beryllium	mg/L	0.004	NA	< 0.005000 U	NA	NA	< 0.005000 U	**0.00310**	< 0.005000 U	**0.000322 J**	< 0.005000 U	< 0.005000 U	< 0.000500 U	< 0.00500 U	< 0.00500 U	NA	NA	< 0.00500 U	NA	< 0.00500 U	NA
Cadmium	mg/L	0.005	NA	**0.000214 J**	NA	NA	**0.000783 J**	**0.00858**	**0.000710 J**	< 0.005000 U	< 0.005000 U	< 0.005000 U	< 0.000500 U	**0.000207 J**	< 0.00500 U	NA	NA	< 0.00500 U	NA	< 0.00500 U	NA
Calcium	mg/L	NV	NA	**17.9**	NA	NA	**50.8**	**182**	**371**	**58.2**	**6.82**	**2.93**	**15.2**	**8.52**	**20.6**	NA	NA	**46.7**	NA	**19.7**	NA
Chromium	mg/L	0.1	NA	**0.0175**	NA	NA	**0.409**	**9.14**	**1.80**	**0.00520**	**0.0100**	**0.000595 J**	**0.0245**	**0.000791 J**	**0.000744 J**	NA	NA	< 0.000500 U	NA	**0.000674 J**	NA
Cobalt	mg/L	6.1	NA	**0.00123 J**	NA	NA	**0.0132**	**0.418**	**0.0122**	**0.000122 J**	**0.000430 J**	**0.00504**	**0.000243 J**	**0.00641**	**0.00410 J**	NA	NA	**0.000279 J**	NA	**0.00214 J**	NA
Copper	mg/L	1.3	NA	< 0.00100 U	NA	NA	**0.0119**	**0.755**	**0.109**	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	**0.00151 J**	< 0.00100 U	NA	NA	< 0.00100 U	NA	< 0.00100 U	NA
Iron	mg/L	NV	NA	**39.4**	NA	NA	**1.90**	**29.7**	**25.2**	**113**	**15.8**	**4.37**	**0.0577 J**	**0.483**	**27.0**	NA	NA	**87.5**	NA	**63.2**	NA
Lead	mg/L	0.015	NA	< 0.00100 U	NA	NA	< 0.00100 U	**0.00364 J**	**0.00130 J**	**0.000647 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	< 0.00100 U	NA	< 0.00100 U	NA
Magnesium	mg/L	NV	NA	**9.91**	NA	NA	**40.4**	**166**	**249**	**36.3**	**3.17**	**2.08**	**3.50**	**6.41**	**12.5**	NA	NA	**30.1**	NA	**12.4**	NA
Manganese	mg/L	1.1*	NA	**0.792**	NA	NA	**0.876**	**3.12**	**0.308**	**2.33**	**0.279**	**0.220**	**0.00169 J**	**2.89**	**2.92**	NA	NA	**1.52**	NA	**0.994**	NA
Nickel	mg/L	0.49*	NA	**0.0111**	NA	NA	**0.306**	**14.3**	**0.886**	**0.00103 J**	**0.00475 J**	**0.00749**	< 0.00100 U	**0.206**	**0.00273 J**	NA	NA	< 0.00100 U	NA	**0.00170 J**	NA
Potassium	mg/L	NV	NA	**2.58**	NA	NA	**4.38**	**4.36**	**1.55**	**3.49**	**2.04**	**1.33**	**4.81**	**1.08**	**1.51**	NA	NA	**3.38**	NA	**4.20**	NA
Selenium	mg/L	0.05	NA	< 0.00250 U	NA	NA	< 0.00250 U	**0.0130**	**0.00181 J**	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	NA	NA	< 0.00250 U	NA	< 0.00250 U	NA
Silver	mg/L	0.51	NA	< 0.000500 U	NA	NA	< 0.000500 U	**0.000338 J**	**0.000215 J**	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	< 0.000500 U	NA	< 0.000500 U	NA
Sodium	mg/L	NV	NA	**42.5**	NA	NA	**137**	**532**	**1,270**	**148**	**22.5**	**26.2**	**39.1**	**208**	**35.7**	NA	NA	**168**	NA	**233**	NA
Thallium	mg/L	0.002	NA	< 0.000500 U	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	< 0.000500 U	NA	< 0.000500 U	NA
Vanadium	mg/L	0.72	NA	0.00236 UB	NA	NA	0.00422 UB	**0.0771**	**0.0203**	< 0.00100 U	**0.00202 J**	**0.000822 J**	**0.0148**	**0.00210 J**	0.000983 UB	NA	NA	< 0.00100 U	NA	< 0.00100 U	NA
Zinc	mg/L	31	NA	**0.0131**	NA	NA	**0.0390**	**0.175**	**0.185**	**0.0145**	**0.0211**	**0.0191**	**0.0168**	**0.138**	**0.0183**	NA	NA	**0.0216**	NA	**0.0188**	NA
Mercury	mg/L	0.002	NA	< 0.000100 U	NA	NA	< 0.000100 U	**0.0000520 J**	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	NA	NA	< 0.000100 U	NA	< 0.000100 U	NA
1,4-Dioxane (8270D SIM)																					
1,4-Dioxane	µg/L	9.1	< 0.010 U	< 0.010 U	< 0.010 U	< 0.010 U	NA	NA	NA	< 0.010 U	NA	**0.25**	**0.017**	NA	< 0.010 U	NA	NA	**0.012**	NA	NA	< 0.010 U

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

a - duplicate sample

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected. Value presented is the limit of detection.

NV - No Value

UB - considered a non-detect due to blank contamination

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

Table 6. LHAAP-18/24 Analytical Results - June 2019

Location Identification: / Sample Date:	Units	MCL/MSC/ PCL	C09_062619 6/26/19	MW1_061919 6/19/19	MW2_061919 6/19/19	MW2_061919_a 6/19/19	MW3_062519 6/25/19	MW5_061819 6/18/19	MW6_061819 6/18/19	MW7_061719 6/17/19	MW8_062119 6/21/19	MW9_062519 6/25/19	MW10_062519 6/25/19	MW12_062019 6/20/19	MW13_062519 6/25/19	MW14_062019 6/20/19	MW14_062019-a 6/20/19	MW16_062619 6/26/19	MW17_062519 6/25/19	MW18_062619 6/26/19
Lab Package:			HS19061486	HS19061083	HS19061083	HS19061083	HS19061383	HS19060986	HS19060986	HS19060929	HS19061210	HS19061386	HS19061386	HS19061164	HS19061386	HS19061164	HS19061164	HS19061482	HS19061386	HS19061486
Well Identification:			C-09	MW-1	MW-2	MW-2	MW-3	MW-5	MW-6	MW-7	MW-8	MW-9	MW-10	MW-12	MW-13	MW-14	MW-14	MW-16	MW-17	MW-18
Perchlorate (6850)																				
Perchlorate	µg/L	17*	< 2.0 U	590	<2.0 U	<2.0 U	11,000	26,000	4,400	26,000	7,100	520	<2.0 U	<2.0 U	< 2.0 U	240,000	230,000	2,900	< 2.0 U	<2.0 U
Volatile Organic Compounds (8260C)																				
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
1,1,1-Trichloroethane	µg/L	200	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
1,1,2-Trichloroethane	µg/L	5	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
1,1-Dichloroethane	µg/L	10,000	< 0.5 UJ	< 10 U	< 25 U	< 25 U	**1.4**	**1.1**	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	**0.89 J**	NA	< 0.5 U
1,1-Dichloroethene	µg/L	7	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**1.0**	< 0.5 U	**130**	**140 J**	**15**	NA	< 0.5 U
1,1-Dichloropropene	µg/L	2.9	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5 UJ	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 U	< 0.5 UJ	< 10 U	< 10 U	< 0.5 UJ	NA	< 0.5 U
1,2,3-Trichloropropane	µg/L	0.041	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5 UJ	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 10 UJ	< 10 UJ	< 0.5 UJ	NA	< 0.5 U
1,2-Dibromoethane	µg/L	0.05	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
1,2-Dichlorobenzene	µg/L	600	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
1,2-Dichloroethane	µg/L	5	< 0.5 U	**300**	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	**26**	**0.75 J**	< 0.5 U	< 0.5 U	**0.57 J**	< 0.5 U	**100**	**110 J**	**84**	NA	< 0.5 U
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	**0.62 J**	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
1,3-Dichloropropane	µg/L	29	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
1,4-Dichlorobenzene	µg/L	75	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
2,2-Dichloropropane	µg/L	42	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
2-Butanone	µg/L	61,000	< 1.0 U	< 20 U	< 50 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 20 U	< 20 U	< 1.0 U	NA	< 1.0 U
2-Chlorotoluene	µg/L	2,000	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
2-Hexanone	µg/L	6,100	< 1.0 U	< 20 U	< 50 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 20 U	< 20 U	< 1.0 U	NA	< 1.0 U
4-Chlorotoluene	µg/L	2,000	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
4-Isopropyltoluene	µg/L	10,000	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
4-Methyl-2-pentanone	µg/L	8,200	< 1.0 U	< 20 U	< 25 U	< 25 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 20 U	< 20 U	< 1.0 U	NA	< 1.0 U
Acetone	µg/L	92,000	**4.2**	< 20 U	< 50 U	< 50 U	< 1.0 U	4.9 UB	< 1.0 U	< 5.0 U	< 1.0 U	**2.1**	< 1.0 U	**3.5**	< 1.0 U	< 20 U	< 20 U	< 1.0 U	NA	**3.3**
Benzene	µg/L	5	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Bromobenzene	µg/L	2,000	< 0.5 UJ	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Bromochloromethane	µg/L	4,100	< 0.5 UJ	< 10 U	**660 J**	**460 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Bromodichloromethane	µg/L	4.6	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Bromoform	µg/L	36	< 0.5 UJ	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 0.5 UJ	< 10 UJ	< 10 UJ	< 0.5 UJ	NA	< 0.5 U
Bromomethane	µg/L	140	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Carbon disulfide	µg/L	10,000	< 1.0 U	< 20 U	< 50 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 20 U	< 20 U	< 1.0 U	NA	< 1.0 U
Carbon tetrachloride	µg/L	5	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Chlorobenzene	µg/L	100	< 0.5 UJ	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Chloroethane	µg/L	41,000	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Chloroform	µg/L	1,000	< 0.5 UJ	< 10 U	**75**	**74**	< 0.5 U	< 0.5 U	< 0.5 U	**3.4 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	**25 J**	< 0.5 U	NA	< 0.5 U
Chloromethane	µg/L	220	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
cis-1,2-Dichloroethene	µg/L	70	< 0.5 U	**4,000**	**58,000**	**59,000**	**52**	**8.5**	**4.7**	**10**	< 0.5 U	**25**	< 0.5 U	**15**	< 0.5 U	**1,800**	**2,000 J**	**52**	NA	**1.2**
cis-1,3-Dichloropropene	µg/L	5.3	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Dibromochloromethane	µg/L	34	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Dibromomethane	µg/L	380	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Dichlorodifluoromethane	µg/L	20,000	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Ethylbenzene	µg/L	700	< 0.5 U	< 10 U	**32 J**	**33 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Hexachlorobutadiene	µg/L	20	< 1.0 U	< 20 U	< 50 U	< 50 U	< 0.5 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 20 U	< 20 U	< 1.0 U	NA	< 1.0 U
Isopropylbenzene	µg/L	10,000	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
m,p-Xylene	µg/L	10,000**	< 1.0 U	< 20 U	< 50 U	< 50 U	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 20 U	< 20 U	< 1.0 U	NA	< 1.0 U
Methylene chloride	µg/L	5	< 1.0 U	< 20 U	**510,000**	**500,000**	< 1.0 U	< 1.0 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 20 U	< 20 U	< 1.0 U	NA	< 1.0 U
Naphthalene	µg/L	2,000	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
n-Butylbenzene	µg/L	4,100	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
n-Propylbenzene	µg/L	4,100	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
o-Xylene	µg/L	10,000**	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
sec-Butylbenzene	µg/L	4,100	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Styrene	µg/L	100	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
tert-Butylbenzene	µg/L	4,100	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Tetrachloroethene	µg/L	5	< 0.5 U	< 10 U	**43 J**	**44 J**	**0.7 J**	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	**1.4**	NA	< 0.5 U
Toluene	µg/L	1,000	< 0.5 U	< 10 U	**30 J**	**31 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
trans-1,2-Dichloroethene	µg/L	100	< 0.5 U	< 10 U	**150**	**150**	**0.99 J**	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
trans-1,3-Dichloropropene	µg/L	29	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Trichloroethene	µg/L	5	< 0.5 U	**15,000**	**1,400**	**1,400**	**240**	**30**	**14**	**1,300**	**120**	**1,100**	**22**	**160**	< 0.5 U	**11,000**	**11,000**	**1,200**	NA	**25**
Trichlorofluoromethane	µg/L	31,000	< 0.5 U	< 10 U	< 25 U	< 25 U	< 0.5 U	< 0.5 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	< 0.5 U	NA	< 0.5 U
Vinyl chloride	µg/L	2	< 0.5 U	< 10 U	< 25 U	< 25 U	**3.0**	**1.6**	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 10 U	< 10 U	**2.1**	NA	< 0.5 U

Table 6. LHAAP-18/24 Analytical Results - June 2019

Location Identification: / Sample Date:	Units	MCL/MSC/ PCL	C09_062619 6/26/19	MW1_061919 6/19/19	MW2_061919 6/19/19	MW2_061919_a 6/19/19	MW3_062519 6/25/19	MW5_061819 6/18/19	MW6_061819 6/18/19	MW7_061719 6/17/19	MW8_062119 6/21/19	MW9_062519 6/25/19	MW10_062519 6/25/19	MW12_062019 6/20/19	MW13_062519 6/25/19	MW14_062019 6/20/19	MW14_062019-a 6/20/19	MW16_062619 6/26/19	MW17_062519 6/25/19	MW18_062619 6/26/19
Metals (6020A)																				
Aluminum	mg/L	100	**0.370**	**0.0775**	NA	NA	**0.00644 J**	NA	**0.0152**	NA	NA	**0.0255**	NA	NA	**0.336**	**0.0408**	**0.0353**	NA	NA	NA
Antimony	mg/L	0.006	**0.000800 J**	< 0.00500 U	NA	NA	< 0.000500 U	NA	< 0.000500 U	NA	NA	< 0.000500 U	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	NA
Arsenic	mg/L	0.01	< 0.00500 U	< 0.00500 U	NA	NA	**0.000625 J**	NA	**0.00204 J**	NA	NA	< 0.000500 U	NA	NA	**0.000513 J**	**0.00702**	**0.00636**	NA	NA	NA
Barium	mg/L	2	**0.238**	**0.406**	NA	NA	**0.370**	NA	**0.700**	NA	NA	**0.119**	NA	NA	**0.234**	**0.311**	**0.297**	NA	NA	NA
Beryllium	mg/L	0.004	< 0.00500 U	< 0.00500 U	NA	NA	< 0.000500 U	NA	< 0.000500 U	NA	NA	< 0.000500 U	NA	NA	< 0.000500 U	**0.000305 J**	**0.000276 J**	NA	NA	NA
Cadmium	mg/L	0.005	< 0.00500 U	< 0.00500 U	NA	NA	< 0.000500 U	NA	**0.000205 J**	NA	NA	< 0.000500 U	NA	NA	**0.000407 J**	**0.000877 J**	**0.000834 J**	NA	NA	NA
Calcium	mg/L	NV	**76.3**	**17.9**	NA	NA	**26.5**	NA	**26.9**	NA	NA	**15.0**	NA	NA	**14.8**	**122**	**116**	NA	NA	NA
Chromium	mg/L	0.1	**0.00659**	**0.358**	NA	NA	**0.00222 J**	NA	**0.228**	NA	NA	**0.156**	NA	NA	**0.738**	**0.0974**	**0.0866**	NA	NA	NA
Cobalt	mg/L	6.1	**0.000529 J**	**0.0170**	NA	NA	**0.00313 J**	NA	**0.00561**	NA	NA	**0.00255 J**	NA	NA	**0.00531**	**0.0252**	**0.0240**	NA	NA	NA
Copper	mg/L	1.3	**0.00119 J**	0.00256 UB	NA	NA	**0.00658**	NA	0.00520 UB	NA	NA	< 0.00100 U	NA	NA	**0.0274**	0.00394 UB	0.00362 UB	NA	NA	NA
Iron	mg/L	NV	**0.354**	**5.03**	NA	NA	**0.218**	NA	**2.15**	NA	NA	**0.830**	NA	NA	**37.1**	**128**	**120**	NA	NA	NA
Lead	mg/L	0.015	< 0.00100 U	< 0.00100 U	NA	NA	< 0.00100 U	NA	< 0.00100 U	NA	NA	< 0.00100 U	NA	NA	< 0.00100 U	< 0.00100 U	< 0.00100 U	NA	NA	NA
Magnesium	mg/L	NV	**3.79**	**14.4**	NA	NA	**16.4**	NA	**22.9**	NA	NA	**3.78**	NA	NA	**7.96**	**72.8**	**68.8**	NA	NA	NA
Manganese	mg/L	1.1*	**0.0798**	**0.703**	NA	NA	**0.295**	NA	**0.137 J**	NA	NA	**0.0495**	NA	NA	**0.844**	**4.58**	**4.81**	NA	NA	NA
Nickel	mg/L	0.49*	**0.00408 J**	**1.07**	NA	NA	**0.00306 J**	NA	**0.168**	NA	NA	**0.127**	NA	NA	**0.247**	**0.158**	**0.150**	NA	NA	NA
Potassium	mg/L	NV	**0.511**	**2.47**	NA	NA	**1.56**	NA	**2.16**	NA	NA	**0.438**	NA	NA	**3.58**	**14.0**	**13.5**	NA	NA	NA
Selenium	mg/L	0.05	< 0.00250 U	< 0.00250 U	NA	NA	< 0.00250 U	NA	< 0.00250 U	NA	NA	< 0.00250 U	NA	NA	< 0.00250 U	< 0.00250 U	< 0.00250 U	NA	NA	NA
Silver	mg/L	0.51	< 0.000500 U	< 0.000500 U	NA	NA	< 0.000500 U	NA	< 0.000500 U	NA	NA	< 0.000500 U	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	NA
Sodium	mg/L	NV	**14.3**	**170**	NA	NA	**254**	NA	**203**	NA	NA	**17.2**	NA	NA	**56.0**	**449**	**482**	NA	NA	NA
Thallium	mg/L	0.002	**0.000881 J**	< 0.000500 U	NA	NA	< 0.000500 U	NA	< 0.000500 U	NA	NA	< 0.000500 U	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	NA	NA
Vanadium	mg/L	0.72	**0.00199 J**	0.00117 UB	NA	NA	**0.00152 J**	NA	0.00378 UB	NA	NA	**0.000919 J**	NA	NA	**0.00339 J**	< 0.00100 U	< 0.00100 U	NA	NA	NA
Zinc	mg/L	31	**0.0252**	**0.00816**	NA	NA	**0.0217**	NA	**0.0358**	NA	NA	**0.0279**	NA	NA	**0.0257**	**0.467**	**0.439**	NA	NA	NA
Mercury	mg/L	0.002	< 0.000100 U	< 0.000100 U	NA	NA	< 0.000100 U	NA	< 0.000100 U	NA	NA	< 0.000100 U	NA	NA	< 0.000100 U	< 0.000100 U	< 0.000100 U	NA	NA	NA
1,4-Dioxane (8270D SIM)																				
1,4-Dioxane	µg/L	9.1	NA	NA	**3.5 J**	**6.2 J**	NA	< 0.010 U	NA	**9.7**	**0.46**	**2.0**	**0.12**	NA	NA	**280 J**	**390 J**	**12**	**0.31**	NA

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

a - duplicate sample

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected. Value presented is the limit of detection.

NV - No Value

UB - considered a non-detect due to blank contamination

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

Table 6. LHAAP-18/24 Analytical Results - June 2019

Location Identification: / Sample Date:	Units	MCL/MSC/ PCL	MW19_062619 6/2619	MW20_061319 6/13/19	MW21-061819 6/18/19	MW22_062119 6/21/19	MW23_062419 6/24/19	102_062419 6/24/19	109_061819 6/18/19	120_062019 6/20/19	125_062419 6/24/19	126_062419 6/24/19	129_062419 6/24/19	130_062519 6/25/19	130_062519-a 6/25/19	ICT2_062819 6/28/19	ICT4_062819 6/28/19	ICT7_062819 6/28/19	ICT8_062819 6/28/19	ICT11_062819 6/28/19	ICT11_062819-a 6/28/19
Lab Package:			HS19061482	HS19060835	HS19060986	HS19061210	HS19061279	HS19061279	HS19060986	HS19061164	HS19061279	HS19061279	HS19061279	HS19061386	HS19061386	HS19070016	HS19070016	HS19070016	HS19070016	HS19070016	HS19070016
Well Identification:			MW-19	MW-20	MW-21	MW-22	MW-23	MW-102	MW-109	MW-120	MW-125	MW-126	MW-129	MW-130	MW-130	ICT-2	ICT-4	ICT-7	ICT-8	ICT-11	ICT-11
Perchlorate (6850)																					
Perchlorate	µg/L	17*	<2.0 U	<2.0 U	**24,000**	**95**	**67,000**	**33**	**10,000**	**13,000**	**260**	**5.9 J**	**4,200**	<2.0 U	<2.0 U	**6,900**	**7,700**	**260**	**140**	**2,500**	**2,600**
Volatile Organic Compounds (8260C)																					
1,1,1,2-Tetrachloroethane	µg/L	110	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,1,1-Trichloroethane	µg/L	200	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,1,2-Trichloroethane	µg/L	5	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.73 J**	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,1-Dichloroethane	µg/L	10,000	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.55 J**	< 0.5 U	**9.3 J**	< 0.5 U	< 0.5 U
1,1-Dichloroethene	µg/L	7	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	**78**	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**2.0**	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,1-Dichloropropene	µg/L	2.9	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,2,3-Trichlorobenzene	µg/L	310	< 0.5 UJ	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,2,3-Trichloropropane	µg/L	0.041	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,2,4-Trichlorobenzene	µg/L	70	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,2,4-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 0.5 UJ	< 0.5 U	< 10 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U	< 10 UJ	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,2-Dibromoethane	µg/L	0.05	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,2-Dichlorobenzene	µg/L	600	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,2-Dichloroethane	µg/L	5	< 0.5 U	< 0.5 U	**38**	**3.3**	**66**	< 0.5 U	< 0.5 U	**17 J**	< 5.0 U	< 0.5 U	**15**	< 0.5 U	< 0.5 U	**40**	**110**	< 0.5 U	**47**	**0.99 J**	**0.87 J**
1,2-Dichloropropane	µg/L	5	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,3,5-Trimethylbenzene	µg/L	5,100	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,3-Dichlorobenzene	µg/L	3,100	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,3-Dichloropropane	µg/L	29	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
1,4-Dichlorobenzene	µg/L	75	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
2,2-Dichloropropane	µg/L	42	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
2-Butanone	µg/L	61,000	< 1.0 U	< 1.0 U	< 20 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 20 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U
2-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
2-Hexanone	µg/L	6,100	< 1.0 U	< 1.0 U	< 20 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 20 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U
4-Chlorotoluene	µg/L	2,000	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
4-Isopropyltoluene	µg/L	10,000	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
4-Methyl-2-pentanone	µg/L	8,200	< 1.0 U	< 1.0 U	< 20 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 20 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U
Acetone	µg/L	92,000	< 1.0 U	**2.1**	< 20 U	< 1.0 U	< 5.0 U	< 1.0 U	7.8 UB	< 20 U	< 10 U	< 1.0 U	**4.0**	< 1.0 U	**5.8**	< 1.0 U	< 1.0 U	**2.8**	< 10 U	**6.4 J**	**3.6 J**
Benzene	µg/L	5	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**1.2**	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Bromobenzene	µg/L	2,000	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Bromochloromethane	µg/L	4,100	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**8.8 J**	< 0.5 U	< 0.5 U
Bromodichloromethane	µg/L	4.6	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Bromoform	µg/L	36	< 0.5 UJ	< 0.5 U	< 10 U	< 0.5 UJ	< 2.5 U	< 0.5 U	< 0.5 U	< 10 UJ	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Bromomethane	µg/L	140	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Carbon disulfide	µg/L	10,000	< 1.0 U	< 1.0 U	< 20 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 20 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	**1.3 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U
Carbon tetrachloride	µg/L	5	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**13**	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Chlorobenzene	µg/L	100	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Chloroethane	µg/L	41,000	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Chloroform	µg/L	1,000	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	**20 J**	< 0.5 U	< 0.5 U	**27**	**26 J**	< 0.5 U	**1.2 J**	< 0.5 U	< 0.5 U	< 0.5 U	**9.1**	< 0.5 U	**16**	< 0.5 U	< 0.5 U
Chloromethane	µg/L	220	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
cis-1,2-Dichloroethene	µg/L	70	< 0.5 U	< 0.5 U	**190**	**0.90 J**	**8.1**	< 0.5 U	**57**	**790**	< 5.0 U	< 0.5 U	**2.8**	< 0.5 U	< 0.5 U	**35**	**2,000**	< 0.5 U	**3,200**	**32**	**27**
cis-1,3-Dichloropropene	µg/L	5.3	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Dibromochloromethane	µg/L	34	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Dibromomethane	µg/L	380	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Dichlorodifluoromethane	µg/L	20,000	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Ethylbenzene	µg/L	700	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Hexachlorobutadiene	µg/L	20	< 1.0 U	< 1.0 U	< 20 U	< 0.5 U	< 5.0 U	< 1.0 U	< 1.0 U	< 20 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U
Isopropylbenzene	µg/L	10,000	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 1.0 U	< 1.0 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
m,p-Xylene	µg/L	10,000**	< 1.0 U	< 1.0 U	< 20 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 20 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 1.0 U	< 1.0 U
Methylene chloride	µg/L	5	< 1.0 U	< 1.0 U	< 20 U	< 1.0 U	< 5.0 U	< 1.0 U	< 1.0 U	< 20 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**8,400**	< 1.0 U	< 1.0 U
Naphthalene	µg/L	2,000	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
n-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
n-Propylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
o-Xylene	µg/L	10,000**	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
sec-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Styrene	µg/L	100	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
tert-Butylbenzene	µg/L	4,100	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Tetrachloroethene	µg/L	5	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.90 J**	**1.8**	< 0.5 U	**240**	< 0.5 U	< 0.5 U
Toluene	µg/L	1,000	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
trans-1,2-Dichloroethene	µg/L	100	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**1.0**	**5.2**	< 0.5 U	**9.8 J**	< 0.5 U	< 0.5 U
trans-1,3-Dichloropropene	µg/L	29	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Trichloroethene	µg/L	5	**0.63 J**	< 0.5 U	**6,300**	**230**	**2,600**	< 0.5 U	**130**	**7,900**	< 5.0 U	< 0.5 U	**820**	< 0.5 U	< 0.5 U	**670**	**6,000**	**1.0**	**7,500**	**270**	**210**
Trichlorofluoromethane	µg/L	31,000	< 0.5 U	< 0.5 U	< 10 U	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 0.5 U	< 0.5 U
Vinyl chloride	µg/L	2	< 0.5 U	< 0.5 U	**18 J**	< 0.5 U	< 2.5 U	< 0.5 U	< 0.5 U	< 10 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**0.95 J**	**10**	< 0.5 U	**13**	< 0.5 U	< 0.5 U

Table 6. LHAAP-18/24 Analytical Results - June 2019

Location Identification: / Sample Date:	Units	MCL/MSC/ PCL	MW19_062619 6/2619	MW20_061319 6/13/19	MW21-061819 6/18/19	MW22_062119 6/21/19	MW23_062419 6/24/19	102_062419 6/24/19	109_061819 6/18/19	120_062019 6/20/19	125_062419 6/24/19	126_062419 6/24/19	129_062419 6/24/19	130_062519 6/25/19	130_062519-a 6/25/19	ICT2_062819 6/28/19	ICT4_062819 6/28/19	ICT7_062819 6/28/19	ICT8_062819 6/28/19	ICT11_062819 6/28/19	ICT11_062819-a 6/28/19
Metals (6020A)																					
Aluminum	mg/L	100	**1.54**	**1.12**	**0.0299**	**0.0158**	NA	**10.3**	NA	NA	**0.324**	< 0.000500 U	**0.0917**	**2.44**	< 0.000500 U	< 0.000500 U	**5.22**	**5.34**	0.000493 UB	**0.0112**	**0.211**	**0.0188**	**0.00846 J**	**0.0149 J**
Antimony	mg/L	0.006	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	< 0.000500 U	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U
Arsenic	mg/L	0.01	**0.0137**	**0.00104 J**	**0.00241 J**	**0.00145 J**	NA	**0.00262 J**	NA	NA	**0.000450 J**	**0.00462 J**	**0.00120 J**	**0.00360 J**	**0.00349 J**	**0.00229 J**	**0.000680 J**	**0.000594 J**	**0.00649**	< 0.000500 U	**0.000576 J**
Barium	mg/L	2	**0.467**	**0.479**	**9.21**	**0.683**	NA	**0.276**	NA	NA	**0.0647**	**10.4**	**0.119**	**0.0930**	**0.0899**	**0.167**	**0.134**	**0.217**	**0.303**	**0.443**	**0.446**
Beryllium	mg/L	0.004	**0.000294 J**	< 0.000500 U	**0.000301 J**	< 0.000500 U	NA	**0.00113 J**	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	**0.000454 J**	**0.000469 J**	< 0.000500 U	< 0.000500 U	**0.000549 J**	< 0.000500 U	**0.000285 J**	**0.000280 J**
Cadmium	mg/L	0.005	**0.00227**	**0.000359 J**	**0.000837 J**	< 0.000500 U	NA	**0.000225 J**	NA	NA	**0.000218 J**	**0.000370 J**	**0.000738 J**	**0.000499 J**	**0.000533 J**	< 0.000500 U	**0.000394 J**	< 0.000500 U	< 0.000500 U	**0.000354 J**	**0.000314 J**
Calcium	mg/L	NV	**44.1**	**44.7**	**223**	**76.1**	NA	**3.53**	NA	NA	**1.25**	**344**	**4.49**	**8.03**	**8.07**	**19.5**	**35.8**	**2.41**	**12.8**	**10.3**	**10.4**
Chromium	mg/L	0.1	**0.791**	**0.0188**	**1.09**	**0.0930**	NA	**0.0141**	NA	NA	**0.00412 J**	**0.000825 J**	**0.00567**	**0.00929**	**0.00918**	**0.00284 J**	**0.0321**	**0.00142 J**	**0.00144 J**	**0.142 J**	**0.219 J**
Cobalt	mg/L	6.1	**0.0171**	**0.0154**	**0.117**	**0.00142 J**	NA	**0.00925**	NA	NA	**0.000344 J**	**0.00777**	**0.00936**	**0.00947**	**0.00954**	**0.0116**	**0.00928**	**0.00298 J**	**0.00314 J**	**0.00481 J**	**0.00468 J**
Copper	mg/L	1.3	**0.0244**	0.00576 UB	**0.219**	**0.00249 J**	NA	**0.0139**	NA	NA	< 0.00100 U	< 0.00100 U	**0.00326 J**	**0.00755**	**0.00743**	**0.0501**	< 0.00100 U	**0.00281 J**	< 0.00100 U	**0.00472 J**	**0.00424 J**
Iron	mg/L	NV	**67.1**	**3.14**	**15.2**	**1.13**	NA	**15.7**	NA	NA	**0.466**	**4.05**	**3.29**	**7.93**	**7.87**	**4.17**	**0.404**	**0.836**	**16.0**	**1.00**	**1.58**
Lead	mg/L	0.015	**0.00323 J**	**0.00155 J**	**0.000663 J**	< 0.00100 U	NA	**0.0113**	NA	NA	**0.00128 J**	< 0.00100 U	**0.00297 J**	**0.00546**	**0.00565**	**0.00446 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U	< 0.00100 U
Magnesium	mg/L	NV	**26.1**	**12.5**	**178**	**34.5**	NA	**3.81**	NA	NA	**0.937**	**269**	**3.31**	**5.19**	**5.20**	**20.0**	**31.8**	**2.46**	**10.3**	**7.04**	**7.20**
Manganese	mg/L	1.1*	**1.50**	**0.274**	**2.59**	**0.0164**	NA	**0.0964**	NA	NA	**0.00625**	**0.150**	**0.176**	**0.285**	**0.287**	**0.336**	**0.311**	**0.0961**	**0.228**	**0.205**	**0.200**
Nickel	mg/L	0.49*	**0.214**	**0.540**	**1.49**	**0.179**	NA	**0.0255**	NA	NA	**0.0022 J**	**0.0137**	**0.00812**	**0.00933**	**0.00981**	**0.0139**	**0.265**	**0.0181**	**0.0213**	**0.564**	**0.547**
Potassium	mg/L	NV	**4.36**	**0.862**	**3.20**	**1.93**	NA	**1.73**	NA	NA	**0.321**	**3.57**	**0.647**	**1.88**	**1.89**	**1.24**	**1.54**	**1.45**	**1.48**	**0.934**	**0.968**
Selenium	mg/L	0.05	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	NA	**0.00243 J**	NA	NA	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U
Silver	mg/L	0.51	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	< 0.000500 U	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U
Sodium	mg/L	NV	**453**	**48.6**	**552**	**383**	NA	**17.0**	NA	NA	**28.8**	**949**	**69.6**	**123**	**126**	**155**	**259**	**13.3**	**69.6**	**64.8**	**67.2**
Thallium	mg/L	0.002	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	NA	**0.000275 J**	NA	NA	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	**0.000618 J**	< 0.000500 U
Vanadium	mg/L	0.72	**0.0102**	0.00507 UB	0.00433 UB	0.00257 UB	NA	**0.0237**	NA	NA	0.00142 UB	0.00257 UB	**0.00659**	**0.0165**	**0.0168**	0.00189 UB	0.00174 UB	0.00136 UB	0.00195 UB	0.00109 UB	0.00243 UB
Zinc	mg/L	31	**0.0441**	**0.102**	**0.0462**	**0.0241**	NA	**0.0748**	NA	NA	**0.0207**	**0.0423**	**0.0356**	**0.0478**	**0.0456**	**0.196**	**0.0164**	**0.0553**	**0.0101**	**0.0902**	**0.0793**
Mercury	mg/L	0.002	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	NA	< 0.000100 U	NA	NA	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U
1,4-Dioxane (8270D SIM)																					
1,4-Dioxane	µg/L	9.1	NA	NA	**1.2 J**	NA	NA	NA	**0.500**	**9.9**	NA	< 0.010 U	**1.2**	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

a - duplicate sample

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected. Value presented is the limit of detection.

NV - No Value

UB - considered a non-detect due to blank contamination

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

Table 6. LHAAP-18/24 Analytical Results - June 2019

Location Identification: / Sample Date:	Units	MCL/MSC/ PCL	ICT12B_062819 6/28/19	ICT12B_062819-a 6/28/19	ICT12C_062819 6/28/19	ICT12D_062819 6/28/19	ICT12E_062819 6/28/19	ICT13A_071118 7/11/18	ICT13B_062819 6/28/19	ICT13D_062819 6/28/19	ICT13E_062819 6/28/19	ICT13F_062819 6/28/19	ICT14B_062819 6/28/19	ICT14C_062819 6/28/19	ICT14D_062819 6/28/19
Lab Package:			HS19070016	HS19070016	HS19070016	HS19070016	HS19070016	HS19070622	HS19070016	HS19070016	HS19070016	HS19070016	HS19070016	HS19070016	HS19070016
Well Identification:			ICT-12B	ICT-12B	ICT-12C	ICT-12D	ICT-12E	ICT-13A	ICT-13B	ICT-13D	ICT-13E	ICT-13F	ICT-14B	ICT-14C	ICT-14D
Perchlorate (6850)															
Perchlorate	µg/L	17*	**140,000**	**150,000**	**6,500**	**13,000**	**28,000**	**540**	< 2.0 U	**43**	**3.8 J**	< 2.0 U	**12,000**	< 2.0 U	**210**
Volatile Organic Compounds (8260C)															
1,1,1,2-Tetrachloroethane	µg/L	110	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
1,1,1-Trichloroethane	µg/L	200	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
1,1,2,2-Tetrachloroethane	µg/L	14	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
1,1,2-Trichloroethane	µg/L	5	< 5.0 U	< 5.0 U	< 5.0 U	**9.8 J**	**14**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**5.1 J**	< 5.0 U
1,1-Dichloroethane	µg/L	10,000	**11**	**12**	< 5.0 U	**75**	**100**	**1.3 J**	**1.0**	< 0.5 U	< 0.5 U	< 0.5 U	**1.4**	**10**	**25**
1,1-Dichloroethene	µg/L	7	< 5.0 U	< 5.0 U	< 5.0 U	**370**	**550**	**5.5 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**140**	< 5.0 U
1,1-Dichloropropene	µg/L	2.9	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
1,2,3-Trichlorobenzene	µg/L	310	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
1,2,3-Trichloropropane	µg/L	0.041	< 5.0 U	< 5.0 U	< 5.0 U	**350**	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
1,2,4-Trichlorobenzene	µg/L	70	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
1,2,4-Trimethylbenzene	µg/L	5,100	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
1,2-Dibromo-3-chloropropane	µg/L	0.2	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
1,2-Dibromoethane	µg/L	0.05	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
1,2-Dichlorobenzene	µg/L	600	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
1,2-Dichloroethane	µg/L	5	**91**	**68**	**27**	**160**	**63**	**18 J**	**42**	**10**	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	**13**
1,2-Dichloropropane	µg/L	5	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
1,3,5-Trimethylbenzene	µg/L	5,100	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
1,3-Dichlorobenzene	µg/L	3,100	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
1,3-Dichloropropane	µg/L	29	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
1,4-Dichlorobenzene	µg/L	75	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
2,2-Dichloropropane	µg/L	42	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
2-Butanone	µg/L	61,000	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 10 U
2-Chlorotoluene	µg/L	2,000	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
2-Hexanone	µg/L	6,100	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 10 U
4-Chlorotoluene	µg/L	2,000	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
4-Isopropyltoluene	µg/L	10,000	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
4-Methyl-2-pentanone	µg/L	8,200	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 10 U
Acetone	µg/L	92,000	< 10 U	< 10 U	< 10 U	< 10 U	**180**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**6.2**	< 10 U	< 10 U
Benzene	µg/L	5	**16 J**	**11 J**	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Bromobenzene	µg/L	2,000	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Bromochloromethane	µg/L	4,100	< 5.0 U	< 5.0 U	< 5.0 U	**55**	**40**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	**22**
Bromodichloromethane	µg/L	4.6	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Bromoform	µg/L	36	< 5.0 U	< 5.0 U	< 5.0 U	**7.8 J**	< 5.0 U	< 0.5 UJ	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Bromomethane	µg/L	140	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Carbon disulfide	µg/L	10,000	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 10 U
Carbon tetrachloride	µg/L	5	**68 J**	**49 J**	**11**	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Chlorobenzene	µg/L	100	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Chloroethane	µg/L	41,000	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Chloroform	µg/L	1,000	**74**	**60**	**16**	**61**	**84**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	**39**	**29**
Chloromethane	µg/L	220	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
cis-1,2-Dichloroethene	µg/L	70	**930**	**1,100**	**140**	**10,000**	**17,000**	**86 J**	**140**	**37**	< 0.5 U	< 0.5 U	**31**	**11,000**	**21,000**
cis-1,3-Dichloropropene	µg/L	5.3	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Dibromochloromethane	µg/L	34	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Dibromomethane	µg/L	380	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Dichlorodifluoromethane	µg/L	20,000	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Ethylbenzene	µg/L	700	< 5.0 U	< 5.0 U	< 5.0 U	**6.0 J**	**7.7 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Hexachlorobutadiene	µg/L	20	< 10 U	< 10 U	< 10 U	< 10 U	< 10 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 0.5 U	< 10 U	< 10 U
Isopropylbenzene	µg/L	10,000	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
m,p-Xylene	µg/L	10,000**	< 10 U	< 10 U	< 10 U	**7.1 J**	**12 J**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 10 U	< 10 U
Methylene chloride	µg/L	5	**12 J**	**11 J**	< 10 U	**11,000**	**120,000**	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	< 1.0 U	**1,000**	**11,000 J**
Naphthalene	µg/L	2,000	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
n-Butylbenzene	µg/L	4,100	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
n-Propylbenzene	µg/L	4,100	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
o-Xylene	µg/L	10,000**	< 5.0 U	< 5.0 U	< 5.0 U	**5.3 J**	**8.6 J**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
sec-Butylbenzene	µg/L	4,100	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Styrene	µg/L	100	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	**41**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
tert-Butylbenzene	µg/L	4,100	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Tetrachloroethene	µg/L	5	**6.6 J**	< 5.0 U	< 5.0 U	**10**	**14**	**2.2 J**	**1.2**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	**13**
Toluene	µg/L	1,000	< 5.0 U	< 5.0 U	< 5.0 U	**17**	**28**	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
trans-1,2-Dichloroethene	µg/L	100	**5.3 J**	**5.2 J**	< 5.0 U	**29**	**43**	**1.1 J**	**1.2**	< 0.5 U	< 0.5 U	< 0.5 U	**0.6 J**	**51**	**44**
trans-1,3-Dichloropropene	µg/L	29	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 0.5 U	< 5.0 U	< 5.0 U
Trichloroethene	µg/L	5	**14,000**	**15,000**	**3,900**	**44,000**	**84,000**	**920**	**1,200**	**160**	< 0.5 U	< 0.5 U	**190**	**120**	**1,400**
Trichlorofluoromethane	µg/L	31,000	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 5.0 U	< 0.5 U	< 0.5 U	< 0.5 U	0.5 U	0.5 U	0.5 U	< 5.0 U	< 5.0 U
Vinyl chloride	µg/L	2	**28**	**32**	< 5.0 U	**320**	**440**	**6.4 J**	**3.5**	**1.5**	0.5 U	0.5 U	**0.68 J**	**1,600**	**1,100**

Table 6. LHAAP-18/24 Analytical Results - June 2019

Location Identification: / Sample Date:	Units	MCL/MSC/ PCL	ICT12B_062819 6/28/19	ICT12B_062819-a 6/28/19	ICT12C_062819 6/28/19	ICT12D_062819 6/28/19	ICT12E_062819 6/28/19	ICT13A_071118 7/11/18	ICT13B_062819 6/28/19	ICT13D_062819 6/28/19	ICT13E_062819 6/28/19	ICT13F_062819 6/28/19	ICT14B_062819 6/28/19	ICT14C_062819 6/28/19	ICT14D_062819 6/28/19
Metals (6020A)															
Aluminum	mg/L	100	**0.0271**	**0.0285**	**0.0415**	**0.595**	**0.0433**	**0.677**	**0.0158**	**1.41**	**6.70**	**3.09**	**0.0254**	**0.00742 J**	**0.0223 J**
Antimony	mg/L	0.006	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U
Arsenic	mg/L	0.01	< 0.000500 U	< 0.000500 U	< 0.000500 U	**0.00524**	**0.00106 J**	**0.00149 J**	**0.00630**	**0.00193 J**	**0.00294 J**	**0.00162 J**	**0.00114 J**	**0.0108**	**0.00810**
Barium	mg/L	2	**0.286**	**0.285**	**0.123**	**0.444**	**0.197**	**0.0656 J**	**0.203**	**0.0962**	**0.136**	**0.115**	**0.447**	**1.07**	**1.18**
Beryllium	mg/L	0.004	< 0.000500 U	< 0.000500 U	< 0.000500 U	**0.000829 J**	**0.000205 J**	**0.000221 J**	**0.000547 J**	< 0.000500 U	**0.00102 J**	**0.000645 J**	**0.000259 J**	< 0.000500 U	**0.000518 J**
Cadmium	mg/L	0.005	< 0.000500 U	< 0.000500 U	< 0.000500 U	**0.000738 J**	**0.000355 J**	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	**0.000225 J**	**0.000219 J**	**0.000514 J**
Calcium	mg/L	NV	**26.6**	**27.2**	**6.85**	**20.5**	**37.7**	**3.93**	**13.3**	**3.50**	**1.16**	**1.05**	**12.4**	**78.9**	**80.0**
Chromium	mg/L	0.1	**0.0412**	**0.0449**	**0.0972**	**0.338**	**0.142**	**0.0155**	**0.0230**	**0.121**	**0.0248**	**0.0124**	**0.0489**	**0.0341**	**0.00422 J**
Cobalt	mg/L	6.1	**0.00545**	**0.00515**	**0.000998 J**	**0.0404**	**0.0315**	**0.00696**	**0.105**	**0.00316 J**	**0.00491 J**	**0.00302 J**	**0.00274 J**	**0.0331**	**0.0141**
Copper	mg/L	1.3	**0.0824**	**0.0802**	< 0.00250 U	**0.721**	**0.0229**	**0.00803**	**0.0276**	**0.00533**	**0.0168**	**0.0127**	**0.00307 J**	**0.00281 J**	**0.00411 J**
Iron	mg/L	NV	**1.68**	**1.58**	**0.969**	**20.4**	**3.22**	**5.49**	**20.3**	**9.93**	**12.1**	**6.24**	**0.842**	**274**	**19.5**
Lead	mg/L	0.015	< 0.00100 U	< 0.00100 U	< 0.00100 U	**0.0259**	< 0.00100 U	**0.000925 J**	< 0.00100 U	**0.00505**	**0.00889**	**0.00438 J**	< 0.00100 U	< 0.00100 U	< 0.00100 U
Magnesium	mg/L	NV	**18.6**	**18.6**	**5.56**	**17.2**	**29.8**	**3.51**	**17.7**	**4.38**	**1.63**	**1.14**	**11.6**	**80.4**	**57.2**
Manganese	mg/L	1.1*	**0.165**	**0.155**	**0.0176**	**1.13**	**1.28**	**0.132**	**4.05**	**0.0744**	**0.0546**	**0.0357**	**0.239**	**2.33**	**1.31**
Nickel	mg/L	0.49*	**0.345**	**0.328**	**0.0408**	**0.850**	**0.178**	**0.0145**	**0.0245**	**0.0578**	**0.0192**	**0.00929**	**0.0822**	**0.120**	**0.0474**
Potassium	mg/L	NV	**0.743**	**0.749**	**0.301**	**1.05**	**2.43**	**0.708**	**2.37**	**0.918**	**2.09**	**1.90**	**0.565**	**1.41**	**1.46**
Selenium	mg/L	0.05	< 0.00250 U	< 0.00250 U	< 0.00250 U	**0.00224 J**	**0.00349 J**	**0.00127 J**	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	< 0.00250 U	**0.0109**	< 0.000500 U
Silver	mg/L	0.51	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U
Sodium	mg/L	NV	**195**	**192**	**96.2**	**175**	**339**	**70.0**	**103**	**34.2**	**5.75**	**4.44**	**85.8**	**265**	**295**
Thallium	mg/L	0.002	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	**0.000243 J**	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U	< 0.000500 U
Vanadium	mg/L	0.72	**0.000667 J**	**0.000792 J**	**0.00125 J**	**0.00303 J**	< 0.000500 U	**0.00425 J**	**0.00112 J**	**0.00524**	**0.0267**	**0.0146**	0.00184 UB	< 0.000500 U	**0.000634 J**
Zinc	mg/L	31	**0.105**	**0.120**	**0.0188**	**0.0862**	**0.0387**	**0.288**	**0.0910**	**0.491**	**0.0557**	**0.0596**	**0.0305**	**0.0439**	**0.141**
Mercury	mg/L	0.002	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U	< 0.000100 U
1,4-Dioxane (8270D SIM)															
1,4-Dioxane	µg/L	9.1	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Notes:

Blue highlighting indicates concentrations above the MCL/MSC/PCL

MCL/MSC - Maximum Contaminant Limit/Medium-Specific Concentrations/Protective Concentration Level

NA - Not Analyzed

µg/L - micrograms per liter

mg/L - milligrams per liter

a - duplicate sample

J - Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.

UJ - The analyte was not detected; however, the result is estimated due to discrepancies in meeting certain analyte-specific quality control criteria.

U - Undetected: The analyte was analyzed for, but not detected. Value presented is the limit of detection.

NV - No Value

UB - considered a non-detect due to blank contamination

*Perchlorate, manganese, and nickel compared to the PCL

** Value is for total xylenes

PCL – Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level

Table 7. Weekly Perchlorate Sample Results

Sample Identification	Lab Package	Date Sampled	Sample Location	Effluent Discharge Point	Harrison Bayou Maximum Allowable Daily Discharge Perchlorate Concentration (µg/L)	INF Pond Discharge Criteria for Perchlorate (µg/L)	Reporting Limit	Influent Perchlorate (6850)	Effluent Perchlorate (6850)		Does Concentration Meet Discharge Limit? (Yes/No)	No Daily Maximum Concentration		
								Result (µg/L)	Result (µg/L)	DVQ		Ammonia as N (350.3) (mg/L)	Ortho-Phosphate (365.3) (mg/L)	Organic Carbon (415.1) (mg/L)
LH18/24-SP650_040419/BIX	HS19040313	4/4/2019	TK-650	INF Pond	589	17	4	NA	< 2.0	U	Yes	**17**	**3.63**	**2.23**
LH18/24-SP650_041019/BIX	HS19040653	4/10/2019	TK-650	INF Pond	589	17	4	NA	< 2.0	U	Yes	**15**	**3.92**	**2.37**
LH18/24-SP650_041719/BIX	HS19041072	4/17/2019	TK-650	INF Pond	589	17	4	NA	< 2.0	U	Yes	**17**	**4.37**	**1.89**
LH18/24-SP650_041019/BIX (monthly)	HS19040652	4/10/2019	TK-650	INF Pond	589	17	4	NA	< 2.0	U	Yes	--	--	--
LH18/24-SP140_041019 (monthly)	HS19040654	4/10/2019	TK-140	--	--	--	NA	**5,600**	NA		NA	--	--	--
LH18/24-SP650_050119/BIX	HS19050126	5/1/2019	TK-650	INF Pond	589	17	4	NA	**1.1**	J	Yes	**24**	**6.2**	**1.51**
LH18/24-SP650_050719/BIX	HS19050397	5/7/2019	TK-650	INF Pond	589	17	4	NA	< 2.0	U	Yes	**21**	**4.95**	**1.46**
LH18/24-SP650_050719 (monthly)	HS19050398	5/7/2019	TK-650	INF Pond	589	17	4	NA	< 2.0	U	Yes	--	--	--
LH18/24-SP140_050719 (monthly)	HS19050401	5/7/2019	TK-140	--	--	--	NA	**4,200**	NA		NA	--	--	--
LH18/24-SP650_051419/BIX	HS19050886	5/14/2019	TK-650	INF Pond	589	17	4	NA	< 2.0	U	NA	**14**	**4.22**	**1.64**
LH18/24-SP650_052119/BIX	HS19051289	5/21/2019	TK-650	INF Pond	589	17	4	NA	< 2.0	U	Yes	**11**	**2.47**	**1.65**
LH18/24-SP650_052919/BIX	HS19051856	5/29/2019	TK-650	INF Pond	589	17	4	NA	< 2.0	U	Yes	**10**	**2.21**	**2.12**
LH18/24-SP650_052919/BIX (quarterly)	HS19051859	5/29/2019	TK-650	INF Pond	589	17	4	NA	< 2.0	U	Yes	--	--	--
LH18/24-SP140_052919 (quarterly)	HS19051863	5/29/2019	TK-140	--	--	--	NA	**4,900**	NA		NA	--	--	--
LH18/24-SP650_060419/BIX	HS19060172	6/4/2019	TK-650	INF Pond	589	17	4	NA	< 2.0	U	Yes	**7.5**	**2.11**	**2.21**
LH18/24-SP650_060419/BIX (monthly)	HS19060168	6/4/2019	TK-650	INF Pond	589	17	4	NA	< 2.0	U	Yes	--	--	--
LH18/24-SP140_060419 (monthly)	HS19060174	6/4/2019	TK-140	--	--	--	NA	**6,800**	NA		NA	--	--	--
LH18/24-SP650_061219/BIX	HS19060672	6/12/2019	TK-650	INF Pond	589	17	4	NA	< 2.0	U	Yes	**10**	**2.37**	**2.04**

Notes:

Texas Risk Reduction Program (TRRP) Tier 1 Groundwater Residential Protective Concentration Level (PCL)

SP140 samples are influent samples.

µg/L - micrograms per liter

DVQ - data validation qualifier

J - Estimated concentration between the detection limit and limit of quantitation and/or due to quality control discrepancies

NA - not applicable

U - non detect and reported to the limit of detection

BIX - before ion exchange

mg/L - milligrams per liter

Table 8. Bi-Weekly GWTP Analytical Sampling Results for April 2019

			Sample Location	EFFLUENT - Biweekly		EFFLUENT - Monthly		INFLUENT - Monthly*		EFFLUENT - Biweekly		Does Concentration Meet Effluent Discharge Limits? (Yes/No)
			Sample Identification	LH18/24-SP650_040419		LH18/24-SP650_041019		LH18/24-SP140_041019		LH18/24-SP650_041719		
			Lab Package	HS19040319		HS19040652		HS19040654		HS19041158		
			Sample Date	4/4/2019		4/10/2019		4/10/2019		4/17/2019		
			Sample Type	GRAB		GRAB		GRAB		GRAB		
	Effluent Limitation for Discharge (µg/L) per Table 2 of ROD			Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	
	Daily Average Concentration	Daily Maximum Concentration	Reporting Limit									
VOLATILES	**µg/L**	**µg/L**	**µg/L**			**µg/L**		**µg/L**		**µg/L**		
1,1,1-Trichloroethane	3,417	7,230	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	Yes
1,1,2-Trichloroethane	102.5	216.9	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	Yes
1,1-Dichloroethane	6,633	14,032	1	< 0.5	U	< 0.5	U	NA		< 0.5	UJ	Yes
1,1-Dichloroethene	119	253	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	Yes
1,2-Dichloroethane	85	181	1	**0.58**	J	**0.67**	J	NA		< 0.5	U	Yes
1,2-Dichloropropane	NA	NA	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	Yes
Acetone	1,132	2,395	2	< 1.0	U	< 1.0	U	NA		< 1.0	U	Yes
Benzene	85	181	1	< 0.5	U	< 0.5	U	NA		< 0.5	UJ	Yes
Carbon Tetrachloride	85	181	1	< 0.5	UJ	< 0.5	UJ	NA		< 0.5	U	Yes
Chlorobenzene	22,300	47,180	1	< 0.5	U	< 0.5	U	NA		< 0.5	UJ	Yes
Chloroform	1,708	3,615	1	< 0.5	U	< 0.5	U	NA		< 0.5	UJ	Yes
Ethylbenzene	26,954	57,025	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	Yes
m,p-Xylenes	39.5	83.6	2	< 1.0	U	< 1.0	U	NA		< 1.0	U	Yes
Methylene Chloride	803	1,699	2	< 1.0	U	< 1.0	U	NA		< 1.0	UJ	Yes
o-Xylene	39.5	83.6	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	Yes
Styrene	2,829	5,987	1	< 0.5	U	< 0.5	U	NA		**37**	J	Yes
Tetrachloroethene	85.4	180.7	1	< 0.5	UJ	< 0.5	UJ	NA		< 0.5	UJ	Yes
Toluene	1,980	4,189	1	< 0.5	U	< 0.5	U	NA		**1.8**	J	Yes
Trichloroethene	85	181	1	**0.78**	J	**0.82**	J	NA		< 0.5	U	Yes
Vinyl Chloride	34	72	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	Yes
ANIONS	**mg/L**	**mg/L**	**mg/L**			**mg/L**		**mg/L**		**mg/L**		
Chloride	NA	NA	10	**377**	J	NA		NA		**344**		NA
Sulfate	NA	NA	10	**29.6**		NA		NA		**25.6**		NA
PERCHLORATE	**µg/L**	**µg/L**	**µg/L**			**µg/L**		**µg/L**		**µg/L**		
Perchlorate	278	589	4	NA		< 2.0	U	**5,600**		NA		Yes
METALS	**mg/L**	**mg/L**	**mg/L**			**mg/L**		**mg/L**		**mg/L**		
Hexavalent Chromium	0.058	0.124	0.010	NA		< 0.0100	U	< 0.0100	U	NA		Yes
Barium	1	2	0.004	NA		**0.154**		NA		NA		Yes
Lead	0.0022	0.0046	0.002	NA		< 0.00100	U	NA		NA		Yes
Selenium	0.0057	0.0120	0.002	NA		< 0.00250	U	< 0.00250	U	NA		Yes
Silver	0.0014	0.0030	0.002	A		< 0.000500	U	< 0.000500	U	NA		Yes
SEMI-VOLATILES	**µg/L**	**µg/L**	**µg/L**			**µg/L**		**µg/L**		**µg/L**		
1,4-Dioxane**	NA	134.2	1	NA		**7.9**		NA		NA		Yes

Notes:

µg/L - micrograms per liter
mg/L - milligrams per liter
DVQ - data validation qualifier
NA - not applicable or not analyzed
GWTP - Groundwater Treatment Plant
ROD - Record of Decision
Grab samples are compared to the daily maximum and composite samples to the daily average.
U - not detected and reported to the limit of detection
J - estimated concentration and/or due to QC discrepancies
UJ - estimated non detected due to QC issue(s)
*Influent sample not compared to discharge limits
** Calculated Effluent Limit

Table 9. Bi-Weekly GWTP Analytical Sampling Results for May 2019

			Sample Location	EFFLUENT - Biweekly		EFFLUENT - Monthly		INFLUENT - Monthly*		EFFLUENT - Biweekly		EFFLUENT - Biweekly		
			Sample Identification	LH18/24-SP650_050119		LH18/24-SP650_050719		LH18/24-SP140_050719		LH 18/24-SP650_051419		LH18/24-SP650_052919		
			Lab Package	HS19050138		HS19050398		HS19050401		HS19050920		HS19051866		
			Sample Date	5/1/2019		5/7/2019		5/7/2019		5/14/2019		5/29/2019		
			Sample Type	GRAB		GRAB		GRAB		GRAB		GRAB		
	Effluent Limitation for Discharge (µg/L) per Table 2 of ROD													
	Daily Average Concentration	Daily Maximum Concentration	Detection Limit	Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	Result	DVQ	Does Concentration Meet Effluent Discharge Limits? (Yes/No)
VOLATILES	**µg/L**	**µg/L**	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		
1,1,1-Trichloroethane	3,417	7,230	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	Yes
1,1,2-Trichloroethane	102.5	216.9	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	Yes
1,1-Dichloroethane	6,633	14,032	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	Yes
1,1-Dichloroethene	119	253	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	Yes
1,2-Dichloroethane	85	181	1	**0.51**	J	**0.51**	J	NA		< 0.5	U	< 0.5	U	Yes
1,2-Dichloropropane	NA	NA	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	Yes
Acetone	1,132	2,395	2	< 1.0	U	< 1.0	U	NA		< 1.0	U	< 1.0	U	Yes
Benzene	85	181	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	Yes
Carbon Tetrachloride	85	181	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	Yes
Chlorobezene	22,300	47,180	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	Yes
Chloroform	1,708	3,615	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	Yes
Ethylbenzene	26,954	57,025	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	Yes
m,p-Xylenes	39.5	83.6	2	< 1.0	U	< 1.0	U	NA		< 1.0	U	< 1.0	U	Yes
Methylene Chloride	803	1,699	2	< 1.0	U	< 1.0	U	NA		< 1.0	U	< 1.0	U	Yes
o-Xylene	39.5	83.6	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	Yes
Styrene	2,829	5,987	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	Yes
Tetrachloroethene	85.4	180.7	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	Yes
Toluene	1,980	4,189	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	Yes
Trichloroethene	85	181	1	**0.65**	J	**0.65**	J	NA		**0.56**	J	**0.85**	J	Yes
Vinyl Chloride	34	72	1	< 0.5	U	< 0.5	U	NA		< 0.5	U	< 0.5	U	Yes
ANIONS	**mg/L**	**mg/L**	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		
Chloride	NA	NA	10	**302**		NA		NA		**231**		**252**		NA
Sulfate	NA	NA	10	**15**		NA		NA		**24.1**		**34**		NA
PERCHLORATE	**µg/L**	**µg/L**	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		
Perchlorate	278	589	4	NA		< 2.0	U	**4,200**		NA		NA		Yes
METALS	**mg/L**	**mg/L**	**mg/L**	**mg/L**		**mg/L**		**mg/L**		**mg/L**		**mg/L**		
Hexavalent Chromium	0.058	0.124	0.010	NA		< 0.0100	U	< 0.0100	U	NA		NA		Yes
Barium	1	2	0.004	NA		**0.136**		NA		NA		NA		Yes
Lead	0.0022	0.0046	0.002	NA		< 0.00100	U	NA		NA		NA		Yes
Selenium	0.0057	0.0120	0.002	NA		< 0.00250	U	< 0.00250	U	NA		NA		Yes
Silver	0.0014	0.0030	0.002	NA		< 0.000500	U	< 0.000500	U	NA		NA		Yes
SEMI-VOLATILES	**µg/L**	**µg/L**	**µg/L**	**µg/L**		**µg/L**		**µg/L**		**µg/L**		**µg/L**		
1,4-Dioxane**	NA	134.2	1	NA		**21**		NA		NA		NA		Yes

Notes:

µg/L - micrograms per liter
mg/L - milligrams per liter
DVQ - data validation qualifier
ROD - Record of Decision
GWTP - Groundwater Treatment Plant
*Influent sample not compared to discharge limits
NA - not applicable or not analyzed
U - not detected and reported to the limit of detection
Grab samples are compared to the daily maximum and composite samples to the daily average.
** Calculated Effluent Limit
J - estimated concentration and/or due to QC discrepancies

Table 10. Bi-Weekly Analytical GWTP Sampling Results for June 2019

			Sample Location	EFFLUENT - Monthly		INFLUENT - Monthly*		EFFLUENT - Biweekly		Does Concentration Meet Effluent Discharge Limits? (Yes/No)
			Sample Identification	LH18/24-SP650_060419		LH18/24-SP140_060419		LH18/24-SP650_061219		
			Lab Package	HS19060168		HS19060174		HS19060699		
			Sample Date	6/4/2019		6/4/2019		6/12/2019		
			Sample Type	GRAB		GRAB		GRAB		
	Effluent Limitation for Discharge (µg/L) per Table 2 of ROD			Result	DVQ	Result	DVQ	Result	DVQ	
	Daily Average Concentration	Daily Maximum Concentration	Detection Limit							
VOLATILES	**µg/L**	**µg/L**	**µg/L**	**µg/L**						
1,1,1-Trichloroethane	3,417	7,230	1	< 0.5	U	NA		< 0.5	U	Yes
1,1,2-Trichloroethane	102.5	216.9	1	< 0.5	U	NA		< 0.5	U	Yes
1,1-Dichloroethane	6,633	14,032	1	< 0.5	U	NA		< 0.5	U	Yes
1,1-Dichloroethene	119	253	1	< 0.5	U	NA		< 0.5	U	Yes
1,2-Dichloroethane	85	181	1	< 0.5	U	NA		**0.46**	J	Yes
1,2-Dichloropropane	NA	NA	1	< 0.5	U	NA		< 0.5	U	Yes
Acetone	1,132	2,395	2	< 1.0	U	NA		< 1.0	UJ	Yes
Benzene	85	181	1	< 0.5	U	NA		< 0.5	U	Yes
Carbon Tetrachloride	85	181	1	< 0.5	U	NA		< 0.5	U	Yes
Chlorobenzene	22,300	47,180	1	< 0.5	U	NA		< 0.5	U	Yes
Chloroform	1,708	3,615	1	< 0.5	U	NA		< 0.5	U	Yes
Ethylbenzene	26,954	57,025	1	< 0.5	U	NA		< 0.5	U	Yes
m,p-Xylenes	39.5	83.6	2	< 1.0	U	NA		< 1.0	U	Yes
Methylene Chloride	803	1,699	2	< 0.5	U	NA		< 0.5	U	Yes
o-Xylene	39.5	83.6	1	< 0.5	U	NA		< 0.5	U	Yes
Styrene	2,829	5,987	1	< 0.5	U	NA		< 0.5	U	Yes
Tetrachloroethene	85.4	180.7	1	< 0.5	U	NA		< 0.5	U	Yes
Toluene	1,980	4,189	1	< 0.5	U	NA		< 0.5	U	Yes
Trichloroethene	85	181	1	**0.76**	J	NA		**0.64**	J	Yes
Vinyl Chloride	34	72	1	< 0.5	U	NA		< 0.5	U	Yes
ANIONS	**mg/L**	**mg/L**	**mg/L**	**mg/L**		**mg/L**		**mg/L**		
Chloride	NA	NA	10	NA		NA		**362**		NA
Sulfate	NA	NA	10	NA		NA		**33.4**		NA
PERCHLORATE	**µg/L**	**µg/L**	**µg/L**	**µg/L**		**µg/L**		**µg/L**		
Perchlorate	278	589	4	< 2.0	U	**6,800**		NA		Yes
METALS	**mg/L**	**mg/L**	**mg/L**	**mg/L**		**mg/L**		**mg/L**		
Hexavalent Chromium	0.058	0.124	0.010	< 0.0100	U	< 0.0100	U	NA		Yes
Barium	1	2	0.004	**0.175**		NA		NA		Yes
Lead	0.0022	0.0046	0.002	< 0.00100	U	NA		NA		Yes
Selenium	0.0057	0.0120	0.002	< 0.00250	UJ	< 0.00250	U	NA		Yes
Silver	0.0014	0.0030	0.002	< 0.000500	U	< 0.000500	U	NA		Yes
SEMI-VOLATILES	**µg/L**	**µg/L**	**µg/L**	**µg/L**		**µg/L**		**µg/L**		
1,4-Dioxane**	NA	134.2	1	**6.2**		NA		NA		Yes

Notes:
µg/L - micrograms per liter
DVQ - data validation qualifier
GWTP - Groundwater Treatment Plant
U - Non detect reported to the limit of detection
mg/L - milligrams per liter
J - estimated concentration between the detection limit and limit of quantitation and/or due to quality control discrepancy
*Influent sample not compared to discharge limits
** Calculated Effluent Limit
Grab samples are compared to the daily maximum and composite samples to the daily average.
ROD - Record of Decision
NA - not applicable or not analyzed

Table 11. Quarterly GWTP Analytical Sampling Results

			Sample Location	EFFLUENT		INFLUENT*		Does Concentration Meet Discharge Limits? (Yes/No)
			Sample Identification	LH18/24-SP650_052919		LH18/24-SP140_052919		
			Lab Package	HS19051859		HS19051863		
			Sample Date	5/29/2019		5/29/2019		
			Sample Type	GRAB		GRAB		
	Effluent Limitation for Discharge (µg/L) per Protocol			Result	DVQ	Result	DVQ	
	Daily Average Concentration	Daily Maximum Concentration	Reporting Limit					
VOLATILES	**µg/L**	**µg/L**	**µg/L**	**µg/L**		**µg/L**		
1,1,1-Trichloroethane	3,417	7,230	1	< 0.5	U	< 50	U	Yes
1,1,2-Trichloroethane	102.5	216.9	1	< 0.5	U	< 50	U	Yes
1,1-Dichloroethane	6,633	14,032	1	< 0.5	U	< 50	U	Yes
1,1-Dichloroethene	119	253	1	< 0.5	U	< 50	U	Yes
1,2-Dichloroethane	85	181	1	< 0.5	U	**53**	J	Yes
1,2-Dichloropropane	NA	NA	1	< 0.5	U	< 50	U	Yes
Acetone	1,132	2,395	2	< 2.0	U	< 100	U	Yes
Benzene	85	181	1	< 0.5	U	< 50	U	Yes
Carbon Tetrachloride	85	181	1	< 0.5	U	< 50	U	Yes
Chlorobenzene	22,300	47,180	1	< 0.5	U	< 50	U	Yes
Chloroform	1,708	3,615	1	< 0.5	U	< 50	U	Yes
Ethylbenzene	26,954	57,025	1	< 0.5	U	< 50	U	Yes
m,p-Xylenes	39.5	83.6	2	< 1.0	U	< 100	U	Yes
Methylene Chloride	803	1,699	2	< 0.5	U	**3,900**		Yes
o-Xylene	39.5	83.6	1	< 0.5	U	< 50	U	Yes
Styrene	2,829	5,987	1	< 0.5	U	< 50	U	Yes
Tetrachloroethene	85.4	180.7	1	< 0.5	U	**62**	J	Yes
Toluene	1,980	4,189	1	< 0.5	U	< 50	U	Yes
Trichloroethene	85	181	1	**0.92**	J	**5,600**		Yes
Vinyl Chloride	34	72	1	< 0.5	U	< 50	U	Yes
ANIONS	**mg/L**	**mg/L**	**mg/L**	**mg/L**		**mg/L**		
Chloride	NA	NA	10	**253**		**240**		NA
Sulfate	NA	NA	10	**33**		**37.4**		NA
PERCHLORATE	**µg/L**	**µg/L**	**µg/L**	**µg/L**		**µg/L**		
Perchlorate	278	589	4	< 2.0	U	**4,900**		Yes
METALS	**mg/L**	**mg/L**	**mg/L**	**mg/L**		**mg/L**		
Aluminum	0.777	1.644	0.0100	**0.0422**		**0.165**		Yes
Antimony	NA	NA	0.00200	< 0.000500	U	< 0.000500	U	NA
Arsenic	0.365	0.772	0.00200	**0.000699**	J	**0.00138**	J	Yes

Table 11. Quarterly GWTP Analytical Sampling Results

			Sample Location	EFFLUENT		INFLUENT*		Does Concentration Meet Discharge Limits? (Yes/No)
			Sample Identification	LH18/24-SP650_052919		LH18/24-SP140_052919		
			Lab Package	HS19051859		HS19051863		
			Sample Date	5/29/2019		5/29/2019		
			Sample Type	GRAB		GRAB		
	Effluent Limitation for Discharge (µg/L) per Protocol							
	Daily Average Concentration	Daily Maximum Concentration	Reporting Limit	Result	DVQ	Result	DVQ	
Barium	1	2	0.00400	**0.114**		**0.448**		Yes
Beryllium	NA	NA	0.00200	< 0.000500	U	< 0.000500	U	NA
Cadmium	0.0016	0.0034	0.00200	< 0.000500	U	< 0.000500	U	Yes
Calcium	NA	NA	0.500	**8.42**		**22.2**		NA
Chromium	0.355	0.752	0.00400	**0.00105**	J	**0.00112**	J	Yes
Cobalt	5.433	11.495	0.00500	**0.00105**	J	**0.00904**		Yes
Iron	1.132	2.395	0.200	**0.195**	J	**1.04**		Yes
Lead	0.0022	0.0046	0.00200	< 0.00100	U	< 0.00100	U	Yes
Magnesium	NA	NA	0.200	**10.7**		**20.1**		NA
Manganese	7.323	15.494	0.00500	**0.0833**		**0.428**		Yes
Nickel	0.087	0.184	0.00200	**0.00257**		**0.00947**		Yes
Potassium	NA	NA	0.200	**1.46**		**1.41**		NA
Selenium	0.0057	0.012	0.00200	< 0.00250	U	< 0.00250	U	Yes
Silver	0.0014	0.003	0.00200	< 0.000500	U	< 0.000500	U	Yes
Sodium	NA	NA	1.00	**280**		**140**		NA
Thallium	NA	NA	0.00200	< 0.000500	U	< 0.000500	U	NA
Vanadium	1.698	3.592	0.00500	**0.000969**	J	**0.00202**	J	Yes
Zinc	0.146	0.31	0.00400	**0.0228**		**0.0260**		No
Mercury	NA	NA	0.000200	**0.0000900**	J	< 0.000100	U	NA
1,4-DIOXANE	**µg/L**	**µg/L**	**µg/L**	**µg/L**		**µg/L**		
1,4-Dioxane	NA	134.2	1	**5.1**		**8.6**		Yes
CHEMICAL OXYGEN DEMAND (COD)	**mg/L**	**mg/L**	**mg/L**	**mg/L**		**mg/L**		
COD	NA	200	75	**16**		**15**		Yes
OIL AND GREASE (O&G)	**mg/L**	**mg/L**	**mg/L**	**mg/L**		**mg/L**		
O&G	NA	15	2	**1.46**	J	**6.56**		Yes

Notes:
µg/L - micrograms per liter
DVQ - data validation qualifier
Grab samples are compared to the daily maximum and composite samples to the daily average
* only Effluent sample is compared to discharge limits
J - Estimated concentration between the detection limit and limit of quantitation and/or due to quality control discrepancy
U - non detect and reported to the limit of detection
mg/L - milligrams per liter
NA - not applicable
GWTP - Groundwater Treatment Plant

3 EVALUATION OF LHAAP-16 EXTRACTION SYSTEM

No groundwater was extracted from LHAAP-16 in the 2nd quarter of 2019 due to the main transformer being down. However, monthly depth to water measurements were collected.

3.1 Groundwater Elevation

The groundwater elevations in the piezometers and monitoring wells at LHAAP-16 for April, May, and June 2019 are presented in **Table 12**. The potentiometric surface maps for the shallow and Upper Wilcox (intermediate) groundwater zones at LHAAP-16 for April, May, and June 2019 are presented on **Figures B-7** through **B-12** in **Appendix B**. Based on the potentiometric surface maps, the general groundwater flow direction in the shallow and intermediate zone is east-southeast towards Harrison Bayou. However, the shallow and intermediates zone during the April 2019 well gauging showed a generally flat gradient with flow still generally to the east-southeast.

Table 12. Groundwater Elevations at LHAAP-16 Piezometers and Monitoring Wells – 2nd Quarter 2019

Location Identification	Type	Reference Elevation (feet amsl)	Depth to Water (feet) 4/26/2019	Groundwater Elevation (feet amsl) 4/26/2019	Depth to Water (feet) 5/29/2019	Groundwater Elevation (feet amsl) 5/29/2019	Depth to Water (feet) 6/28/2019	Groundwater Elevation (feet amsl) 6/28/2019
16PZ-1	Piezometer	199.44	26.25	173.19	25.97	173.47	25.74	173.70
16PZ-2	Piezometer	199.75	26.17	173.58	25.80	173.95	25.70	174.05
16PZ-3	Piezometer	198.61	25.10	173.51	24.76	173.85	24.59	174.02
16PZ-4	Piezometer	198.81	25.40	173.41	25.02	173.79	24.89	173.92
16PZ-5	Piezometer	198.31	24.71	173.60	24.39	173.92	24.19	174.12
16PZ-6	Piezometer	198.61	25.24	173.37	25.95	172.66	25.72	172.89
16PZ-7	Piezometer	200.10	26.19	173.91	25.83	174.27	25.70	174.40
16PZ-8	Piezometer	199.93	26.50	173.43	26.15	173.78	25.97	173.96
16PZ-9	Piezometer	196.49	23.14	173.35	22.79	173.70	22.57	173.92
16PZ-10	Piezometer	196.65	23.27	173.38	22.93	173.72	22.80	173.85
16PZ-11	Piezometer	198.88	25.25	173.63	24.87	174.01	24.71	174.17
16PZ-12	Piezometer	199.00	25.49	173.51	25.07	173.93	24.96	174.04
16PZ-13	Piezometer	196.58	23.08	173.50	22.71	173.87	22.58	174.00
16PZ-14	Piezometer	196.09	22.69	173.40	22.38	173.71	22.20	173.89
16PZ-15	Piezometer	191.93	18.33	173.60	18.00	173.93	17.69	174.24
16PZ-16	Piezometer	190.79	17.41	173.38	17.07	173.72	16.83	173.96
16PZ-17	Piezometer	186.67	13.16	173.51	12.77	173.90	12.55	174.12
16PZ-18	Piezometer	185.99	12.80	173.19	12.45	173.54	12.23	173.76
16PZ-19	Piezometer	183.98	10.72	173.26	10.39	173.59	10.25	173.73
16PZ-20	Piezometer	183.12	9.88	173.24	9.55	173.57	9.42	173.70
16WW12	Monitoring Well	188.81	15.87	172.94	15.67	173.14	15.55	173.26
16WW14	Monitoring Well	198.87	24.66	174.21	24.29	174.58	24.10	174.77
16WW22	Monitoring Well	200.13	26.53	173.60	26.07	174.06	25.95	174.18
16WW25	Monitoring Well	188.77	15.01	173.76	15.11	173.66	14.89	173.88
16WW26	Monitoring Well	188.83	14.55	174.28	13.90	174.93	13.76	175.07
16WW29	Monitoring Well	178.24	3.94	174.30	4.81	173.43	4.62	173.62
16WW30	Monitoring Well	178.47	4.11	174.36	5.11	173.36	4.98	173.49
16WW31	Monitoring Well	202.78	29.00	173.78	28.39	174.39	28.20	174.58
16WW33	Monitoring Well	203.09	29.12	173.97	28.60	174.49	28.41	174.68
16WW35	Monitoring Well	191.23	17.20	174.03	16.82	174.41	16.60	174.63
16WW36	Monitoring Well	190.94	16.73	174.21	16.33	174.61	16.17	174.77

4 QUALITY CONTROL

This report summarizes the data for samples collected during April, May, and June 2019. The samples were reviewed and validated in accordance with the guidelines in the *USEPA Contract Laboratory Program National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA, January 2017); *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (USEPA, January 2017); and the quality control criteria specified in the *Basewide Uniform Federal Policy - Quality Assurance Project Plan Longhorn Army Ammunition Plant* which is in Appendix C of the *Final Installation-Wide Work Plan for Longhorn Army Ammunition Plant Karnack, Texas* (Bhate, May 2018).

The purpose of the sampling program is to evaluate the effectiveness of the groundwater pump and treat system, assess water quality within the capture zone, and assure compliance with the effluent discharge requirements of the Interim ROD. Quality control and quality assurance problems noted in the case narratives received from the laboratory are minor and do not affect the usability of the data for compliance at the GWTP. No sample results from the 2nd quarter of 2019 were rejected due to quality control problems.

ALS Environmental analyzed the compliance samples collected from the GWTP. Independent data verification and validation was performed by the Bhate project chemist as described in the Quality Control Summary Report in **Appendix G**. The laboratory reports for the 2nd quarter of 2019 sampling conducted at LHAAP-18/24 are included in **Appendix C** on a CD and the laboratory results for the GWTP are included in **Appendix F** on CD. Air monitoring data is presented in **Appendix H** on CD.

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5 TREATED GROUNDWATER DISCHARGED

Reinjection of groundwater in ICT 6 and ICT 9 was discontinued as of 15 July 2012. The last injection occurred on 24 May 2012, immediately prior to the scrubber system malfunction which caused GWTP operation to cease temporarily.

Treated groundwater that met the perchlorate discharge criteria was discharged to Harrison Bayou or the INF Pond in accordance with the Protocol for Discharging GWTP Effluent (**Appendix I**). **Table 4** summarizes flow rates from the INF Pond to the Harrison Bayou, the maximum flow rate allowed by chloride and sulfate concentrations, and the approximated flow rate discharged for the 2nd quarter of 2019. Approximately 271,989 gallons of treated groundwater was discharged from the GWTP to the Harrison Bayou in April, 504,435 gallons in May, and 285,912 gallons in June. No treated groundwater was discharged to the INF Pond in the 2nd quarter of 2019 due to the continuous flow of the Harrison Bayou.

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6 AIR MONITORING

6.1 Summary of Air Monitoring Approach

Operation of the GWTP without air abatement was approved by the TCEQ and USEPA conditioned on collection of air monitoring data to determine the effect of GWTP operation on ambient air quality with respect to potential human health exposure risk. An Interim Air Monitoring Plan was developed by AECOM in August 2012 and used to implement the air monitoring program. The air monitoring program included sampling emission concentrations from the air stripper, ambient air at the GWTP, and ambient air downwind of the GWTP. Collection of air data occurred on a weekly basis between September 2012 and September 2013, on a monthly basis between September 2013 and September 2014, and on a quarterly basis since that time. The sampling program includes use of Summa canisters and a photoionization detector (PID) to measure vapor phase concentrations. The air stripper emission sample is collected as a grab sample, while the ambient air samples are collected as composite samples. The GWTP sample is collected over 8 hours to represent a work day and the downwind sample is collected over 24 hours to represent potential exposure to an off-site receptor[1]. The downwind sample is collected at the closest downwind property boundary, based on prevailing wind direction.

PID data (after system calibration) are collected each time the GWTP is operated and serve as a real-time indicator of ambient air conditions at and downwind of the GWTP. Correlations between definitive analytical air data and PID measurements were established and a means to calculate contaminant concentration from PID measurements was developed. A PID threshold of 0.4 parts per million by volume (ppmv) in ambient air was established, such that Summa canister measurements would occur when the PID threshold is exceeded.

The Summa canister samples are analyzed for VOCs using USEPA Method TO-15. The PID measurements are collected after instrument calibration. The air sampling results are summarized and reported to the USEPA and TCEQ in the GWTP quarterly reports; however, the air results are reviewed immediately upon receipt for the potential presence of any exceedances of ambient air concentrations. **Appendix J** (**Tables 1 through 3**) includes a comparison of ambient air concentrations with TCEQ Air Monitoring Comparison Values (AMCVs) or the short-term Effects Screening Levels (ESLs) for chemicals with no published AMCVs, calculations of emission rates from the emission point, and a compilation of PID results and calibration records. The air monitoring results to date indicate that all ambient air concentrations are lower than the AMCVs or ESLs. The stripper stack sample concentrations are used to calculate emission rates in pounds

[1] Off-site receptor - Any recreational area, residence, commercial/industrial facility, or other normally occupied structures not used solely by the owner or operator of the facilities or the owner of the site upon which the facilities are located. Measurements of distances to determine compliance with this distance restriction must be taken toward structures that are in use as of the date that a notification is filed with the commission.

per hour (lbs/hr) and tons per year (tpy). The calculated emission rates in lbs/hr are then compared to the allowable emission rates per 30 Texas Administrative Code (TAC) §106.533(f)(1). The emission rates have been lower than the allowable emission rates to the conservatively-selected off-site receptor. The calculated emission rate in tpy is compared to the allowable limit of 5 tpy per chemical. All emission rates have been lower than the allowable emission rates.

The air monitoring results from the first few months of operation between September and November 2012 were compiled and submitted in a separate report (December 2012) (along with validated data) to TCEQ to demonstrate compliance with Texas Permit by Rule emission standards. Approval of the analytical results and concurrence that the site will continue to meet Title 30 TAC §106.533 without the use of air abatement using a catalytic oxidation system was obtained from the TCEQ via email on 22 February 2013.

On 18 February 2013, AECOM presented analysis of the approach applicable to obtaining a variance for operating the GWTP without air abatement equipment to the TCEQ and USEPA. The analysis indicated that the use of an Explanation of Significant Difference (ESD) was the appropriate approach for the site. Approval of use of an ESD was obtained from the USEPA via email on 21 March 2013. The ESD was developed, reviewed, and accepted by USEPA and TCEQ. The ESD was signed by the designated parties on 3 April 2014, and concurrence from the TCEQ was obtained in a letter dated 16 April 2014.

6.2 Air Monitoring Results for the 2nd Quarter of 2019

During the 2nd quarter of 2019, air sampling was completed on 29 May 2019. The laboratory data package is presented in **Appendix H.** A summary of the air sampling results is presented in **Appendix J (Tables 1 through 3)**. All results met the criteria described in Section 6.1.

6.2.1 Summa Canister Monitoring Results

One sampling event was conducted on 29 May 2019, for presentation during the 2nd Quarter 2019 reporting period using Summa canisters. The samples were collected and analyzed as described in Section 6.1 and per the approved air monitoring plan dated August 2012. The analytical results were then compiled in spreadsheets where calculations were completed and comparisons to applicable criteria were made as described in Section 6.1.

6.2.1.1 Ambient Air Results

Acetone; 1,2-dichloroethane; benzene; carbon disulfide; chloroform; Tetrachloroethene; n-hexane; styrene; toluene; ethylbenzene; m,p-xylenes; o-xylene; propene; dichlorodifluoromethane; ethanol; trichlorofluoromethane; trichlorotrifluoroethane; alpha-pinene; and d-limonene were detected in May 2019 in ambient air downwind of the GWTP.

Compounds originating at the GWTP would be expected to have lower concentrations in the downwind sampling location than at the GWTP sampling location. Likewise, compounds like acetone; n-hexane; toluene; m,p-xylenes; propene; dichlorodifluoromethane; ethanol; trichlorofluoromethane; and alpha-pinene with similar concentrations in both GWTP ambient air and downwind ambient air are suspected to be present in the ambient (background) air. The

ambient air results during the quarter met the ambient air criteria, as presented in **Table 1** within **Appendix J**.

6.2.1.2 Air Stripper Effluent Results

The VOCs present in groundwater that are removed via the air stripper include vinyl chloride; Tetrachloroethene; 1,2-dichloroethane; 1,1-dichloroethene; and methylene chloride. The highest reported concentrations are for cis-1,2-DCE; trichlorotrifluoroethane; and trichloroethene. These compounds are frequently reported in groundwater at the site, with the exception of trichlorotrifluoroethane which is not typically a groundwater analyte at LHAAP. Trichlorotrifluoroethane, however, appears to be present in groundwater as indicated by limited analysis conducted in December 2013, where it was detected in several wells, and from historical accounts. Many of the chemicals that are reported in ambient air are not detected in the air stripper effluent. This is likely because the reporting limit for the air stripper effluent is higher than the reporting limit for the ambient air samples or the source for some of these chemicals are extraneous to groundwater.

The air stripper effluent concentrations were below the emission criteria, as presented in **Table 2** within **Appendix J**.

6.2.2 PID Results

Along with collection of Summa canister air samples, PID measurements from the same sources/areas are collected and recorded. These simultaneous measurements allowed establishing a correlation between PID readings and VOC concentrations in the Summa canister air samples. Conversion from PID to compound concentrations was established by TCEQ in 30 TAC §106.533(h). The TCEQ equation allows use of a PID to determine individual compound concentrations if the distribution of chemicals in the ambient air is known or assumed. This allows the use of a PID as a tool to measure VOC concentrations and convert the PID results to estimates of compound concentrations. All ambient air PID measurements during this quarter at the GWTP were reported at 0.0 parts per million. The stripper PID location detected between 19.7 and 24.3 parts per million at each sampling event. The other two locations had no detections. The results of the PID readings collected during GWTP operations are presented in **Table 3** within **Appendix J**.

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7 COMMENTS AND RESPONSES

The USEPA does not have comments on the 1st quarter 2019 GWTP Quarterly Evaluation Report per electronic mail (e-mail) dated 14 August 2019. The TCEQ issued the following comment on 14 August 2019.

Comment 1: 2.4, first sentence – please add that all requirements are documented in the Final Revised Sampling and Analysis Plan.

> **Response to Comment 1:** Concur. The following sentence will be added to Section 2.5: *Sampling and analysis is completed in accordance with the requirements documented in the Final Revised Sampling and Analysis Plan (AECOM Technical Services, Inc., September 2017).*

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APPENDIX A
ICT LAYOUT AND GWTP PROCESS FLOW DIAGRAM

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Table A-1: ICTs Completion Depths

ICT	TOC Elevation	Total Depth	Sump Elevation	Comment
1	186.07	22.5	163.57	Taken out of service in 2007.
2	185.02	29.5	155.52	
3	192.27	37.75	154.52	Taken out of service in 2007.
4	193.51	37.5	156.01	
5	192.67	35	157.67	Taken out of service in 2007.
6	197.30	40.75	156.55	Converted to infiltration in 2007. Ceased reinjection in July 2012.
7	198.03	32.33	165.7	
8	198.97	44.5	154.47	
9	197.64	45.5	152.14	Converted to infiltration in 2007. Ceased reinjection in July 2012.
10	198.07	45.42	152.65	Taken out of service in 2007.
11	198.01	43.33	154.68	
12A	189.06	31.5	157.56	Taken out of service in 2007. Reinstituted in December 2012.
12B	191.97	36.25	155.72	
12C	193.90	34.33	159.57	
12D	185.64	33.75	151.89	
12E	183.38	32.25	151.13	
13A	182.59	28.17	154.42	
13B	184.72	29.58	155.14	
13C	186.13	28.17	157.96	
13D	186.72	26.17	160.55	
13E	191.79	27.08	164.71	
13F	197.81	32.33	165.48	
13G	197.03	27.25	169.78	Taken out of service in 2008.
14A	196.8	43.00	153.8	
14B	197.61	43.42	154.19	
14C	197.86	41.33	156.53	
14D	198.47	44.25	154.22	
14E	198.47	43.08	155.39	

Note(s):

ICT - interception-collection trench

TOC - top of casing, measuring point for groundwater elevations

Elevations are reported as feet above mean sea level.

Total depths are reported as feet below TOC.

Sump elevation calculated by subtracting total depth from TOC elevation.

ICTs were installed in 1998.

ICT 12A was replaced on December 5, 2012, and extraction has resumed.

TOC Elevations and total depth measured in October 2003, 4th Quarter 2003, Groundwater Treatment Plant Report.

0 100 200 400 Feet

N

Harrison Bayou

ICT-13G
ICT-13F
ICT-14A
18WW17
ICT-13E
ICT-7
ICT-14B
ICT-13D
ICT-14C
LHAAP-24
ICT-13C
ICT-5
ICT-6
ICT-14D
ICT-13B
Open Burning Pan 157
EW-1
ICT-1
ICT-8
ICT-13A
ICT-14E
ICT-2
ICT-3
LHAAP-18
33-X
ICT-12E
35-X
37-X
41-X
ICT-9
ICT-4
21-X
Open Burning Cage 155
ICT-12D
27-X
22-X
ICT-12C
ICT-10
22-X-1
20-X
ICT-12B
LHAAP-39
24-X
25-X
Groundwater Treatment Plant
ICT-12A
ICT-11
Ditch
LHAAP-17
AVE "Q"
SCUDDAY AVE
LONG POINT RD

Legend:
- Extraction Location
- Deactivated ICT Sump
- Injection Point – Inactive since May 24, 2012
- ICT Location
- HDPE Liner Installed outside of the ICT
- Installation Restoration Program (IRP) Area
- Stream / Ditch Centerline
- Road Line
- 401 Building Number
- 717 Former Building Location and Number

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Operations Manual Introduction
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	9/13/2019	MRM

ICT Layout Map

Figure 1

00937394

PROCESS WATER FROM SUMP COLLECTION

FLOW MONITORING METER FIT-140

GROUNDWATER FROM BURNING GROUNDS AND SITE 17

TK-140 EQUALIZATION 300,700 GAL.

FLOW MONITORING METER FIT-172

TK-200A ORP 5,900 GAL.

TK-200B pH 5,700 GAL.

TK-200C POLYMER 3,400 GAL.

POLYMER POTABLE WATER

TK-240 CLARIFIER 10,000 GAL.

METALS TREATMENT

TK-640 BACK WASH TANK

FL-290 SAND FILTER

TK-300 STRIPPER FEED TANK 22,800 GAL.

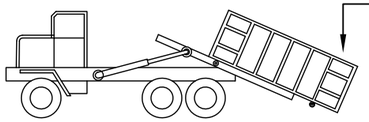
FLOW MONITORING METER FIT-322

TK-140 Sampling Spigot

VENT HEADER

VENT TO ATMOSPHERE

RECYCLE



FILTER CAKE FOR DISPOSAL

TK-530 8,670 GAL.

TK-510B 8,670 GAL.

TK-510A 8,670 GAL.

DECANT

DECANT

FILTER PRESS MAKEUP WATER SOURCE

SAND FILTER BACKWASH WATER SOURCE

BELT PRESS BFP-560

SOLIDS REMOVAL

COLLECTION FROM FLOOR DRAINS IN CONTAINMENT AREA AND FROM DECON PAD

SUMP

TO TK 140

ELECTRON DONOR SUBSTRATE TANK 55 GAL. DRUM

TK-103 NUTRIENT TANK

P-104

P-103

FILTER PRESS MAKEUP WATER

SAND FILTER BACKWASH WATER

CARBON FILTER

T-330 AIR STRIPPER

TK-630 EFFLUENT STORAGE 127,000 GAL.

P-175

FLOW MONITORING METER FIT-103

Recycle

VOLATILE ORGANICS TREATMENT

P-101A

P-101B

T-101 FBR

T-105 MEDIA CAPTURE TANK

TK-650 1,000 GAL.

P-641

P-642

TO INF POND

TO HARRISON BAYOU

TO IRRIGATION AT BURNING GROUNDS

Liquid Phase Adsorber Protect™ LM-36 Series

PERCHLORATE TREATMENT

TK-650 Sampling Spigot

FLOW MONITORING METER FIT-686

NOTES:

GAL.	GALLON
TK or T	TANK
BFP	BELT FILTER PRESS
P	PUMP
FL	FILTER
FBR	FLUIDIZED BED REACTOR

Process Flow Diagram

Figure 2

Operations Manual Introduction
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

DRAWN BY: MRM

DATE: 9/13/2019

SCALE: Not to Scale

PROJECT NO: NWO1312.0150

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APPENDIX B
GROUNDWATER ELEVATION CONTOUR MAPS

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Table B-1: Extraction Equipment Maintenance Since 2011

LHAAP-18/24

Well I.D.	Replaced Parts	Date	Contractor
ICT 14E	Pump	3/15/2012	Shaw
ICT 14D	Pump, motor, level probes	3/16/2012	Shaw
ICT 14B	Pump, level probes, level probe wire	3/16/2012	Shaw
ICT 14A	Pump, motor, level probes, level probe wire	3/17/2012	Shaw
ICT 2	Pump, motor	3/17/2012	Shaw
ICT 13D	Pump	3/19/2012	Shaw
ICT 13B	Pump	3/20/2012	Shaw
ICT 14E	Pump, motor, broken piping	11/19/2012	AECOM
ICT 13C	Pump	11/20/2012	AECOM
ICT13E	Pump	11/20/2012	AECOM
ICT 12A	Pump, motor, wiring harness, level probes, level probe wire	12/5/2012	AECOM
ICT 7	Pump, motor, wiring harness, level probes	12/6/2012	AECOM
ICT2	Pump	6/10/2013	AECOM
ICT 13C	Pump	6/11/2013	AECOM
ICT 13D	Pump	6/12/2013	AECOM
ICT 14E	Pump rebuilt	6/15/2013	AECOM
ICT 14E	Replaced low level switch	6/19/2013	AECOM
ICT 13C	Pump, wiring harness, flow meter	4/15/2014	AECOM
ICT 14D	Repaired level probes	6/24/2014	AECOM
ICT 14E	Repaired level probes	6/24/2014	AECOM
ICT 14E	Pump and motor troubleshooting	6/26/2014	AECOM
ICT2, 13F, 14C, 14D, 14E	Repaired level probes	7/7/2014	AECOM
ICT 12E	Pump, motor	10/2/2014	AECOM
ICT 12E	Wiring harness, fixed leak	10/8/2014	AECOM
ICT 12E	Level probes	10/9/2014	AECOM
ICT13A	Pump, piping	10/15/2014	AECOM
ICT 12E	Repaired leaking fittings	10/16/2014	AECOM
ICT 11	1" tee and 1" elbow	1/13/2015	AECOM
ICT 12B	Flow meter	1/13/2015	AECOM
ICT 7	1" tee, repaired 1" pipe	1/13/2015	AECOM
ICT 13A	Flow meter	1/15/2015	AECOM
ICT 13B	Pump	1/15/2015	AECOM
ICT 13C	Pump	1/16/2015	AECOM
ICT 7	Low level probe	1/16/2015	AECOM
ICT 13D	Pump, level probes	1/17/2015	AECOM
ICT 14C	Low level probe	1/17/2015	AECOM
ICT 14C	Low level probe	1/29/2015	AECOM
ICT 14D	Low level probe	1/29/2015	AECOM
ICT 13D	Level probes	1/29/2015	AECOM
ICT 2	Pump	1/30/2015	AECOM
ICT 8	Fuse	3/2/2015	AECOM
ICT 8	Fuse	3/9/2015	AECOM
ICT 12E	Flow meter	3/13/2015	AECOM
ICT 13D	Union	3/13/2015	AECOM
ICT 14C	Cleaned level probes	4/1/2015	AECOM
ICT 14D	Cleaned level probes	4/1/2015	AECOM
ICT 13A	Cleaned level probes	4/21/2015	AECOM
ICT 14C	Cleaned level probes	4/21/2015	AECOM
ICT 8	Low level probe	7/24/2015	AECOM
ICT 13C	Installed New Pump	7/28/2015	AECOM

Table B-1: Extraction Equipment Maintenance Since 2011

Well I.D.	Replaced Parts	Date	Contractor
ICT 14C	Installed New Pump and Electric Motor	7/29/2015	AECOM
ICT 14E	Installed New Pump and Electric Motor	7/31/2015	AECOM
ICT 12E	Repaired wiring	8/12/2015	AECOM
ICT 13E	Replaced high and low level probes	8/12/2015	AECOM
ICT 2	Installed Rebuilt Pump	9/9/2015	AECOM
ICT 12 E, ICT 14E	Replaced high level probe and wiring	9/15/2015	AECOM
ICT 13A	Installed new pump	12/23/2015	AECOM
ICT 13B	Installed new pump	12/24/2015	AECOM
ICT 13D	Replaced high level probe	2/11/2016	Aerotek
ICT 14C	Replace low level probe on ICT 14C	2/15/2016	Aerotek
ICT 8	Installed new pump and electric motor	2/19/2016	Aerotek
ICT 14C	Repaired piping leak	3/10/2016	Aerotek
ICT 14E	Installed high and low level probes, level probe wire	3/22/2016	Aerotek
ICT 13D, ICT 14B	Installed high and low level probes, level probe wire	3/24/2016	Aerotek
ICT 14B	Installed new pump and electric motor	3/31/2016	Aerotek
ICT 14C	Installed new low level probe	4/20/2016	Aerotek
ICT 12B	Installed new mechanical flow meter	6/16/2016	Aerotek
ICT 13C	Installed rebuilt pump and new flow meter	8/10/2016	Aerotek
ICT 13A	Installed rebuilt pump, new flow meter, and new 1" unions	8/24/2016	Aerotek
ICT 14E	Installed new mechanical flow meter	8/26/2016	Aerotek
ICT 12C	Repair flow meter	8/30/2016	Aerotek
ICT 2	Install rebuilt pump and new flow meter	8/31/2016	Aerotek
ICT 14C	Clean and adjust level probes	9/7/2016	Aerotek
ICT 14C	Replaced level probes	9/12/2016	Aerotek
ICT 14C	Installed new level probe wire and level probes	9/21/2016	Aerotek
ICT 12C	Installed rebuilt pump, new electric motor, new wiring harness, new level probe wire, and new level probes	9/27/2016	Aerotek
ICT 14C	Cleaned and adjusted level probes	10/14/2016	Aerotek
ICT 13C	Cleaned and adjusted level probes	10/21/2016	Aerotek
ICT 13B	Installed rebuilt pump	10/25/2016	Aerotek
ICT 14D	Installed rebuilt pump	10/27/2016	Aerotek
ICT 13C	Replace low level probe	11/8/2016	Aerotek
ICT 13B	Replace relay base plate	11/8/2016	Aerotek
ICT 13E	Clean and adjust low level probe	11/15/2016	Aerotek
ICT 13B	Replace broken relay base plate and bad level probe wire	11/17/2016	Aerotek
ICT 13C	Clean & repair leaking flow meter	11/18/2016	Aerotek
ICT 13B	Clean & adjust low level probe	11/18/2016	Aerotek
ICT 13A, 13B, & 13E	Clean and adjust low level probes	12/2/2016	Aerotek
ICT 13C & 14C	Pulled piping and pumps	2/8/2017	Aerotek
ICT 14C	Installed new electric motor	2/8/2017	Aerotek
ICT 13C & 14C	Installed rebuilt grundfos pumps	2/8/2017	Aerotek
ICT 7, 13A, & 14D	Repaired sample ports	2/9/2017	Aerotek
ICT 13B & 14E	Cleaned and adjusted low level probes	3/30/2017	Aerotek
ICT 13B & 13F	Installed new flow meters	3/30/2017	Aerotek
ICT 12B	Repair flow meter	4/13/2017	Aerotek
ICT 12C	Replace broken 1" tee	5/1/2017	Aerotek
ICT 11	Installed new manual flow meter	5/5/2017	Aerotek
ICT 2	Installed new flow meter	5/9/2017	Aerotek
ICT 14C & 14D	Cleaned and adjusted low level probes	5/31/2017	Aerotek
ICT 14C	Cleaned and adjusted low level probe	6/27/2017	Aerotek
ICT 8	Clean low level probe	7/11/2017	Aerotek
ICT 2 & 14D	Cleaned and replaced level probes	7/17/2017	Aerotek
ICT 14C	Cleaned low level probe	7/24/2017	Aerotek

Table B-1: Extraction Equipment Maintenance Since 2011

Well I.D.	Replaced Parts	Date	Contractor
ICT 13A	Installed new pump and flow meter	8/8/2017	Aerotek
ICT 13C & 13B	Installed new pump and flow meter	8/9/2017	Aerotek
ICT 13B	Installed new low level probe	8/10/2017	Aerotek
ICT 11	Installed new pump and flow meter	8/11/2017	Aerotek
ICT 4	Replaced low level probe	8/11/2017	Aerotek
ICT 2	Installed rebuilt pump	9/19/2017	Aerotek
ICT 13D	Adjusted level probes	9/22/2017	Aerotek
ICT 14C	Cleaned level probes	10/11/2017	Bhate
ICT 13E	Clean and adjust level probes	10/24/2017	Bhate
ICT 12B	Adjust level probes	11/15/2017	Bhate
ICT 14D	Cleaned level probes	11/15/2017	Bhate
ICT 8	Clean and adjust level probes	11/28/2017	Bhate
ICT 2	Cleaned level probes	12/20/2017	Bhate
ICT 13C	Install new flow meter	1/30/2018	Bhate
ICT 14C	Cleaned level probes	1/30/2018	Bhate
ICT 13C	Cleaned & adjusted level probes	2/1/2018	Bhate
ICT 13B	Repair broken 1" union	2/1/2018	Bhate
ICT 14A	Repair 2 broken 1" elbows & lower high level probe	2/1/2018	Bhate
ICT 14B	Repair broken 1" tee & lower high level probe	2/1/2018	Bhate
ICT 14D	Install new flow meter	2/8/2018	Bhate
ICT 8	Replace broken 1" tee & clened level probes	2/8/2018	Bhate
ICT 14D	Cleaned level probes	2/28/2018	Bhate
ICT 14C	Replace low level probe	2/28/2018	Bhate
ICT 13B	Cleaned level probes	2/28/2018	Bhate
ICT 13A	Install new motor & replace leaking 1" union	3/14/2018	Bhate
ICT 13C	Cleaned & adjusted level probes	3/21/2018	Bhate
ICT 12B	Replace broken 1" elbow & install new flow meter	3/21/2018	Bhate
ICT 2	Install new pump	3/22/2018	Bhate
ICT 13B	Replaced level probes	3/30/2018	Bhate
ICT 14E	Lower high level probe	3/30/2018	Bhate
ICT 14C	Cleaned level probes	4/27/2018	Bhate
ICT 11	Install new breaker	4/27/2018	Bhate
ICT 14E	Cleaned level probes	6/7/2018	Bhate
ICT 12C	Cleaned level probes	6/7/2018	Bhate
EW 01	Cleaned level probes	6/7/2018	Bhate
ICT 14E	Replaced level probes	6/8/2018	Bhate
ICT 11	Install new electrical wire from breaker to well	6/14/2018	Bhate
ICT 12B	Replaced pump	6/25/2018	Bhate
ICT 14E	Cleaned level probes	6/26/2018	Bhate
ICT 8	Cleaned level probes	6/26/2018	Bhate
ICT 14C	Replaced pump	6/27/2018	Bhate
EW01	Replaced level probes	9/12/2018	Bhate
ICT 7	Cleaned level probes	9/12/2018	Bhate
ICT 12C	Replaced low level probe wire and probe	9/12/2018	Bhate
ICT 14D	Replaced high level probe wire & probe	9/13/2018	Bhate
ICT 12B	Replaced high and low level probe wires & probes	9/13/2018	Bhate
ICT 12B	Replaced electrical relay and relay base plate	9/13/2018	Bhate
ICT 14C	Cleaned level probes	9/13/2018	Bhate
ICT 13E	Replaced flow meter	9/14/2018	Bhate
ICT 14D	Replace low level probe	10/31/2018	Bhate
ICT 8	Cleaned level probes	10/31/2018	Bhate
ICT 14C	Cleaned level probes	10/31/2018	Bhate
ICT 13A	Replace broken 1" Tee	12/12/2018	Bhate
ICT 14C	Cleaned level probes	12/12/2018	Bhate
ICT 13A	Install new flow meters	2/14/2019	Bhate

Table B-1: Extraction Equipment Maintenance Since 2011

Well I.D.	Replaced Parts	Date	Contractor
ICT 12D	Replace pump & motor	3/6/2019	Bhate
ICT 13C	Replace pump	3/8/2019	Bhate
ICT 2	Replace pump & flow meter	3/11/2019	Bhate
ICT 14C	Replace pump & motor	3/12/2019	Bhate
ICT 14D	Replace pump	3/12/2019	Bhate
ICT 14E	Replace pump, seal plate & level probes	3/14/2019	Bhate
ICT 14A	Replace pump and repair leaking 1" pipe	3/15/2019	Bhate
ICT 13C	Lower high level probe	3/22/2019	Bhate
ICT 14A	Lower high level probe	3/22/2019	Bhate
EW-01	Replace pump	3/29/2019	Bhate
ICT 8	Clean level probes	4/1/2019	Bhate
ICT 12C	Clean level probes	4/1/2019	Bhate
ICT 13D	Clean level probes	4/1/2019	Bhate
ICT 14E	Replaced bad relay	4/2/2019	Bhate
ICT 12A	Replace flow meter	4/3/2019	Bhate
ICT 13F	Replace flow meter	4/3/2019	Bhate
ICT 13D	Replace low level probe	4/3/2019	Bhate
ICT 13C	Clean level probes	5/8/2019	Bhate
ICT 14C	Clean level probes	5/8/2019	Bhate
ICT 12D	Replace bad relay	5/8/2019	Bhate

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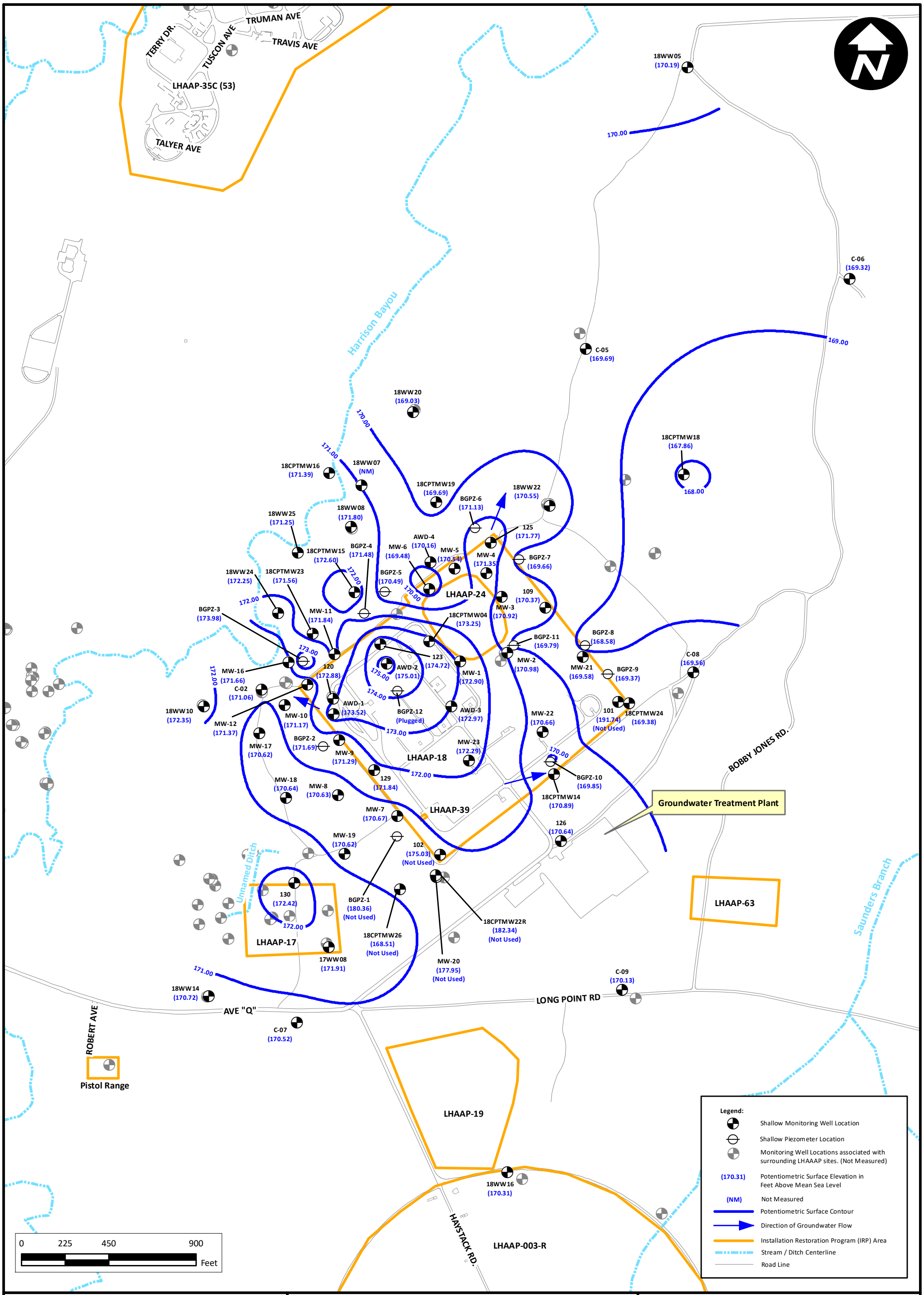
Well I.D.	Replaced Parts	Date	Contractor
EW08	New pump	2/28/2011	Shaw
EW01	Rebuild pump	8/25/2011	Shaw
EW06	Rebuild pump	8/25/2011	Shaw
EW02	Rebuild pump	2/12/2012	Shaw
EW03	Rebuild pump	2/12/2012	Shaw
EW08	Rebuild pump	11/8/2012	AECOM
EW01	Rebuild pump	11/8/2012	AECOM
EW04	Repair pump	11/13/2012	AECOM
EW07	Rebuild pump	11/13/2012	AECOM
EW04	Installed New Pump	11/28/2012	AECOM
EW06	Installed New Pump	11/28/2012	AECOM
EW02	Installed New Pump	12/4/2012	AECOM
EW03	Installed New Pump	12/4/2012	AECOM
EW01	Installed New Pump	12/17/2012	AECOM
EW01	Replaced Low level probe	1/17/2015	AECOM
EW01	Cleaned and adjusted level probes	10/21/2016	Aerotek



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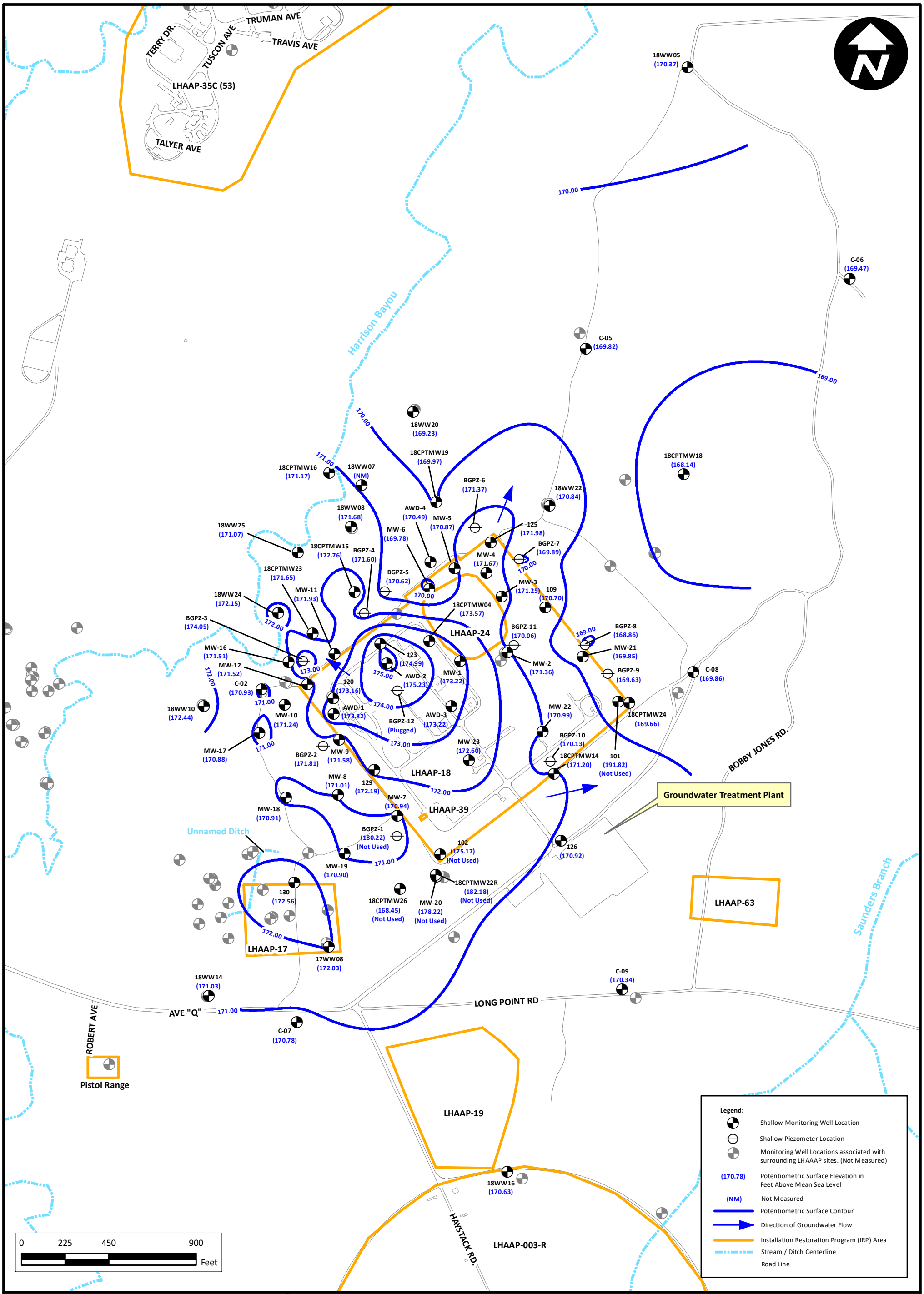
Groundwater Potentiometric Surface Map
Shallow Zone (April 26, 2019) LHAAP-18/24

Figure B-1



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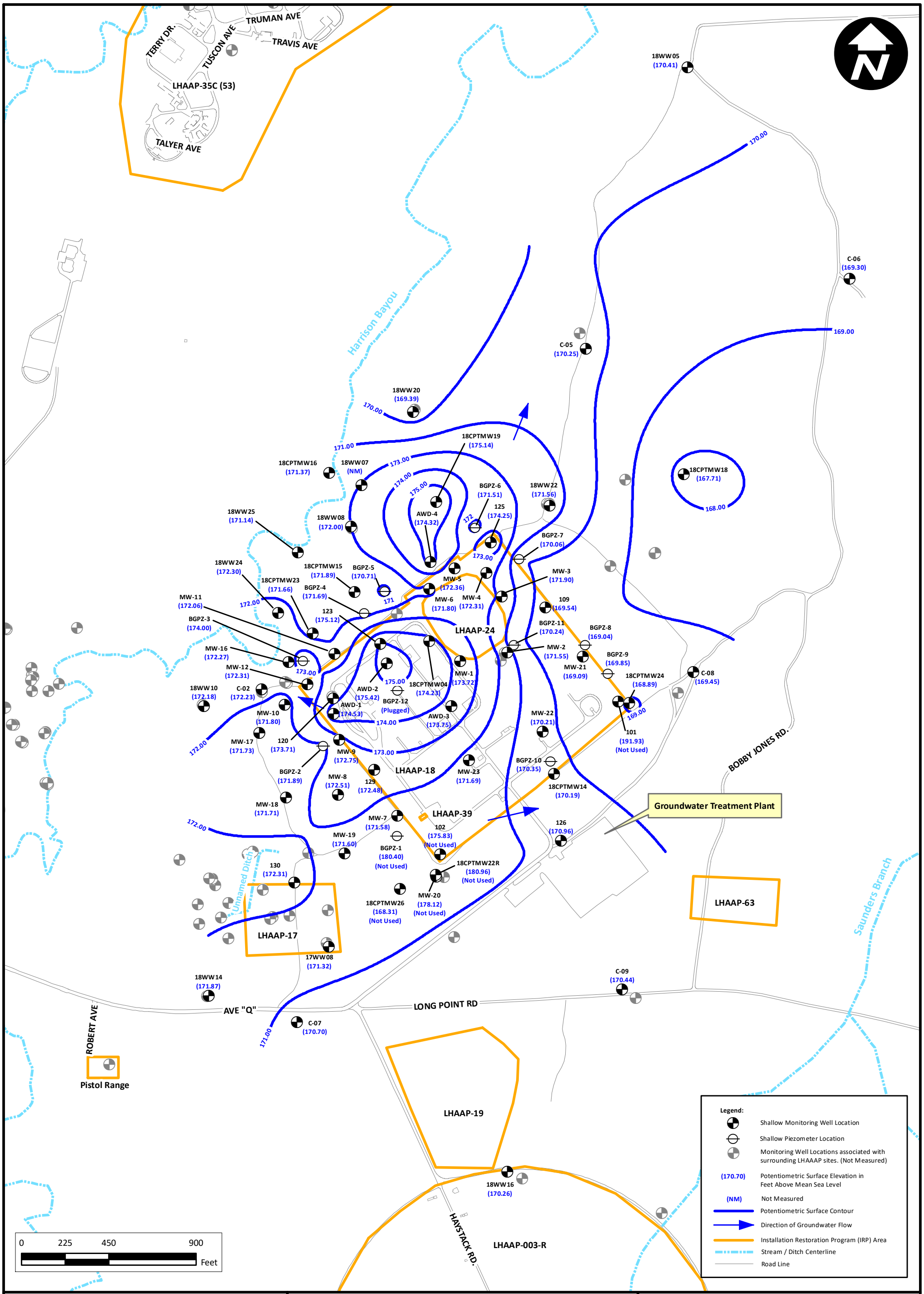
Groundwater Potentiometric Surface Map
Shallow Zone (May 29-30, 2019) LHAAP-18/24

Figure B-2



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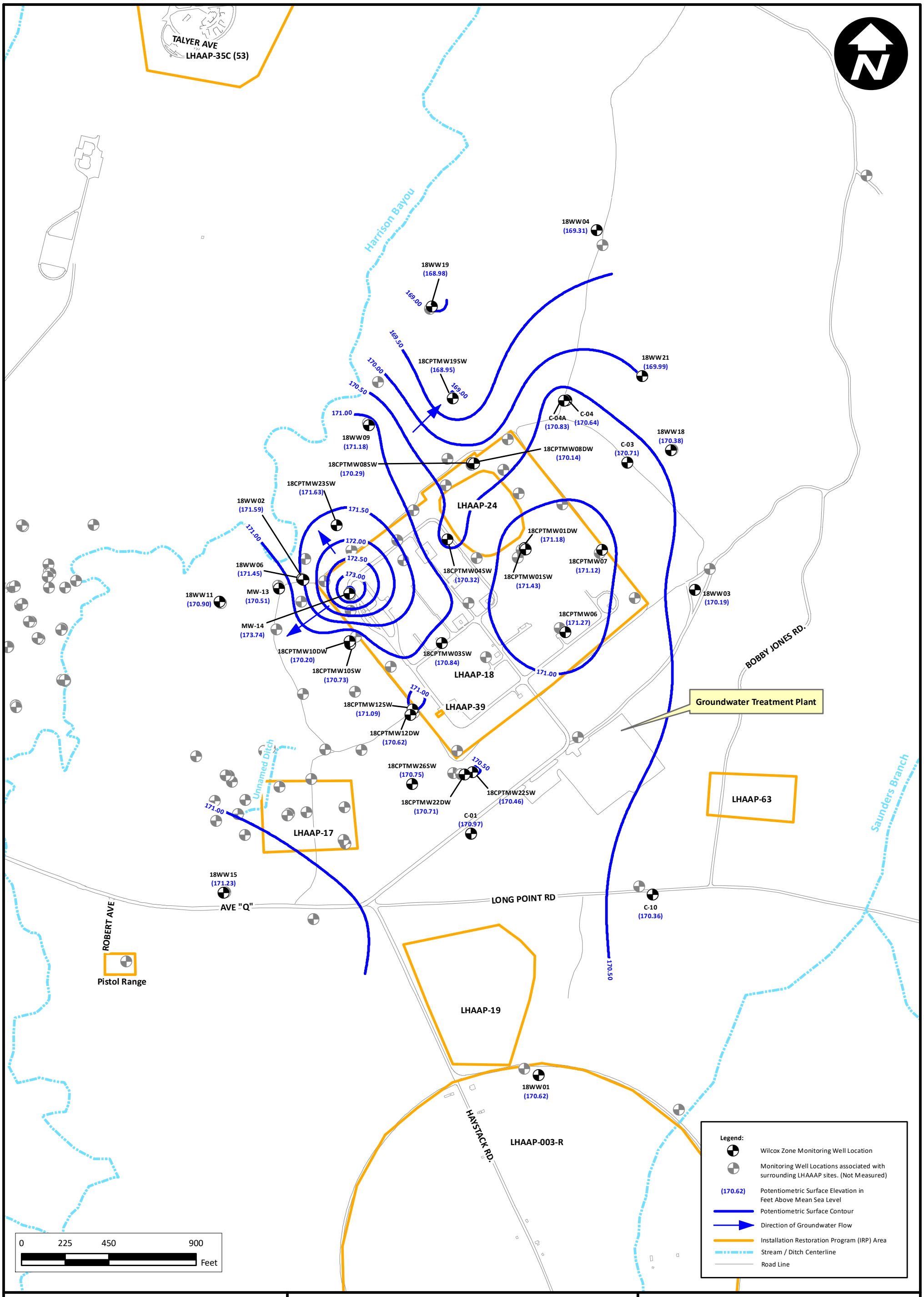
Groundwater Potentiometric Surface Map
Shallow Zone (June 28, 2019) LHAAP-18/24

Figure B-3



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Groundwater Potentiometric Surface Map
Wilcox Zone (April 26, 2019) LHAAP-18/24

Figure B-4

TALYER AVE
LHAAP-35C (53)
Harrison Bayou
18WW04 (169.53)
18WW19 (169.16)
18CPTMW19SW (169.28)
18WW21 (170.25)
C-04 (170.83)
C-04A (171.05)
18WW09 (171.21)
18CPTMW08SW (170.59)
18WW18 (170.65)
C-03 (171.04)
18CPTMW08DW (170.42)
18CPTMW23SW (171.74)
18WW06 (171.57)
18WW02 (171.68)
LHAAP-24
18CPTMW04SW (170.61)
18CPTMW01SW (171.62)
18CPTMW07 (171.36)
18CPTMW01DW (171.39)
18WW11 (171.02)
MW-13 (170.69)
18WW03 (170.44)
MW-14 (173.93)
LHAAP-18
18CPTMW06 (171.57)
18CPTMW10DW (170.41)
18CPTMW03SW (171.13)
18CPTMW10SW (170.94)
BOBBY JONES RD.
18CPTMW12SW (171.36)
Groundwater Treatment Plant
LHAAP-39
18CPTMW12DW (170.88)
Unnamed Ditch
18CPTMW26SW (170.88)
18CPTMW22SW (170.72)
LHAAP-63
LHAAP-17
18CPTMW22DW (171.02)
C-01 (171.30)
Saunders Branch
18WW15 (171.45)
ROBERT AVE
AVE "Q"
LONG POINT RD
C-10 (170.58)
Pistol Range
LHAAP-19
18WW01 (170.91)
HAYSTACK RD.
LHAAP-003-R
169.50
170.00
170.50
171.00
171.50
172.00
172.50
173.00
173.50

0 225 450 900 Feet

Legend:
- Wilcox Zone Monitoring Well Location
- Monitoring Well Locations associated with surrounding LHAAAP sites. (Not Measured)
- (170.91) Potentiometric Surface Elevation in Feet Above Mean Sea Level
- Potentiometric Surface Contour
- Direction of Groundwater Flow
- Installation Restoration Program (IRP) Area
- Stream / Ditch Centerline
- Road Line

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Groundwater Potentiometric Surface Map
Wilcox Zone (May 29-30, 2019) LHAAP-18/24

Figure B-5

TALYER AVE
LHAAP-35C (53)
Harrison Bayou
18WW04 (169.69)
18WW19 (169.36)
169.50
170.00
170.50
171.00
171.50
18WW21 (170.37)
C-04A (171.94)
18CPTMW19SW (171.64)
C-04 (171.68)
18WW09 (171.56)
18CPTMW08DW (171.44)
18CPTMW08SW (171.73)
C-03 (171.38)
18WW18 (171.10)
18CPTMW04SW (171.57)
18WW06 (171.52)
18CPTMW23SW (171.31)
LHAAP-24
18CPTMW01SW (172.48) (Not Used)
18CPTMW07 (171.29)
172.00
172.50
173.00
173.50
174.00
18CPTMW01DW (170.98)
18WW02 (171.83)
MW-13 (171.62)
18WW11 (170.90)
18WW03 (170.66)
18CPTMW06 (171.25)
MW-14 (174.86)
LHAAP-18
18CPTMW10DW (171.16)
18CPTMW10SW (171.63)
18CPTMW03SW (171.38)
BOBBY JONES RD.
18CPTMW12SW (171.25)
LHAAP-39
Groundwater Treatment Plant
18CPTMW12DW (171.18)
Unnamed Ditch
18CPTMW26SW (171.19)
18CPTMW22SW (170.83)
LHAAP-63
18CPTMW22DW (171.00)
LHAAP-17
C-01 (171.52)
Saunders Branch
18WW15 (172.01)
AVE "Q"
LONG POINT RD
C-10 (170.67)
ROBERT AVE
Pistol Range
LHAAP-19
18WW01 (171.02)
HAYSTACK RD.
LHAAP-003-R

0 225 450 900 Feet

Legend:
- Wilcox Zone Monitoring Well Location
- Monitoring Well Locations associated with surrounding LHAAAP sites. (Not Measured)
- (171.02) Potentiometric Surface Elevation in Feet Above Mean Sea Level
- Potentiometric Surface Contour
- Direction of Groundwater Flow
- Installation Restoration Program (IRP) Area
- Stream / Ditch Centerline
- Road Line

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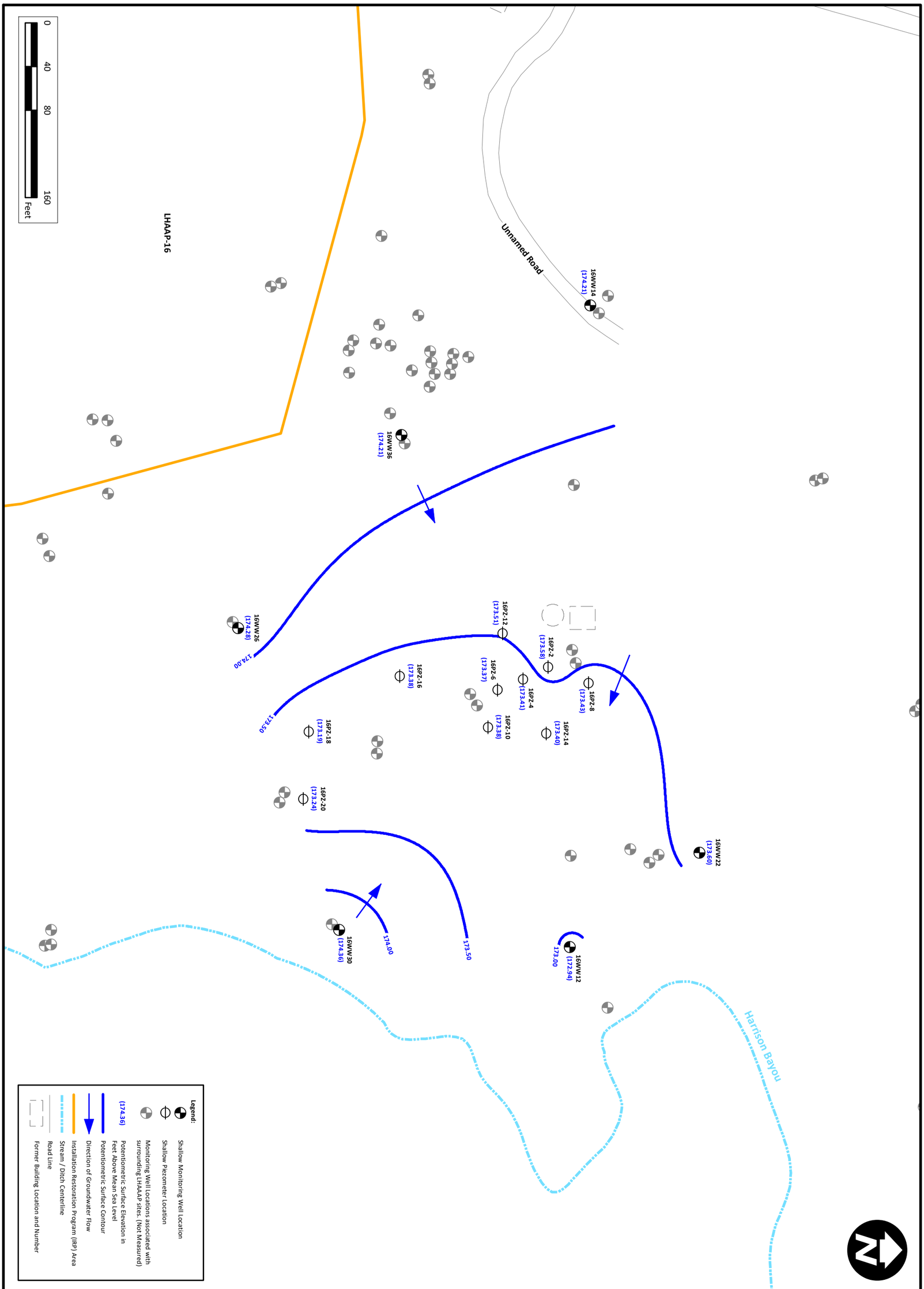
Groundwater Potentiometric Surface Map
Wilcox Zone (June 28, 2019) LHAAP-18/24

Figure B-6



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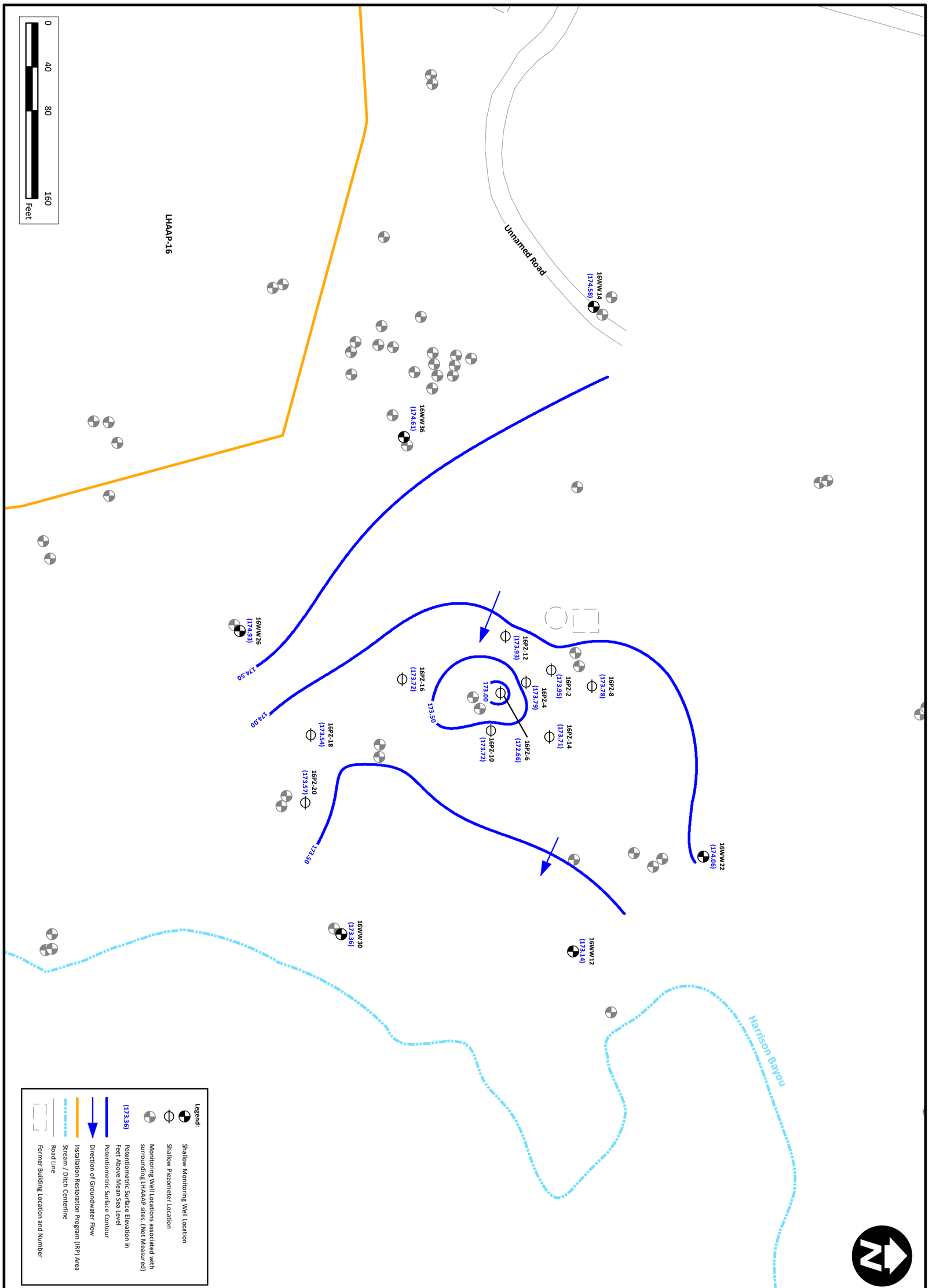
Groundwater Potentiometric Surface Map
Shallow Zone (April 26, 2019) LHAAP-16

Figure B-7

00937407



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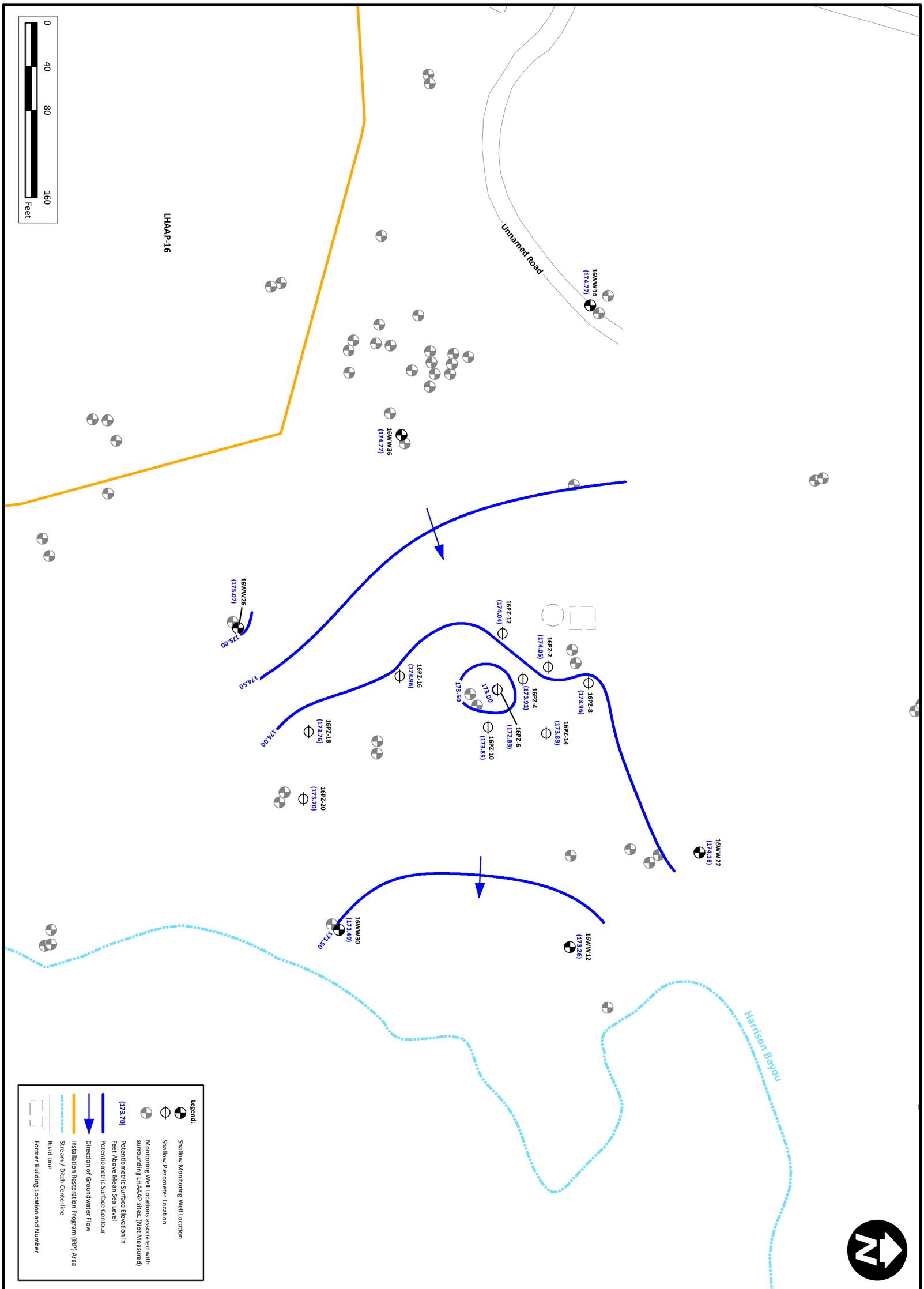
Groundwater Potentiometric Surface Map
Shallow Zone (May 29, 2019) LHAAP-16

Figure B-8

00937408



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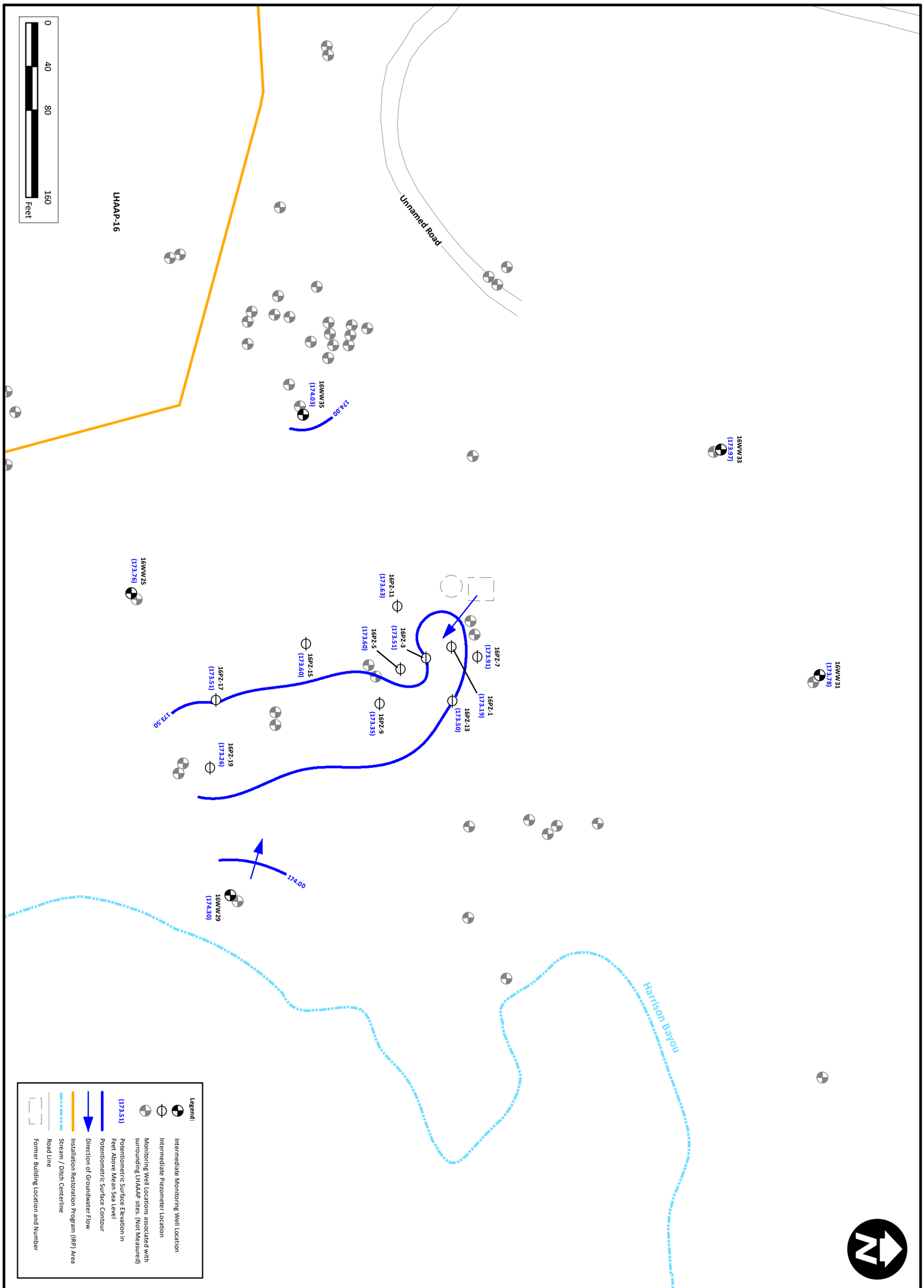
Groundwater Potentiometric Surface Map
Shallow Zone (June 28, 2019) LHAAP-16

Figure B-9

00937409



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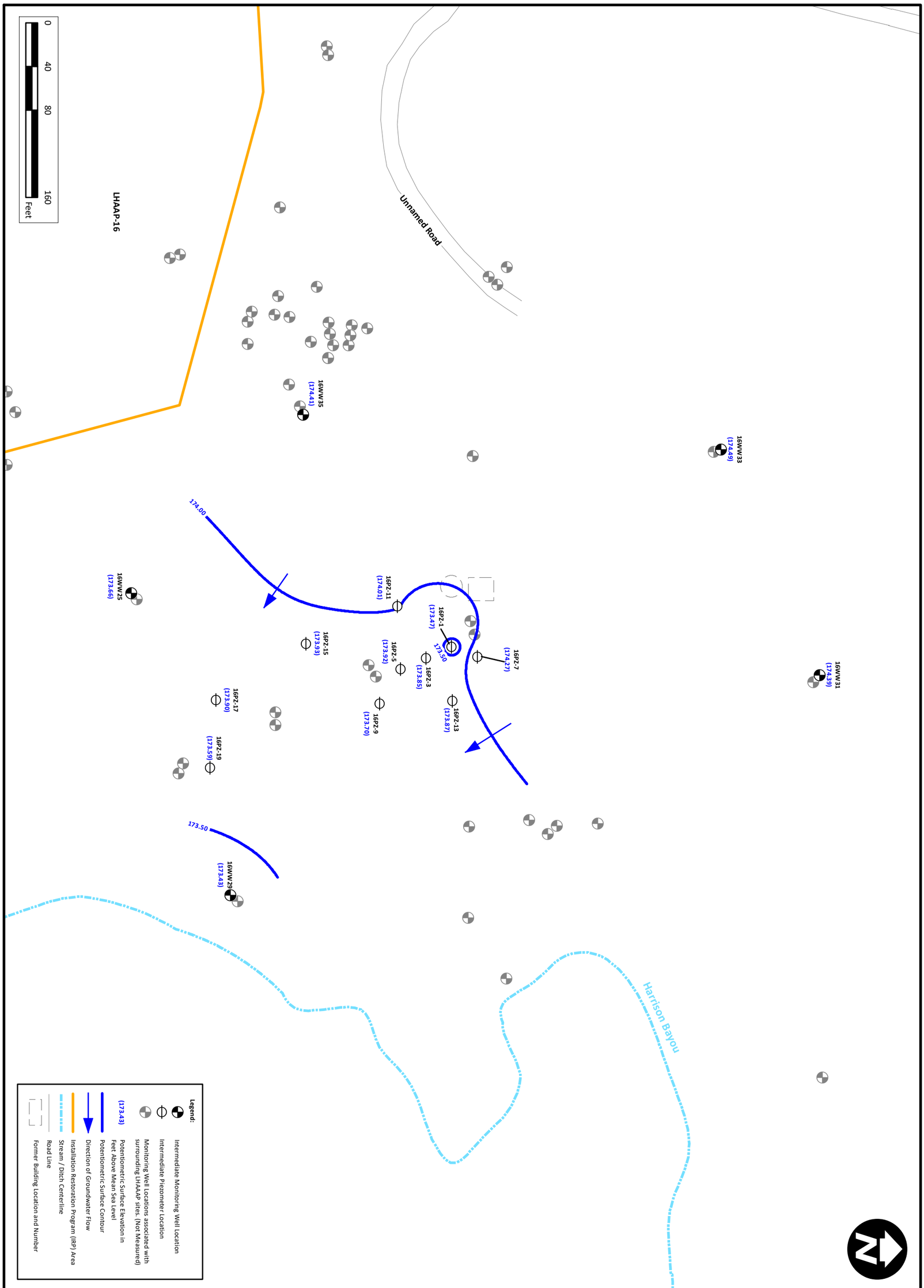
Groundwater Potentiometric Surface Map
Intermediate Zone (April 26, 2019) LHAAP-16

Figure B-10

00937410



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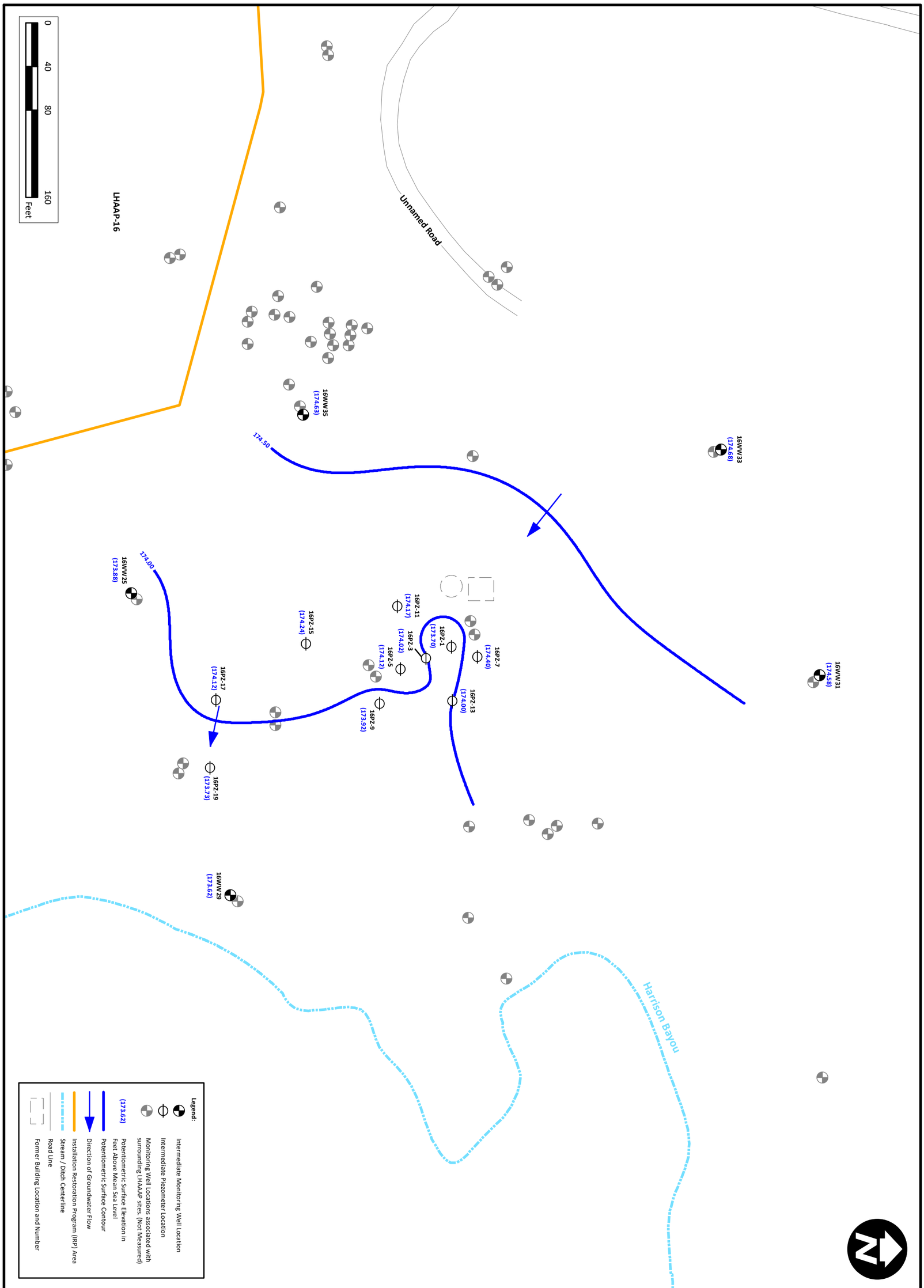
Quarterly Evaluation Report 2nd Quarter (April – June) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	12/4/2019	MRM

Groundwater Potentiometric Surface Map
Intermediate Zone (May 29, 2019) LHAAP-16

Figure B-11

00937411



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Quarterly Evaluation Report 2nd Quarter (April – June) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	12/5/2019	MRM

Groundwater Potentiometric Surface Map
Intermediate Zone (June 28, 2019) LHAAP-16

Figure B-12

00937412

APPENDIX C
LABORATORY ANALYTICAL RESULTS FOR LHAAP-18/24
(PROVIDED ON CD ONLY)

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10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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April 16, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19040313**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Apr 05, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 16-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19040313

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19040313-01	LH18/24-SP650_040419	Water		04-Apr-2019 14:00	05-Apr-2019 08:40	☐
HS19040313-02	LH18/24-SP650_040419_BIX	Water		04-Apr-2019 14:00	05-Apr-2019 08:40	☐

ALS Houston, US Date: 16-Apr-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order:

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

• The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

WetChemistry by Method E350.3

Batch ID: R336353

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E365.3

Batch ID: R336073

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 16-Apr-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19040313

Sample ID: LH18/24-SP650_040419 Lab ID:HS19040313-01

Collection Date: 04-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: KVL
Nitrogen, Ammonia (As N)	**17**		**0.20**	**0.10**	**0.20**	**mg/L**	1	09-Apr-2019 11:30
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: MZD
Phosphorus, Total Orthophosphate (As P)	**3.63**		**0.100**	**0.200**	**0.250**	**mg/L**	10	05-Apr-2019 15:53
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	12-Apr-2019 11:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 16-Apr-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19040313

Sample ID: LH18/24-SP650_040419_BIX Lab ID:HS19040313-02

Collection Date: 04-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	15-Apr-2019 09:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 16-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19040313

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R336073	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3			**Matrix:** Water		
HS19040313-01	LH18/24-SP650_040419	04 Apr 2019 14:00			05 Apr 2019 15:53	10
Batch ID R336353	**Test Name :** AMMONIA AS N BY E350.3(ISE)			**Matrix:** Water		
HS19040313-01	LH18/24-SP650_040419	04 Apr 2019 14:00			09 Apr 2019 11:30	1
Batch ID R336479	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS			**Matrix:** Water		
HS19040313-01	LH18/24-SP650_040419	04 Apr 2019 14:00			12 Apr 2019 11:32	1
Batch ID R336563	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19040313-02	LH18/24-SP650_040419_BIX	04 Apr 2019 14:00			15 Apr 2019 09:48	1

ALS Houston, US Date: 16-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19040313

QC BATCH REPORT NEW

Batch ID: R336073 (0) **Instrument: UV-2450** **Method: ORTHO PHOSPHATE (PO4) AS P BY E365.3**

MBLK Sample ID: **MBLK-336073** Units: **mg/L** Analysis Date: **05-Apr-2019 15:53**
Client ID: Run ID: **UV-2450_336073** SeqNo: **5024403** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0200	0.0250								U

LCS Sample ID: **LCS-336073** Units: **mg/L** Analysis Date: **05-Apr-2019 15:53**
Client ID: Run ID: **UV-2450_336073** SeqNo: **5024404** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.251	0.0250	0.25	0	100	85 - 115				

MS Sample ID: **HS19040313-01MS** Units: **mg/L** Analysis Date: **05-Apr-2019 15:53**
Client ID: **LH18/24-SP650_040419** Run ID: **UV-2450_336073** SeqNo: **5024406** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	6.15	0.250	2.5	3.63	101	80 - 120				

MSD Sample ID: **HS19040313-01MSD** Units: **mg/L** Analysis Date: **05-Apr-2019 15:53**
Client ID: **LH18/24-SP650_040419** Run ID: **UV-2450_336073** SeqNo: **5024407** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	6.17	0.250	2.5	3.63	102	80 - 120	6.15	0.325	20	

The following samples were analyzed in this batch: HS19040313-01

ALS Houston, US Date: 16-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19040313

QC BATCH REPORT NEW

Batch ID: R336353 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R336353** Units: **mg/L** Analysis Date: **09-Apr-2019 11:30**
Client ID: Run ID: **WetChem_HS_336353** SeqNo: **5030695** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R336353** Units: **mg/L** Analysis Date: **09-Apr-2019 11:30**
Client ID: Run ID: **WetChem_HS_336353** SeqNo: **5030694** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.81	0.20	10	0	108	80 - 120				

MS Sample ID: **HS19040342-01MS** Units: **mg/L** Analysis Date: **09-Apr-2019 11:30**
Client ID: Run ID: **WetChem_HS_336353** SeqNo: **5030701** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.54	0.20	10	0.1863	104	80 - 120				

MSD Sample ID: **HS19040342-01MSD** Units: **mg/L** Analysis Date: **09-Apr-2019 11:30**
Client ID: Run ID: **WetChem_HS_336353** SeqNo: **5030702** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.34	0.20	10	0.1863	102	80 - 120	10.54	1.92	20	

The following samples were analyzed in this batch: HS19040313-01

ALS Houston, US Date: 16-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS19040313**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020

ALS Houston, US Date: 16-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19040313

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19040313-01	LH18/24-SP650_040419	Login	4/5/2019 10:59:51 AM	NDR	WET094
HS19040313-01	LH18/24-SP650_040419	Login	4/5/2019 10:59:51 AM	NDR	WET094
HS19040313-01	LH18/24-SP650_040419	Login	4/5/2019 10:59:51 AM	NDR	Sub
HS19040313-02	LH18/24-SP650_040419_BIX	Login	4/5/2019 10:59:51 AM	NDR	Sub

ALS Houston, US Date: 16-Apr-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19040313
Date/Time Received: **05-Apr-2019 08:40**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature 5-Apr-2019 Date
Reviewed by: *RJ Modashia* eSignature 5-Apr-2019 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	3.5 UC/C	IR11	
Cooler(s)/Kit(s):	44555		
Date/Time sample(s) sent to storage:	04/05/2019 12:00		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

HS19040313

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modshia

Bhate Environmental Associates, Inc.

I18/24 Longhorn GW Treatment Plant Weekly Sampl

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. NWO1312.0150.0 16.0001
Job: **GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE							Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_040419	Water	04/04/19 / 14:00		2	X	X									H2SO4	
LH18/24-SP650_040419	Water	04/04/19 / 14:00		1			X								NONE	
LH18/24-SP650_040419_BIX	Water	04/04/19 / 14:00		1				X							NONE	

Additional Remarks: **Standard TAT on all parameters**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	04/04/19	14:30							N.L	4/4/19	08.40

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

4455S Temp 3.5

IR# 11

c/f 9

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
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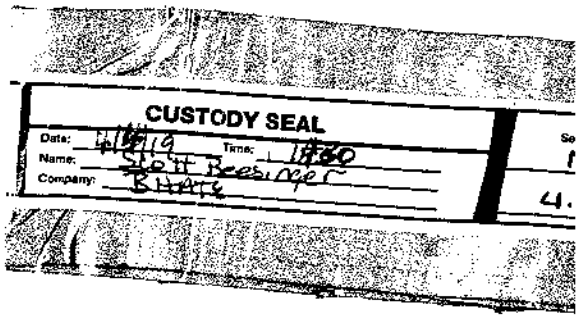
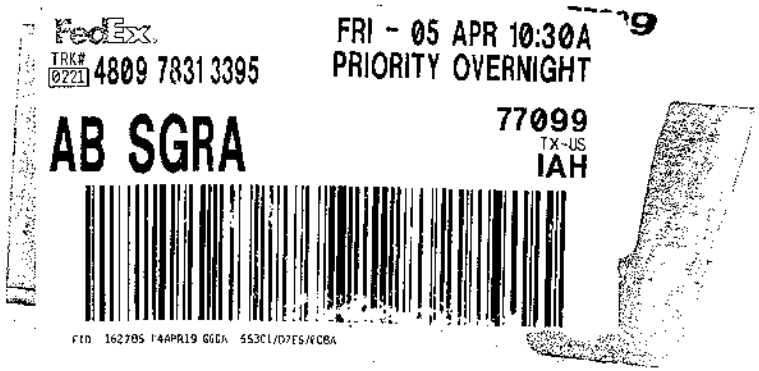

CUSTODY SEAL
Date:
Time:
Name:
Company:


FedEx
TRK# 0221 4809 7831 3395
FRI - 05 APR 10:30A
PRIORITY OVERNIGHT
AB SGRA
77099
TX-US
IAH

ALS Environmental
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Kelso, WA 98626
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www.alsglobal.com

April 12, 2019 **Analytical Report for Service Request No:** K1903068

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: ALS Houston DOD TOC / HS19040313

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory April 06, 2019
For your reference, these analyses have been assigned our service request number **K1903068.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

For Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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Acronyms
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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
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1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client: ALS Environmental - US
Project: ALS Houston DOD TOC
Sample Matrix: Water

Service Request: K1903068
Date Received: 04/06/2019

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 04/06/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by _____ Date 04/12/2019

Chain of Custody

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K1903068

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

COC ID: 11075

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19040313
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19040313-01**	**LH18/24-SP650_040419**	**Water**	**04 Apr 2019 14:00**
	TOC Analysis for DOD Level IV			15 Apr 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Modashia Date/Time: 4/5/19 18:00

Received By: Date/Time: 4/8/19 1010

Cooler ID(s): Temperature(s):

00937438

PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request K19 0306 8

Received: 4/6/19 Opened: 4/6/19 By: CG Unloaded: 4/6/19 By: CG

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.3	-0.1	1.4	1.6	+0.2	379	11075	4809 7832 5995	

4. Packing material: *Inserts* (*Baggies*) *Bubble Wrap* *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions:

RUSH

General Chemistry

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1903068
Project:	ALS Houston DOD TOC/HS19040313	**Date Collected:**	04/4/19
Sample Matrix:	Water	**Date Received:**	04/6/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_040419	K1903068-001	**2.23**	0.50	0.20	0.07	1	04/10/19 22:46	
Method Blank	K1903068-MB	ND U	0.50	0.20	0.07	1	04/11/19 12:23	

ALS Group USA, Corp.

dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1903068
Project	ALS Houston DOD TOC/HS19040313	**Date Collected:**	04/04/19
Sample Matrix:	Water	**Date Received:**	04/06/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	MRL	LOQ	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
Batch QC	K1902831-003DUP	50	20	7	655	654	654	<1	10	04/11/19
LH18/24-SP650_040419	K1903068-001DUP	0.50	0.20	0.07	2.23	2.22	2.22	<1	10	04/10/19
Batch QC	K1903133-001DUP	50	20	7	686	675	680	2	10	04/11/19
Batch QC	K1903135-001DUP	0.50	0.20	0.07	30.9	31.1	31.0	<1	10	04/10/19
Batch QC	K1903135-002DUP	0.50	0.20	0.07	30.7	31.0	30.9	1	10	04/11/19
Batch QC	K1903135-003DUP	0.50	0.20	0.07	12.3	12.0	12.2	2	10	04/11/19
Batch QC	K1903135-004DUP	0.50	0.20	0.07	13.9	13.8	13.9	<1	10	04/11/19
Batch QC	K1903167-001DUP	0.50	0.20	0.07	1.25	1.30	1.27	3	10	04/11/19
Batch QC	K1903167-002DUP	0.50	0.20	0.07	0.89	0.85	0.872	4	10	04/11/19
Batch QC	K1903167-003DUP	0.50	0.20	0.07	1.61	1.61	1.61	<1	10	04/11/19
Batch QC	K1903167-004DUP	0.50	0.20	0.07	1.21	1.20	1.21	1	10	04/11/19
Batch QC	K1903167-005DUP	0.50	0.20	0.07	6.65	6.70	6.67	<1	10	04/11/19

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1903068
Project:	ALS Houston DOD TOC/HS19040313	**Date Collected:**	04/04/19
Sample Matrix:	Water	**Date Received:**	04/06/19
		Date Analyzed:	04/10/19
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	LH18/24-SP650_040419	**Units:**	mg/L
Lab Code:	K1903068-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1903068-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	2.23	28.7	25.0	106	83-117

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1903068
Project:	ALS Houston DOD TOC/HS19040313	**Date Analyzed:**	04/11/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	631518

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1903068-LCS	26.4	25.0	106	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1903068
Project: ALS Houston DOD TOC/HS19040313

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	631518	KQ1904698-06	04/10/19 20:10	25.0	25.8	103	90-110
CCV2	631518	KQ1904698-07	04/11/19 01:07	25.0	25.7	103	90-110
CCV3	631518	KQ1904698-08	04/11/19 05:50	25.0	25.6	102	90-110
CCV4	631518	KQ1904698-09	04/11/19 11:53	25.0	25.3	101	90-110
CCV5	631518	KQ1904698-10	04/11/19 14:40	25.0	25.2	101	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1903068
Project: ALS Houston DOD TOC/HS19040313

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	631518	KQ1904698-01	04/10/19 20:24	0.50	0.20	0.07	0.14	J
CCB2	631518	KQ1904698-02	04/11/19 01:22	0.50	0.20	0.07	ND	U
CCB3	631518	KQ1904698-03	04/11/19 06:05	0.50	0.20	0.07	ND	U
CCB4	631518	KQ1904698-04	04/11/19 12:08	0.50	0.20	0.07	ND	U
CCB5	631518	KQ1904698-05	04/11/19 14:55	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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Work Request # Original ( ) K1903051,3149,3076,3068,2807,3149,2831,3133,3135,3167

Tier: II II II IV I II II II II II

Date Analyzed: 4/10/19 TOC: 631916, 631918

Analyst: BCD Run # DOC: 631917

Analysis: TOC, DOC

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	yes/no/NA
2.	Holding times met for all analyses and for all samples?	yes/no/NA
3.	Are calculations correct?	yes/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/NA
5.	All quality control criteria met?	yes/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	yes/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	yes/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	yes/no/NA
9.	Are results for methods blanks all ND?	yes/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/no/NA
11.	Are all exceptions explained?	yes/no/NA
12.	Have all applicable service requests been reviewed?	yes/no/NA
13.	Are all samples labeled correctly?	yes/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	yes/no/NA
15.	Are detection limits and units reported correctly?	yes/no/NA
16.	Is the unused space on the benchsheet crossed out?	yes/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/no/NA

COMMENTS: K1903076-7 BCD 4/11/19 reports a high raw result and needs a dilution, will be sent for RA.
K1903076-1/2/3/4/5/6 are over diluted and will be sent for reanalysis.

Final Approved by: [signature] Date: 04/12/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 631516 **Method/Testcode:** 9060/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1902807-014	Carbon, Total Organic	N/A		Water	0.58 mg/L	10 mL	0.58 mg/L	1	0.07	0.50			4/10/19 17:21:00	N	I
KQ1904696-03	Carbon, Total Organic	CCB		Water	0.09 mg/L	10 ml	0.09 mg/L J	1	0.07	0.50			4/10/19 14:04	N	I
KQ1904696-04	Carbon, Total Organic	CCB		Water	0.14 mg/L	10 ml	0.14 mg/L J	1	0.07	0.50			4/10/19 20:24	N	I
KQ1904696-05	Carbon, Total Organic	CCV		Water	25.62 mg/L	10 ml	25.6 mg/L	1			102		4/10/19 13:49	N	I
KQ1904696-06	Carbon, Total Organic	CCV		Water	25.83 mg/L	10 ml	25.8 mg/L	1			103		4/10/19 20:10	N	I
KQ1904696-07	Carbon, Total Organic	LCS		Water	26.45 mg/L	10 ml	26.5 mg/L	1	0.07	0.50	106		4/10/19 15:15	N	I
KQ1904696-08	Carbon, Total Organic	LCS		Water	26.55 mg/L	10 ml	26.5 mg/L	1	0.07	0.50	106		4/10/19 15:15	N	I
KQ1904696-09	Carbon, Total Organic	LCS		Water	26.23 mg/L	10 ml	26.2 mg/L	1	0.07	0.50	105		4/10/19 15:15	N	I
KQ1904696-10	Carbon, Total Organic	LCS		Water	26.22 mg/L	10 ml	26.2 mg/L	1	0.07	0.50	105		4/10/19 15:15	N	I
KQ1904696-11	Carbon, Total Organic	MB		Water	0.03 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/10/19 14:19	N	I
KQ1904696-12	Carbon, Total Organic	MB		Water	0.03 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/10/19 14:19	N	I
KQ1904696-13	Carbon, Total Organic	MB		Water	5.06000000000001E	10 ml	0.50 mg/L U	1	0.07	0.50			4/10/19 14:19	N	I
KQ1904696-14	Carbon, Total Organic	MB		Water	4.56000000000001E	10 ml	0.50 mg/L U	1	0.07	0.50			4/10/19 14:19	N	I

04/12/19

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 631517 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1903051-001	Carbon, Dissolved Organic (DOC)	N/A		Effluent	1.55 mg/L	10 ml	1.55 mg/L	1	0.07	0.50			4/10/19 18:16	N	II
K1903051-002	Carbon, Dissolved Organic (DOC)	N/A		Water	1.73 mg/L	10 ml	1.73 mg/L	1	0.07	0.50			4/10/19 19:14	N	II
K1903076-003	Carbon, Dissolved Organic	N/A		Water	0.08 mg/L	10 ml	1000 mg/L U	2000	200	1000			4/10/19 21:22	N	II
K1903149-001	Carbon, Dissolved Organic (DOC)	N/A		Water	6.13 mg/L	10 ml	6.13 mg/L	1	0.07	0.50			4/10/19 19:42	N	II
K1903149-002	Carbon, Dissolved Organic (DOC)	N/A		Water	5.77 mg/L	10 ml	5.77 mg/L	1	0.07	0.50			4/10/19 20:39	N	II
KQ1904697-01	Carbon, Dissolved Organic	CCB		Effluent	0.09 mg/L	10 ml	0.09 mg/L J	1	0.07	0.50			4/10/19 14:04	N	II
KQ1904697-01	Carbon, Dissolved Organic (DOC)	CCB		Effluent	0.09 mg/L	10 ml	0.09 mg/L J	1	0.07	0.50			4/10/19 14:04	N	II
KQ1904697-02	Carbon, Dissolved Organic	CCB		Effluent	0.14 mg/L	10 ml	0.14 mg/L J	1	0.07	0.50			4/10/19 20:24	N	II
KQ1904697-02	Carbon, Dissolved Organic (DOC)	CCB		Effluent	0.14 mg/L	10 ml	0.14 mg/L J	1	0.07	0.50			4/10/19 20:24	N	II
KQ1904697-03	Carbon, Dissolved Organic	CCB		Effluent	0.02 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/11/19 01:22	N	II
KQ1904697-03	Carbon, Dissolved Organic (DOC)	CCB		Effluent	0.02 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/11/19 01:22	N	II
KQ1904697-04	Carbon, Dissolved Organic	CCV		Effluent	25.62 mg/L	10 ml	25.6 mg/L	1			102		4/10/19 13:49	N	II
KQ1904697-04	Carbon, Dissolved Organic (DOC)	CCV		Effluent	25.62 mg/L	10 ml	25.6 mg/L	1			102		4/10/19 13:49	N	II
KQ1904697-05	Carbon, Dissolved Organic	CCV		Effluent	25.83 mg/L	10 ml	25.8 mg/L	1			103		4/10/19 20:10	N	II
KQ1904697-05	Carbon, Dissolved Organic (DOC)	CCV		Effluent	25.83 mg/L	10 ml	25.8 mg/L	1			103		4/10/19 20:10	N	II
KQ1904697-06	Carbon, Dissolved Organic	CCV		Effluent	25.66 mg/L	10 ml	25.7 mg/L	1			103		4/11/19 01:07	N	II
KQ1904697-06	Carbon, Dissolved Organic (DOC)	CCV		Effluent	25.66 mg/L	10 ml	25.7 mg/L	1			103		4/11/19 01:07	N	II
KQ1904697-07	Carbon, Dissolved Organic	MB		Effluent	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/11/19 01:37	N	II
KQ1904697-07	Carbon, Dissolved Organic (DOC)	MB		Effluent	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/11/19 01:37	N	II
KQ1904697-08	Carbon, Dissolved Organic	LCS		Effluent	26.51 mg/L	10 ml	26.5 mg/L	1	0.07	0.50			4/11/19 01:51	N	II
KQ1904697-08	Carbon, Dissolved Organic (DOC)	LCS		Effluent	26.51 mg/L	10 ml	26.5 mg/L	1	0.07	0.50			4/11/19 01:51	N	II
KQ1904697-09	Carbon, Dissolved Organic (DOC)	MS	K1903051-001	Effluent	28.79 mg/L	10 ml	28.8 mg/L	1	0.07	0.50	109		4/10/19 18:44	N	II
KQ1904697-10	Carbon, Dissolved Organic (DOC)	DUP	K1903051-001	Effluent	1.57 mg/L	10 ml	1.57 mg/L	1	0.07	0.50		1	4/10/19 18:16	N	II
KQ1904697-11	Carbon, Dissolved Organic (DOC)	DUP	K1903051-002	Water	1.84 mg/L	10 ml	1.84 mg/L	1	0.07	0.50		6	4/10/19 19:14	N	II
KQ1904697-12	Carbon, Dissolved Organic (DOC)	DUP	K1903149-001	Water	6.18 mg/L	10 ml	6.18 mg/L	1	0.07	0.50		<1	4/10/19 19:42	N	II
KQ1904697-13	Carbon, Dissolved Organic (DOC)	DUP	K1903149-002	Water	5.81 mg/L	10 ml	5.81 mg/L	1	0.07	0.50		<1	4/10/19 20:39	N	II
KQ1904697-14	Carbon, Dissolved Organic	DUP	K1903076-003	Water	0.05 mg/L	10 ml	1000 mg/L U	2000	200	1000		NC	4/10/19 21:22	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 631517 **Method/Testcode:** 415.1/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1904697-15	Carbon, Dissolved Organic	N/A		Water	1.55 mg/L	10 mL	1.55 mg/L	1	0.07	0.50			4/10/19 18:16:00	N	II
KQ1904697-16	Carbon, Dissolved Organic	MS	KQ1904697-15	Water	28.79 mg/L	10 mL	28.8 mg/L	1	0.07	0.50	109		4/10/19 18:44:00	N	II
KQ1904697-18	Carbon, Dissolved Organic	DUP	KQ1904697-15	Water	1.57 mg/L	10 mL	1.57 mg/L	1	0.07	0.50		1	4/10/19 18:16:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 631518 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1902831-003	Carbon, Total Organic	N/A		Water	6.55 mg/L	10 ml	655 mg/L	100	7	50			4/11/19 03:58	N	II
K1903068-001	Carbon, Total Organic	N/A		Water	2.23 mg/L	10 ml	2.23 mg/L	1	0.07	0.50			4/10/19 22:46	N	IV
K1903076-001	Carbon, Total Organic	N/A		Water	-0.07 mg/L	10 ml	1000 mg/L U	2000	200	1000			4/11/19 07:44	N	II
K1903076-002	Carbon, Total Organic	N/A		Water	-0.12 mg/L	10 ml	1000 mg/L U	2000	200	1000			4/11/19 08:12	N	II
K1903076-003	Carbon, Total Organic	N/A		Water	-0.11 mg/L	10 ml	1000 mg/L U	2000	200	1000			4/11/19 08:41	N	II
K1903076-004	Carbon, Total Organic	N/A		Water	-0.18 mg/L	10 ml	1000 mg/L U	2000	200	1000			4/11/19 09:09	N	II
K1903076-005	Carbon, Total Organic	N/A		Water	-0.18 mg/L	10 ml	1000 mg/L U	2000	200	1000			4/11/19 09:37	N	II
K1903076-006	Carbon, Total Organic	N/A		Water	-0.15 mg/L	10 ml	1000 mg/L U	2000	200	1000			4/11/19 10:05	N	II
K1903076-007	Carbon, Total Organic	N/A		Water	57.49 mg/L	10 ml	230000 mg/L	4000	300	2000			4/11/19 12:52	N	II
K1903133-001	Carbon, Total Organic	N/A		Water	6.86 mg/L	10 ml	686 mg/L	100	7	50			4/11/19 03:30	N	II
K1903135-001	Carbon, Total Organic	N/A		Water	30.95 mg/L	10 ml	30.9 mg/L	1	0.07	0.50			4/10/19 23:43	N	II
K1903135-002	Carbon, Total Organic	N/A		Water	30.69 mg/L	10 ml	30.7 mg/L	1	0.07	0.50			4/11/19 00:11	N	II
K1903135-003	Carbon, Total Organic	N/A		Water	12.27 mg/L	10 ml	12.3 mg/L	1	0.07	0.50			4/11/19 02:06	N	II
K1903135-004	Carbon, Total Organic	N/A		Water	13.92 mg/L	10 ml	13.9 mg/L	1	0.07	0.50			4/11/19 02:34	N	II
K1903167-001	Carbon, Total Organic	N/A		Ground Water	1.25 mg/L	10 ml	1.25 mg/L	1	0.07	0.50			4/11/19 04:54	N	II
K1903167-002	Carbon, Total Organic	N/A		Ground Water	0.89 mg/L	10 ml	0.89 mg/L	1	0.07	0.50			4/11/19 05:22	N	II
K1903167-003	Carbon, Total Organic	N/A		Ground Water	1.61 mg/L	10 ml	1.61 mg/L	1	0.07	0.50			4/11/19 06:20	N	II
K1903167-004	Carbon, Total Organic	N/A		Ground Water	1.22 mg/L	10 ml	1.21 mg/L	1	0.07	0.50			4/11/19 06:48	N	II
K1903167-005	Carbon, Total Organic	N/A		Ground Water	6.65 mg/L	10 ml	6.65 mg/L	1	0.07	0.50			4/11/19 07:16	N	II
KQ1904698-01	Carbon, Total Organic	CCB		Water	0.14 mg/L	10 ml	0.14 mg/L J	1	0.07	0.50			4/10/19 20:24	N	IV
KQ1904698-01	Carbon, Total Organic	CCB		Water	0.14 mg/L	10 ml	0.14 mg/L J	1	0.07	0.50			4/10/19 20:24	N	IV
KQ1904698-02	Carbon, Total Organic	CCB		Water	0.02 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/11/19 01:22	N	IV
KQ1904698-02	Carbon, Total Organic	CCB		Water	0.02 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/11/19 01:22	N	IV
KQ1904698-03	Carbon, Total Organic	CCB		Water	-0.05 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/11/19 06:05	N	IV
KQ1904698-03	Carbon, Total Organic	CCB		Water	-0.05 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/11/19 06:05	N	IV
KQ1904698-04	Carbon, Total Organic	CCB		Water	-0.10 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/11/19 12:08	N	IV
KQ1904698-04	Carbon, Total Organic	CCB		Water	-0.10 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/11/19 12:08	N	IV
KQ1904698-05	Carbon, Total Organic	CCB		Water	-0.17 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/11/19 14:55	N	IV
KQ1904698-05	Carbon, Total Organic	CCB		Water	-0.17 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/11/19 14:55	N	IV
KQ1904698-06	Carbon, Total Organic	CCV		Water	25.83 mg/L	10 ml	25.8 mg/L	1			103		4/10/19 20:10	N	IV
KQ1904698-06	Carbon, Total Organic	CCV		Water	25.83 mg/L	10 ml	25.8 mg/L	1			103		4/10/19 20:10	N	IV
KQ1904698-07	Carbon, Total Organic	CCV		Water	25.66 mg/L	10 ml	25.7 mg/L	1			103		4/11/19 01:07	N	IV
KQ1904698-07	Carbon, Total Organic	CCV		Water	25.66 mg/L	10 ml	25.7 mg/L	1			103		4/11/19 01:07	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

04/12/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 631518 **Method/Testcode:** 415.1/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1904698-08	Carbon, Total Organic	CCV		Water	25.56 mg/L	10 ml	25.6 mg/L	1			102		4/11/19 05:50	N	IV
KQ1904698-08	Carbon, Total Organic	CCV		Water	25.56 mg/L	10 ml	25.6 mg/L	1			102		4/11/19 05:50	N	IV
KQ1904698-09	Carbon, Total Organic	CCV		Water	25.27 mg/L	10 ml	25.3 mg/L	1			101		4/11/19 11:53	N	IV
KQ1904698-09	Carbon, Total Organic	CCV		Water	25.27 mg/L	10 ml	25.3 mg/L	1			101		4/11/19 11:53	N	IV
KQ1904698-10	Carbon, Total Organic	CCV		Water	25.16 mg/L	10 ml	25.2 mg/L	1			101		4/11/19 14:40	N	IV
KQ1904698-10	Carbon, Total Organic	CCV		Water	25.16 mg/L	10 ml	25.2 mg/L	1			101		4/11/19 14:40	N	IV
KQ1904698-11	Carbon, Total Organic	MB		Water	-0.15 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/11/19 12:23	N	IV
KQ1904698-11	Carbon, Total Organic	MB		Water	-0.15 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/11/19 12:23	N	IV
KQ1904698-12	Carbon, Total Organic	LCS		Water	26.39 mg/L	10 ml	26.4 mg/L	1	0.07	0.50	106		4/11/19 12:37	N	IV
KQ1904698-12	Carbon, Total Organic	LCS		Water	26.39 mg/L	10 ml	26.4 mg/L	1	0.07	0.50	106		4/11/19 12:37	N	IV
KQ1904698-13	Carbon, Total Organic	MS	K1903068-001	Water	28.68 mg/L	10 ml	28.7 mg/L	1	0.07	0.50	106		4/10/19 23:14	N	IV
KQ1904698-14	Carbon, Total Organic	DUP	K1903068-001	Water	2.22 mg/L	10 ml	2.22 mg/L	1	0.07	0.50		<1	4/10/19 22:46	N	IV
KQ1904698-15	Carbon, Total Organic	DUP	K1903135-001	Water	31.06 mg/L	10 ml	31.1 mg/L	1	0.07	0.50		<1	4/10/19 23:43	N	II
KQ1904698-16	Carbon, Total Organic	DUP	K1903135-002	Water	31.03 mg/L	10 ml	31.0 mg/L	1	0.07	0.50		1	4/11/19 00:11	N	II
KQ1904698-17	Carbon, Total Organic	DUP	K1903135-003	Water	12.04 mg/L	10 ml	12.0 mg/L	1	0.07	0.50		2	4/11/19 02:06	N	II
KQ1904698-18	Carbon, Total Organic	DUP	K1903135-004	Water	13.83 mg/L	10 ml	13.8 mg/L	1	0.07	0.50		<1	4/11/19 02:34	N	II
KQ1904698-19	Carbon, Total Organic	DUP	K1902831-003	Water	6.54 mg/L	10 ml	654 mg/L	100	7	50		<1	4/11/19 03:58	N	II
KQ1904698-20	Carbon, Total Organic	DUP	K1903133-001	Water	6.75 mg/L	10 ml	675 mg/L	100	7	50		2	4/11/19 03:30	N	II
KQ1904698-21	Carbon, Total Organic	DUP	K1903167-001	Water	1.30 mg/L	10 ml	1.30 mg/L	1	0.07	0.50		3	4/11/19 04:54	N	II
KQ1904698-22	Carbon, Total Organic	DUP	K1903167-002	Water	0.85 mg/L	10 ml	0.85 mg/L	1	0.07	0.50		4	4/11/19 05:22	N	II
KQ1904698-23	Carbon, Total Organic	DUP	K1903167-003	Water	1.61 mg/L	10 ml	1.61 mg/L	1	0.07	0.50		<1	4/11/19 06:20	N	II
KQ1904698-24	Carbon, Total Organic	DUP	K1903167-004	Water	1.20 mg/L	10 ml	1.20 mg/L	1	0.07	0.50		1	4/11/19 06:48	N	II
KQ1904698-25	Carbon, Total Organic	DUP	K1903167-005	Water	6.70 mg/L	10 ml	6.70 mg/L	1	0.07	0.50		<1	4/11/19 07:16	N	II
KQ1904698-26	Carbon, Total Organic	DUP	K1903076-001	Water	-0.08 mg/L	10 ml	1000 mg/L U	2000	200	1000		NC	4/11/19 07:44	N	II
KQ1904698-27	Carbon, Total Organic	DUP	K1903076-002	Water	-0.10 mg/L	10 ml	1000 mg/L U	2000	200	1000		NC	4/11/19 08:12	N	II
KQ1904698-28	Carbon, Total Organic	DUP	K1903076-003	Water	-0.11 mg/L	10 ml	1000 mg/L U	2000	200	1000		NC	4/11/19 08:41	N	II
KQ1904698-29	Carbon, Total Organic	DUP	K1903076-004	Water	-0.13 mg/L	10 ml	1000 mg/L U	2000	200	1000		NC	4/11/19 09:09	N	II
KQ1904698-30	Carbon, Total Organic	DUP	K1903076-005	Water	-0.19 mg/L	10 ml	1000 mg/L U	2000	200	1000		NC	4/11/19 09:37	N	II
KQ1904698-31	Carbon, Total Organic	DUP	K1903076-006	Water	-0.12 mg/L	10 ml	1000 mg/L U	2000	200	1000		NC	4/11/19 10:05	N	II
KQ1904698-32	Carbon, Total Organic	DUP	K1903076-007	Water	57.05 mg/L	10 ml	228000 mg/L	4000	300	2000		<1	4/11/19 12:52	N	II
KQ1904698-33	Carbon, Total Organic	N/A		Water	2.23 mg/L	10 mL	2.23 mg/L	1	0.07	0.50			4/11/19 22:46:00	N	II
KQ1904698-34	Carbon, Total Organic	DUP	KQ1904698-33	Water	2.22 mg/L	10 mL	2.22 mg/L	1	0.07	0.50		<1	4/11/19 22:46:00	N	II
KQ1904698-35	Carbon, Total Organic	MS	KQ1904698-33	Water	28.68 mg/L	10 mL	28.7 mg/L	1	0.07	0.50	106		4/11/19 23:14:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

TOC: 631516, 631518
DOC: 631517

Schedule: 04102019

Version: 3
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/04/10 12:16 - Wednesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	LOD	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
4	Sample	LOQ	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
5	Sample	K1903051-001.03 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	K1903051-001.03 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
7	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
8	Sample	K1903051-002.03 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1903149-001.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1903149-002.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	FB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
12	Sample	K1903076-003.01 doc 2000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
14	Sample	K1903068-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1903068-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
16	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
17	Sample	K1903135-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1903135-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1903135-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1903135-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1903133-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1902831-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1903167-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1903167-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1903167-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1903167-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1903167-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K1903076-001.01 2000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K1903076-002.01 2000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1903076-003.01 2000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1903076-004.01 2000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1903076-005.01 2000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1903076-006.01 2000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	6	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

04/12/19

Schedule: 04102019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K1903076-007.01 4000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	6	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 04102019
Wednesday, April 10, 2019 11:49 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/04/11 16:27 - Thursday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	04102019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3)		
Comment:			

Report Results

04/12/19

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/04/10 11:49

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.93	17.79	4.85	49.69	05:24
2	TC Clean	13.57	16.70	3.12	49.85	07:16
3	TC Clean	2.36	5.72	3.36	49.92	07:03
4	TC Clean	1.81	4.85	3.04	50.00	03:55

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/04/10 12:17

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.08	4.06	2.98	49.74	05:27
2	TC Clean	3.88	6.92	3.04	50.00	04:03
3	TC Clean	2.06	4.99	2.93	50.01	03:48
4	TC Clean	1.71	4.80	3.09	50.05	03:52

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/04/10 12:39

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.93	3.93	3.00	49.71	05:26
2	TC Clean	4.63	7.70	3.07	50.03	04:01
3	TC Clean	2.57	5.66	3.09	50.02	03:47
4	TC Clean	2.03	5.15	3.12	50.01	03:46

Sample Type: Blank (Creating v1244) — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2019/04/10 13:01

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.96	3.97	3.00	49.71	05:15
2	TC Clean	5.02	8.12	3.11	49.97	04:01
3	TC Clean	2.84	5.95	3.11	49.97	03:47
4	TC Clean	2.56	5.73	3.17	50.04	03:55
5	Reagent Blank	7.30	10.49	3.20	50.00	05:03
6	Acid Blank	1.48	4.50	3.02	49.69	05:30

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	1.1222 ppm	0.0000 ppm	0.0000%	2019/04/10 13:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1222	11.2218	16.62	19.77	3.15	50.13	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.8322 ppm (PASS)	0.0000 ppm	0%	2019/04/10 13:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.8322	258.3221	184.81	187.95	3.14	50.14	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.3064 ppm (PASS)	0.0000 ppm	0%	2019/04/10 14:04

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.3064	3.0635	11.54	14.59	3.05	50.15	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.2298 ppm	0.0145 ppm	6.3100%	2019/04/10 14:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2403	2.4032	10.63	13.61	2.98	50.14	10:25
2	TOC	0.2442	2.4415	10.66	13.76	3.10	50.14	10:26
3	TOC	0.2175	2.1749	10.48	13.55	3.07	50.14	10:25
4	TOC	0.2170	2.1705	10.48	13.56	3.08	50.14	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	26.5736 ppm	0.1655 ppm	0.62%	2019/04/10 15:15

						(PASS)				

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.6629	266.6295	190.45	193.39	2.94	50.12	10:28
C	TOC	25.0 ppm	2	26.7622	267.6224	191.12	194.24	3.12	50.11	10:26
C	TOC	25.0 ppm	3	26.4389	264.3887	188.93	191.95	3.03	50.12	10:25
C	TOC	25.0 ppm	4	26.4305	264.3048	188.87	191.88	3.00	50.09	10:22

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample

From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.5597 ppm	0.0000 ppm	0.0000%	2019/04/10 16:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5597	5.5971	12.80	15.99	3.19	50.11	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	LOD	0.4147 ppm	0.0247 ppm	5.9700%	2019/04/10 16:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4458	4.4583	12.03	15.05	3.02	50.12	10:26
2	TOC	0.3997	3.9972	11.72	14.88	3.16	50.12	10:29
3	TOC	0.4226	4.2256	11.87	14.87	3.00	50.11	10:28
4	TOC	0.3906	3.9059	11.65	14.79	3.14	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	LOQ	0.7432 ppm	0.0366 ppm	4.9200%	2019/04/10 17:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7941	7.9410	14.39	17.37	2.97	50.13	10:26
2	TOC	0.7310	7.3105	13.96	17.05	3.09	50.12	10:22
3	TOC	0.7076	7.0762	13.81	16.99	3.18	50.13	10:29
4	TOC	0.7402	7.4018	14.03	17.20	3.18	50.12	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC)	CAS_salt_010711	CAS_salt_010711

(v1244) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K1903051-001.03 doc	1.7736 ppm	0.0147 ppm	0.8300%	2019/04/10 18:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7632	17.6317	20.97	24.18	3.21	50.11	10:32
2	TOC	1.7839	17.8394	21.11	24.28	3.17	50.11	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1903051-001.03 ms doc	29.0015 ppm	0.0000 ppm	0.0000%	2019/04/10 18:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.0015	290.0148	205.86	208.88	3.02	50.12	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	RB	0.3910 ppm	0.0000 ppm	0.0000%	2019/04/10 18:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3910	3.9103	11.66	14.66	3.00	50.12	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1903051-002.03 doc	1.9987 ppm	0.0747 ppm	3.7400%	2019/04/10 19:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9458	19.4585	22.21	25.43	3.22	50.12	10:29
2	TOC	2.0515	20.5148	22.93	26.10	3.17	50.16	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1903149-001.02 doc	6.3700 ppm	0.0329 ppm	0.5200%	2019/04/10 19:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.3467	63.4674	52.08	55.27	3.19	50.13	10:27

2	TOC	6.3933	63.9329	52.40	55.58	3.18	50.13	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	26.0401 ppm (PASS)	0.0000 ppm	0%	2019/04/10 20:10

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	26.0401	260.4008	186.22	189.41	3.19	50.15	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.3548 ppm (PASS)	0.0000 ppm	0%	2019/04/10 20:24

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.3548	3.5482	11.87	14.92	3.05	50.12	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	10	TOC	K1903149-002.02 doc	6.0037 ppm	0.0268 ppm	0.4500%	2019/04/10 20:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.9848	59.8477	49.63	52.56	2.94	50.12	10:30
2	TOC	6.0226	60.2264	49.88	52.89	3.01	50.15	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

		Analysis			Std. Dev.		

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◈	11	TOC	FB	0.4184 ppm	0.0000 ppm	0.0000%	2019/04/10 21:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4184	4.1843	11.84	14.81	2.96	50.14	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1903076-003.01 doc 2000x	0.2744 ppm	0.0226 ppm	8.2400%	2019/04/10 21:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2904	2.9041	10.97	13.94	2.97	50.15	10:29
2	TOC	0.2584	2.5844	10.76	13.77	3.01	50.13	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	RB	0.2574 ppm	0.0357 ppm	13.8700%	2019/04/10 21:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2713	2.7126	10.84	13.78	2.94	50.15	10:28
2	TOC	0.2994	2.9940	11.04	13.94	2.91	50.13	10:27
3	TOC	0.2419	2.4194	10.64	13.48	2.83	50.14	10:31
4	TOC	0.2170	2.1705	10.48	13.37	2.89	50.11	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1903068-001.01	2.4374 ppm	0.0132 ppm	0.5400%	2019/04/10 22:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4467	24.4674	25.61	28.55	2.94	50.10	10:26
2	TOC	2.4280	24.2803	25.48	28.41	2.92	50.10	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1903068-001.01 ms	28.8889 ppm	0.0000 ppm	0.0000%	2019/04/10 23:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	28.8889	288.8892	205.10	207.98	2.88	50.09	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	RB	0.4472 ppm	0.0000 ppm	0.0000%	2019/04/10 23:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4472	4.4716	12.04	15.01	2.98	50.12	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1903135-001.01	31.2161 ppm	0.0819 ppm	0.2600%	2019/04/10 23:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	31.1582	311.5824	220.50	223.50	3.00	50.11	10:29
2	TOC	31.2740	312.7403	221.29	224.37	3.08	50.14	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K1903135-002.01	31.0730 ppm	0.2399 ppm	0.7700%	2019/04/11 00:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	30.9034	309.0338	218.77	221.92	3.14	50.11	10:27
2	TOC	31.2427	312.4266	221.08	224.33	3.25	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	RB	0.3721 ppm	0.1057 ppm	28.4200%	2019/04/11 00:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4469	4.4686	12.04	15.26	3.22	50.15	10:27
2	TOC	0.2973	2.9734	11.02	14.10	3.08	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.8710 ppm (PASS)	0.0000 ppm	0%	2019/04/11 01:07

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.8710	258.7096	185.07	188.15	3.07	50.12	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.2356 ppm (PASS)	0.0000 ppm	0%	2019/04/11 01:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.2356	2.3564	11.06	14.25	3.19	50.11	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample

From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.1695 ppm	0.0000 ppm	0.0000%	2019/04/11 01:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1695	1.6946	10.15	13.30	3.14	50.13	10:35

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS

From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	26.7201 ppm (PASS)	0.0000 ppm	0%	2019/04/11 01:51

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

00937465

	Type									
C	TOC	25.0 ppm	1	26.7201	267.2011	190.84	193.92	3.09	50.11	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	21	TOC	K1903135-003.01	12.3692 ppm	0.1652 ppm	1.3400%	2019/04/11 02:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.4860	124.8601	93.76	96.87	3.12	50.10	10:26
2	TOC	12.2524	122.5236	92.17	95.20	3.03	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	K1903135-004.01	14.0856 ppm	0.0610 ppm	0.4300%	2019/04/11 02:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.1288	141.2878	104.91	107.87	2.96	50.08	10:25
2	TOC	14.0424	140.4245	104.32	107.36	3.04	50.11	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	RB	0.2791 ppm	0.1005 ppm	36.0100%	2019/04/11 03:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3502	3.5022	11.38	14.61	3.23	50.10	10:25
2	TOC	0.2081	2.0806	10.42	13.45	3.04	50.03	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	K1903133-001.01 100x	7.0151 ppm	0.0753 ppm	1.0700%	2019/04/11 03:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.0683	70.6831	56.98	60.07	3.09	50.11	10:27
2	TOC	6.9618	69.6180	56.26	59.31	3.05	50.12	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1902831-003.01 100x	6.7564 ppm	0.0066 ppm	0.1000%	2019/04/11 03:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.7610	67.6100	54.90	58.09	3.19	50.15	10:24
2	TOC	6.7517	67.5172	54.83	57.86	3.02	50.11	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	RB	0.1620 ppm	0.0466 ppm	28.7400%	2019/04/11 04:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1949	1.9495	10.33	13.25	2.93	50.13	10:29
2	TOC	0.1291	1.2910	9.88	13.01	3.13	50.11	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1903167-001.01	1.4867 ppm	0.0311 ppm	2.1000%	2019/04/11 04:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4647	14.6470	18.94	22.07	3.13	50.12	10:25
2	TOC	1.5087	15.0875	19.24	22.09	2.85	50.12	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1903167-002.01	1.0845 ppm	0.0258 ppm	2.3800%	2019/04/11 05:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1027	11.0273	16.49	19.49	3.00	50.11	10:28
2	TOC	1.0662	10.6620	16.24	19.38	3.14	50.14	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.7723 ppm (PASS)	0.0000 ppm	0%	2019/04/11 05:50

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.7723	257.7225	184.40	187.32	2.92	50.11	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.1630 ppm (PASS)	0.0000 ppm	0%	2019/04/11 06:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.1630	1.6301	10.57	13.63	3.06	50.13	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1903167-003.01	1.8253 ppm	0.0016 ppm	0.0900%	2019/04/11 06:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8264	18.2637	21.40	24.39	2.99	50.12	10:30
2	TOC	1.8242	18.2416	21.38	24.40	3.01	50.13	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K1903167-004.01	1.4209 ppm	0.0093 ppm	0.6500%	2019/04/11 06:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4274	14.2743	18.69	21.71	3.01	50.14	10:28
2	TOC	1.4143	14.1432	18.60	21.69	3.09	50.12	10:26

Dilution	Blank Contribution	Method	Calibration

00937468

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K1903167-005.01	6.8869 ppm	0.0341 ppm	0.4900%	2019/04/11 07:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.8628	68.6280	55.59	58.63	3.04	50.15	10:29
2	TOC	6.9110	69.1098	55.91	58.81	2.89	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K1903076-001.01 2000x	0.1368 ppm	0.0091 ppm	6.6200%	2019/04/11 07:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1432	1.4324	9.98	13.13	3.15	50.14	10:30
2	TOC	0.1304	1.3042	9.89	12.94	3.05	50.13	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K1903076-002.01 2000x	0.0999 ppm	0.0135 ppm	13.5500%	2019/04/11 08:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0904	0.9035	9.62	12.68	3.06	50.12	10:29
2	TOC	0.1095	1.0950	9.75	12.80	3.05	50.13	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1903076-003.01 2000x	0.1028 ppm	0.0057 ppm	5.5700%	2019/04/11 08:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1069	1.0685	9.73	12.70	2.97	50.12	10:27
2	TOC	0.0987	0.9875	9.67	12.61	2.94	50.13	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◆	35	TOC	K1903076-004.01 2000x	0.0587 ppm	0.0400 ppm	68.1700%	2019/04/11 09:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0304	0.3039	9.21	12.18	2.97	50.10	10:26
2	TOC	0.0870	0.8696	9.59	12.72	3.12	50.12	10:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	36	TOC	K1903076-005.01 2000x	0.0294 ppm	0.0031 ppm	10.6400%	2019/04/11 09:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0316	0.3157	9.22	12.30	3.09	50.11	10:29
2	TOC	0.0272	0.2715	9.19	12.31	3.13	50.11	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	37	TOC	K1903076-006.01 2000x	0.0755 ppm	0.0221 ppm	29.2600%	2019/04/11 10:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0599	0.5986	9.41	12.64	3.23	50.11	10:25
2	TOC	0.0911	0.9109	9.62	12.72	3.10	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	38	TOC	RB	0.0307 ppm	0.0230 ppm	74.9400%	2019/04/11 10:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0361	0.3614	9.25	12.30	3.05	50.05	10:29
2	TOC	0.0684	0.6840	9.47	12.54	3.08	50.11	10:29
3	TOC	0.0313	0.3128	9.22	12.34	3.13	50.11	10:32
4	TOC	0.0345	0.3452	9.24	12.29	3.05	50.11	10:24
5	TOC	0.0123	0.1227	9.09	12.08	2.99	50.10	10:25
6	TOC	0.0017	0.0166	9.01	12.08	3.06	50.08	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

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Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.4841 ppm (PASS)	0.0000 ppm	0%	2019/04/11 11:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.4841	254.8409	182.45	185.43	2.99	50.09	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.1085 ppm (PASS)	0.0000 ppm	0%	2019/04/11 12:08

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.1085	1.0850	10.20	13.12	2.93	50.07	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	39	TOC	MB3	0.0613 ppm	0.0000 ppm	0.0000%	2019/04/11 12:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0613	0.6133	9.42	12.54	3.13	50.09	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	26.6071 ppm (PASS)	0.0000 ppm	0%	2019/04/11 12:37

	Base									

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Pos	Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.6071	266.0711	190.07	193.12	3.05	50.09	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	40	TOC	K1903076-007.01 4000x	57.4834 ppm	0.3105 ppm	0.5400%	2019/04/11 12:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	57.7030	577.0296	400.69	403.86	3.17	50.10	10:31
2	TOC	57.2638	572.6380	397.71	401.01	3.31	50.10	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	RB	0.1819 ppm	0.1955 ppm	107.4500%	2019/04/11 13:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5584	5.5839	12.79	16.23	3.44	50.10	10:29
2	TOC	0.2085	2.0850	10.42	13.59	3.17	50.11	10:26
3	TOC	0.1054	1.0538	9.72	12.88	3.16	50.12	10:26
4	TOC	0.1396	1.3956	9.95	12.97	3.02	50.12	10:27
5	TOC	0.0579	0.5794	9.40	12.48	3.08	50.13	10:25
6	TOC	0.0218	0.2185	9.15	12.30	3.14	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0027 (IC) (v1244)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.3767 ppm (PASS)	0.0000 ppm	0%	2019/04/11 14:40

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.3767	253.7670	181.72	184.91	3.19	50.12	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B

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Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0468 ppm (PASS)	0.0000 ppm	0%	2019/04/11 14:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0468	0.4678	9.78	12.86	3.08	50.12	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1243	1.8623	1.1330	0.0000	0.0000	0.0000	2019/04/05 14:46	Fusion1 (Fusion1)
v1244	2.4323	1.4770	0.0000	0.0000	0.0000	2019/04/10 13:35	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v30
Ver Creation: 2019/03/05 17:42
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC
Calibration curve formula: TOC: y = 6.788x + 9.463
r^2 value: TOC: r^2 = 0.99963

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58

00937473

10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4 Operator: Fusion1 (Fusion1)
Ver Creation: 2019/02/21 17:57
Comment:

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

00937474

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/04/11 15:11

0.306				OBSERVATIONS	12	ABOVE
0.240	0.240	0.240	0.240	STD Deviation	0.09244	0.2403
0.244	0.244	0.244	0.244	AVERAGE	0.19708	0.2442
0.218	0.218	0.218	0.218	UCL	0.28952	0.2175
0.217	0.217	0.217	0.217	LCL	0.10463	0.217
0.355						ABOVE
0.236	0.236	0.236	0.236			0.2356
0.170	0.170	0.170	0.170	OBSERVATIONS	8	0.1695
0.163	0.163	0.163	0.163	STD Deviation	0.08049	0.163
0.109	0.109			AVERAGE	0.19945	0.1085
0.061				UCL	0.27994	BELOW
0.047				LCL	0.11896	BELOW
						BELOW
						BELOW
				OBSERVATIONS	7	BELOW
				STD Deviation	0.08059	BELOW
				AVERAGE	0.21244	BELOW
				UCL	0.29303	BELOW
				LCL	0.13185	BELOW
						BELOW
						BELOW
				OBSERVATIONS	7	BELOW
				STD Deviation	0.03597	BELOW
				AVERAGE	0.21244 CBA	BELOW
						BELOW
						BELOW
						BELOW
						BELOW
						BELOW
						BELOW

04/12/19

ALS Environmental

StarLIMS Run: 631516, 631517, 631518

Analysis: TOC/DOC

Method: 9060, 415.1, SM 5310 C, 9060A

CCV: 11-GEN-05-77C 50 ppm LCS: 11-GEN-05-77D 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

Spike ID: 11-GEN-05-70O 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-77I

21 % H3PO4: 11-GEN-05-77H

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: NA

Analyzed By: BCP	Date Analyzed: 4/11/19
Reviewed By:	Date Reviewed: 04/12/19

10 RCP 4/11/19

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r.02/24/10

Limit of Quantitation - LOQ Verification

ALS Environmental - Kelso

Analytical Method:	9060/9060A				
Extr./Dig. Method:			Instrument:	Fusion K-TOC-03	
Matrix:	Water		Analyst(s):	BCD	
Units:	mg/L				
	K1900530-26	K1902807-14			

Analyte	Date Analyzed: / Spike Level	3/12/2019 Result	4/10/2019 Result	Result	Result	Avg Percent Recovery	Percent RSD	% Rec Limits	% RSD Limits
total organic carbon	0.500	0.397	0.582			98	26.66	50-150	20
total organic carbon	0.500	0.338	0.519			86	29.78		
total organic carbon	0.500	0.402	0.495			90	14.62		
total organic carbon	0.500	0.381	0.528			91	22.92		
		R-628235	R-631516			#DIV/0!	#DIV/0!		
						#DIV/0!	#DIV/0!		
Supervisor Approval:		TH 3/15/2019	TH 04/12/19						
	QA Approval:								

00937478

Method Detection Limit - LOD Verification

ALS - Kelso

Analytical Method:	9060/9060A	Instrument:	Fusion K- TOC-03
Extr./Dig. Method:		Analyst(s):	BCD
Matrix:	Water		
Units:	mg/L		

Analyte	MDL	Sample ID:	K1900530-26		K1902807-14					
		Date Analyzed:	3/12/2019		4/10/2019					
		Runno	628235		631516					
		Spike Level	Result 1	s/n >3	Result 2	s/n >3	Result 3	s/n >3	Result 4	s/n >3
total organic carbon	0.08	0.16	0.030	y	0.23366	y				
total organic carbon	0.08	0.16	0.021	y	0.18726					
total organic carbon	0.08	0.16	0.007	y	0.21016					
total organic carbon	0.08	0.16	0.052	y	0.17816					
Supervisor Approval:			TH 03/15/19		TH 04/12/19					

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1909152; 1909153; 1909154; 1909947; 1909949

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2233 (236356)

General Set Information: There were ten field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1909153001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 647198) was less than 1/2 the CRDL. The recovery for the LCS (647199) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1909152001 (Client ID's: LH18/24-SP650_032719_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD – 647200/01 failed QC acceptance criteria for percent recoveries, biased high. This is due to the fact that the unspiked sample result of 2.574µg/L was not subtracted from the MS/MSD results. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected. The MS/MSD relative percent difference (RPD) was within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 647196) is reported from the analysis of the Laboratory Control Sample (LCS – 647199) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Thomas Bosch April 11, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: April 11, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1909947**
Project ID: HS19040313
Purchase Order: HS19040313
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/25-SP650_040419_BIX	1909947001	04/04/19	04/06/19	

ANALYTICAL REPORT

Workorder: 34-1909947
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/25-SP650_040419_BIX** | Sampling Site: NA | Collected: 04/04/2019
Lab ID: 1909947001 | Media: 125 mL Nalgene | Received: 04/06/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2233 (HBN: 236356) | **Percent Solid:** NA
Analyzed: 04/10/2019 12:02 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 236356)**

Field sample 1909153001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 04/11/2019 09:27	/S/ Stephen Brose 04/11/2019 15:00

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1909947
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1909947

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2233 (HBN: 236356)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 647198
Analyzed: 04/10/2019 10:42
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 647199
Analyzed: 04/10/2019 10:15
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	3.68	4.00	91.9	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1909152001	**MS:**	647200	**MSD:**	647201
Analyzed:	04/10/2019 10:55	**Analyzed:**	04/10/2019 11:08	**Analyzed:**	04/10/2019 11:22
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	2.60	6.18	4	# 154	78.8	123.8	6.36	# 159	2.92	0.0	20.0

Comments

Field sample 1909153001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
04/11/2019 13:48	04/11/2019 15:00

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

20796/#1 18698/#2

Subcontract Chain of Custody

COC ID: 11076

1909947

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19040313
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19040313-02**	**LH18/24-SP650_040419_BIX**	**Water**	**04 Apr 2019 14:00**
	SUB_Perch-6850			15 Apr 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Pursuant Date/Time: 4/5/19 18:00

Received By: Meredith Stewart Date/Time: 4/6/19 905

Cooler ID(s): 9202 Temperature(s): 2°

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19040313	*Split:*	**Workorder ID:** 1909947	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	04/04/2019 14:00	LH18/25-SP650_040419_BIX	1909947001		Water	A	1	A
2								
3								
4								
5								
6								
7								
8								
9								
10								

COOL

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Werath, Julie	04/06/2019 09:05	ALS Sample Receiving	Sample Login
[signature] R.33.1	4/9/19 1300	BD	Storage
	4.9.19/15:25	T. Burk	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00937486

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

1908947

Client Name: ALS Houston

Project/Task/Site:

Date/Time of Receipt: 4/16/19 905

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9292	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: _____ (Signature) _____ (Printed Name) 4/16/19 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

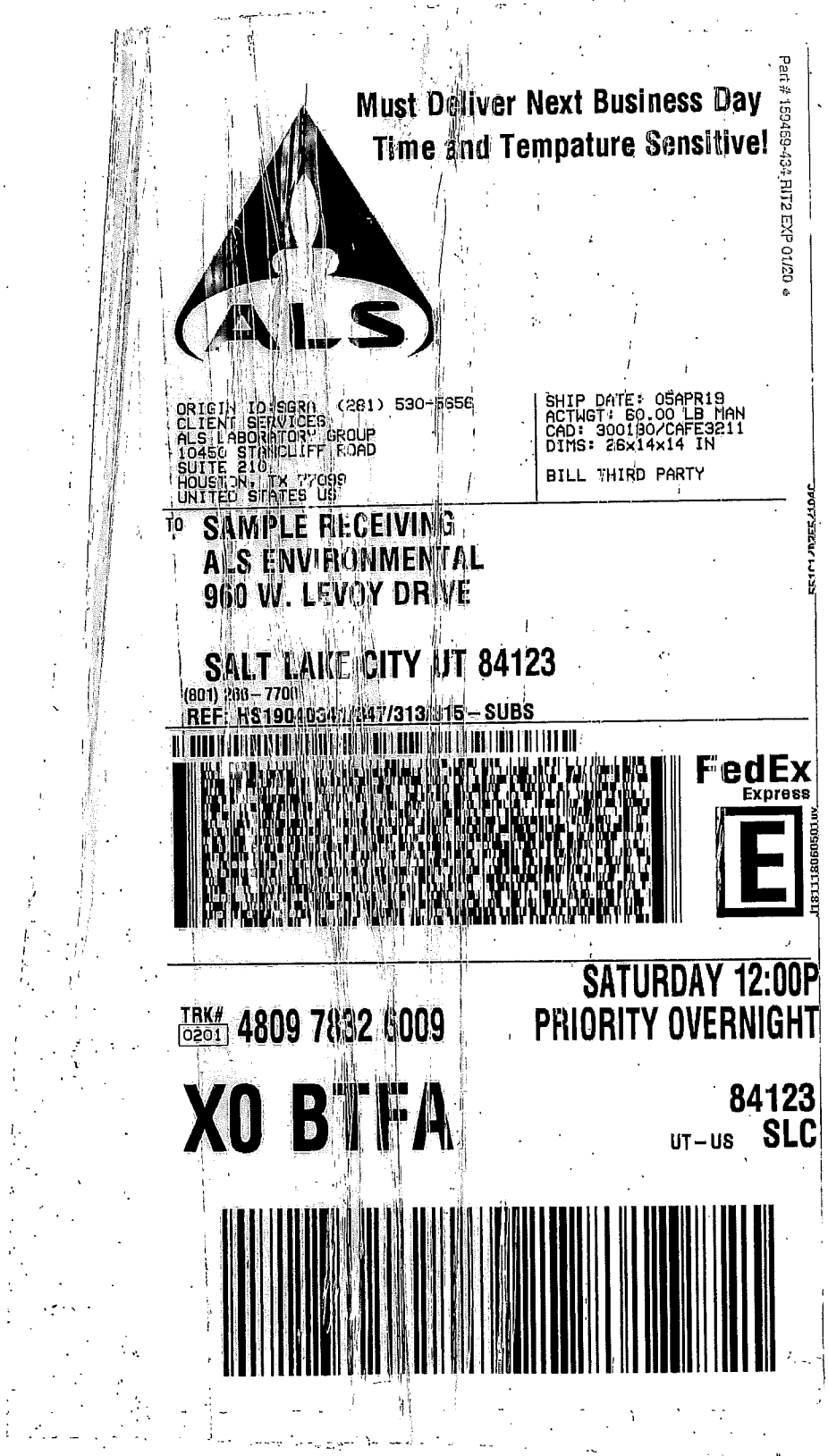
PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018



Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159469-434 RIT2 EXP 01/20

ORIGIN ID:SGRI (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 05APR19
ACTWGT: 60.00 LB MAN
CAD: 3001130/CAFE3211
DIMS: 26x14x14 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS1904034/347/313/15-SUBS

FedEx Express

SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 0201 4809 7832 6009

XO BTFA

84123
UT-US SLC

Batch Worklist

Batch: ELMS/ 2233 **Created:** 4/9/2019 08:42 **Instrument:** LCMS04 **HBN:** 236356

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1909152 [ENV_LVL4]
Workorder: 1909153 [ENV_LVL4]
Workorder: 1909154 [ENV_LVL4]
Workorder: 1909947 [ENV_LVL4]
Workorder: 1909949 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	647195	CCV for HBN 236356 [ELMS/2233]				CCV	3		E685041C3Q	5311		4/11/2019	4/10/2019
2	647199	LCS for HBN 236356 [ELMS/2233]				LCS	3		E6850Q413Q	5311		4/11/2019	4/10/2019
3	647197	ICS for HBN 236356 [ELMS/2233]				ICS	3		E6850..D3Q	5311		4/11/2019	4/10/2019
4	647198	LMB for HBN 236356 [ELMS/2233]				LMB	3		E6850Q413Q	5311		4/11/2019	4/10/2019
5	1909152001	LH18/24-SP650_032719_BIX				SAMPLE	3	1909152001-A	E6850Q41.3	5480	4/24/2019	4/11/2019	4/10/2019
6	647200	LH18/24-SP650...(1909152001MS)				MS	3		E6850Q413Q	5311		4/11/2019	4/10/2019
7	647201	LH18/24-SP65...(1909152001MSD)				MSD	3		E6850Q413Q	5311		4/11/2019	4/10/2019
8	1909153001	LH18-24-SP140_032719				SAMPLE	3	1909153001-A	E6850Q41.3	5480	4/24/2019	4/11/2019	4/10/2019
9	1909154001	LH18/24-SP650_032719_BIX				SAMPLE	3	1909154001-A	E6850Q41.3	5480	4/24/2019	4/11/2019	4/10/2019
10	1909947001	LH18/25-SP650_040419_BIX				SAMPLE	3	1909947001-A	E6850Q41.3	5480	5/2/2019	4/18/2019	4/10/2019
11	1909949001	HBW7_040119				SAMPLE	3	1909949001-A	E6850Q41.3	5480	5/1/2019	4/18/2019	4/10/2019
12	1909949002	HBW7_040119-a				SAMPLE	3	1909949002-A	E6850Q41.3	5480	5/1/2019	4/18/2019	4/10/2019
13	1909949003	HBW10_040119				SAMPLE	3	1909949003-A	E6850Q41.3	5480	5/1/2019	4/18/2019	4/10/2019
14	1909949004	HBW1_040119				SAMPLE	3	1909949004-A	E6850Q41.3	5480	5/1/2019	4/18/2019	4/10/2019
15	1909949005	GPW1_040119				SAMPLE	3	1909949005-A	E6850Q41.3	5480	5/1/2019	4/18/2019	4/10/2019
16	1909949006	GPW3_040119				SAMPLE	3	1909949006-A	E6850Q41.3	5480	5/1/2019	4/18/2019	4/10/2019
17	647196	RLVS for HBN 236356 [ELMS/2233				RLVS	3		E685041C3Q	5311		4/11/2019	4/10/2019
18	647202	CCV for HBN 236356 [ELMS/2233]				CCV	3		E685041C3Q	5311		4/11/2019	4/10/2019

00937489

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1909152 (001); 1909153 (001); 1909154 (001); 1909947 (001); 1909949 (001-06) ELMS Batch/HBN ID: 2233 (236356)
Prep Date: 04/09/2019 Analysis Date: 04/10/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\28MAR19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by TNB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 6 Injection Volume: 30µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 41830 was used for LCS 647199; Target = 4.0µg/L. ASTM type II water was used for LMB 647198.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1909152001 (Client ID's: LH18/24-SP650_032719_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field sample 1909153001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD – 647200/01 failed QC acceptance criteria for percent recoveries, biased high. This is due to the fact that the unspiked sample result of 2.574µg/L was not subtracted from the MS/MSD results. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\APR\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\236356-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 647196) is reported from the analysis of the Laboratory Control Sample (LCS – 647199) at a level 4.0µg/L.
6) Due to limitations of the Chemstation Software, many of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2233 HBN: 236356 Sample Set IDs if Applicable: 1909152/1909153/1909154 1909147 / 1909149	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description - 6850 QC WKG STD 100ug/L

Standard: 41831
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
41830	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/09/2019

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 41830
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — Description: 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L
Standard: 43730	Created By: Thomas Bosch	Amount: 25 mL
MFG: ALS/SLC	Create Date: 09/20/2018 09:09AM	Expires: 09/20/2019
MFG Lot: TNB: 05/09/2018	Verified By: Thomas Bosch	Usable: Yes
Pipette ID: Not Provided	Verify Date:	Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK	Description - Perchlorate ISTD Stock

Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Number: ICC-013
Lot Number: CP-0860

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Number: ICC-013
Lot Number: CP-0860

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

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Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

USstandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

Cambridge Isotope Laboratories, Inc. Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number . Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Report: C:\HPCHEM\1\DATA\10APR19D\10APR19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	647195 CCV@25	Vial 71	1	Control	1	1.06336e6	8.907	21.31933
#*	647199 QC@4.0	Vial 72	1	Control	2	1.97600e5	9.094	3.67714
#*	647197 ICS@4.0	Vial 73	1	Control	3	1.49399e5	8.651	3.21517
#*	647198 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1909152001	Vial 75	1	Sample	5	9.15156e4	8.529	2.57433
#*	647200 91521MS	Vial 76	1	Sample	6	2.25049e5	8.454	6.17769
#*	647201 91521SD	Vial 77	1	Sample	7	2.49579e5	8.497	6.36091
#*	1909153001 1K	Vial 78	1	Sample	8	3.70174e5	9.061	6532.86203
#*	1909154001	Vial 79	1	Sample	9	7.79123e4	8.495	2.34023
#*	1909947001	Vial 80	1	Sample	10	0.00000	0.000	0.00000
#*	1909949001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1909949002	Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1909949003	Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	1909949004	Vial 84	1	Sample	14	0.00000	0.000	0.00000
#*	1909949005	Vial 85	1	Sample	15	0.00000	0.000	0.00000
#*	1909949006	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	647202 CCV@25	Vial 71	1	Control	17	1.08007e6	8.867	22.59518

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	647195 CCV@25	Vial 71	1	Control	1	3.43635e5	8.922	23.09461
#*	647199 QC@4.0	Vial 72	1	Control	2	7.01681e4	9.105	4.22460
#*	647197 ICS@4.0	Vial 73	1	Control	3	5.45965e4	8.666	3.77625
#*	647198 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1909152001	Vial 75	1	Sample	5	3.18275e4	8.549	2.84107
#*	647200 91521MS	Vial 76	1	Sample	6	7.61114e4	8.479	6.88356
#*	647201 91521SD	Vial 77	1	Sample	7	8.42686e4	8.512	7.08137
#*	1909153001 1K	Vial 78	1	Sample	8	1.21054e5	9.077	7051.77497
#*	1909154001	Vial 79	1	Sample	9	2.76117e4	8.519	2.61418
#*	1909947001	Vial 80	1	Sample	10	0.00000	0.000	0.00000
#*	1909949001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
#*	1909949002	Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1909949003	Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	1909949004	Vial 84	1	Sample	14	0.00000	0.000	0.00000
#*	1909949005	Vial 85	1	Sample	15	0.00000	0.000	0.00000
#*	1909949006	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	647202 CCV@25	Vial 71	1	Control	17	3.36319e5	8.885	23.63294

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	647195 CCV@25	Vial 71	1	Control	1	1.53120e5	8.927	5.00000
#*	647199 QC@4.0	Vial 72	1	Control	2	1.77838e5	9.122	5.00000
#*	647197 ICS@4.0	Vial 73	1	Control	3	1.54931e5	8.667	5.00000
#*	647198 LMB	Vial 74	1	Control	4	1.76915e5	8.988	5.00000
#*	1909152001	Vial 75	1	Sample	5	1.20240e5	8.559	5.00000
#*	647200 91521MS	Vial 76	1	Sample	6	1.17757e5	8.476	5.00000
#*	647201 91521SD	Vial 77	1	Sample	7	1.26683e5	8.527	5.00000
#*	1909153001 1K	Vial 78	1	Sample	8	1.82758e5	9.082	5000.00000
#*	1909154001	Vial 79	1	Sample	9	1.13404e5	8.524	5.00000
#*	1909947001	Vial 80	1	Sample	10	1.15130e5	8.458	5.00000
#*	1909949001	Vial 81	1	Sample	11	1.14791e5	8.694	5.00000
#*	1909949002	Vial 82	1	Sample	12	1.24046e5	8.693	5.00000
#*	1909949003	Vial 83	1	Sample	13	1.23373e5	8.718	5.00000
#*	1909949004	Vial 84	1	Sample	14	1.20241e5	8.690	5.00000
#*	1909949005	Vial 85	1	Sample	15	1.27767e5	8.755	5.00000
#*	1909949006	Vial 86	1	Sample	16	1.23965e5	8.816	5.00000
*	647202 CCV@25	Vial 71	1	Control	17	1.46281e5	8.890	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

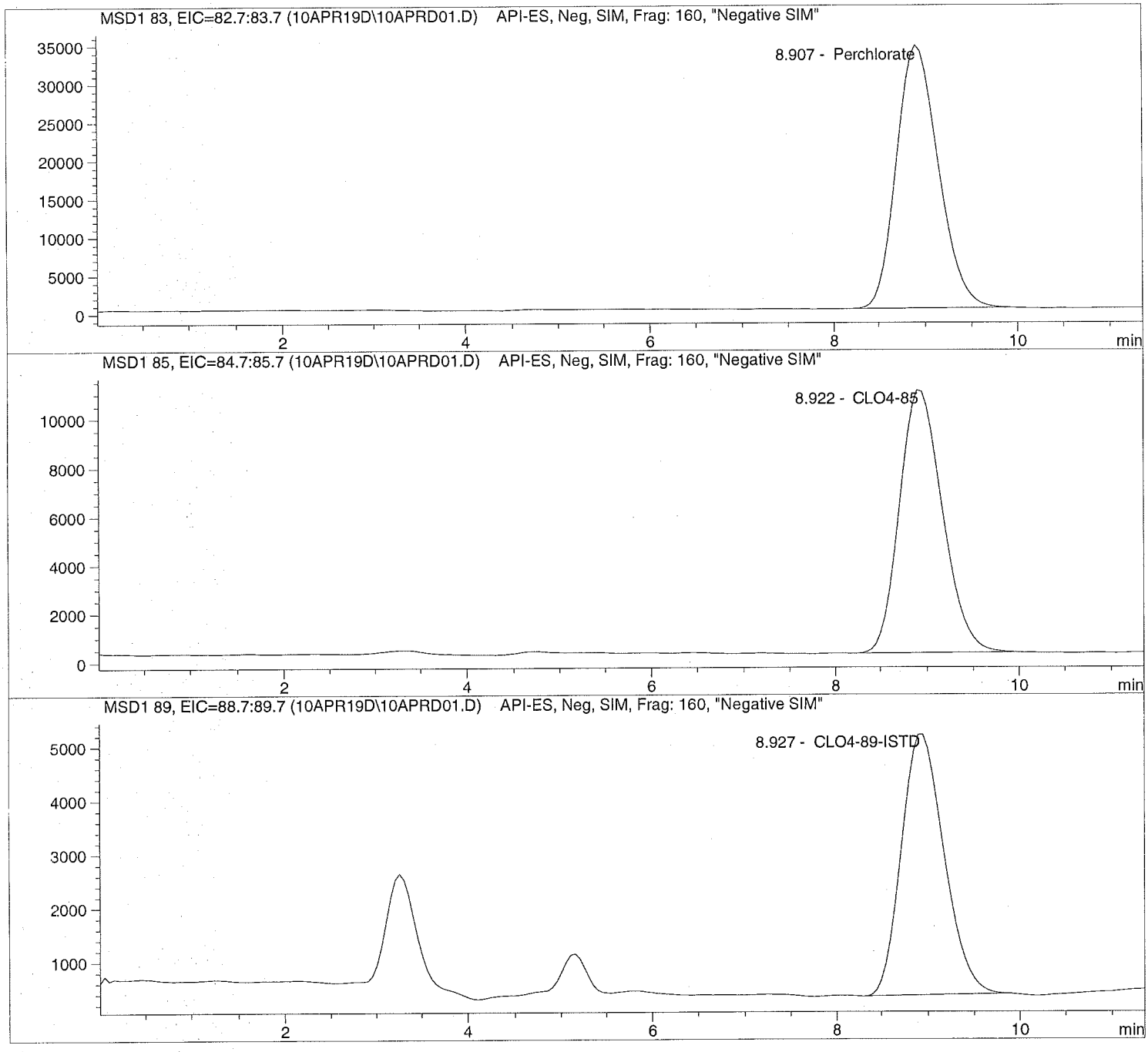
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	647195 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	647199 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	647197 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	647198 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1909152001	CLO4-AQN	1	Sample		
6	Vial 76	647200 91521MS	CLO4-AQN	1	Sample		
7	Vial 77	647201 91521SD	CLO4-AQN	1	Sample		
8	Vial 78	1909153001 1K	CLO4-AQN	1	Sample		
9	Vial 79	1909154001	CLO4-AQN	1	Sample		
10	Vial 80	1909947001	CLO4-AQN	1	Sample		
11	Vial 81	1909949001	CLO4-AQN	1	Sample		
12	Vial 82	1909949002	CLO4-AQN	1	Sample		
13	Vial 83	1909949003	CLO4-AQN	1	Sample		
14	Vial 84	1909949004	CLO4-AQN	1	Sample		
15	Vial 85	1909949005	CLO4-AQN	1	Sample		
16	Vial 86	1909949006	CLO4-AQN	1	Sample		
17	Vial 71	647202 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD01.D Sample Name: 647195 CCV@25

Injection Date:	4/10/2019 10:01:38	Seq Line:	1
Sample Name:	647195 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD01.D Sample Name: 647195 CCV@25

Injection Date:	4/10/2019 10:01:38	Seq Line:	1
Sample Name:	647195 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.907	PBA	1063358.2	21.3193	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.922	PBA	343635.4	23.0946	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.927	PBA	153120.0	5.0000	CLO4-89-ISTD

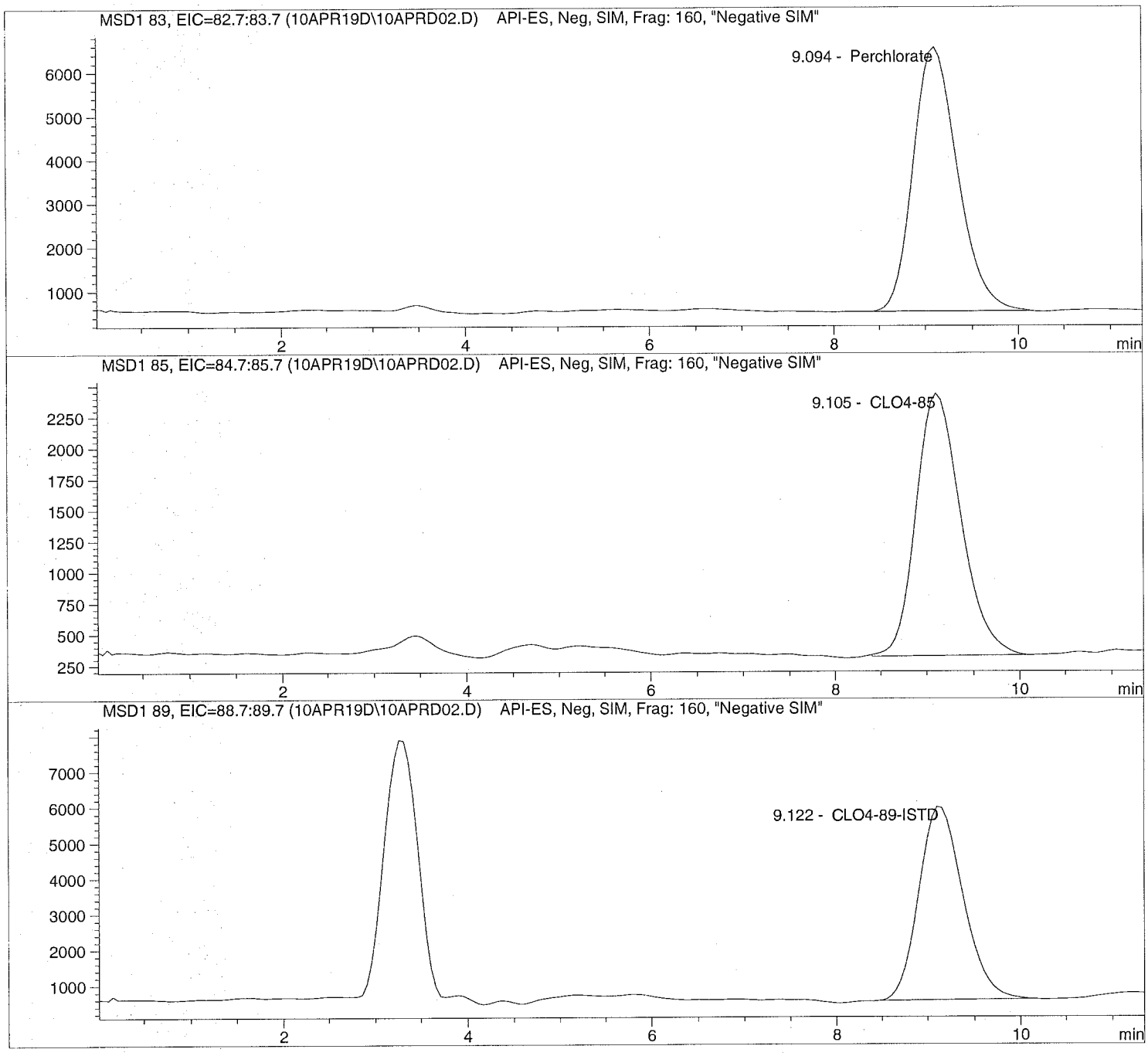
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD02.D Sample Name: 647199 QC@4.0

Injection Date:	4/10/2019 10:15:40	Seq Line:	2
Sample Name:	647199 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD02.D Sample Name: 647199 QC@4.0

Injection Date:	4/10/2019 10:15:40	Seq Line:	2
Sample Name:	647199 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.094	BBA	197600.1	3.6771	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.105	BBA	70168.1	4.2246	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.122	BBA	177837.9	5.0000	CLO4-89-ISTD

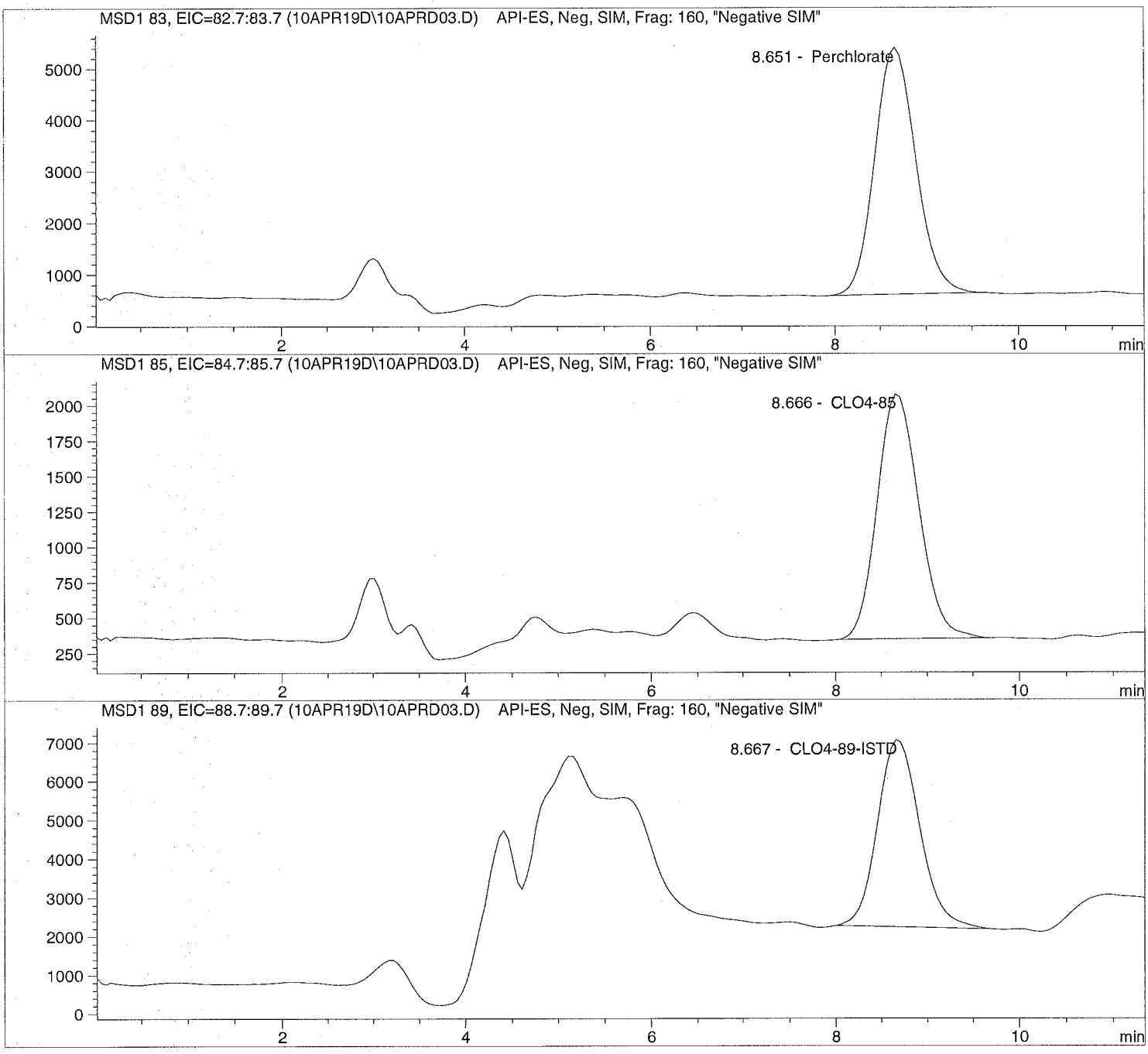
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD03.D Sample Name: 647197 ICS@4.0

Injection Date:	4/10/2019 10:28:57	Seq Line:	3
Sample Name:	647197 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Injection Date:	4/10/2019 10:28:57	Seq Line:	3
Sample Name:	647197 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.651	PBA	149398.5	3.2152	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.666	BBA	54596.5	3.7763	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.667	PBA	154930.6	5.0000	CLO4-89-ISTD

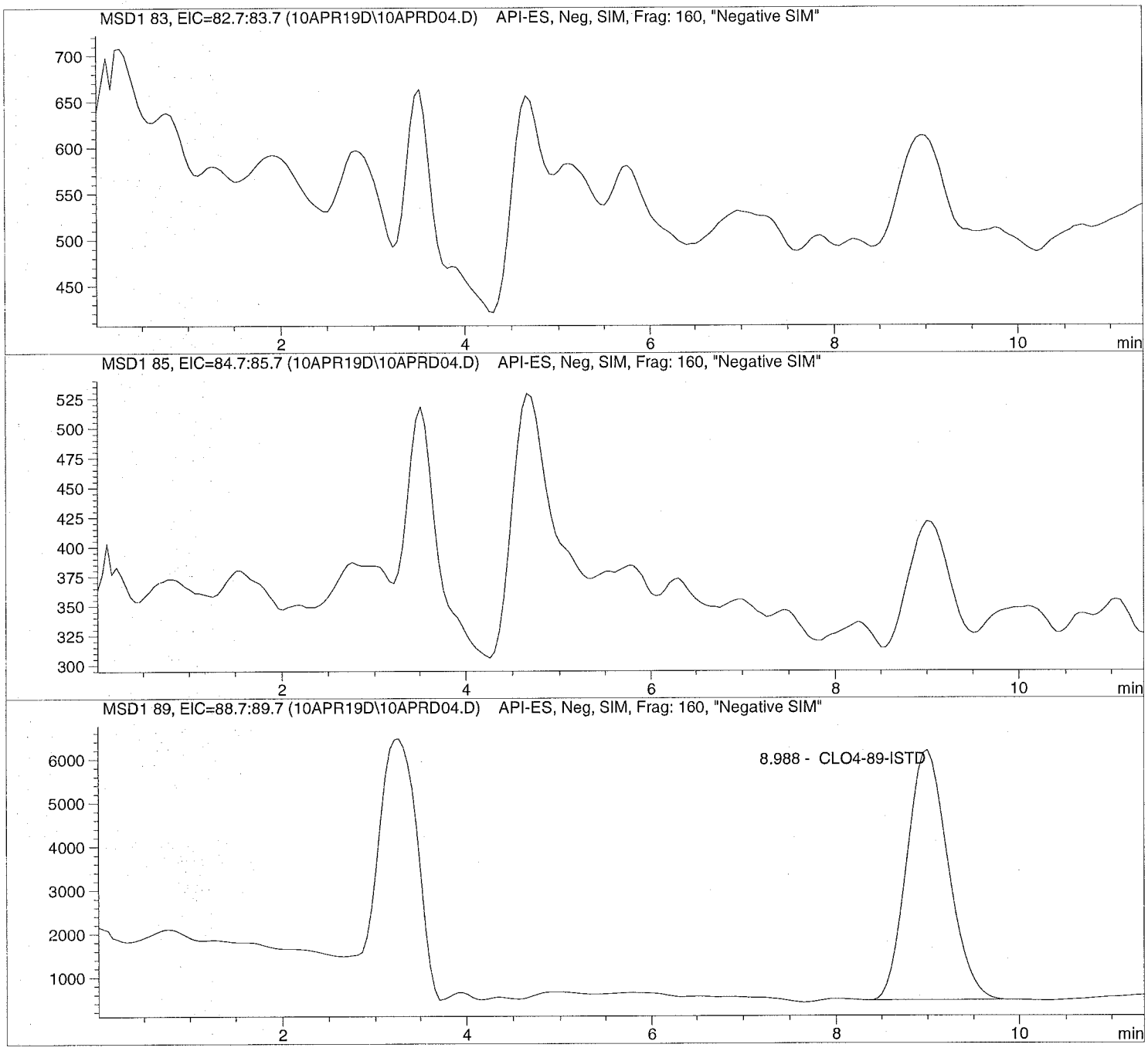
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD04.D Sample Name: 647198 LMB

Injection Date:	4/10/2019 10:42:16	Seq Line:	4
Sample Name:	647198 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD04.D Sample Name: 647198 LMB

Injection Date:	4/10/2019 10:42:16	Seq Line:	4
Sample Name:	647198 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.988	PBA	176915.0	5.0000	CLO4-89-ISTD

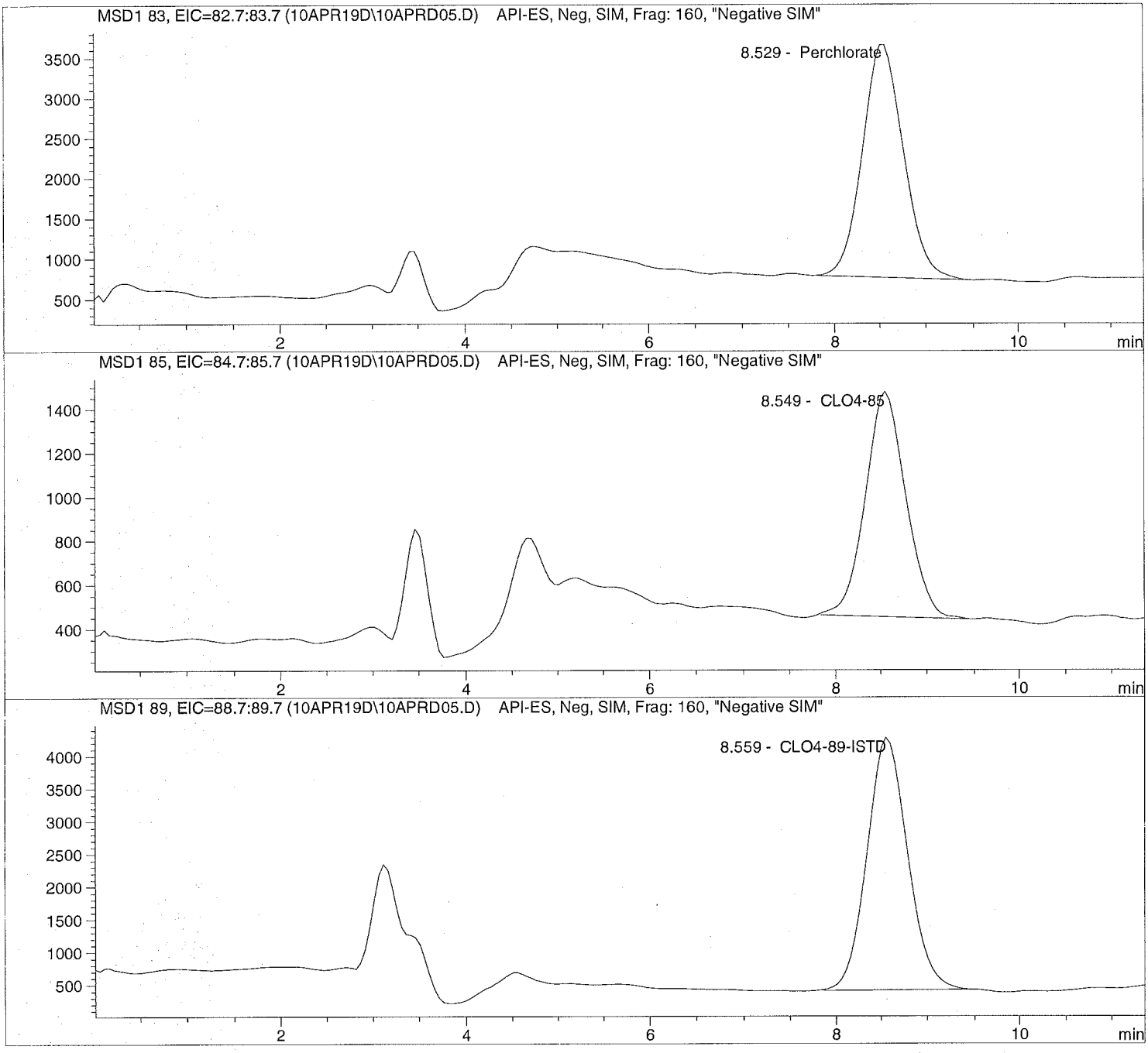
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD05.D Sample Name: 1909152001

Injection Date:	4/10/2019 10:55:33	Seq Line:	5
Sample Name:	1909152001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD05.D Sample Name: 1909152001

Injection Date:	4/10/2019 10:55:33	Seq Line:	5
Sample Name:	1909152001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.529	BBA	91515.6	2.5743	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.549	BBA	31827.5	2.8411	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.559	BBA	120239.7	5.0000	CLO4-89-ISTD

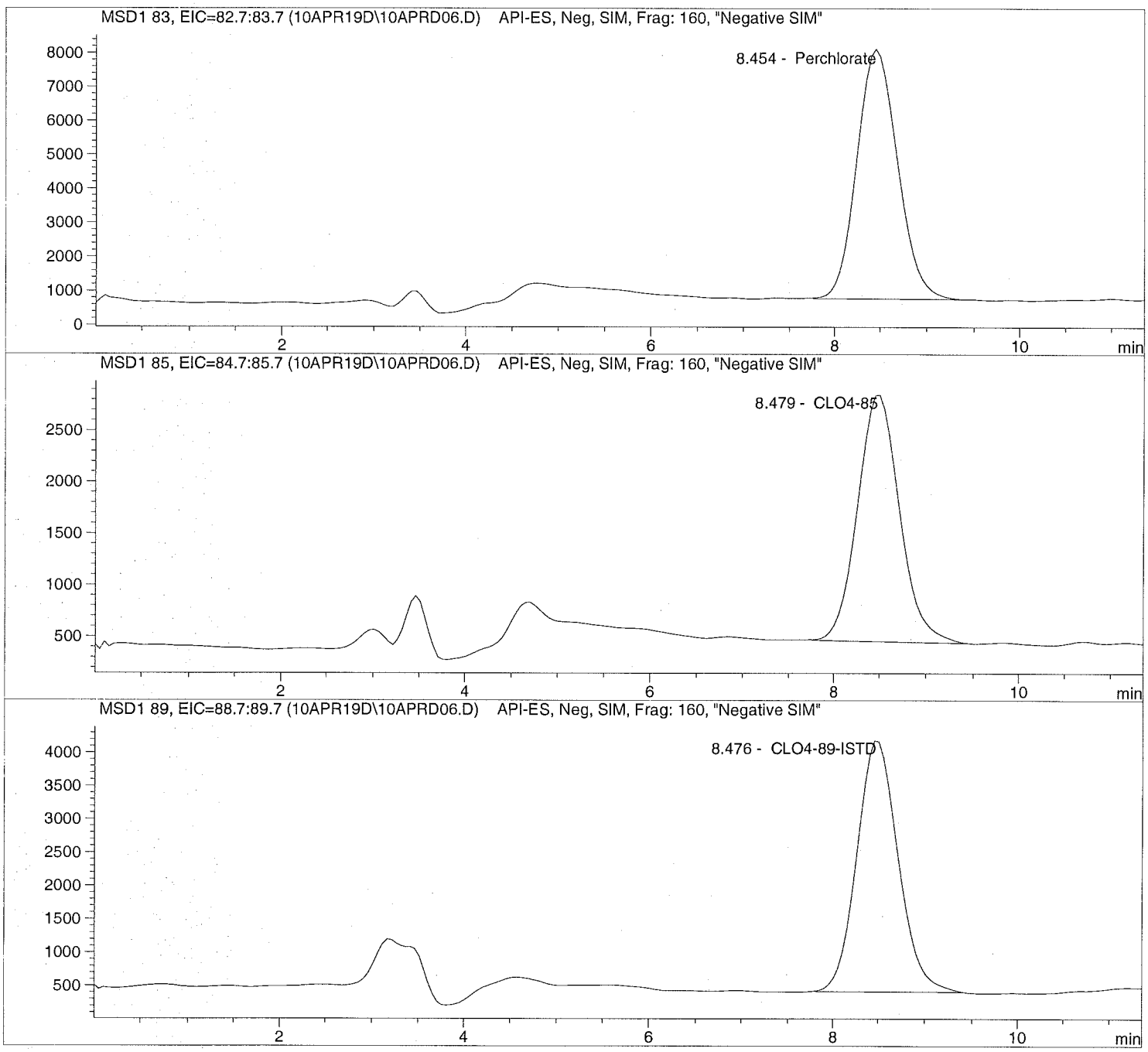
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD06.D Sample Name: 647200 91521MS

Injection Date:	4/10/2019 11:08:49	Seq Line:	6
Sample Name:	647200 91521MS	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD06.D Sample Name: 647200 91521MS

Injection Date:	4/10/2019 11:08:49	Seq Line:	6
Sample Name:	647200 91521MS	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.454	BBA	225049.5	6.1777	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.479	BBA	76111.4	6.8836	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

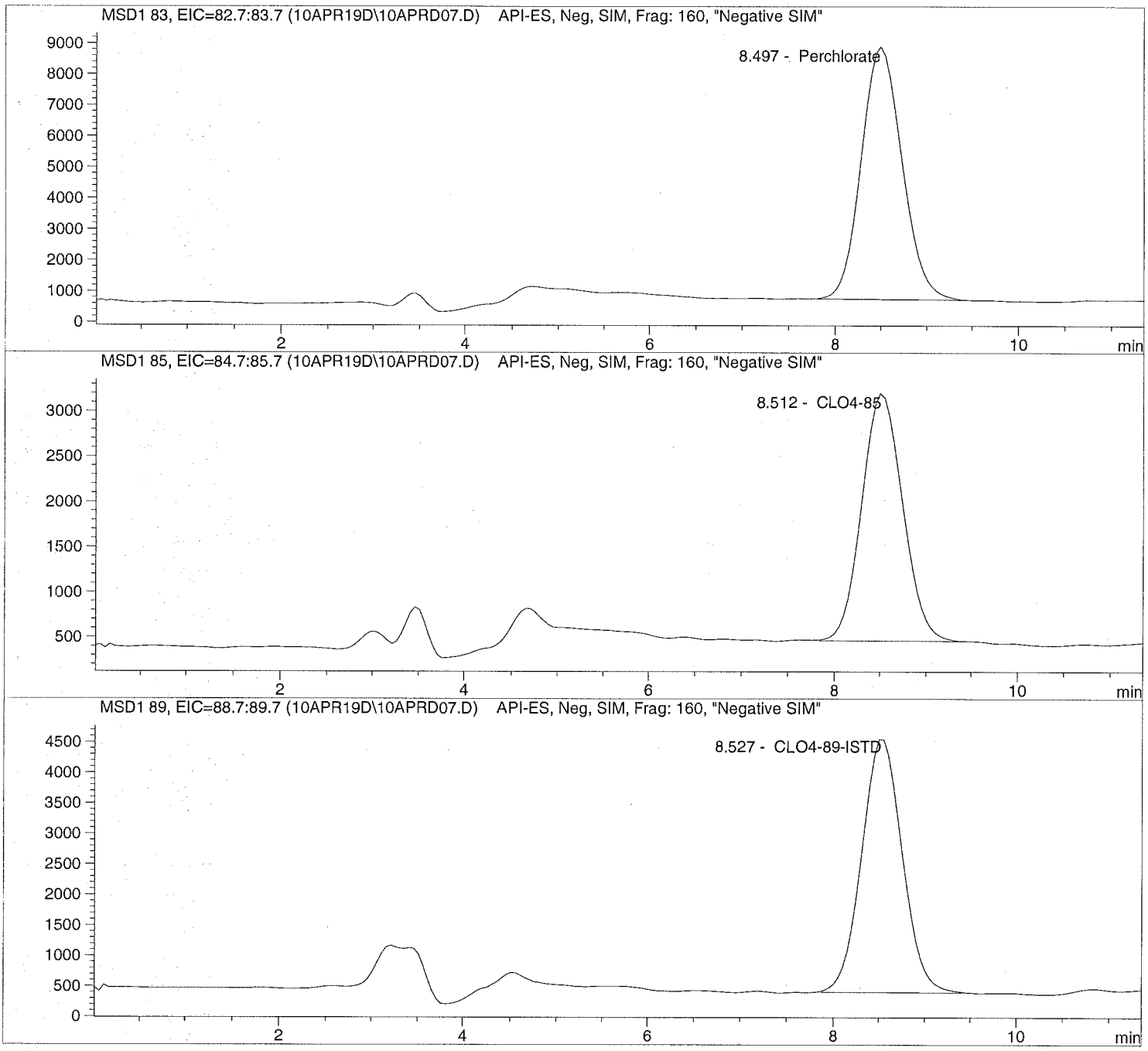
RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.476	BBA	117756.7	5.0000	CLO4-89-ISTD

*** End of Report ***

Injection Date:	4/10/2019 11:22:09	Seq Line:	7
Sample Name:	647201 91521SD	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Injection Date:	4/10/2019 11:22:09	Seq Line:	7
Sample Name:	647201 91521SD	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.497	BBA	249579.0	6.3609	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.512	BBA	84268.6	7.0814	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.527	BBA	126683.1	5.0000	CLO4-89-ISTD

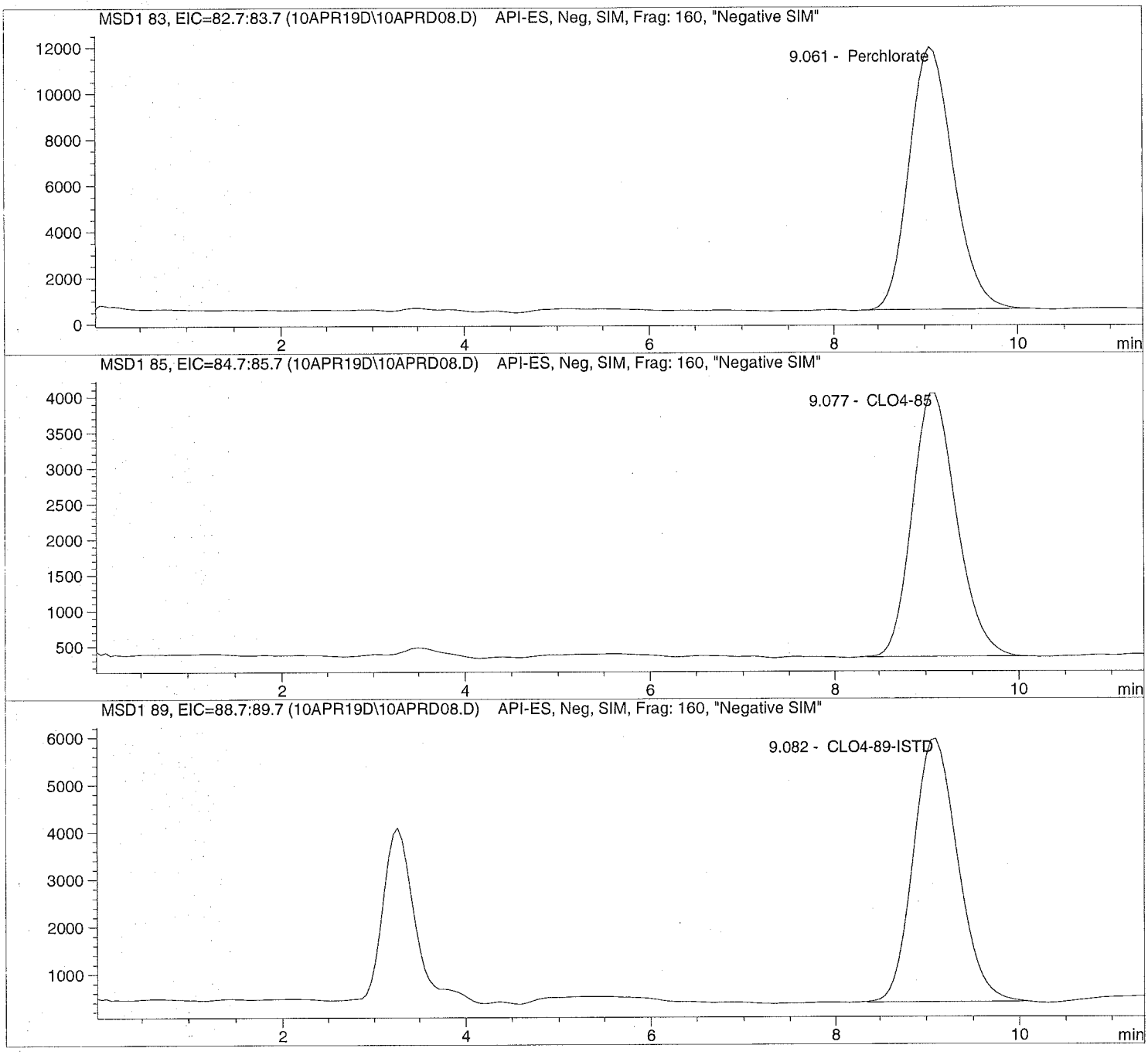
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD08.D Sample Name: 1909153001 1K

Injection Date:	4/10/2019 11:35:27	Seq Line:	8
Sample Name:	1909153001 1K	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD08.D Sample Name: 1909153001 1K

Injection Date:	4/10/2019 11:35:27	Seq Line:	8
Sample Name:	1909153001 1K	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.061	PBA	370174.3	6532.8620	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.077	BBA	121053.5	7051.7750	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.082	BBA	182757.9	5000.0000	CLO4-89-ISTD

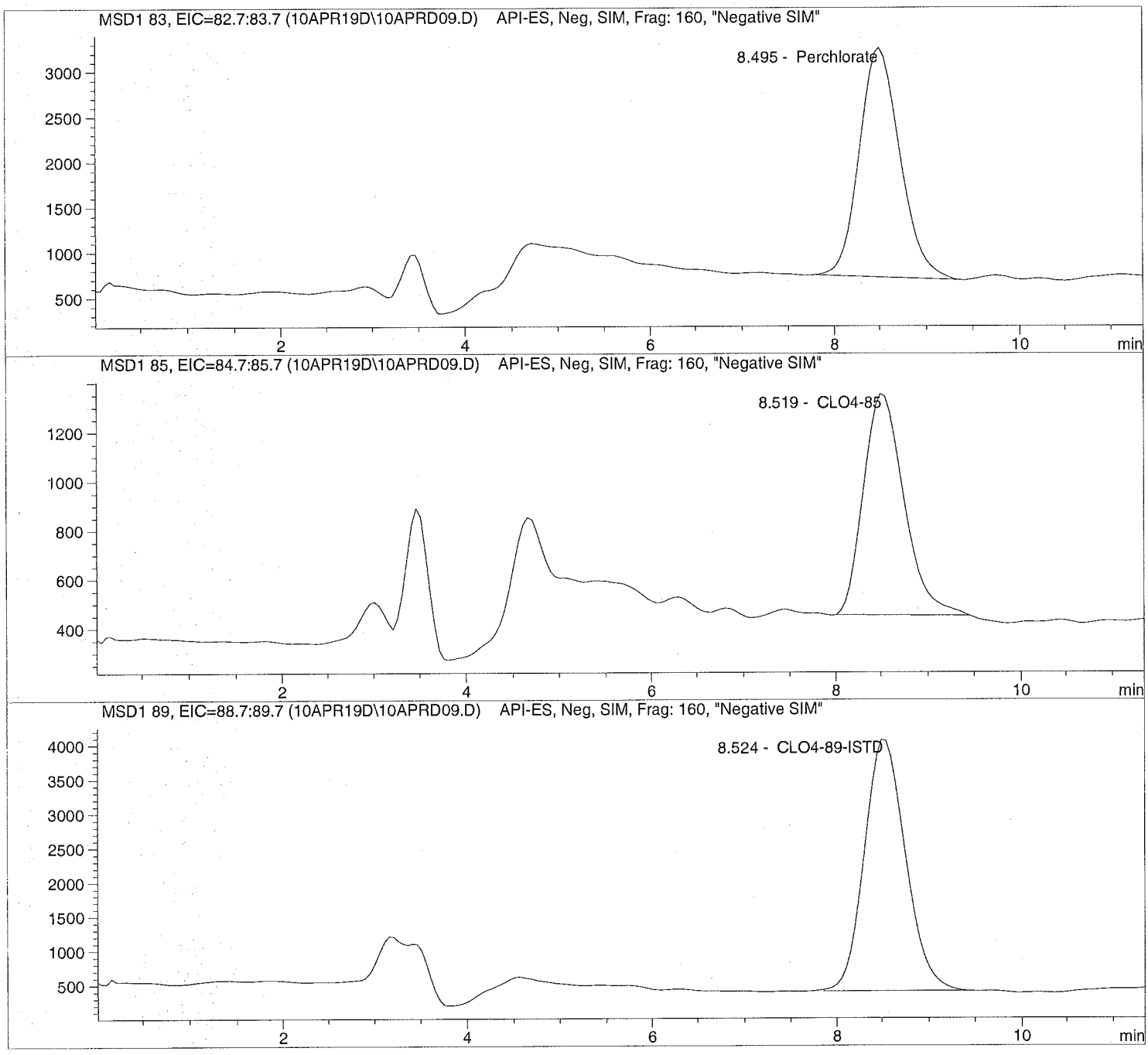
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD09.D Sample Name: 1909154001

Injection Date:	4/10/2019 11:48:52	Seq Line:	9
Sample Name:	1909154001	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD09.D Sample Name: 1909154001

Injection Date:	4/10/2019 11:48:52	Seq Line:	9
Sample Name:	1909154001	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.495	PBA	77912.3	2.3402	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.519	PBA	27611.7	2.6142	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.524	BBA	113404.4	5.0000	CLO4-89-ISTD

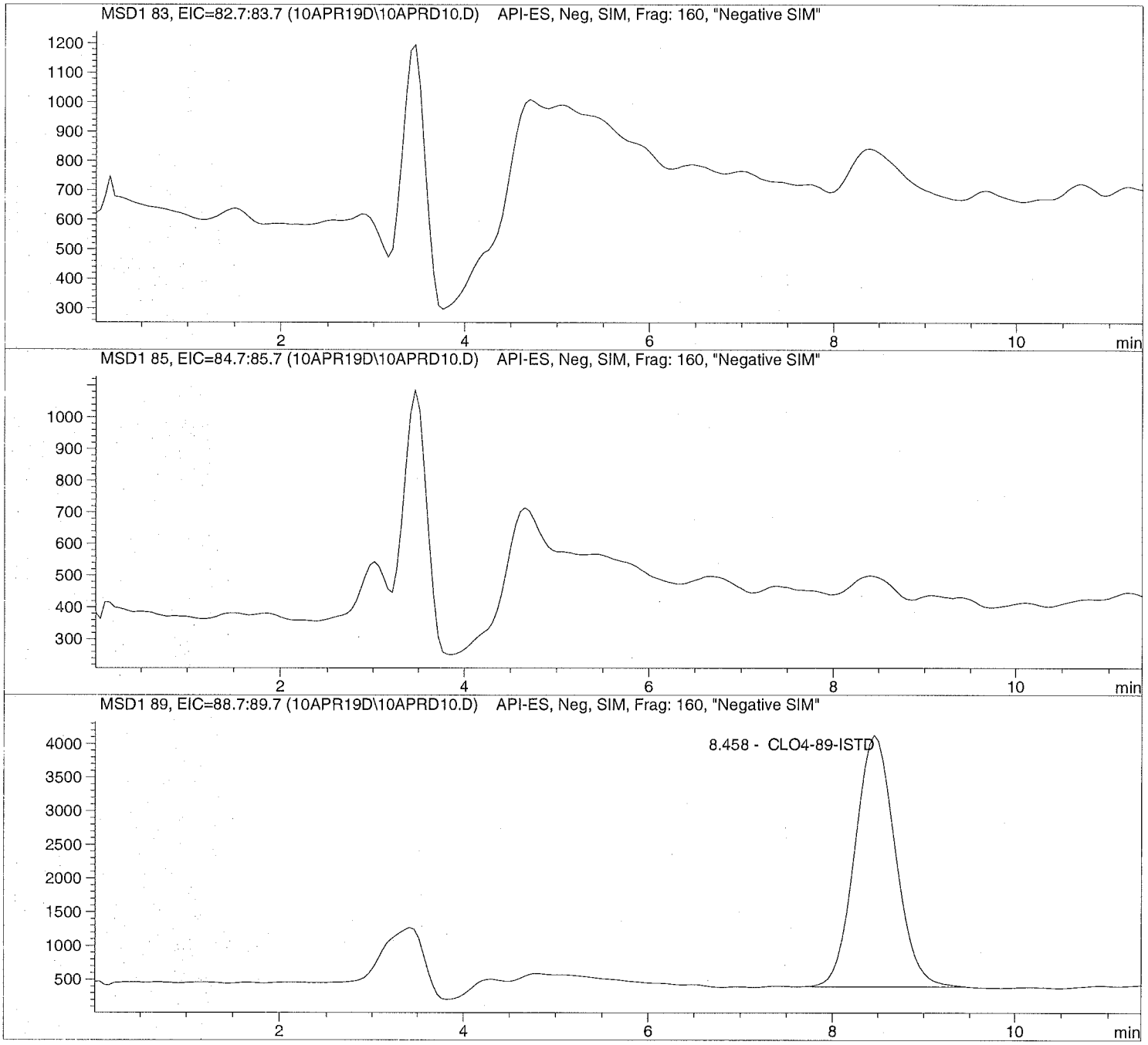
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD10.D Sample Name: 1909947001

Injection Date:	4/10/2019 12:02:10	Seq Line:	10
Sample Name:	1909947001	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD10.D Sample Name: 1909947001

Injection Date:	4/10/2019 12:02:10	Seq Line:	10
Sample Name:	1909947001	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.458	BBA	115129.6	5.0000	CLO4-89-ISTD

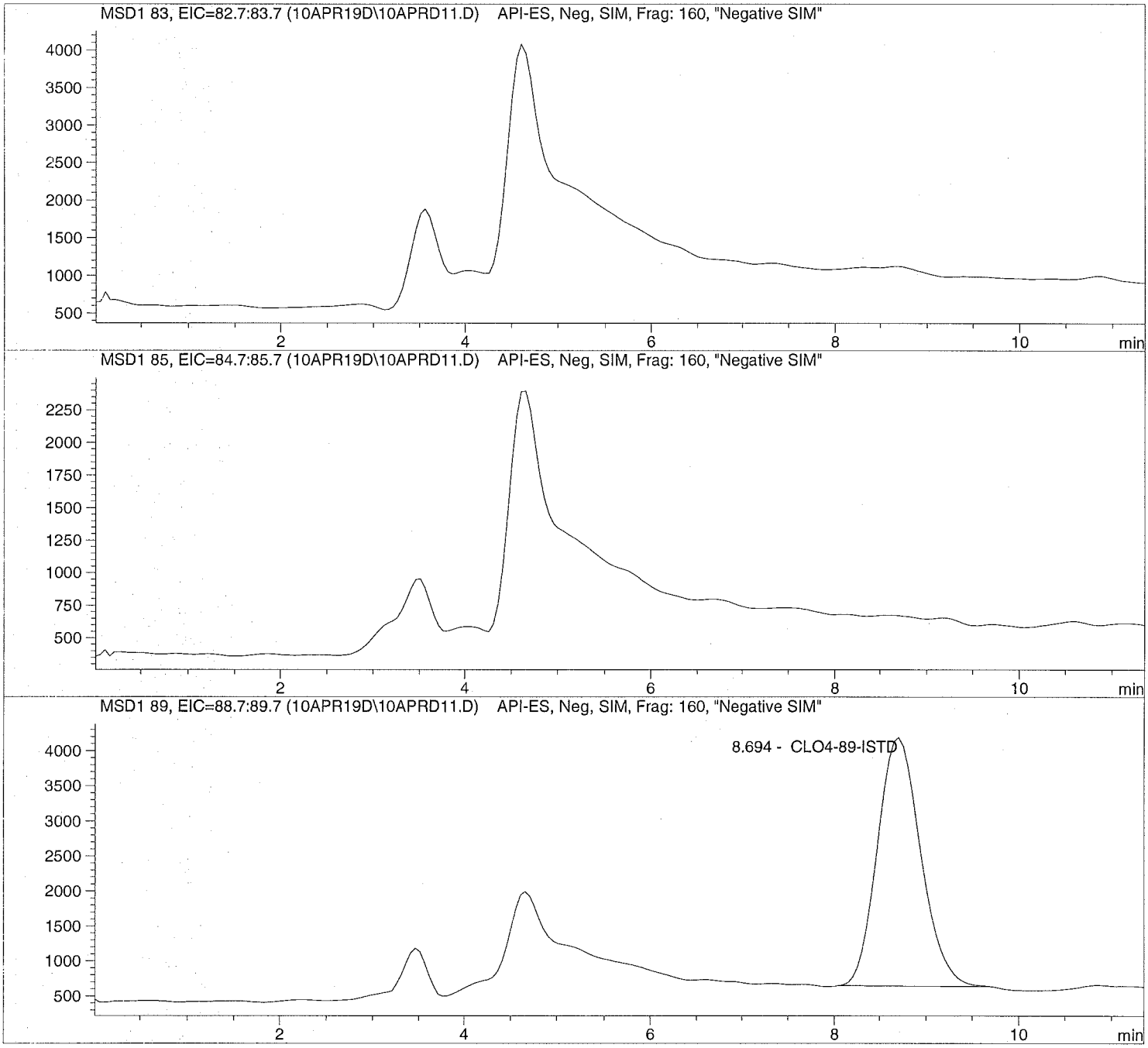
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD11.D Sample Name: 1909949001

Injection Date:	4/10/2019 12:15:27	Seq Line:	11
Sample Name:	1909949001	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD11.D Sample Name: 1909949001

Injection Date:	4/10/2019 12:15:27	Seq Line:	11
Sample Name:	1909949001	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.694	PBA	114791.4	5.0000	CLO4-89-ISTD

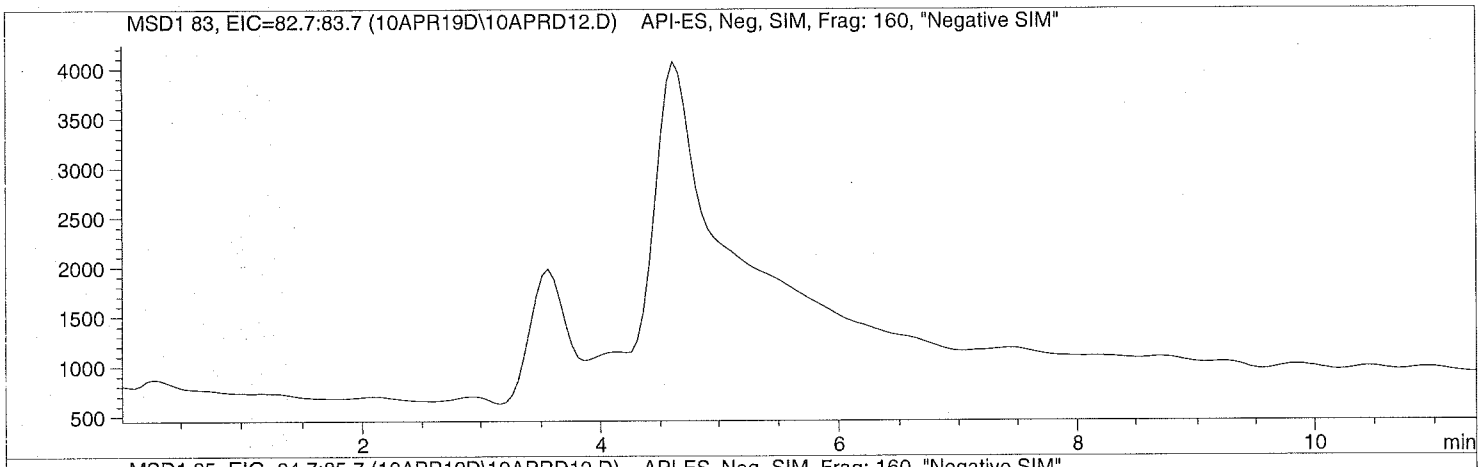
*** End of Report ***

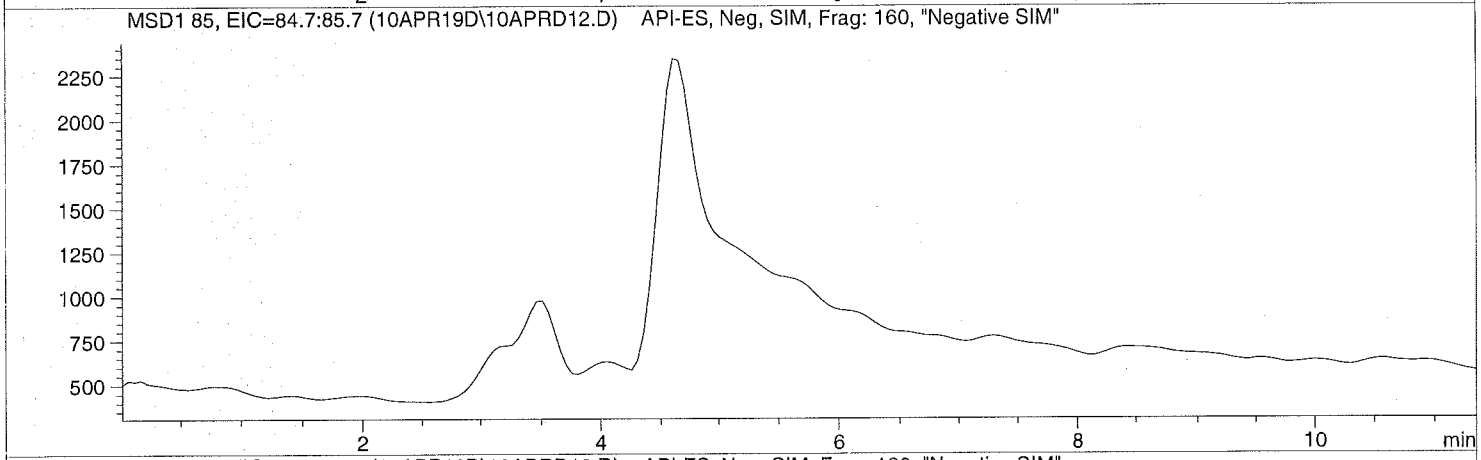
Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD12.D Sample Name: 1909949002

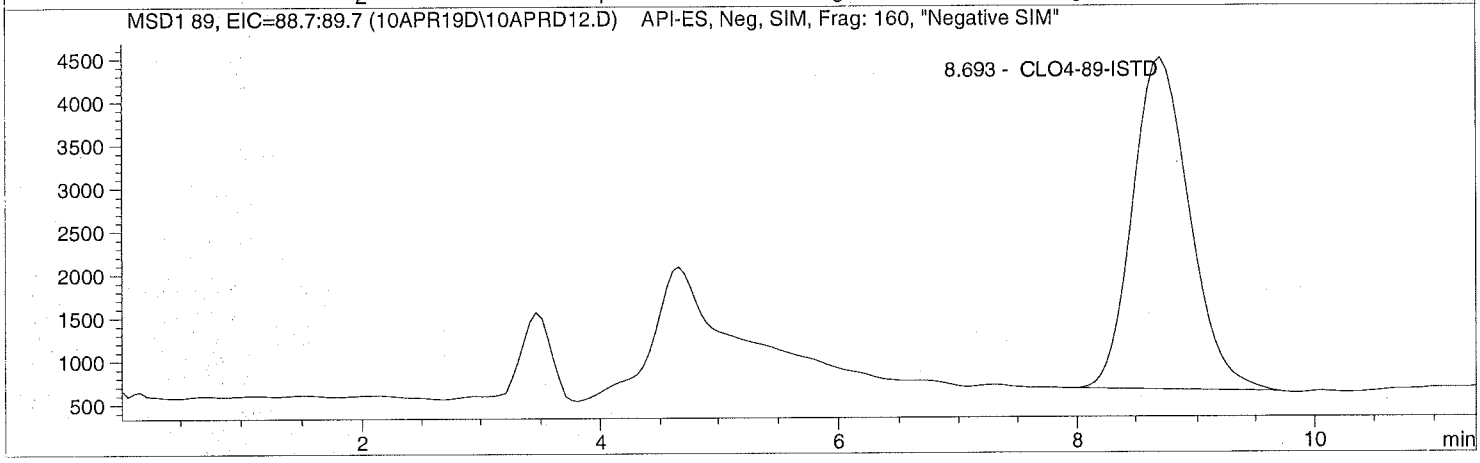
Injection Date:	4/10/2019 12:28:41	Seq Line:	12
Sample Name:	1909949002	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD12.D Sample Name: 1909949002

Injection Date:	4/10/2019 12:28:41	Seq Line:	12
Sample Name:	1909949002	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.693	PBA	124045.6	5.0000	CLO4-89-ISTD

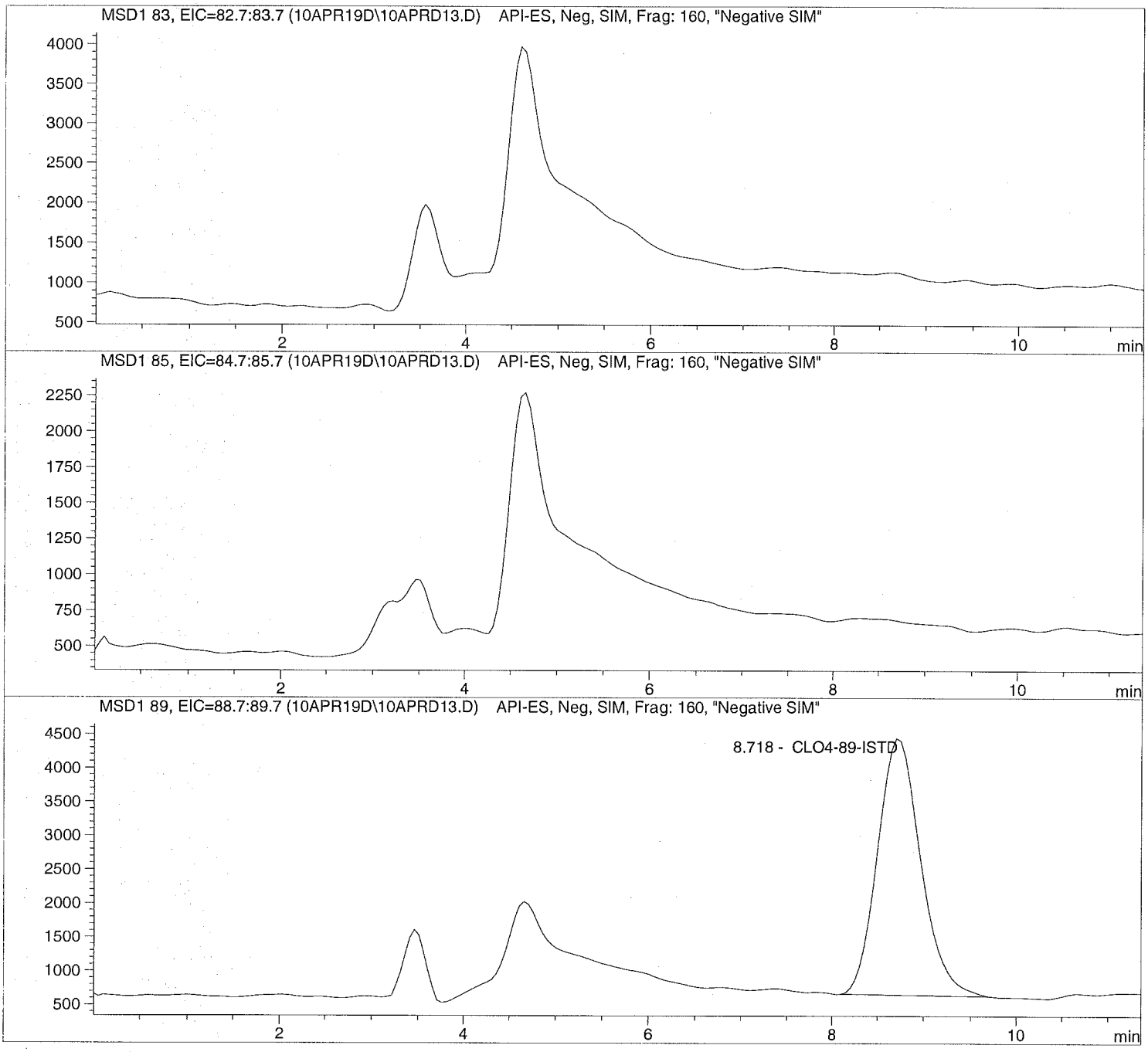
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD13.D Sample Name: 1909949003

Injection Date:	4/10/2019 12:41:59	Seq Line:	13
Sample Name:	1909949003	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD13.D Sample Name: 1909949003

Injection Date:	4/10/2019 12:41:59	Seq Line:	13
Sample Name:	1909949003	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.718	PBA	123373.0	5.0000	CLO4-89-ISTD

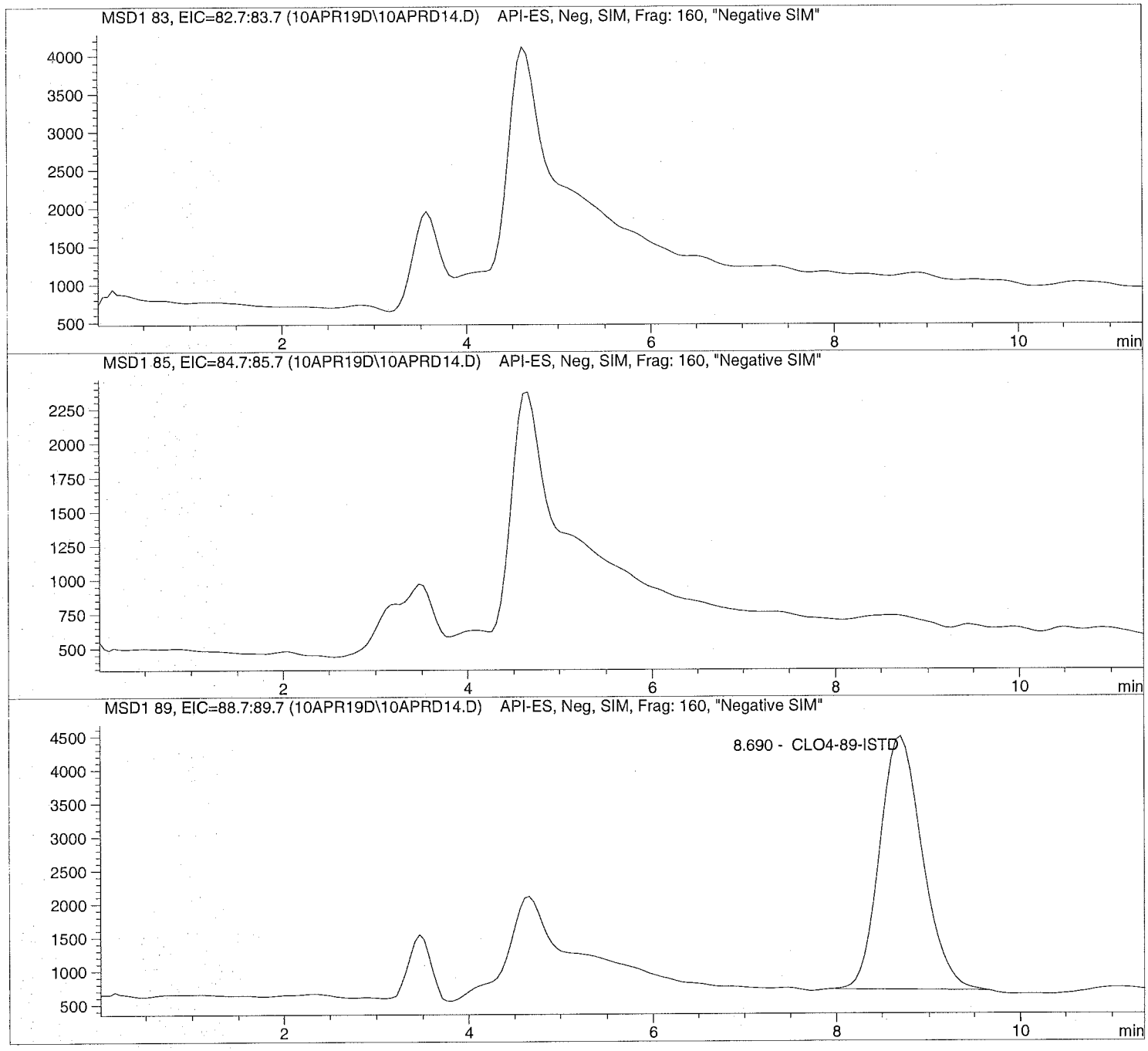
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD14.D Sample Name: 1909949004

Injection Date:	4/10/2019 12:55:15	Seq Line:	14
Sample Name:	1909949004	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD14.D Sample Name: 1909949004

Injection Date:	4/10/2019 12:55:15	Seq Line:	14
Sample Name:	1909949004	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.690	BBA	120241.5	5.0000	CLO4-89-ISTD

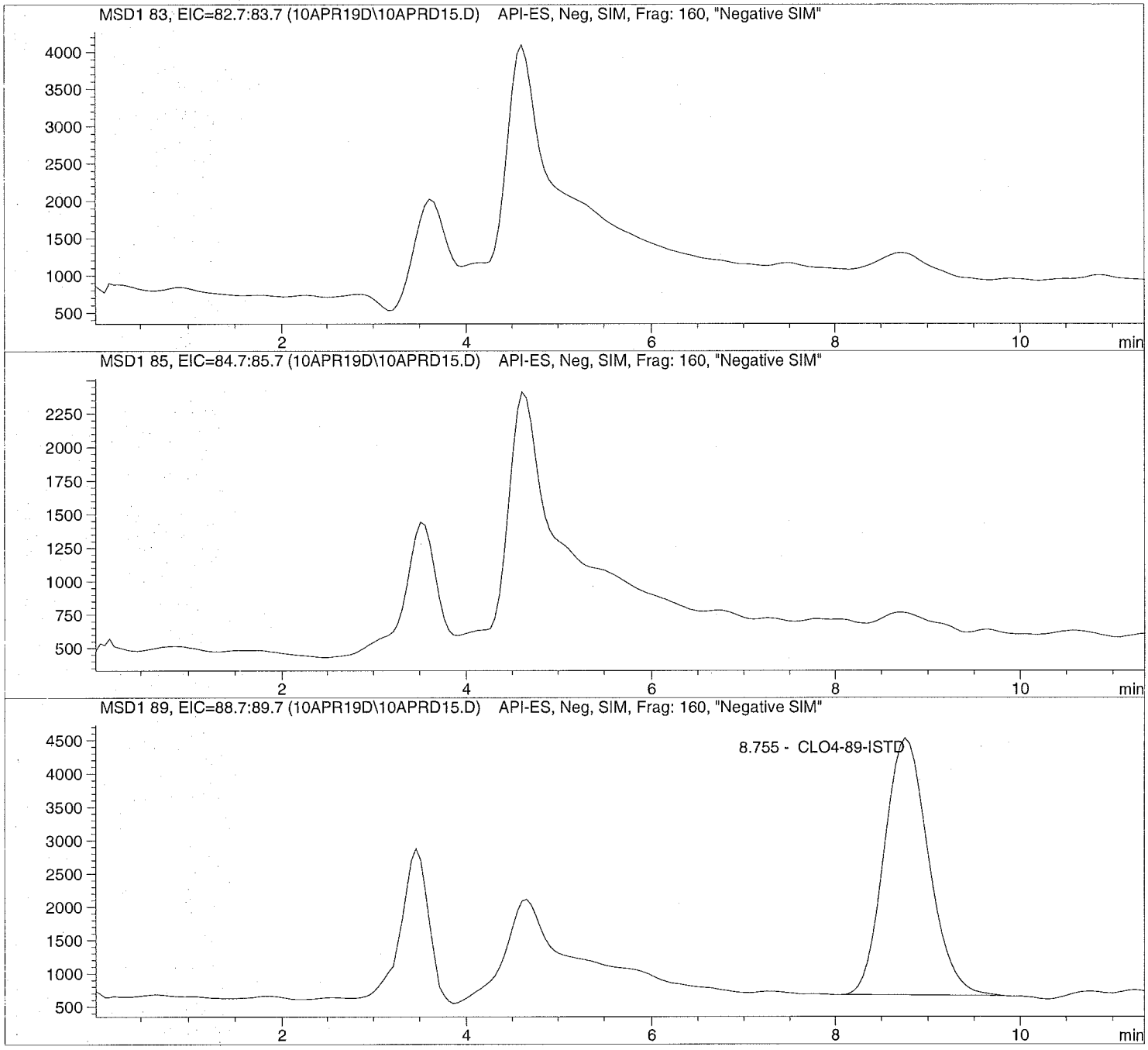
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD15.D Sample Name: 1909949005

Injection Date:	4/10/2019 13:08:30	Seq Line:	15
Sample Name:	1909949005	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD15.D Sample Name: 1909949005

Injection Date:	4/10/2019 13:08:30	Seq Line:	15
Sample Name:	1909949005	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	PBA	127767.0	5.0000	CLO4-89-ISTD

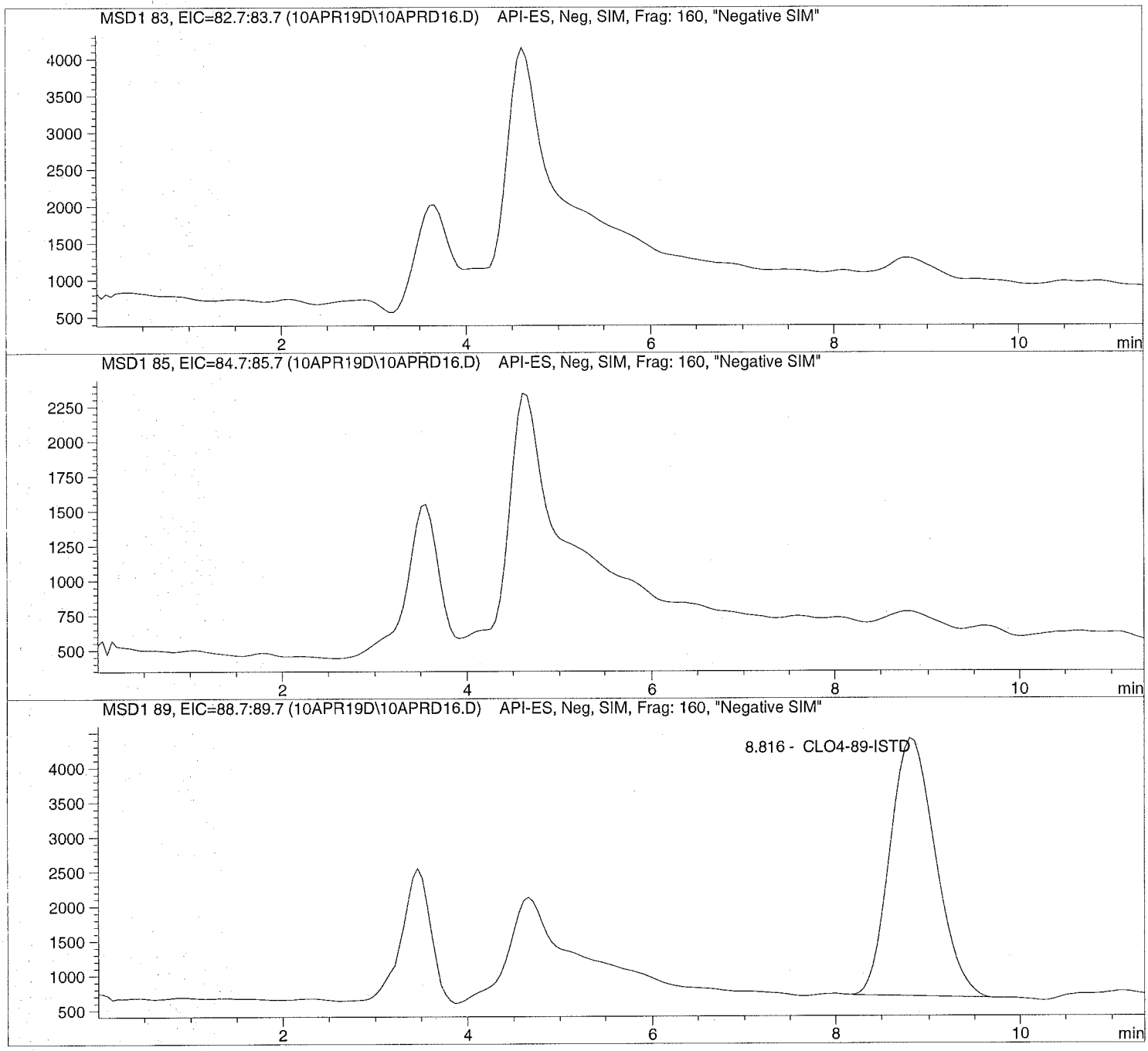
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD16.D Sample Name: 1909949006

Injection Date:	4/10/2019 13:21:46	Seq Line:	16
Sample Name:	1909949006	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD16.D Sample Name: 1909949006

Injection Date:	4/10/2019 13:21:46	Seq Line:	16
Sample Name:	1909949006	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.816	BBA	123964.7	5.0000	CLO4-89-ISTD

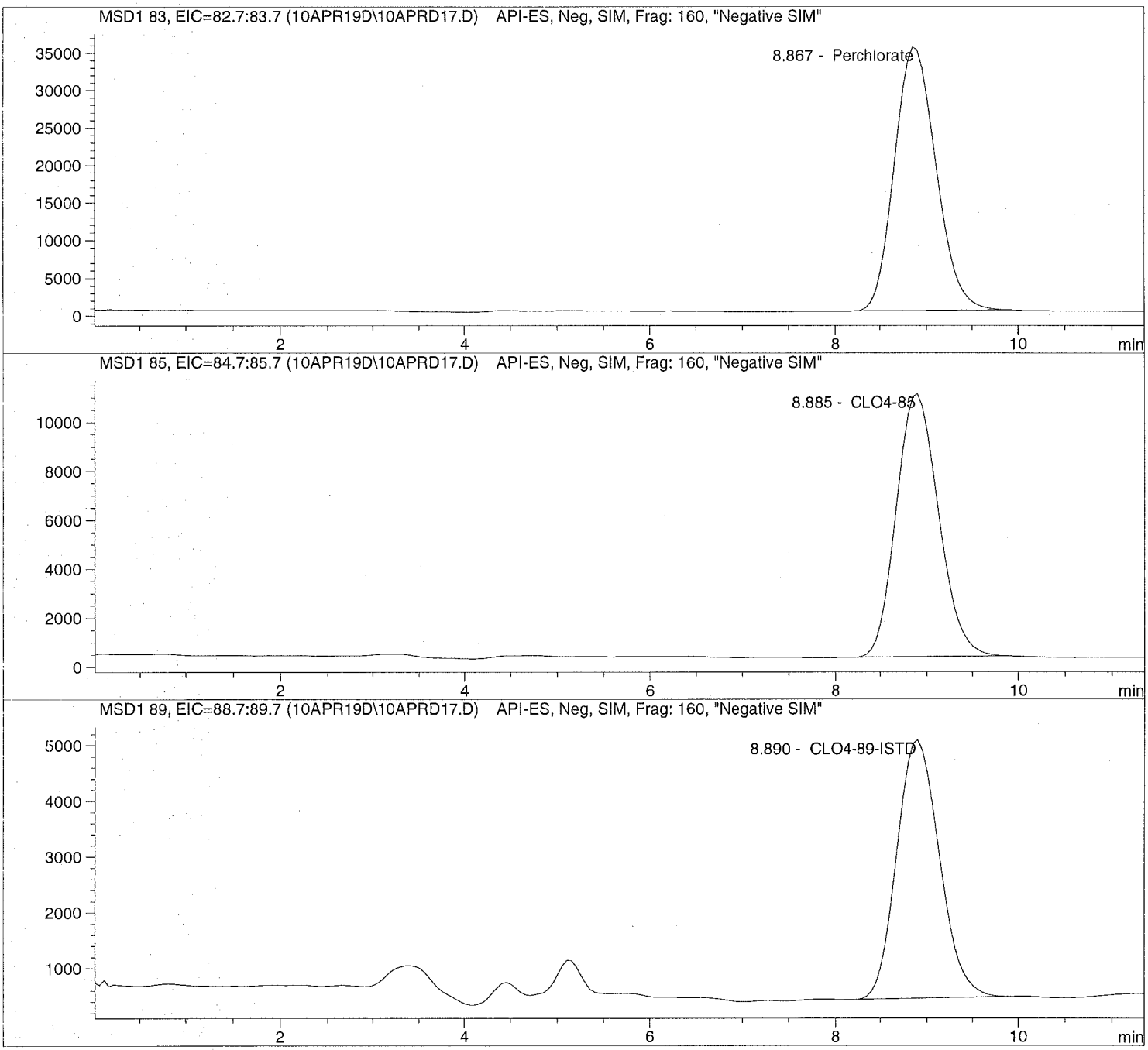
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD17.D Sample Name: 647202 CCV@25

Injection Date:	4/10/2019 13:35:04	Seq Line:	17
Sample Name:	647202 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\10APR19D\10APRD17.D Sample Name: 647202 CCV@25

Injection Date:	4/10/2019 13:35:04	Seq Line:	17
Sample Name:	647202 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:48:09

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.867	PBA	1080071.3	22.5952	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.885	PBA	336319.0	23.6329	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.890	PBA	146280.5	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

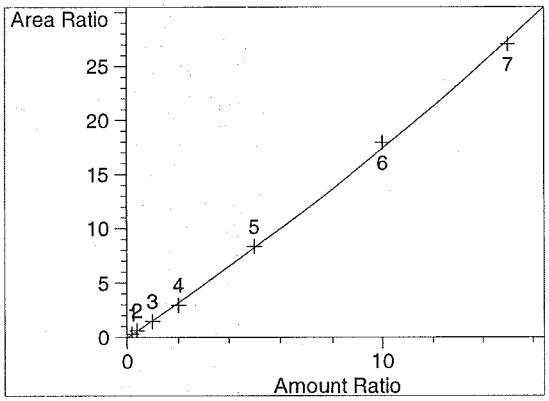
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

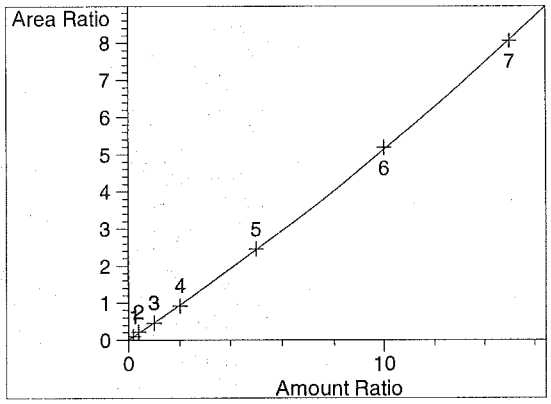
Peak Sum Table

No Entries in table

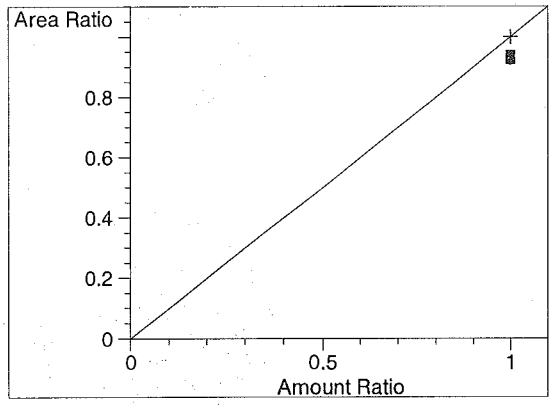
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Report: C:\HPCHEM\1\DATA\19MAR19I\19MAR19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#	*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#	*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#	*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#	*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#	*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#	*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#	*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#	*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#	*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#	*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#	*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#	*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#	*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#	*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#	*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#	*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#	*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#	*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#	*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#	*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#	*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#	*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#	*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#	*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

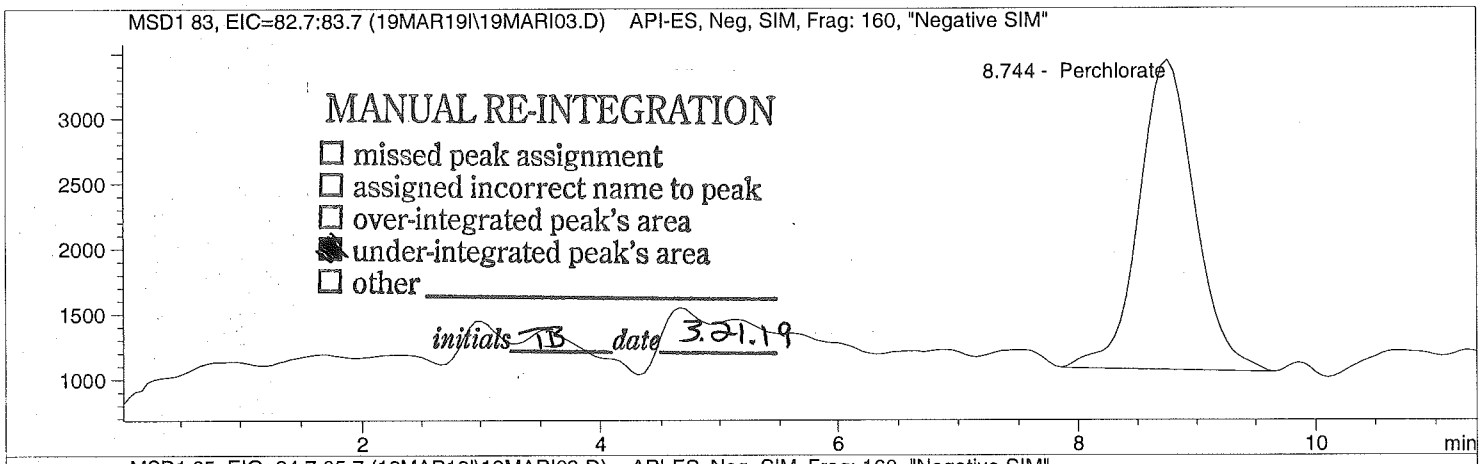
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

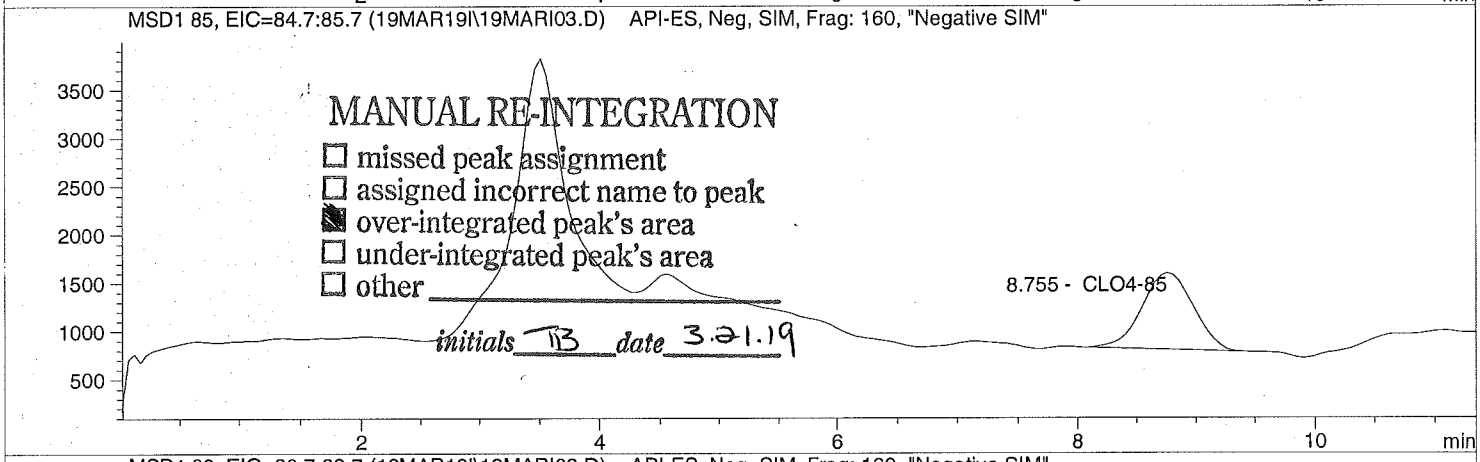
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

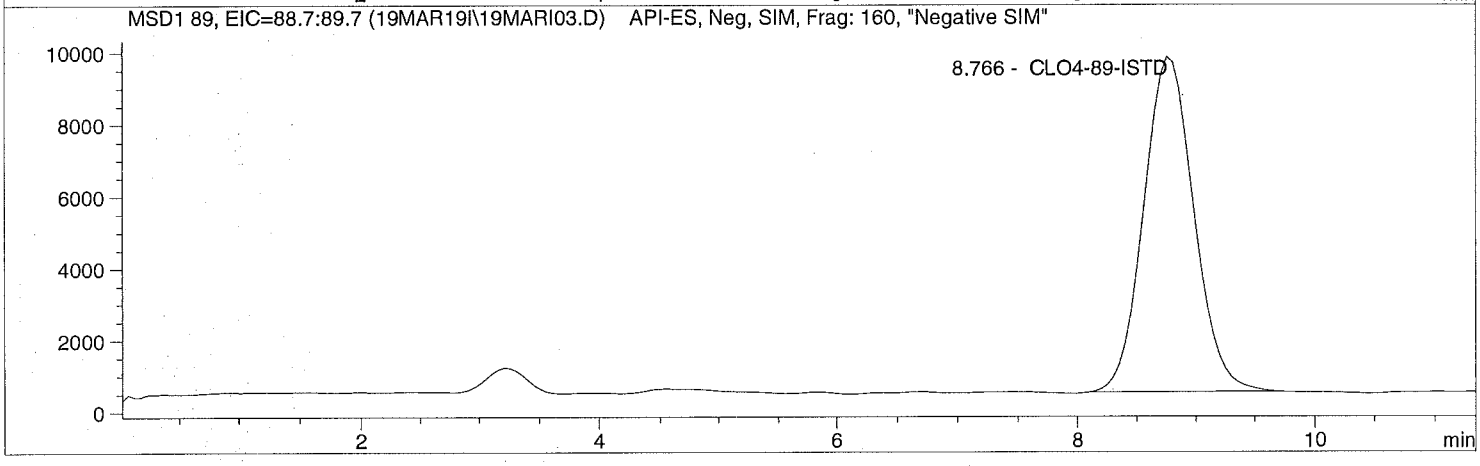
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

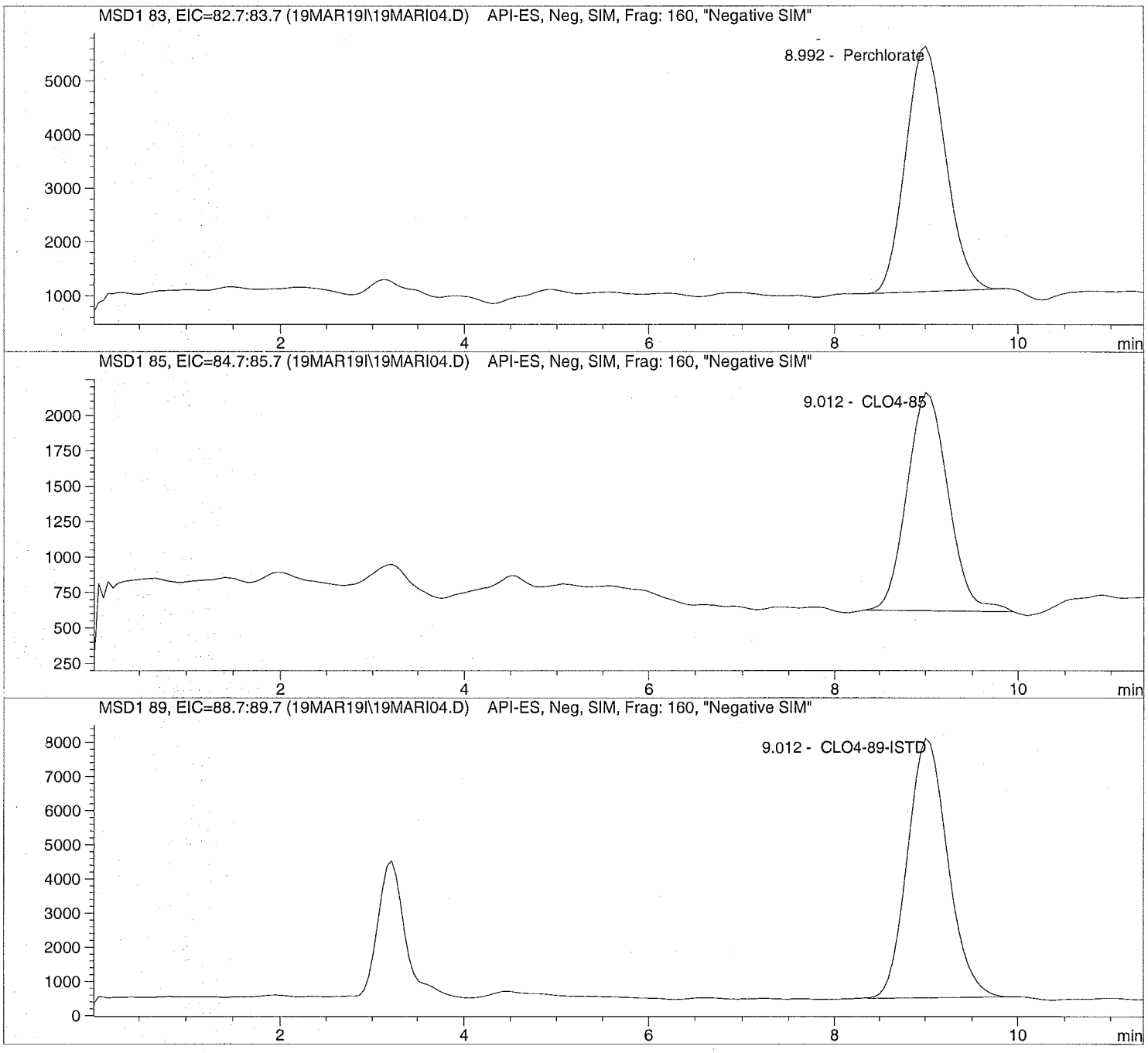
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

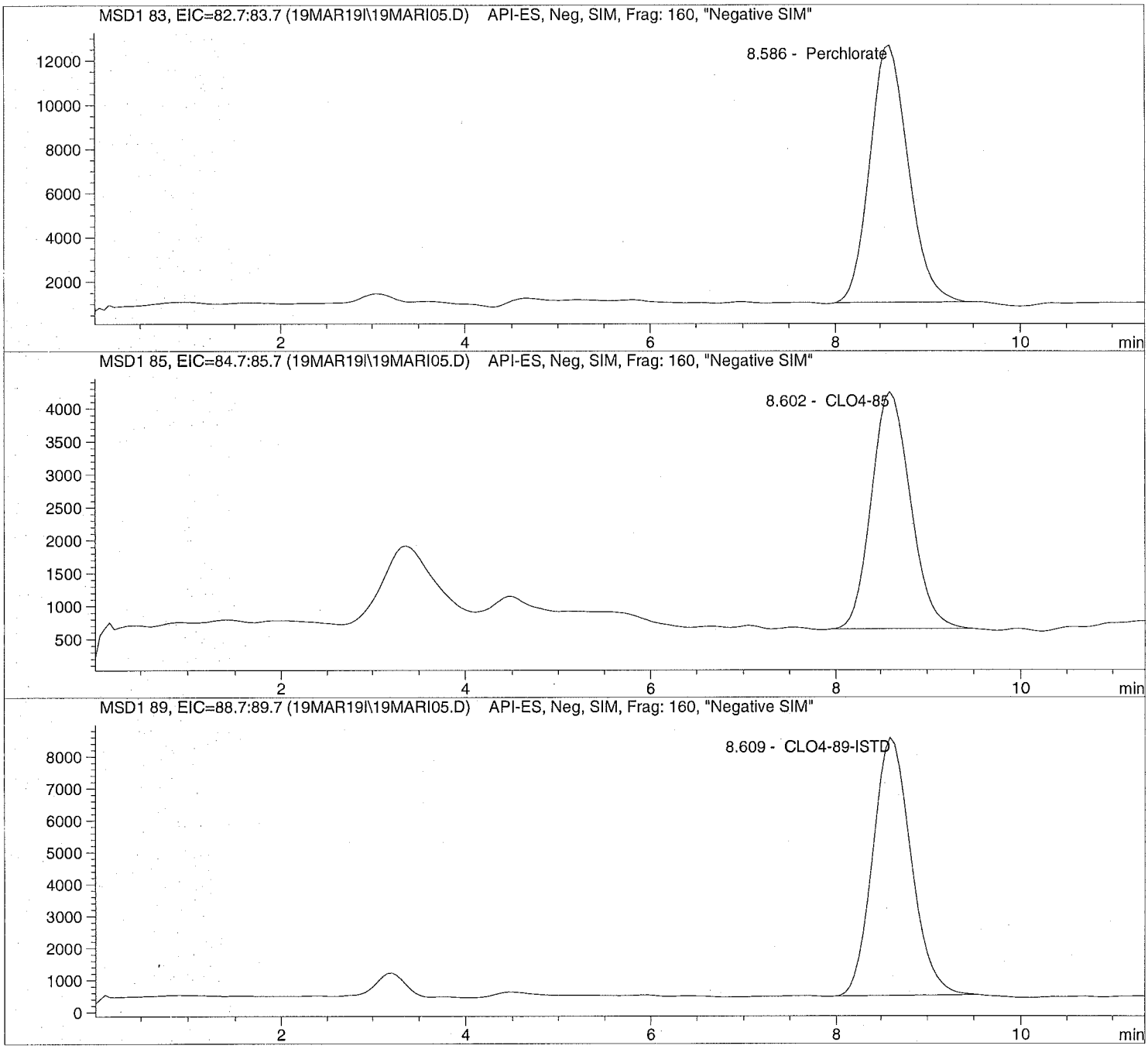
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

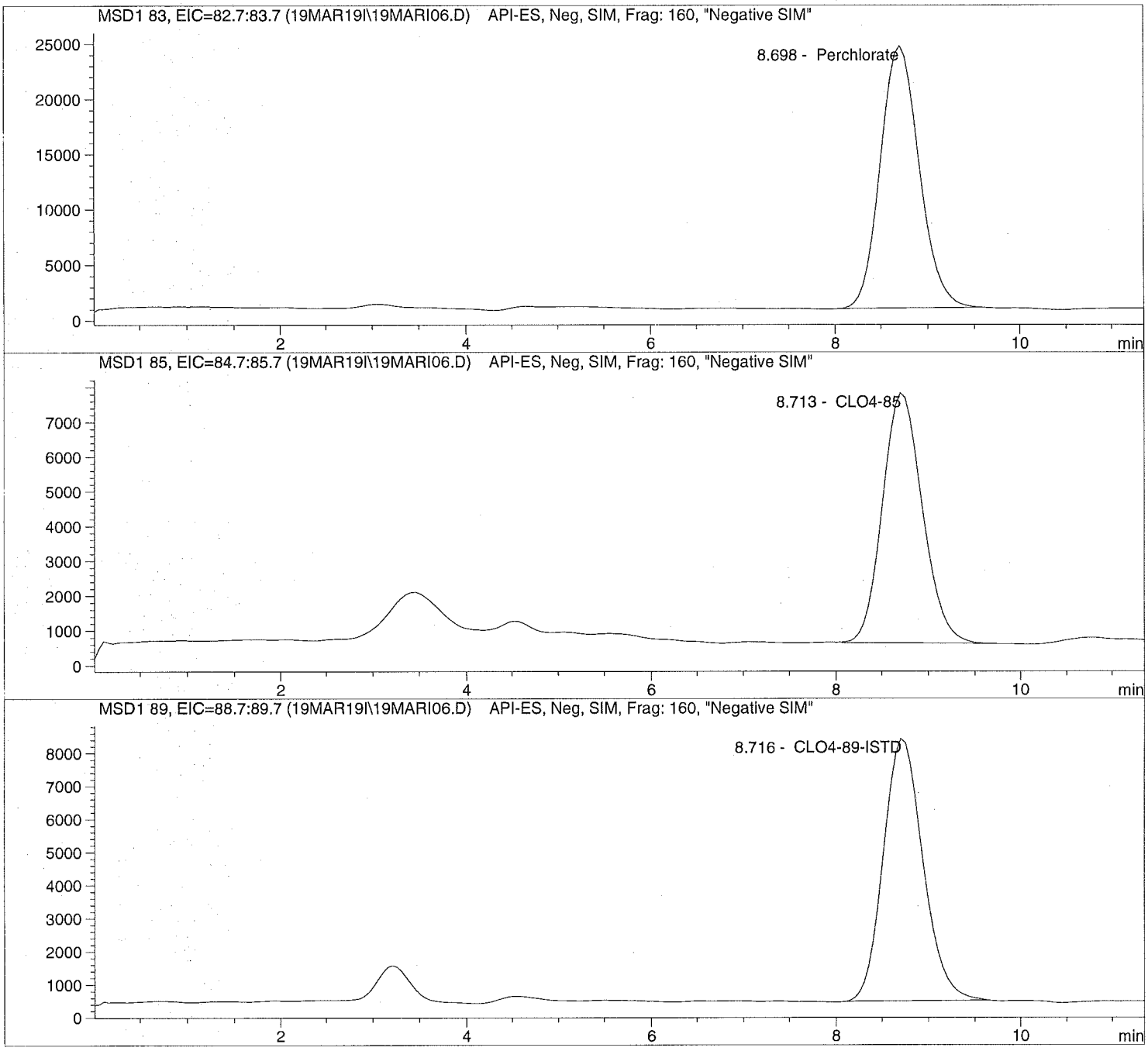
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

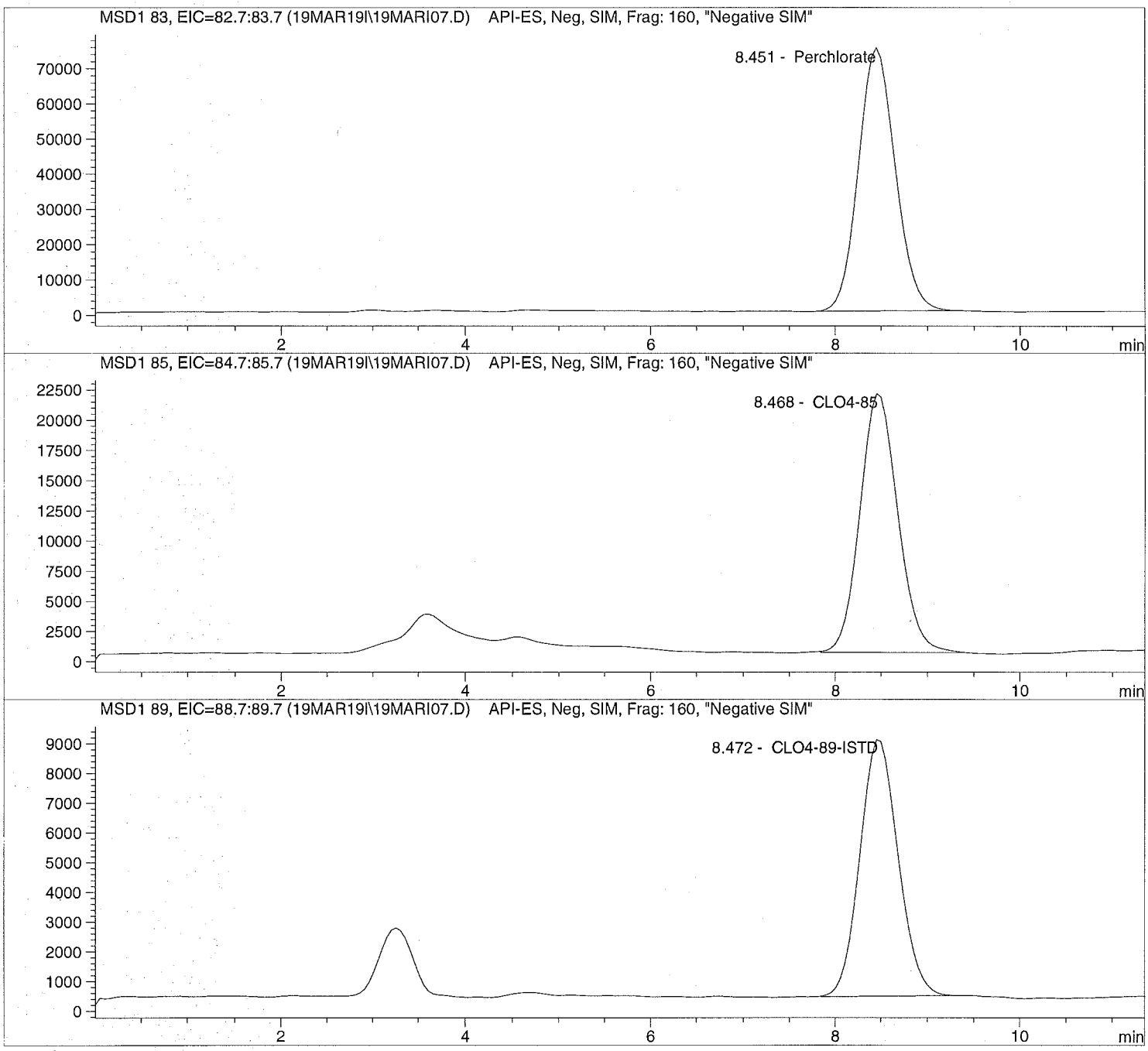
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

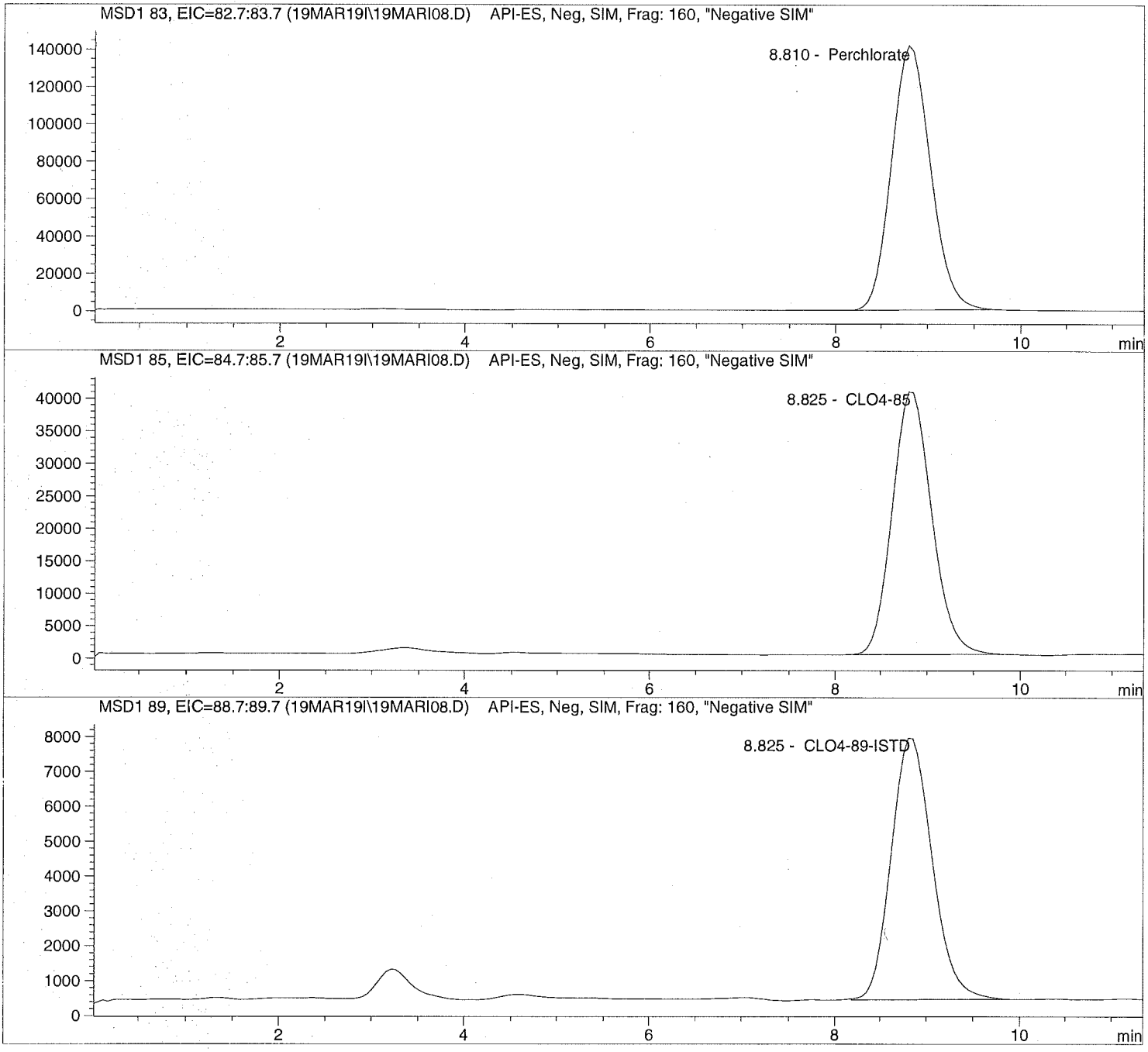
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

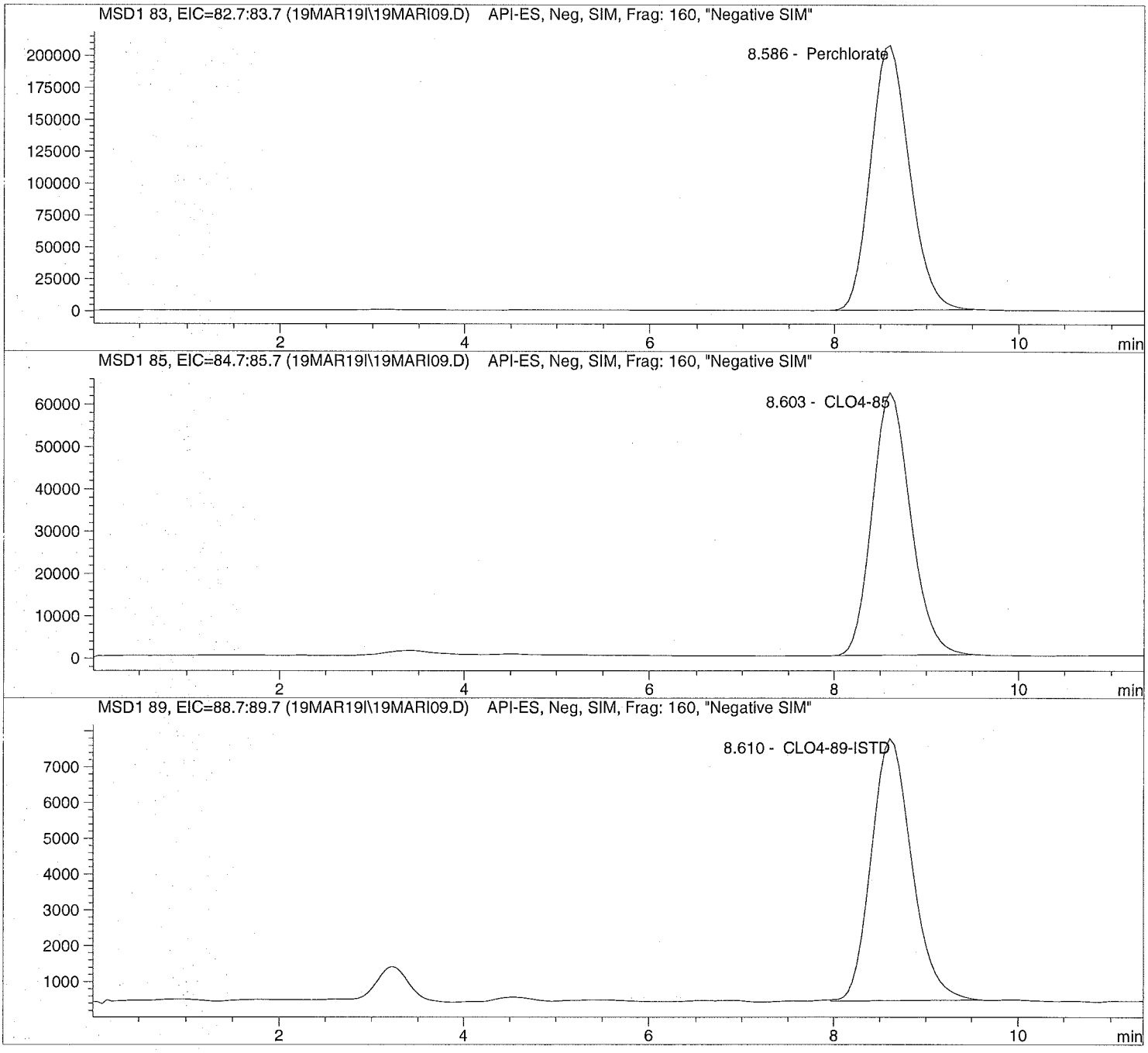
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

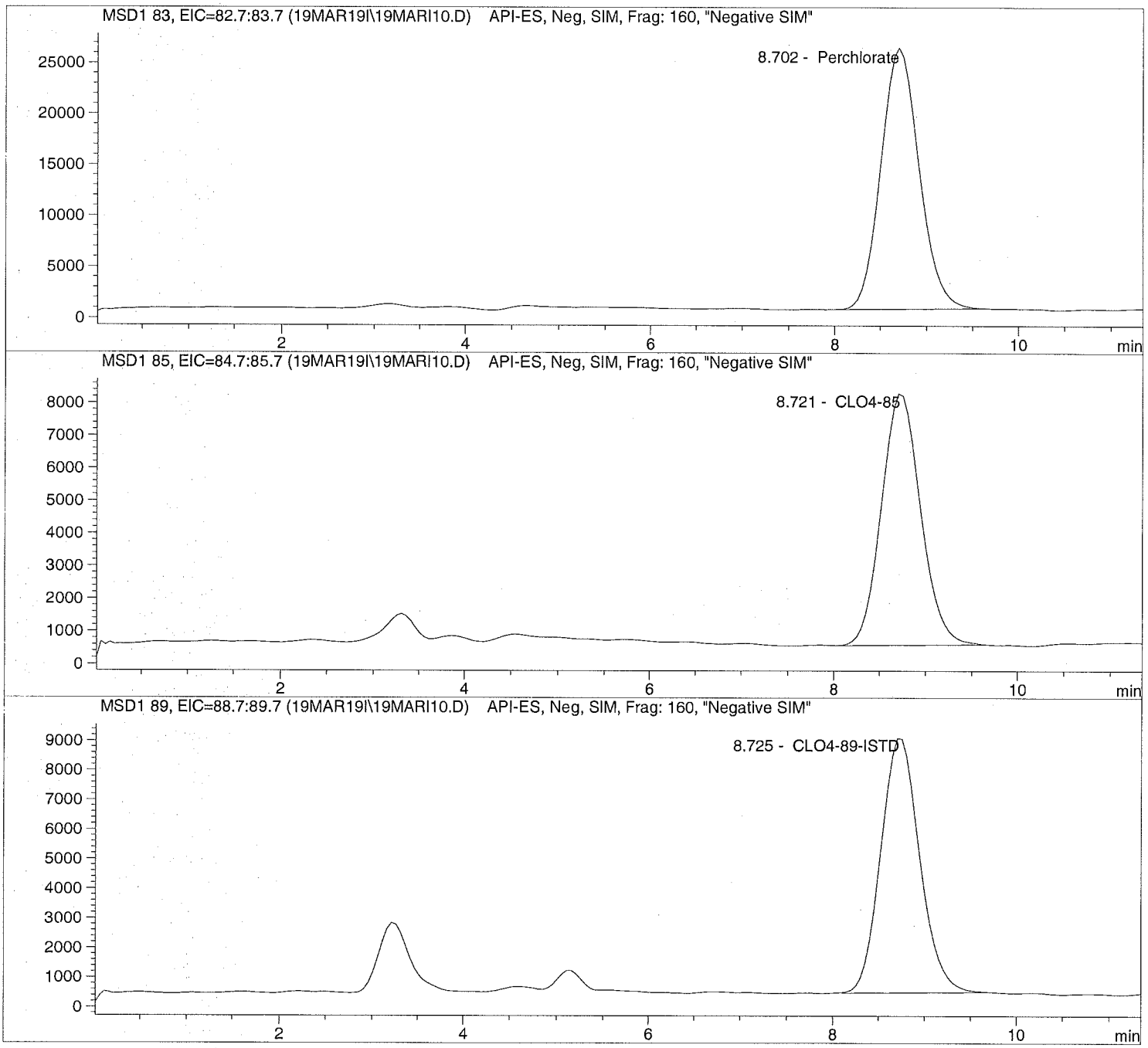
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

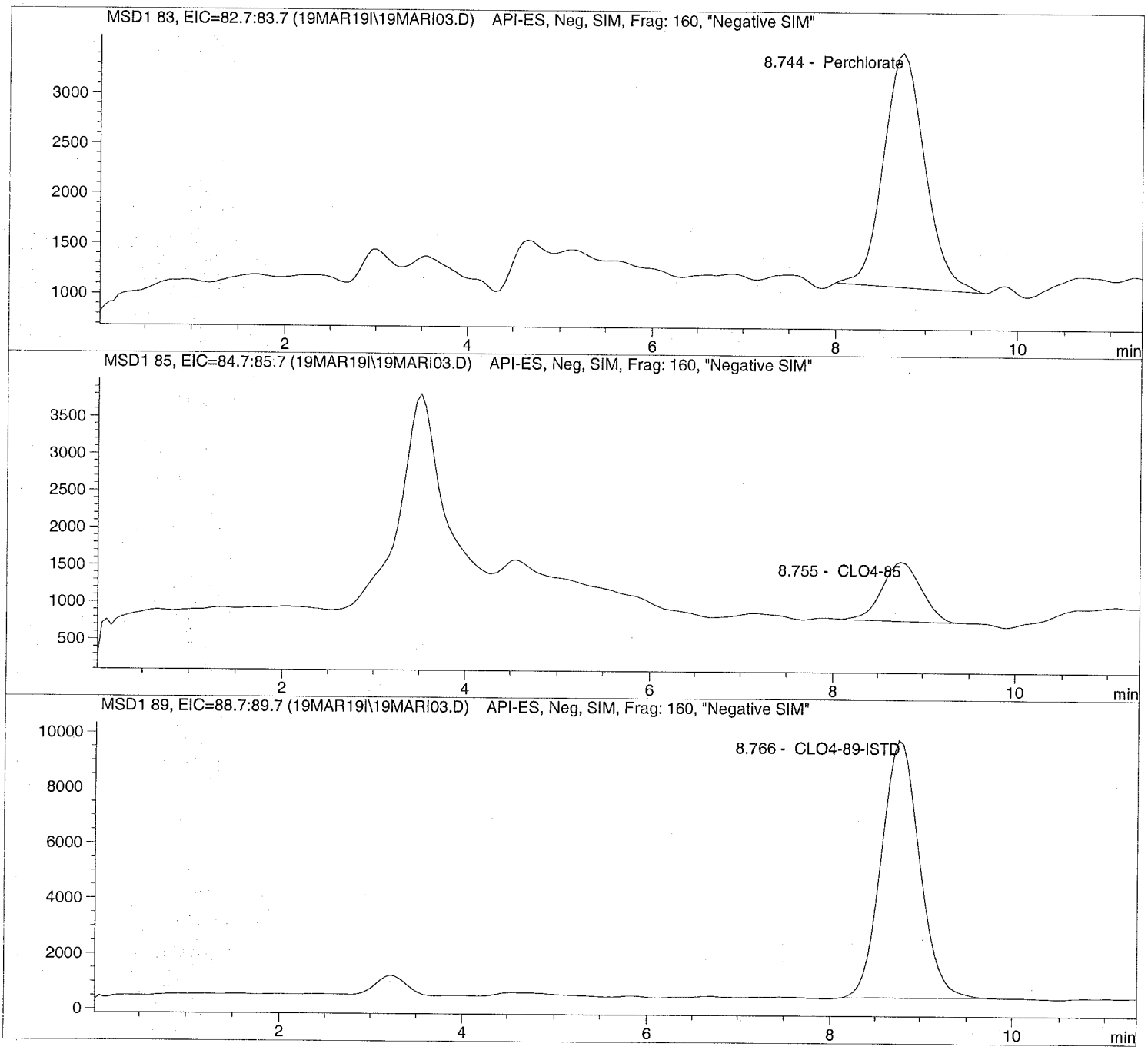
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L 00937567

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

April 18, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19040319**

Laboratory Results for: **Longhorn GW Treatment Plant Bi-Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Apr 05, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19040319

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19040319-01	LH18/24-SP650_040419	Water		04-Apr-2019 14:00	05-Apr-2019 08:40	☐
HS19040319-02	Trip Blank	Water		04-Apr-2019 00:00	05-Apr-2019 08:40	☐

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19040319

GCMS Volatiles by Method SW8260

Batch ID: R336625

Sample ID: CCV

- Carbontetrachloride, Hexachlorobutadiene, n-Butylbenzene and Tetrachloroethene exceeded %D limits on CCV. Samples ND.

Sample ID: HS19040783-05MSD

- MSD was performed on unrelated sample

WetChemistry by Method SW9056

Batch ID: R336786

Sample ID: LH18/24-SP650_040419 (HS19040319-01MS)

- The matrix spike recovery was outside of the control limits. However, the matrix spike duplicate recovery and the RPD between the MS and MSD were in control. (Chloride)

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19040319
Sample ID: LH18/24-SP650_040419 Lab ID:HS19040319-01
Collection Date: 04-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,2-Dichloroethane	**0.58**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Apr-2019 14:25
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:25
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Apr-2019 14:25
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Apr-2019 14:25
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:25
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Apr-2019 14:25
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	15-Apr-2019 14:25
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Apr-2019 14:25
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19040319
Sample ID: LH18/24-SP650_040419 Lab ID:HS19040319-01
Collection Date: 04-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: AKP
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25
cis-1,2-Dichloroethene	**2.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Apr-2019 14:25
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Apr-2019 14:25
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Apr-2019 14:25
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Apr-2019 14:25
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:25
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Trichloroethene	**0.78**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Apr-2019 14:25
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:25
Surr: 1,2-Dichloroethane-d4	*86.6*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2019 14:25*
Surr: 4-Bromofluorobenzene	*96.2*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2019 14:25*
Surr: Dibromofluoromethane	*91.0*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2019 14:25*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2019 14:25*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**377**		**2.00**	**5.00**	**5.00**	**mg/L**	10	16-Apr-2019 15:03
Sulfate	**29.6**		**2.00**	**5.00**	**5.00**	**mg/L**	10	16-Apr-2019 15:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19040319
Sample ID: Trip Blank Lab ID:HS19040319-02
Collection Date: 04-Apr-2019 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 13:37
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Apr-2019 13:37
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Apr-2019 13:37
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 13:37
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Apr-2019 13:37
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	15-Apr-2019 13:37
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Apr-2019 13:37
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder:HS19040319
Sample ID: Trip Blank
Lab ID:HS19040319-02
Collection Date: 04-Apr-2019 00:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: AKP
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Apr-2019 13:37
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Apr-2019 13:37
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Apr-2019 13:37
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 13:37
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 13:37
Surr: 1,2-Dichloroethane-d4	*86.2*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2019 13:37*
Surr: 4-Bromofluorobenzene	*95.5*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2019 13:37*
Surr: Dibromofluoromethane	*90.2*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2019 13:37*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2019 13:37*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19040319

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R336625	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19040319-01	LH18/24-SP650_040419	04 Apr 2019 14:00			15 Apr 2019 14:25	1
HS19040319-02	Trip Blank	04 Apr 2019 00:00			15 Apr 2019 13:37	1
Batch ID R336786	**Test Name :** ANIONS BY SW9056A			**Matrix:** Water		
HS19040319-01	LH18/24-SP650_040419	04 Apr 2019 14:00			16 Apr 2019 15:03	10

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19040319

QC BATCH REPORT NEW

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190415** Units: **UG/L** Analysis Date: **15-Apr-2019 13:13**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036128** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19040319

QC BATCH REPORT NEW

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190415** Units: **UG/L** Analysis Date: **15-Apr-2019 13:13**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036128** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*43.81*	*1.0*	*50*	*0*	*87.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.27*	*1.0*	*50*	*0*	*96.5*	*85 - 114*				
Surr: Dibromofluoromethane	*45.78*	*1.0*	*50*	*0*	*91.6*	*80 - 119*				
Surr: Toluene-d8	*50.76*	*1.0*	*50*	*0*	*102*	*89 - 112*				

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19040319

QC BATCH REPORT NEW

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190415** Units: **UG/L** Analysis Date: **15-Apr-2019 12:01**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036126** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	22.62	1.0	20	0	113	78 - 124				
1,1,1-Trichloroethane	20.75	1.0	20	0	104	74 - 131				
1,1,2,2-Tetrachloroethane	20.57	1.0	20	0	103	71 - 121				
1,1,2-Trichloroethane	20.88	1.0	20	0	104	80 - 119				
1,1-Dichloroethane	18.5	1.0	20	0	92.5	77 - 125				
1,1-Dichloroethene	19.56	1.0	20	0	97.8	71 - 131				
1,1-Dichloropropene	20.53	1.0	20	0	103	78 - 125				
1,2,3-Trichlorobenzene	22.3	1.0	20	0	111	69 - 129				
1,2,3-Trichloropropane	20.92	1.0	20	0	105	73 - 122				
1,2,4-Trichlorobenzene	22.16	1.0	20	0	111	69 - 130				
1,2,4-Trimethylbenzene	23.96	1.0	20	0	120	76 - 124				
1,2-Dibromo-3-chloropropane	21.56	1.0	20	0	108	62 - 128				
1,2-Dibromoethane	22.06	1.0	20	0	110	77 - 121				
1,2-Dichlorobenzene	21.83	1.0	20	0	109	80 - 119				
1,2-Dichloroethane	20.97	1.0	20	0	105	73 - 128				
1,2-Dichloropropane	19.44	1.0	20	0	97.2	78 - 122				
1,3,5-Trimethylbenzene	23.36	1.0	20	0	117	75 - 124				
1,3-Dichlorobenzene	22.14	1.0	20	0	111	80 - 119				
1,3-Dichloropropane	20.55	1.0	20	0	103	80 - 119				
1,4-Dichlorobenzene	21.91	1.0	20	0	110	79 - 118				
2,2-Dichloropropane	20.44	1.0	20	0	102	60 - 139				
2-Butanone	34.91	2.0	40	0	87.3	56 - 143				
2-Chlorotoluene	21.42	1.0	20	0	107	79 - 122				
2-Hexanone	40.09	2.0	40	0	100	57 - 139				
4-Chlorotoluene	21.72	1.0	20	0	109	78 - 122				
4-Isopropyltoluene	23.88	1.0	20	0	119	77 - 127				
4-Methyl-2-pentanone	38.74	2.0	40	0	96.9	67 - 130				
Acetone	33.63	2.0	40	0	84.1	39 - 160				
Benzene	21.09	1.0	20	0	105	79 - 120				
Bromobenzene	23.22	1.0	20	0	116	80 - 120				
Bromochloromethane	20.29	1.0	20	0	101	78 - 123				
Bromodichloromethane	21.35	1.0	20	0	107	79 - 125				
Bromoform	22.42	1.0	20	0	112	66 - 130				
Bromomethane	23.55	1.0	20	0	118	53 - 141				

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19040319

QC BATCH REPORT NEW

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190415** Units: **UG/L** Analysis Date: **15-Apr-2019 12:01**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036126** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	36.08	2.0	40	0	90.2	64 - 133				
Carbon tetrachloride	24.06	1.0	20	0	120	72 - 136				
Chlorobenzene	21.18	1.0	20	0	106	82 - 118				
Chloroethane	17.9	1.0	20	0	89.5	60 - 138				
Chloroform	19.78	1.0	20	0	98.9	79 - 124				
Chloromethane	13.81	1.0	20	0	69.0	50 - 139				
cis-1,2-Dichloroethene	19.48	1.0	20	0	97.4	78 - 123				
cis-1,3-Dichloropropene	19.48	1.0	20	0	97.4	75 - 124				
Dibromochloromethane	22.32	1.0	20	0	112	74 - 126				
Dibromomethane	21.3	1.0	20	0	106	79 - 123				
Dichlorodifluoromethane	20.04	1.0	20	0	100	32 - 152				
Ethylbenzene	23.17	1.0	20	0	116	79 - 121				
Hexachlorobutadiene	26.18	1.0	20	0	131	66 - 134				
Isopropylbenzene	23.3	1.0	20	0	117	72 - 131				
m,p-Xylene	45.06	2.0	40	0	113	80 - 121				
Methylene chloride	19.58	2.0	20	0	97.9	74 - 124				
Naphthalene	21.44	1.0	20	0	107	61 - 128				
n-Butylbenzene	24.06	1.0	20	0	120	75 - 128				
n-Propylbenzene	22.63	1.0	20	0	113	76 - 126				
o-Xylene	21.99	1.0	20	0	110	78 - 122				
sec-Butylbenzene	23.1	1.0	20	0	116	77 - 126				
Styrene	22.87	1.0	20	0	114	78 - 123				
tert-Butylbenzene	22.98	1.0	20	0	115	78 - 124				
Tetrachloroethene	24.12	1.0	20	0	121	74 - 129				
Toluene	22.17	1.0	20	0	111	80 - 121				
trans-1,2-Dichloroethene	19.59	1.0	20	0	98.0	75 - 124				
trans-1,3-Dichloropropene	21.32	1.0	20	0	107	73 - 127				
Trichloroethene	21.61	1.0	20	0	108	79 - 123				
Trichlorofluoromethane	21.57	1.0	20	0	108	65 - 141				
Vinyl chloride	16.87	1.0	20	0	84.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*43.53*	*1.0*	*50*	*0*	*87.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.05*	*1.0*	*50*	*0*	*98.1*	*85 - 114*				
Surr: Dibromofluoromethane	*45.63*	*1.0*	*50*	*0*	*91.3*	*80 - 119*				
Surr: Toluene-d8	*51.4*	*1.0*	*50*	*0*	*103*	*89 - 112*				

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19040319

QC BATCH REPORT NEW

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCSD Sample ID: **VLCSDW-190415** Units: **UG/L** Analysis Date: **15-Apr-2019 12:25**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036127** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.97	1.0	20	0	110	78 - 124	22.62	2.9	20	
1,1,1-Trichloroethane	20.06	1.0	20	0	100	74 - 131	20.75	3.35	20	
1,1,2,2-Tetrachloroethane	20.83	1.0	20	0	104	71 - 121	20.57	1.29	20	
1,1,2-Trichloroethane	20.92	1.0	20	0	105	80 - 119	20.88	0.171	20	
1,1-Dichloroethane	18.16	1.0	20	0	90.8	77 - 125	18.5	1.84	20	
1,1-Dichloroethene	18.88	1.0	20	0	94.4	71 - 131	19.56	3.54	20	
1,1-Dichloropropene	20.24	1.0	20	0	101	78 - 125	20.53	1.46	20	
1,2,3-Trichlorobenzene	23	1.0	20	0	115	69 - 129	22.3	3.1	20	
1,2,3-Trichloropropane	21.34	1.0	20	0	107	73 - 122	20.92	1.98	20	
1,2,4-Trichlorobenzene	22.54	1.0	20	0	113	69 - 130	22.16	1.72	20	
1,2,4-Trimethylbenzene	23.74	1.0	20	0	119	76 - 124	23.96	0.958	20	
1,2-Dibromo-3-chloropropane	21.98	1.0	20	0	110	62 - 128	21.56	1.93	20	
1,2-Dibromoethane	22.29	1.0	20	0	111	77 - 121	22.06	1.05	20	
1,2-Dichlorobenzene	21.95	1.0	20	0	110	80 - 119	21.83	0.537	20	
1,2-Dichloroethane	21.51	1.0	20	0	108	73 - 128	20.97	2.51	20	
1,2-Dichloropropane	19.29	1.0	20	0	96.4	78 - 122	19.44	0.804	20	
1,3,5-Trimethylbenzene	23.21	1.0	20	0	116	75 - 124	23.36	0.612	20	
1,3-Dichlorobenzene	21.98	1.0	20	0	110	80 - 119	22.14	0.73	20	
1,3-Dichloropropane	20.58	1.0	20	0	103	80 - 119	20.55	0.163	20	
1,4-Dichlorobenzene	21.54	1.0	20	0	108	79 - 118	21.91	1.66	20	
2,2-Dichloropropane	19.64	1.0	20	0	98.2	60 - 139	20.44	4.01	20	
2-Butanone	36.5	2.0	40	0	91.2	56 - 143	34.91	4.44	20	
2-Chlorotoluene	21.24	1.0	20	0	106	79 - 122	21.42	0.83	20	
2-Hexanone	40.49	2.0	40	0	101	57 - 139	40.09	0.977	20	
4-Chlorotoluene	21.68	1.0	20	0	108	78 - 122	21.72	0.156	20	
4-Isopropyltoluene	23.3	1.0	20	0	116	77 - 127	23.88	2.44	20	
4-Methyl-2-pentanone	39.85	2.0	40	0	99.6	67 - 130	38.74	2.81	20	
Acetone	34.57	2.0	40	0	86.4	39 - 160	33.63	2.77	20	
Benzene	20.5	1.0	20	0	102	79 - 120	21.09	2.83	20	
Bromobenzene	22.92	1.0	20	0	115	80 - 120	23.22	1.33	20	
Bromochloromethane	20.14	1.0	20	0	101	78 - 123	20.29	0.728	20	
Bromodichloromethane	21.33	1.0	20	0	107	79 - 125	21.35	0.112	20	
Bromoform	22.36	1.0	20	0	112	66 - 130	22.42	0.259	20	
Bromomethane	21.73	1.0	20	0	109	53 - 141	23.55	8.04	20	

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19040319

QC BATCH REPORT NEW

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCSD Sample ID: **VLCSDW-190415** Units: **UG/L** Analysis Date: **15-Apr-2019 12:25**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036127** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.78	2.0	40	0	86.9	64 - 133	36.08	3.68	20	
Carbon tetrachloride	23.64	1.0	20	0	118	72 - 136	24.06	1.75	20	
Chlorobenzene	21.23	1.0	20	0	106	82 - 118	21.18	0.223	20	
Chloroethane	17.77	1.0	20	0	88.9	60 - 138	17.9	0.709	20	
Chloroform	19.21	1.0	20	0	96.1	79 - 124	19.78	2.9	20	
Chloromethane	13.34	1.0	20	0	66.7	50 - 139	13.81	3.42	20	
cis-1,2-Dichloroethene	18.99	1.0	20	0	94.9	78 - 123	19.48	2.55	20	
cis-1,3-Dichloropropene	19.64	1.0	20	0	98.2	75 - 124	19.48	0.777	20	
Dibromochloromethane	21.98	1.0	20	0	110	74 - 126	22.32	1.55	20	
Dibromomethane	21.37	1.0	20	0	107	79 - 123	21.3	0.368	20	
Dichlorodifluoromethane	19.28	1.0	20	0	96.4	32 - 152	20.04	3.87	20	
Ethylbenzene	22.22	1.0	20	0	111	79 - 121	23.17	4.15	20	
Hexachlorobutadiene	25.09	1.0	20	0	125	66 - 134	26.18	4.27	20	
Isopropylbenzene	22.72	1.0	20	0	114	72 - 131	23.3	2.54	20	
m,p-Xylene	43.7	2.0	40	0	109	80 - 121	45.06	3.05	20	
Methylene chloride	19.08	2.0	20	0	95.4	74 - 124	19.58	2.6	20	
Naphthalene	22.19	1.0	20	0	111	61 - 128	21.44	3.44	20	
n-Butylbenzene	24.01	1.0	20	0	120	75 - 128	24.06	0.198	20	
n-Propylbenzene	22.35	1.0	20	0	112	76 - 126	22.63	1.24	20	
o-Xylene	21.28	1.0	20	0	106	78 - 122	21.99	3.3	20	
sec-Butylbenzene	22.9	1.0	20	0	114	77 - 126	23.1	0.895	20	
Styrene	22.39	1.0	20	0	112	78 - 123	22.87	2.13	20	
tert-Butylbenzene	22.55	1.0	20	0	113	78 - 124	22.98	1.89	20	
Tetrachloroethene	23.45	1.0	20	0	117	74 - 129	24.12	2.8	20	
Toluene	21.39	1.0	20	0	107	80 - 121	22.17	3.6	20	
trans-1,2-Dichloroethene	18.77	1.0	20	0	93.9	75 - 124	19.59	4.27	20	
trans-1,3-Dichloropropene	20.84	1.0	20	0	104	73 - 127	21.32	2.27	20	
Trichloroethene	20.94	1.0	20	0	105	79 - 123	21.61	3.17	20	
Trichlorofluoromethane	20.92	1.0	20	0	105	65 - 141	21.57	3.03	20	
Vinyl chloride	16.4	1.0	20	0	82.0	58 - 137	16.87	2.85	20	
Surr: 1,2-Dichloroethane-d4	*44.62*	*1.0*	*50*	*0*	*89.2*	*81 - 118*	*43.53*	*2.47*	*20*	
Surr: 4-Bromofluorobenzene	*48.9*	*1.0*	*50*	*0*	*97.8*	*85 - 114*	*49.05*	*0.319*	*20*	
Surr: Dibromofluoromethane	*45.81*	*1.0*	*50*	*0*	*91.6*	*80 - 119*	*45.63*	*0.395*	*20*	
Surr: Toluene-d8	*50.74*	*1.0*	*50*	*0*	*101*	*89 - 112*	*51.4*	*1.28*	*20*	

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19040319

QC BATCH REPORT NEW

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19040783-05MS** Units: **UG/L** Analysis Date: **15-Apr-2019 15:37**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036134** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	219.1	10	200	0	110	78 - 124				
1,1,1-Trichloroethane	208.4	10	200	0	104	74 - 131				
1,1,2,2-Tetrachloroethane	205.5	10	200	0	103	71 - 121				
1,1,2-Trichloroethane	205.1	10	200	2.7	101	80 - 119				
1,1-Dichloroethane	183.3	10	200	0	91.7	77 - 125				
1,1-Dichloroethene	195.9	10	200	0	97.9	71 - 131				
1,1-Dichloropropene	211.2	10	200	50.1	80.5	78 - 125				
1,2,3-Trichlorobenzene	224.5	10	200	0	112	69 - 129				
1,2,3-Trichloropropane	201.6	10	200	3.051	99.3	73 - 122				
1,2,4-Trichlorobenzene	224.3	10	200	0	112	69 - 130				
1,2,4-Trimethylbenzene	226.6	10	200	3.34	112	76 - 124				
1,2-Dibromo-3-chloropropane	227.9	10	200	0	114	62 - 128				
1,2-Dibromoethane	216.1	10	200	0	108	77 - 121				
1,2-Dichlorobenzene	217.4	10	200	0	109	80 - 119				
1,2-Dichloroethane	212.8	10	200	13.12	99.8	73 - 128				
1,2-Dichloropropane	187.2	10	200	0	93.6	78 - 122				
1,3,5-Trimethylbenzene	227	10	200	2.269	112	75 - 124				
1,3-Dichlorobenzene	215.7	10	200	0	108	80 - 119				
1,3-Dichloropropane	203.4	10	200	0	102	80 - 119				
1,4-Dichlorobenzene	215.1	10	200	0	108	79 - 118				
2,2-Dichloropropane	200.1	10	200	0	100	60 - 139				
2-Butanone	362	20	400	0	90.5	56 - 143				
2-Chlorotoluene	212.5	10	200	0	106	79 - 122				
2-Hexanone	403.2	20	400	0	101	57 - 139				
4-Chlorotoluene	212.4	10	200	0	106	78 - 122				
4-Isopropyltoluene	232.2	10	200	1.803	115	77 - 127				
4-Methyl-2-pentanone	396.8	20	400	2.045	98.7	67 - 130				
Acetone	398	20	400	6.558	97.9	39 - 160				
Benzene	678.1	10	200	485.3	96.4	79 - 120				
Bromobenzene	219.1	10	200	0	110	80 - 120				
Bromochloromethane	188.3	10	200	0	94.1	78 - 123				
Bromodichloromethane	205.8	10	200	0	103	79 - 125				
Bromoform	214.5	10	200	15.19	99.7	66 - 130				
Bromomethane	214.3	10	200	5.754	104	53 - 141				

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19040319

QC BATCH REPORT NEW

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19040783-05MS** Units: **UG/L** Analysis Date: **15-Apr-2019 15:37**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036134** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	380.9	20	400	0	95.2	64 - 133				
Carbon tetrachloride	238.1	10	200	92.29	72.9	72 - 136				
Chlorobenzene	212.7	10	200	0	106	82 - 118				
Chloroethane	185.8	10	200	0	92.9	60 - 138				
Chloroform	192.8	10	200	1.452	95.7	79 - 124				
Chloromethane	158.9	10	200	0	79.4	50 - 139				
cis-1,2-Dichloroethene	185.9	10	200	0	93.0	78 - 123				
cis-1,3-Dichloropropene	197.3	10	200	0	98.6	75 - 124				
Dibromochloromethane	215.1	10	200	0	108	74 - 126				
Dibromomethane	205.9	10	200	0	103	79 - 123				
Dichlorodifluoromethane	218.8	10	200	0	109	32 - 152				
Ethylbenzene	222.1	10	200	14.36	104	79 - 121				
Hexachlorobutadiene	257	10	200	0	128	66 - 134				
Isopropylbenzene	227.3	10	200	0	114	72 - 131				
m,p-Xylene	458.8	20	400	11.39	112	80 - 121				
Methylene chloride	201.1	20	200	13.8	93.6	74 - 124				
Naphthalene	219.8	10	200	1.985	109	61 - 128				
n-Butylbenzene	234.8	10	200	1.33	117	75 - 128				
n-Propylbenzene	225.7	10	200	0	113	76 - 126				
o-Xylene	223	10	200	4.111	109	78 - 122				
sec-Butylbenzene	232.8	10	200	2.756	115	77 - 126				
Styrene	218.6	10	200	0	109	78 - 123				
tert-Butylbenzene	230.2	10	200	0	115	78 - 124				
Tetrachloroethene	237.2	10	200	0	119	74 - 129				
Toluene	238.4	10	200	22.15	108	80 - 121				
trans-1,2-Dichloroethene	194.8	10	200	0	97.4	75 - 124				
trans-1,3-Dichloropropene	200.7	10	200	0	100	73 - 127				
Trichloroethene	217.9	10	200	0	109	79 - 123				
Trichlorofluoromethane	227.9	10	200	0	114	65 - 141				
Vinyl chloride	174.3	10	200	0	87.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*438.9*	*10*	*500*	*0*	*87.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*490.6*	*10*	*500*	*0*	*98.1*	*85 - 114*				
Surr: Dibromofluoromethane	*458.5*	*10*	*500*	*0*	*91.7*	*80 - 119*				
Surr: Toluene-d8	*513*	*10*	*500*	*0*	*103*	*89 - 112*				

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19040319

QC BATCH REPORT NEW

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19040783-05MSD** Units: **UG/L** Analysis Date: **15-Apr-2019 16:01**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036135** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	215.6	10	200	0	108	78 - 124	219.1	1.61	20	
1,1,1-Trichloroethane	198.6	10	200	0	99.3	74 - 131	208.4	4.82	20	
1,1,2,2-Tetrachloroethane	203.8	10	200	0	102	71 - 121	205.5	0.84	20	
1,1,2-Trichloroethane	205.1	10	200	2.7	101	80 - 119	205.1	0.0221	20	
1,1-Dichloroethane	174.7	10	200	0	87.3	77 - 125	183.3	4.82	20	
1,1-Dichloroethene	184.7	10	200	0	92.3	71 - 131	195.9	5.87	20	
1,1-Dichloropropene	199.6	10	200	50.1	74.8	78 - 125	211.2	5.64	20	S
1,2,3-Trichlorobenzene	235.3	10	200	0	118	69 - 129	224.5	4.68	20	
1,2,3-Trichloropropane	199	10	200	3.051	98.0	73 - 122	201.6	1.3	20	
1,2,4-Trichlorobenzene	224.3	10	200	0	112	69 - 130	224.3	0.0243	20	
1,2,4-Trimethylbenzene	218.7	10	200	3.34	108	76 - 124	226.6	3.56	20	
1,2-Dibromo-3-chloropropane	222.9	10	200	0	111	62 - 128	227.9	2.23	20	
1,2-Dibromoethane	216.6	10	200	0	108	77 - 121	216.1	0.217	20	
1,2-Dichlorobenzene	213.3	10	200	0	107	80 - 119	217.4	1.92	20	
1,2-Dichloroethane	205.1	10	200	13.12	96.0	73 - 128	212.8	3.69	20	
1,2-Dichloropropane	181.8	10	200	0	90.9	78 - 122	187.2	2.93	20	
1,3,5-Trimethylbenzene	220	10	200	2.269	109	75 - 124	227	3.1	20	
1,3-Dichlorobenzene	211.5	10	200	0	106	80 - 119	215.7	1.95	20	
1,3-Dichloropropane	201.3	10	200	0	101	80 - 119	203.4	1.01	20	
1,4-Dichlorobenzene	210.6	10	200	0	105	79 - 118	215.1	2.11	20	
2,2-Dichloropropane	189.5	10	200	0	94.8	60 - 139	200.1	5.45	20	
2-Butanone	360.4	20	400	0	90.1	56 - 143	362	0.44	20	
2-Chlorotoluene	205.1	10	200	0	103	79 - 122	212.5	3.53	20	
2-Hexanone	401.2	20	400	0	100	57 - 139	403.2	0.482	20	
4-Chlorotoluene	207.7	10	200	0	104	78 - 122	212.4	2.2	20	
4-Isopropyltoluene	226.3	10	200	1.803	112	77 - 127	232.2	2.56	20	
4-Methyl-2-pentanone	392.9	20	400	2.045	97.7	67 - 130	396.8	0.971	20	
Acetone	405.6	20	400	6.558	99.8	39 - 160	398	1.91	20	
Benzene	652.6	10	200	485.3	83.7	79 - 120	678.1	3.82	20	
Bromobenzene	216.6	10	200	0	108	80 - 120	219.1	1.14	20	
Bromochloromethane	183.1	10	200	0	91.5	78 - 123	188.3	2.81	20	
Bromodichloromethane	198.4	10	200	0	99.2	79 - 125	205.8	3.66	20	
Bromoform	214.2	10	200	15.19	99.5	66 - 130	214.5	0.158	20	
Bromomethane	214	10	200	5.754	104	53 - 141	214.3	0.12	20	

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19040319

QC BATCH REPORT NEW

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19040783-05MSD** Units: **UG/L** Analysis Date: **15-Apr-2019 16:01**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036135** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	358.8	20	400	0	89.7	64 - 133	380.9	5.96	20	
Carbon tetrachloride	226.7	10	200	92.29	67.2	72 - 136	238.1	4.89	20	S
Chlorobenzene	208.3	10	200	0	104	82 - 118	212.7	2.09	20	
Chloroethane	159.6	10	200	0	79.8	60 - 138	185.8	15.2	20	
Chloroform	184.5	10	200	1.452	91.5	79 - 124	192.8	4.37	20	
Chloromethane	153.7	10	200	0	76.8	50 - 139	158.9	3.34	20	
cis-1,2-Dichloroethene	183.5	10	200	0	91.7	78 - 123	185.9	1.34	20	
cis-1,3-Dichloropropene	192.4	10	200	0	96.2	75 - 124	197.3	2.51	20	
Dibromochloromethane	212.1	10	200	0	106	74 - 126	215.1	1.41	20	
Dibromomethane	199.3	10	200	0	99.7	79 - 123	205.9	3.25	20	
Dichlorodifluoromethane	206.6	10	200	0	103	32 - 152	218.8	5.7	20	
Ethylbenzene	216.4	10	200	14.36	101	79 - 121	222.1	2.59	20	
Hexachlorobutadiene	258.8	10	200	0	129	66 - 134	257	0.713	20	
Isopropylbenzene	221.9	10	200	0	111	72 - 131	227.3	2.39	20	
m,p-Xylene	441	20	400	11.39	107	80 - 121	458.8	3.96	20	
Methylene chloride	194.1	20	200	13.8	90.2	74 - 124	201.1	3.52	20	
Naphthalene	224.1	10	200	1.985	111	61 - 128	219.8	1.93	20	
n-Butylbenzene	228.5	10	200	1.33	114	75 - 128	234.8	2.72	20	
n-Propylbenzene	218.6	10	200	0	109	76 - 126	225.7	3.21	20	
o-Xylene	219.2	10	200	4.111	108	78 - 122	223	1.71	20	
sec-Butylbenzene	225	10	200	2.756	111	77 - 126	232.8	3.43	20	
Styrene	212.6	10	200	0	106	78 - 123	218.6	2.78	20	
tert-Butylbenzene	223.5	10	200	0	112	78 - 124	230.2	2.97	20	
Tetrachloroethene	227.2	10	200	0	114	74 - 129	237.2	4.3	20	
Toluene	231	10	200	22.15	104	80 - 121	238.4	3.17	20	
trans-1,2-Dichloroethene	187.5	10	200	0	93.7	75 - 124	194.8	3.85	20	
trans-1,3-Dichloropropene	198	10	200	0	99.0	73 - 127	200.7	1.35	20	
Trichloroethene	207.4	10	200	0	104	79 - 123	217.9	4.91	20	
Trichlorofluoromethane	213.7	10	200	0	107	65 - 141	227.9	6.43	20	
Vinyl chloride	163.4	10	200	0	81.7	58 - 137	174.3	6.44	20	
Surr: 1,2-Dichloroethane-d4	*432.1*	*10*	*500*	*0*	*86.4*	*81 - 118*	*438.9*	*1.56*	*20*	
Surr: 4-Bromofluorobenzene	*490.4*	*10*	*500*	*0*	*98.1*	*85 - 114*	*490.6*	*0.0491*	*20*	
Surr: Dibromofluoromethane	*460.5*	*10*	*500*	*0*	*92.1*	*80 - 119*	*458.5*	*0.425*	*20*	
Surr: Toluene-d8	*516*	*10*	*500*	*0*	*103*	*89 - 112*	*513*	*0.582*	*20*	

ALS Houston, US Date: 18-Apr-19

Client:	Bhate Environmental Associates, Inc.
Project:	Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder:	HS19040319

QC BATCH REPORT NEW

Batch ID:	**R336625 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19040319-01 HS19040319-02

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19040319

QC BATCH REPORT NEW

Batch ID: R336786 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-041619** Units: **mg/L** Analysis Date: **16-Apr-2019 11:54**
Client ID: Run ID: **ICS2100_336786** SeqNo: **5039313** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-041619** Units: **mg/L** Analysis Date: **16-Apr-2019 12:09**
Client ID: Run ID: **ICS2100_336786** SeqNo: **5039314** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.02	0.500	20	0	100	80 - 120				
Sulfate	19.78	0.500	20	0	98.9	80 - 120				

LCSD Sample ID: **WLCSDW1-041619** Units: **mg/L** Analysis Date: **16-Apr-2019 12:23**
Client ID: Run ID: **ICS2100_336786** SeqNo: **5039315** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.7	0.500	20	0	104	80 - 120	20.02	3.33	20	
Sulfate	20.55	0.500	20	0	103	80 - 120	19.78	3.81	20	

MS Sample ID: **HS19040319-01MS** Units: **mg/L** Analysis Date: **16-Apr-2019 15:18**
Client ID: **LH18/24-SP650_040419** Run ID: **ICS2100_336786** SeqNo: **5039317** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	452	5.00	100	376.6	75.4	80 - 120				S
Sulfate	121.7	5.00	100	29.61	92.1	80 - 120				

MSD Sample ID: **HS19040319-01MSD** Units: **mg/L** Analysis Date: **16-Apr-2019 15:33**
Client ID: **LH18/24-SP650_040419** Run ID: **ICS2100_336786** SeqNo: **5039318** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	457.9	5.00	100	376.6	81.3	80 - 120	452	1.3	20	
Sulfate	124.1	5.00	100	29.61	94.5	80 - 120	121.7	2.01	20	

The following samples were analyzed in this batch: HS19040319-01

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: **HS19040319**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020

ALS Houston, US Date: 18-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19040319

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19040319-01	LH18/24-SP650_040419	Login	4/5/2019 11:49:50 AM	NDR	WET341
HS19040319-01	LH18/24-SP650_040419	Login	4/5/2019 11:49:50 AM	NDR	VOA067
HS19040319-02	Trip Blank	Login	4/5/2019 11:49:50 AM	NDR	VOA067

ALS Houston, US Date: 18-Apr-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19040319
Date/Time Received: **05-Apr-2019 08:40**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 5-Apr-2019 Date
Reviewed by: *RJ Modashia* eSignature — 5-Apr-2019 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	3.5c U/c	IR11
Cooler(s)/Kit(s):	44555	
Date/Time sample(s) sent to storage:	04/05/2019 12:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210, Houston, Tx. 77099 ATTN: R.J. Modashia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No.
NWO1312.0150.0
16.0001

Job:
GROUNDWATER TREATMENT PLANT
BI-WEEKLY SAMPLES

Prepared By:
Scott Beesinger

P.O Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC	Analyses: CHLORIDE, SULFATE	Remarks (Preservatives, etc.)
LH18/24-SP650_040419	Water	04/04/19 / 14:00		3	3		HCL
LH18/24-SP650_040419	Water	04/04/19 / 14:00		1		1	NONE
Trip Blank	Water	04/04/19		2	2		HCL

Additional Remarks: **STANDARD TAT ON ALL PARAMETERS.**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	04/04/19	14:30							NVL	4/5/19	08:40

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

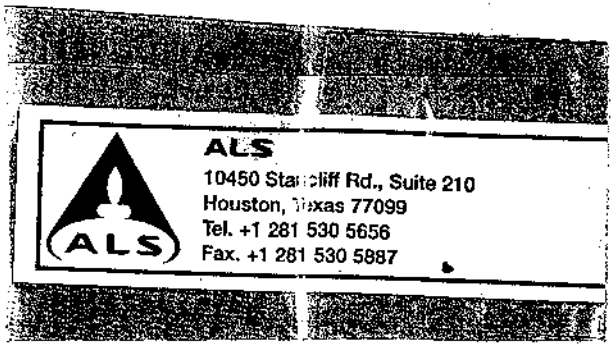
Remarks

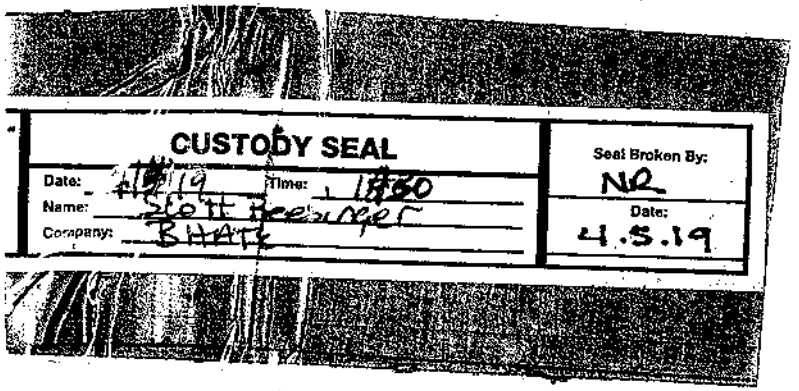
214555 Temp 3.5 NVL

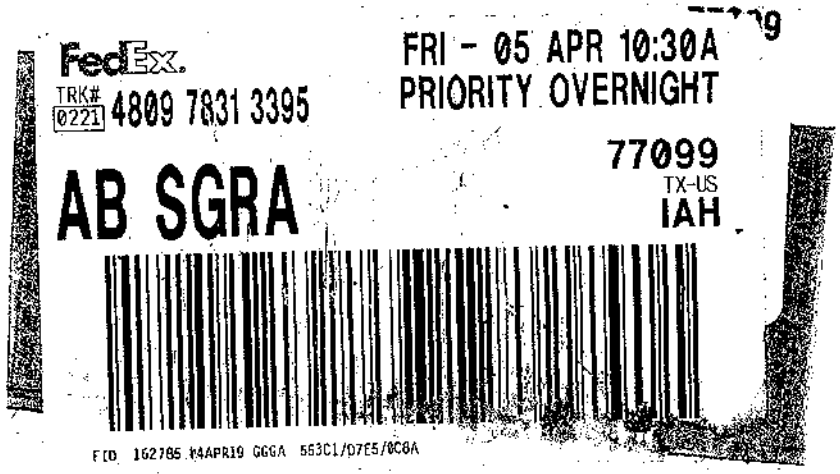
(Word) S:\Users\Forms\Chain of Custody - BiWeekly

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Bi-Weekly Samples

HS19040319


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887


CUSTODY SEAL
Date: 4/5/19
Time: 1830
Name: Scott Beeninger
Company: BHATE
Seal Broken By:
NR
Date:
4.5.19


FedEx.
TRK# 0221 4809 7831 3395
FRI - 05 APR 10:30A
PRIORITY OVERNIGHT
77099
TX-US
IAH
AB SGRA
FID 162705 04APR19 GGGA 563C1/D7E5/0C8A

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

April 29, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19040652**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples**

Dear Marcia,

ALS Environmental received 3 sample(s) on Apr 11, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS19040652

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19040652-01	LH18/24-SP650_041019	Water		10-Apr-2019 14:00	11-Apr-2019 09:00	☐
HS19040652-02	LH18/24-SP650_041019_BIX	Water		10-Apr-2019 14:00	11-Apr-2019 09:00	☐
HS19040652-03	Trip Blank	Water		10-Apr-2019 14:00	11-Apr-2019 09:00	☐

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order:

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 139780

Sample ID: LH18/24-SP650_041019 (HS19040652-01)

• The surrogate recoveries could not be determined due to dilution below the calibration range.

GCMS Volatiles by Method SW8260

Batch ID: R336625

Sample ID: CCV

• Carbontetrachloride, Hexachlorobutadiene, n-Butylbenzene and Tetrachloroethene exceeded %D limits on CCV. Samples ND.

Sample ID: HS19040783-05MS

• MS and MSD are for an unrelated sample

Metals by Method SW6020

Batch ID: 139800

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW7196

Batch ID: R336862

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19040652

Sample ID: LH18/24-SP650_041019 Lab ID:HS19040652-01

Collection Date: 10-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,2-Dichloroethane	**0.67**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Apr-2019 14:49
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Apr-2019 14:49
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Apr-2019 14:49
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:49
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Apr-2019 14:49
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	15-Apr-2019 14:49
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Apr-2019 14:49
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19040652

Sample ID: LH18/24-SP650_041019 Lab ID:HS19040652-01

Collection Date: 10-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: AKP
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49
cis-1,2-Dichloroethene	**2.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Apr-2019 14:49
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Apr-2019 14:49
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Apr-2019 14:49
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Apr-2019 14:49
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:49
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Trichloroethene	**0.82**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Apr-2019 14:49
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:49
Surr: 1,2-Dichloroethane-d4	*86.7*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2019 14:49*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2019 14:49*
Surr: Dibromofluoromethane	*90.6*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2019 14:49*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2019 14:49*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 12-Apr-2019		Analyst: QX
1,4-Dioxane	**7.9**		**1.0**	**1.0**	**1.0**	**ug/L**	100	15-Apr-2019 15:15
Surr: 2-Fluorobiphenyl	*0*	*S*		0	*40-140*	*%REC*	*100*	*15-Apr-2019 15:15*
Surr: 4-Terphenyl-d14	*0*	*S*		0	*40-140*	*%REC*	*100*	*15-Apr-2019 15:15*
Surr: Nitrobenzene-d5	*0*	*S*		0	*40-140*	*%REC*	*100*	*15-Apr-2019 15:15*
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 15-Apr-2019		Analyst: JHD
Barium	**0.154**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	16-Apr-2019 23:33
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	16-Apr-2019 23:33
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	16-Apr-2019 23:33
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	16-Apr-2019 23:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19040652

Sample ID: LH18/24-SP650_041019 Lab ID:HS19040652-01

Collection Date: 10-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
HEXAVALENT CHROMIUM BY SW7196A	**Method:SW7196**							Analyst: MZD
Chromium, Hexavalent	0.0100	U	0.00600	0.0100	0.0100	mg/L	1	11-Apr-2019 12:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19040652

Sample ID: LH18/24-SP650_041019_BIX Lab ID:HS19040652-02

Collection Date: 10-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	25-Apr-2019 17:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19040652

Sample ID: Trip Blank Lab ID:HS19040652-03

Collection Date: 10-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: AKP
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:01
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Apr-2019 14:01
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Apr-2019 14:01
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:01
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Apr-2019 14:01
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	15-Apr-2019 14:01
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Apr-2019 14:01
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19040652

Sample ID: Trip Blank Lab ID:HS19040652-03

Collection Date: 10-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: AKP
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Apr-2019 14:01
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Apr-2019 14:01
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Apr-2019 14:01
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Apr-2019 14:01
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Apr-2019 14:01
Surr: 1,2-Dichloroethane-d4	*86.4*			**0**	*81-118*	*%REC*	*1*	*15-Apr-2019 14:01*
Surr: 4-Bromofluorobenzene	*95.7*			**0**	*85-114*	*%REC*	*1*	*15-Apr-2019 14:01*
Surr: Dibromofluoromethane	*90.8*			**0**	*80-119*	*%REC*	*1*	*15-Apr-2019 14:01*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*15-Apr-2019 14:01*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 29-Apr-19

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

Batch ID: 139780 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19040652-01	1	1000	1 (mL)	0.001

Batch ID: 139800 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19040652-01	1	10	10 (mL)	1

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 139780	**Test Name :** SEMIVOLATILES SIM			**Matrix:** Water		
HS19040652-01	LH18/24-SP650_041019	10 Apr 2019 14:00		12 Apr 2019 14:36	15 Apr 2019 15:15	100
Batch ID 139800	**Test Name :** METALS BY ICPMS BY SW6020A			**Matrix:** Water		
HS19040652-01	LH18/24-SP650_041019	10 Apr 2019 14:00		15 Apr 2019 08:30	16 Apr 2019 23:33	1
Batch ID R336625	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19040652-01	LH18/24-SP650_041019	10 Apr 2019 14:00			15 Apr 2019 14:49	1
HS19040652-03	Trip Blank	10 Apr 2019 14:00			15 Apr 2019 14:01	1
Batch ID R336862	**Test Name :** HEXAVALENT CHROMIUM BY SW7196A			**Matrix:** Water		
HS19040652-01	LH18/24-SP650_041019	10 Apr 2019 14:00			11 Apr 2019 12:10	1
Batch ID R337297	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19040652-02	LH18/24-SP650_041019_BIX	10 Apr 2019 14:00			25 Apr 2019 17:26	1

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

QC BATCH REPORT

Batch ID: 139800 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-139800** Units: **mg/L** Analysis Date: **16-Apr-2019 22:45**
Client ID: Run ID: **ICPMS05_336650** SeqNo: **5038034** PrepDate: **15-Apr-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.00250	0.00400								U
Lead	0.00100	0.00200								U
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U

LCS Sample ID: **LCS-139800** Units: **mg/L** Analysis Date: **16-Apr-2019 22:48**
Client ID: Run ID: **ICPMS05_336650** SeqNo: **5038035** PrepDate: **15-Apr-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.04817	0.00400	0.05	0	96.3	80 - 120				
Lead	0.04697	0.00200	0.05	0	93.9	80 - 120				
Selenium	0.05057	0.00200	0.05	0	101	80 - 120				
Silver	0.05065	0.00200	0.05	0	101	80 - 120				

MS Sample ID: **HS19040658-01MS** Units: **mg/L** Analysis Date: **16-Apr-2019 22:58**
Client ID: Run ID: **ICPMS05_336650** SeqNo: **5038040** PrepDate: **15-Apr-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.09918	0.00400	0.05	0.05263	93.1	80 - 120				
Lead	0.05081	0.00200	0.05	0.001376	98.9	80 - 120				
Selenium	0.05136	0.00200	0.05	0.000747	101	80 - 120				
Silver	0.04992	0.00200	0.05	0.000017	99.8	80 - 120				

MSD Sample ID: **HS19040658-01MSD** Units: **mg/L** Analysis Date: **16-Apr-2019 23:01**
Client ID: Run ID: **ICPMS05_336650** SeqNo: **5038041** PrepDate: **15-Apr-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.101	0.00400	0.05	0.05263	96.7	80 - 120	0.09918	1.82	20	
Lead	0.05184	0.00200	0.05	0.001376	101	80 - 120	0.05081	2	20	
Selenium	0.05176	0.00200	0.05	0.000747	102	80 - 120	0.05136	0.78	20	
Silver	0.04999	0.00200	0.05	0.000017	99.9	80 - 120	0.04992	0.14	20	

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

QC BATCH REPORT

Batch ID: 139800 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19040658-01PDS** Units: **mg/L** Analysis Date: **16-Apr-2019 23:03**
Client ID: Run ID: **ICPMS05_336650** SeqNo: **5038042** PrepDate: **15-Apr-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.1474	0.00400	0.1	0.05263	94.8	75 - 125				
Lead	0.09706	0.00200	0.1	0.001376	95.7	75 - 125				
Selenium	0.101	0.00200	0.1	0.000747	100	75 - 125				
Silver	0.0996	0.00200	0.1	0.000017	99.6	75 - 125				

SD Sample ID: **HS19040658-01SD** Units: **mg/L** Analysis Date: **16-Apr-2019 22:56**
Client ID: Run ID: **ICPMS05_336650** SeqNo: **5038039** PrepDate: **15-Apr-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Lead	0.00500	0.0100					0.001376	0	10	U
Selenium	0.0125	0.0100					0.000747	0	10	U
Silver	0.00250	0.0100					0.000017	0	10	U

The following samples were analyzed in this batch: HS19040652-01

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

QC BATCH REPORT

Batch ID: 139780 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-139780** Units: **ug/L** Analysis Date: **15-Apr-2019 12:25**
Client ID: Run ID: **SV-5_336636** SeqNo: **5036512** PrepDate: **12-Apr-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.08629*	*0*	*0.08*	*0*	*108*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.07264*	*0*	*0.08*	*0*	*90.8*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07613*	*0*	*0.08*	*0*	*95.2*	*40 - 140*				

LCS Sample ID: **LCS-139780** Units: **ug/L** Analysis Date: **15-Apr-2019 12:46**
Client ID: Run ID: **SV-5_336636** SeqNo: **5036513** PrepDate: **12-Apr-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08801	0.010	0.08	0	110	40 - 140				
Surr: 2-Fluorobiphenyl	*0.09164*	*0*	*0.08*	*0*	*115*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.08667*	*0*	*0.08*	*0*	*108*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07931*	*0*	*0.08*	*0*	*99.1*	*40 - 140*				

LCSD Sample ID: **LCSD-139780** Units: **ug/L** Analysis Date: **15-Apr-2019 13:07**
Client ID: Run ID: **SV-5_336636** SeqNo: **5036514** PrepDate: **12-Apr-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.09214	0.010	0.08	0	115	40 - 140	0.08801	4.59	20	
Surr: 2-Fluorobiphenyl	*0.09791*	*0*	*0.08*	*0*	*122*	*40 - 140*	*0.09164*	*6.61*	*20*	
Surr: 4-Terphenyl-d14	*0.07892*	*0*	*0.08*	*0*	*98.6*	*40 - 140*	*0.08667*	*9.37*	*20*	
Surr: Nitrobenzene-d5	*0.09288*	*0*	*0.08*	*0*	*116*	*40 - 140*	*0.07931*	*15.8*	*20*	

The following samples were analyzed in this batch: HS19040652-01

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

QC BATCH REPORT

Batch ID: R336625 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190415** Units: **UG/L** Analysis Date: **15-Apr-2019 13:13**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036128** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

QC BATCH REPORT

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190415** Units: **UG/L** Analysis Date: **15-Apr-2019 13:13**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036128** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*43.81*	*1.0*	*50*	*0*	*87.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.27*	*1.0*	*50*	*0*	*96.5*	*85 - 114*				
Surr: Dibromofluoromethane	*45.78*	*1.0*	*50*	*0*	*91.6*	*80 - 119*				
Surr: Toluene-d8	*50.76*	*1.0*	*50*	*0*	*102*	*89 - 112*				

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

QC BATCH REPORT

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190415** Units: **UG/L** Analysis Date: **15-Apr-2019 12:01**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036126** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	22.62	1.0	20	0	113	78 - 124				
1,1,1-Trichloroethane	20.75	1.0	20	0	104	74 - 131				
1,1,2,2-Tetrachloroethane	20.57	1.0	20	0	103	71 - 121				
1,1,2-Trichloroethane	20.88	1.0	20	0	104	80 - 119				
1,1-Dichloroethane	18.5	1.0	20	0	92.5	77 - 125				
1,1-Dichloroethene	19.56	1.0	20	0	97.8	71 - 131				
1,1-Dichloropropene	20.53	1.0	20	0	103	78 - 125				
1,2,3-Trichlorobenzene	22.3	1.0	20	0	111	69 - 129				
1,2,3-Trichloropropane	20.92	1.0	20	0	105	73 - 122				
1,2,4-Trichlorobenzene	22.16	1.0	20	0	111	69 - 130				
1,2,4-Trimethylbenzene	23.96	1.0	20	0	120	76 - 124				
1,2-Dibromo-3-chloropropane	21.56	1.0	20	0	108	62 - 128				
1,2-Dibromoethane	22.06	1.0	20	0	110	77 - 121				
1,2-Dichlorobenzene	21.83	1.0	20	0	109	80 - 119				
1,2-Dichloroethane	20.97	1.0	20	0	105	73 - 128				
1,2-Dichloropropane	19.44	1.0	20	0	97.2	78 - 122				
1,3,5-Trimethylbenzene	23.36	1.0	20	0	117	75 - 124				
1,3-Dichlorobenzene	22.14	1.0	20	0	111	80 - 119				
1,3-Dichloropropane	20.55	1.0	20	0	103	80 - 119				
1,4-Dichlorobenzene	21.91	1.0	20	0	110	79 - 118				
2,2-Dichloropropane	20.44	1.0	20	0	102	60 - 139				
2-Butanone	34.91	2.0	40	0	87.3	56 - 143				
2-Chlorotoluene	21.42	1.0	20	0	107	79 - 122				
2-Hexanone	40.09	2.0	40	0	100	57 - 139				
4-Chlorotoluene	21.72	1.0	20	0	109	78 - 122				
4-Isopropyltoluene	23.88	1.0	20	0	119	77 - 127				
4-Methyl-2-pentanone	38.74	2.0	40	0	96.9	67 - 130				
Acetone	33.63	2.0	40	0	84.1	39 - 160				
Benzene	21.09	1.0	20	0	105	79 - 120				
Bromobenzene	23.22	1.0	20	0	116	80 - 120				
Bromochloromethane	20.29	1.0	20	0	101	78 - 123				
Bromodichloromethane	21.35	1.0	20	0	107	79 - 125				
Bromoform	22.42	1.0	20	0	112	66 - 130				
Bromomethane	23.55	1.0	20	0	118	53 - 141				

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

QC BATCH REPORT

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190415** Units: **UG/L** Analysis Date: **15-Apr-2019 12:01**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036126** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	36.08	2.0	40	0	90.2	64 - 133				
Carbon tetrachloride	24.06	1.0	20	0	120	72 - 136				
Chlorobenzene	21.18	1.0	20	0	106	82 - 118				
Chloroethane	17.9	1.0	20	0	89.5	60 - 138				
Chloroform	19.78	1.0	20	0	98.9	79 - 124				
Chloromethane	13.81	1.0	20	0	69.0	50 - 139				
cis-1,2-Dichloroethene	19.48	1.0	20	0	97.4	78 - 123				
cis-1,3-Dichloropropene	19.48	1.0	20	0	97.4	75 - 124				
Dibromochloromethane	22.32	1.0	20	0	112	74 - 126				
Dibromomethane	21.3	1.0	20	0	106	79 - 123				
Dichlorodifluoromethane	20.04	1.0	20	0	100	32 - 152				
Ethylbenzene	23.17	1.0	20	0	116	79 - 121				
Hexachlorobutadiene	26.18	1.0	20	0	131	66 - 134				
Isopropylbenzene	23.3	1.0	20	0	117	72 - 131				
m,p-Xylene	45.06	2.0	40	0	113	80 - 121				
Methylene chloride	19.58	2.0	20	0	97.9	74 - 124				
Naphthalene	21.44	1.0	20	0	107	61 - 128				
n-Butylbenzene	24.06	1.0	20	0	120	75 - 128				
n-Propylbenzene	22.63	1.0	20	0	113	76 - 126				
o-Xylene	21.99	1.0	20	0	110	78 - 122				
sec-Butylbenzene	23.1	1.0	20	0	116	77 - 126				
Styrene	22.87	1.0	20	0	114	78 - 123				
tert-Butylbenzene	22.98	1.0	20	0	115	78 - 124				
Tetrachloroethene	24.12	1.0	20	0	121	74 - 129				
Toluene	22.17	1.0	20	0	111	80 - 121				
trans-1,2-Dichloroethene	19.59	1.0	20	0	98.0	75 - 124				
trans-1,3-Dichloropropene	21.32	1.0	20	0	107	73 - 127				
Trichloroethene	21.61	1.0	20	0	108	79 - 123				
Trichlorofluoromethane	21.57	1.0	20	0	108	65 - 141				
Vinyl chloride	16.87	1.0	20	0	84.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*43.53*	*1.0*	*50*	*0*	*87.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.05*	*1.0*	*50*	*0*	*98.1*	*85 - 114*				
Surr: Dibromofluoromethane	*45.63*	*1.0*	*50*	*0*	*91.3*	*80 - 119*				
Surr: Toluene-d8	*51.4*	*1.0*	*50*	*0*	*103*	*89 - 112*				

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

QC BATCH REPORT

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCSD Sample ID: **VLCSDW-190415** Units: **UG/L** Analysis Date: **15-Apr-2019 12:25**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036127** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	21.97	1.0	20	0	110	78 - 124	22.62	2.9	20	
1,1,1-Trichloroethane	20.06	1.0	20	0	100	74 - 131	20.75	3.35	20	
1,1,2,2-Tetrachloroethane	20.83	1.0	20	0	104	71 - 121	20.57	1.29	20	
1,1,2-Trichloroethane	20.92	1.0	20	0	105	80 - 119	20.88	0.171	20	
1,1-Dichloroethane	18.16	1.0	20	0	90.8	77 - 125	18.5	1.84	20	
1,1-Dichloroethene	18.88	1.0	20	0	94.4	71 - 131	19.56	3.54	20	
1,1-Dichloropropene	20.24	1.0	20	0	101	78 - 125	20.53	1.46	20	
1,2,3-Trichlorobenzene	23	1.0	20	0	115	69 - 129	22.3	3.1	20	
1,2,3-Trichloropropane	21.34	1.0	20	0	107	73 - 122	20.92	1.98	20	
1,2,4-Trichlorobenzene	22.54	1.0	20	0	113	69 - 130	22.16	1.72	20	
1,2,4-Trimethylbenzene	23.74	1.0	20	0	119	76 - 124	23.96	0.958	20	
1,2-Dibromo-3-chloropropane	21.98	1.0	20	0	110	62 - 128	21.56	1.93	20	
1,2-Dibromoethane	22.29	1.0	20	0	111	77 - 121	22.06	1.05	20	
1,2-Dichlorobenzene	21.95	1.0	20	0	110	80 - 119	21.83	0.537	20	
1,2-Dichloroethane	21.51	1.0	20	0	108	73 - 128	20.97	2.51	20	
1,2-Dichloropropane	19.29	1.0	20	0	96.4	78 - 122	19.44	0.804	20	
1,3,5-Trimethylbenzene	23.21	1.0	20	0	116	75 - 124	23.36	0.612	20	
1,3-Dichlorobenzene	21.98	1.0	20	0	110	80 - 119	22.14	0.73	20	
1,3-Dichloropropane	20.58	1.0	20	0	103	80 - 119	20.55	0.163	20	
1,4-Dichlorobenzene	21.54	1.0	20	0	108	79 - 118	21.91	1.66	20	
2,2-Dichloropropane	19.64	1.0	20	0	98.2	60 - 139	20.44	4.01	20	
2-Butanone	36.5	2.0	40	0	91.2	56 - 143	34.91	4.44	20	
2-Chlorotoluene	21.24	1.0	20	0	106	79 - 122	21.42	0.83	20	
2-Hexanone	40.49	2.0	40	0	101	57 - 139	40.09	0.977	20	
4-Chlorotoluene	21.68	1.0	20	0	108	78 - 122	21.72	0.156	20	
4-Isopropyltoluene	23.3	1.0	20	0	116	77 - 127	23.88	2.44	20	
4-Methyl-2-pentanone	39.85	2.0	40	0	99.6	67 - 130	38.74	2.81	20	
Acetone	34.57	2.0	40	0	86.4	39 - 160	33.63	2.77	20	
Benzene	20.5	1.0	20	0	102	79 - 120	21.09	2.83	20	
Bromobenzene	22.92	1.0	20	0	115	80 - 120	23.22	1.33	20	
Bromochloromethane	20.14	1.0	20	0	101	78 - 123	20.29	0.728	20	
Bromodichloromethane	21.33	1.0	20	0	107	79 - 125	21.35	0.112	20	
Bromoform	22.36	1.0	20	0	112	66 - 130	22.42	0.259	20	
Bromomethane	21.73	1.0	20	0	109	53 - 141	23.55	8.04	20	

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

QC BATCH REPORT

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCSD Sample ID: **VLCSDW-190415** Units: **UG/L** Analysis Date: **15-Apr-2019 12:25**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036127** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.78	2.0	40	0	86.9	64 - 133	36.08	3.68	20	
Carbon tetrachloride	23.64	1.0	20	0	118	72 - 136	24.06	1.75	20	
Chlorobenzene	21.23	1.0	20	0	106	82 - 118	21.18	0.223	20	
Chloroethane	17.77	1.0	20	0	88.9	60 - 138	17.9	0.709	20	
Chloroform	19.21	1.0	20	0	96.1	79 - 124	19.78	2.9	20	
Chloromethane	13.34	1.0	20	0	66.7	50 - 139	13.81	3.42	20	
cis-1,2-Dichloroethene	18.99	1.0	20	0	94.9	78 - 123	19.48	2.55	20	
cis-1,3-Dichloropropene	19.64	1.0	20	0	98.2	75 - 124	19.48	0.777	20	
Dibromochloromethane	21.98	1.0	20	0	110	74 - 126	22.32	1.55	20	
Dibromomethane	21.37	1.0	20	0	107	79 - 123	21.3	0.368	20	
Dichlorodifluoromethane	19.28	1.0	20	0	96.4	32 - 152	20.04	3.87	20	
Ethylbenzene	22.22	1.0	20	0	111	79 - 121	23.17	4.15	20	
Hexachlorobutadiene	25.09	1.0	20	0	125	66 - 134	26.18	4.27	20	
Isopropylbenzene	22.72	1.0	20	0	114	72 - 131	23.3	2.54	20	
m,p-Xylene	43.7	2.0	40	0	109	80 - 121	45.06	3.05	20	
Methylene chloride	19.08	2.0	20	0	95.4	74 - 124	19.58	2.6	20	
Naphthalene	22.19	1.0	20	0	111	61 - 128	21.44	3.44	20	
n-Butylbenzene	24.01	1.0	20	0	120	75 - 128	24.06	0.198	20	
n-Propylbenzene	22.35	1.0	20	0	112	76 - 126	22.63	1.24	20	
o-Xylene	21.28	1.0	20	0	106	78 - 122	21.99	3.3	20	
sec-Butylbenzene	22.9	1.0	20	0	114	77 - 126	23.1	0.895	20	
Styrene	22.39	1.0	20	0	112	78 - 123	22.87	2.13	20	
tert-Butylbenzene	22.55	1.0	20	0	113	78 - 124	22.98	1.89	20	
Tetrachloroethene	23.45	1.0	20	0	117	74 - 129	24.12	2.8	20	
Toluene	21.39	1.0	20	0	107	80 - 121	22.17	3.6	20	
trans-1,2-Dichloroethene	18.77	1.0	20	0	93.9	75 - 124	19.59	4.27	20	
trans-1,3-Dichloropropene	20.84	1.0	20	0	104	73 - 127	21.32	2.27	20	
Trichloroethene	20.94	1.0	20	0	105	79 - 123	21.61	3.17	20	
Trichlorofluoromethane	20.92	1.0	20	0	105	65 - 141	21.57	3.03	20	
Vinyl chloride	16.4	1.0	20	0	82.0	58 - 137	16.87	2.85	20	
Surr: 1,2-Dichloroethane-d4	*44.62*	*1.0*	*50*	*0*	*89.2*	*81 - 118*	*43.53*	*2.47*	*20*	
Surr: 4-Bromofluorobenzene	*48.9*	*1.0*	*50*	*0*	*97.8*	*85 - 114*	*49.05*	*0.319*	*20*	
Surr: Dibromofluoromethane	*45.81*	*1.0*	*50*	*0*	*91.6*	*80 - 119*	*45.63*	*0.395*	*20*	
Surr: Toluene-d8	*50.74*	*1.0*	*50*	*0*	*101*	*89 - 112*	*51.4*	*1.28*	*20*	

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

QC BATCH REPORT

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19040783-05MS** Units: **UG/L** Analysis Date: **15-Apr-2019 15:37**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036134** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	219.1	10	200	0	110	78 - 124				
1,1,1-Trichloroethane	208.4	10	200	0	104	74 - 131				
1,1,2,2-Tetrachloroethane	205.5	10	200	0	103	71 - 121				
1,1,2-Trichloroethane	205.1	10	200	2.7	101	80 - 119				
1,1-Dichloroethane	183.3	10	200	0	91.7	77 - 125				
1,1-Dichloroethene	195.9	10	200	0	97.9	71 - 131				
1,1-Dichloropropene	211.2	10	200	50.1	80.5	78 - 125				
1,2,3-Trichlorobenzene	224.5	10	200	0	112	69 - 129				
1,2,3-Trichloropropane	201.6	10	200	3.051	99.3	73 - 122				
1,2,4-Trichlorobenzene	224.3	10	200	0	112	69 - 130				
1,2,4-Trimethylbenzene	226.6	10	200	3.34	112	76 - 124				
1,2-Dibromo-3-chloropropane	227.9	10	200	0	114	62 - 128				
1,2-Dibromoethane	216.1	10	200	0	108	77 - 121				
1,2-Dichlorobenzene	217.4	10	200	0	109	80 - 119				
1,2-Dichloroethane	212.8	10	200	13.12	99.8	73 - 128				
1,2-Dichloropropane	187.2	10	200	0	93.6	78 - 122				
1,3,5-Trimethylbenzene	227	10	200	2.269	112	75 - 124				
1,3-Dichlorobenzene	215.7	10	200	0	108	80 - 119				
1,3-Dichloropropane	203.4	10	200	0	102	80 - 119				
1,4-Dichlorobenzene	215.1	10	200	0	108	79 - 118				
2,2-Dichloropropane	200.1	10	200	0	100	60 - 139				
2-Butanone	362	20	400	0	90.5	56 - 143				
2-Chlorotoluene	212.5	10	200	0	106	79 - 122				
2-Hexanone	403.2	20	400	0	101	57 - 139				
4-Chlorotoluene	212.4	10	200	0	106	78 - 122				
4-Isopropyltoluene	232.2	10	200	1.803	115	77 - 127				
4-Methyl-2-pentanone	396.8	20	400	2.045	98.7	67 - 130				
Acetone	398	20	400	6.558	97.9	39 - 160				
Benzene	678.1	10	200	485.3	96.4	79 - 120				
Bromobenzene	219.1	10	200	0	110	80 - 120				
Bromochloromethane	188.3	10	200	0	94.1	78 - 123				
Bromodichloromethane	205.8	10	200	0	103	79 - 125				
Bromoform	214.5	10	200	15.19	99.7	66 - 130				
Bromomethane	214.3	10	200	5.754	104	53 - 141				

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

QC BATCH REPORT

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19040783-05MS** Units: **UG/L** Analysis Date: **15-Apr-2019 15:37**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036134** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	380.9	20	400	0	95.2	64 - 133				
Carbon tetrachloride	238.1	10	200	92.29	72.9	72 - 136				
Chlorobenzene	212.7	10	200	0	106	82 - 118				
Chloroethane	185.8	10	200	0	92.9	60 - 138				
Chloroform	192.8	10	200	1.452	95.7	79 - 124				
Chloromethane	158.9	10	200	0	79.4	50 - 139				
cis-1,2-Dichloroethene	185.9	10	200	0	93.0	78 - 123				
cis-1,3-Dichloropropene	197.3	10	200	0	98.6	75 - 124				
Dibromochloromethane	215.1	10	200	0	108	74 - 126				
Dibromomethane	205.9	10	200	0	103	79 - 123				
Dichlorodifluoromethane	218.8	10	200	0	109	32 - 152				
Ethylbenzene	222.1	10	200	14.36	104	79 - 121				
Hexachlorobutadiene	257	10	200	0	128	66 - 134				
Isopropylbenzene	227.3	10	200	0	114	72 - 131				
m,p-Xylene	458.8	20	400	11.39	112	80 - 121				
Methylene chloride	201.1	20	200	13.8	93.6	74 - 124				
Naphthalene	219.8	10	200	1.985	109	61 - 128				
n-Butylbenzene	234.8	10	200	1.33	117	75 - 128				
n-Propylbenzene	225.7	10	200	0	113	76 - 126				
o-Xylene	223	10	200	4.111	109	78 - 122				
sec-Butylbenzene	232.8	10	200	2.756	115	77 - 126				
Styrene	218.6	10	200	0	109	78 - 123				
tert-Butylbenzene	230.2	10	200	0	115	78 - 124				
Tetrachloroethene	237.2	10	200	0	119	74 - 129				
Toluene	238.4	10	200	22.15	108	80 - 121				
trans-1,2-Dichloroethene	194.8	10	200	0	97.4	75 - 124				
trans-1,3-Dichloropropene	200.7	10	200	0	100	73 - 127				
Trichloroethene	217.9	10	200	0	109	79 - 123				
Trichlorofluoromethane	227.9	10	200	0	114	65 - 141				
Vinyl chloride	174.3	10	200	0	87.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*438.9*	*10*	*500*	*0*	*87.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*490.6*	*10*	*500*	*0*	*98.1*	*85 - 114*				
Surr: Dibromofluoromethane	*458.5*	*10*	*500*	*0*	*91.7*	*80 - 119*				
Surr: Toluene-d8	*513*	*10*	*500*	*0*	*103*	*89 - 112*				

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

QC BATCH REPORT

Batch ID: R336625 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19040783-05MSD** Units: **UG/L** Analysis Date: **15-Apr-2019 16:01**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036135** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	215.6	10	200	0	108	78 - 124	219.1	1.61	20	
1,1,1-Trichloroethane	198.6	10	200	0	99.3	74 - 131	208.4	4.82	20	
1,1,2,2-Tetrachloroethane	203.8	10	200	0	102	71 - 121	205.5	0.84	20	
1,1,2-Trichloroethane	205.1	10	200	2.7	101	80 - 119	205.1	0.0221	20	
1,1-Dichloroethane	174.7	10	200	0	87.3	77 - 125	183.3	4.82	20	
1,1-Dichloroethene	184.7	10	200	0	92.3	71 - 131	195.9	5.87	20	
1,1-Dichloropropene	199.6	10	200	50.1	74.8	78 - 125	211.2	5.64	20	S
1,2,3-Trichlorobenzene	235.3	10	200	0	118	69 - 129	224.5	4.68	20	
1,2,3-Trichloropropane	199	10	200	3.051	98.0	73 - 122	201.6	1.3	20	
1,2,4-Trichlorobenzene	224.3	10	200	0	112	69 - 130	224.3	0.0243	20	
1,2,4-Trimethylbenzene	218.7	10	200	3.34	108	76 - 124	226.6	3.56	20	
1,2-Dibromo-3-chloropropane	222.9	10	200	0	111	62 - 128	227.9	2.23	20	
1,2-Dibromoethane	216.6	10	200	0	108	77 - 121	216.1	0.217	20	
1,2-Dichlorobenzene	213.3	10	200	0	107	80 - 119	217.4	1.92	20	
1,2-Dichloroethane	205.1	10	200	13.12	96.0	73 - 128	212.8	3.69	20	
1,2-Dichloropropane	181.8	10	200	0	90.9	78 - 122	187.2	2.93	20	
1,3,5-Trimethylbenzene	220	10	200	2.269	109	75 - 124	227	3.1	20	
1,3-Dichlorobenzene	211.5	10	200	0	106	80 - 119	215.7	1.95	20	
1,3-Dichloropropane	201.3	10	200	0	101	80 - 119	203.4	1.01	20	
1,4-Dichlorobenzene	210.6	10	200	0	105	79 - 118	215.1	2.11	20	
2,2-Dichloropropane	189.5	10	200	0	94.8	60 - 139	200.1	5.45	20	
2-Butanone	360.4	20	400	0	90.1	56 - 143	362	0.44	20	
2-Chlorotoluene	205.1	10	200	0	103	79 - 122	212.5	3.53	20	
2-Hexanone	401.2	20	400	0	100	57 - 139	403.2	0.482	20	
4-Chlorotoluene	207.7	10	200	0	104	78 - 122	212.4	2.2	20	
4-Isopropyltoluene	226.3	10	200	1.803	112	77 - 127	232.2	2.56	20	
4-Methyl-2-pentanone	392.9	20	400	2.045	97.7	67 - 130	396.8	0.971	20	
Acetone	405.6	20	400	6.558	99.8	39 - 160	398	1.91	20	
Benzene	652.6	10	200	485.3	83.7	79 - 120	678.1	3.82	20	
Bromobenzene	216.6	10	200	0	108	80 - 120	219.1	1.14	20	
Bromochloromethane	183.1	10	200	0	91.5	78 - 123	188.3	2.81	20	
Bromodichloromethane	198.4	10	200	0	99.2	79 - 125	205.8	3.66	20	
Bromoform	214.2	10	200	15.19	99.5	66 - 130	214.5	0.158	20	
Bromomethane	214	10	200	5.754	104	53 - 141	214.3	0.12	20	

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

QC BATCH REPORT

Batch ID: R336625 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19040783-05MSD** Units: **UG/L** Analysis Date: **15-Apr-2019 16:01**
Client ID: Run ID: **VOA6_336625** SeqNo: **5036135** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	358.8	20	400	0	89.7	64 - 133	380.9	5.96	20	
Carbon tetrachloride	226.7	10	200	92.29	67.2	72 - 136	238.1	4.89	20	S
Chlorobenzene	208.3	10	200	0	104	82 - 118	212.7	2.09	20	
Chloroethane	159.6	10	200	0	79.8	60 - 138	185.8	15.2	20	
Chloroform	184.5	10	200	1.452	91.5	79 - 124	192.8	4.37	20	
Chloromethane	153.7	10	200	0	76.8	50 - 139	158.9	3.34	20	
cis-1,2-Dichloroethene	183.5	10	200	0	91.7	78 - 123	185.9	1.34	20	
cis-1,3-Dichloropropene	192.4	10	200	0	96.2	75 - 124	197.3	2.51	20	
Dibromochloromethane	212.1	10	200	0	106	74 - 126	215.1	1.41	20	
Dibromomethane	199.3	10	200	0	99.7	79 - 123	205.9	3.25	20	
Dichlorodifluoromethane	206.6	10	200	0	103	32 - 152	218.8	5.7	20	
Ethylbenzene	216.4	10	200	14.36	101	79 - 121	222.1	2.59	20	
Hexachlorobutadiene	258.8	10	200	0	129	66 - 134	257	0.713	20	
Isopropylbenzene	221.9	10	200	0	111	72 - 131	227.3	2.39	20	
m,p-Xylene	441	20	400	11.39	107	80 - 121	458.8	3.96	20	
Methylene chloride	194.1	20	200	13.8	90.2	74 - 124	201.1	3.52	20	
Naphthalene	224.1	10	200	1.985	111	61 - 128	219.8	1.93	20	
n-Butylbenzene	228.5	10	200	1.33	114	75 - 128	234.8	2.72	20	
n-Propylbenzene	218.6	10	200	0	109	76 - 126	225.7	3.21	20	
o-Xylene	219.2	10	200	4.111	108	78 - 122	223	1.71	20	
sec-Butylbenzene	225	10	200	2.756	111	77 - 126	232.8	3.43	20	
Styrene	212.6	10	200	0	106	78 - 123	218.6	2.78	20	
tert-Butylbenzene	223.5	10	200	0	112	78 - 124	230.2	2.97	20	
Tetrachloroethene	227.2	10	200	0	114	74 - 129	237.2	4.3	20	
Toluene	231	10	200	22.15	104	80 - 121	238.4	3.17	20	
trans-1,2-Dichloroethene	187.5	10	200	0	93.7	75 - 124	194.8	3.85	20	
trans-1,3-Dichloropropene	198	10	200	0	99.0	73 - 127	200.7	1.35	20	
Trichloroethene	207.4	10	200	0	104	79 - 123	217.9	4.91	20	
Trichlorofluoromethane	213.7	10	200	0	107	65 - 141	227.9	6.43	20	
Vinyl chloride	163.4	10	200	0	81.7	58 - 137	174.3	6.44	20	
Surr: 1,2-Dichloroethane-d4	*432.1*	*10*	*500*	*0*	*86.4*	*81 - 118*	*438.9*	*1.56*	*20*	
Surr: 4-Bromofluorobenzene	*490.4*	*10*	*500*	*0*	*98.1*	*85 - 114*	*490.6*	*0.0491*	*20*	
Surr: Dibromofluoromethane	*460.5*	*10*	*500*	*0*	*92.1*	*80 - 119*	*458.5*	*0.425*	*20*	
Surr: Toluene-d8	*516*	*10*	*500*	*0*	*103*	*89 - 112*	*513*	*0.582*	*20*	

ALS Houston, US Date: 29-Apr-19

Client:	Bhate Environmental Associates, Inc.
Project:	LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder:	HS19040652

QC BATCH REPORT

Batch ID:	**R336625 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19040652-01 HS19040652-03

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19040652

QC BATCH REPORT

Batch ID: R336862 (0) **Instrument: UV-2450** **Method: HEXAVALENT CHROMIUM BY SW7196A**

MBLK Sample ID: **MBLK-336862** Units: **mg/L** Analysis Date: **11-Apr-2019 12:10**
Client ID: Run ID: **UV-2450_336862** SeqNo: **5041171** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.0100	0.0100								U

LCS Sample ID: **LCS-336862** Units: **mg/L** Analysis Date: **11-Apr-2019 12:10**
Client ID: Run ID: **UV-2450_336862** SeqNo: **5041172** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.243	0.0100	0.25	0	97.2	80 - 120				

MS Sample ID: **HS19040652-01MS** Units: **mg/L** Analysis Date: **11-Apr-2019 12:10**
Client ID: **LH18/24-SP650_041019** Run ID: **UV-2450_336862** SeqNo: **5041174** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.242	0.0100	0.25	-0.003	98.0	75 - 125				

MSD Sample ID: **HS19040652-01MSD** Units: **mg/L** Analysis Date: **11-Apr-2019 12:10**
Client ID: **LH18/24-SP650_041019** Run ID: **UV-2450_336862** SeqNo: **5041175** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.251	0.0100	0.25	-0.003	102	75 - 125	0.242	3.65	20	

The following samples were analyzed in this batch: HS19040652-01

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: **HS19040652**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

ALS Houston, US Date: 29-Apr-19

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS19040652

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19040652-01	LH18/24-SP650_041019	Login	4/11/2019 10:29:12 AM	RPG	EXT049
HS19040652-01	LH18/24-SP650_041019	Login	4/11/2019 10:29:12 AM	RPG	WET070
HS19040652-01	LH18/24-SP650_041019	Login	4/11/2019 10:29:12 AM	RPG	MET033
HS19040652-01	LH18/24-SP650_041019	Login	4/11/2019 10:29:12 AM	RPG	VOA193
HS19040652-02	LH18/24-SP650_041019_BIX	Login	4/11/2019 10:29:12 AM	RPG	Sub
HS19040652-03	Trip Blank	Login	4/11/2019 10:29:12 AM	RPG	VOA193

00937624

ALS Houston, US Date: 29-Apr-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19040652
Date/Time Received: **11-Apr-2019 09:00**
Received by: **PMG**

Checklist completed by: *Raegen Giga* eSignature 11-Apr-2019 Date
Reviewed by: *RJ Modashia* eSignature 11-Apr-2019 Date

Matrices: **water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	4.7c uc/c	IR 25
Cooler(s)/Kit(s):	25587	
Date/Time sample(s) sent to storage:	04/11/2019 10:34	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

00937625

HS19040652

Bhate Environmental Associates, Inc.

LH18/24 Longhorn GW Treatment Plant Monthly Effluen

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, TX 77099 (281) 530 – 5656 ATTN: RJ Modashia

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. NWO1312.0150.0 16.0001
Job: **GROUNDWATER TREATMENT PLANT MONTHLY EFFLUENT SAMPLES**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOLATILES	SILVER, SELENIUM, LEAD, BARIUM	HEXAVALENT CHROMIUM	1, 4 - DIOXANE	PERCHLORATE						Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_041019	Water	04/10/19 / 14:00		3	X										HCL	
LH18/24-SP650_041019	Water	04/10/19 / 14:00		2			X	X							NONE	
LH18/24-SP650_041019_BIX	Water	04/10/19 / 14:00		1					X						NONE	
LH18/24-SP650_041019	Water	04/10/19 / 14:00		1		X									HNO3	
Trip Blank	Water	04/10/19		2	X										HCL	

Additional Remarks: **STANDARD TURN AROUND TIME**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	04/10/19	14:30		4/11/19	07:30						

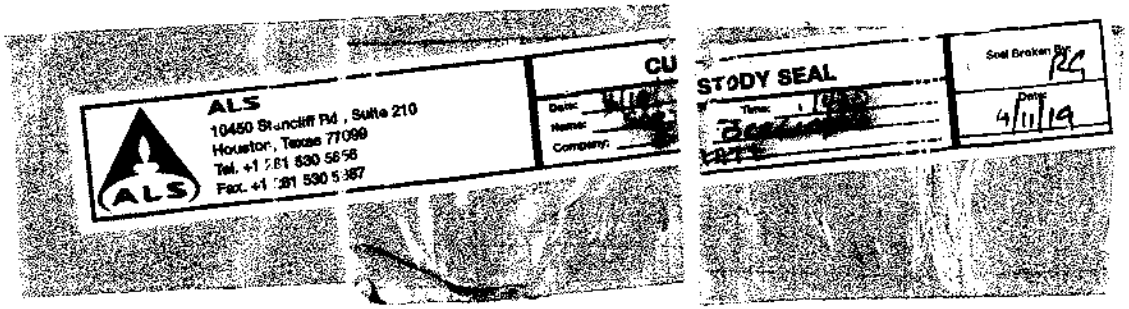
For Lab Use Only

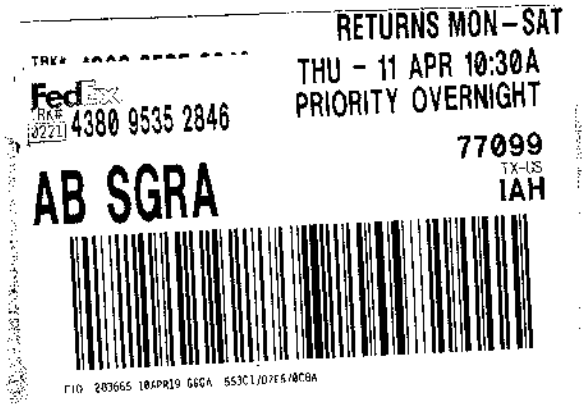
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

25587 ulc. 4.7° #12 Cli-0.4°

(Word) S:\I-ccs\Forms\Chain of Custody - BiWeekly


ALS
10450 Stancliff Rd , Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CU
Date:
Name:
Company:
STODY SEAL
Seal Broken By
Date:
4/11/19


RETURNS MON-SAT
THU - 11 APR 10:30A
PRIORITY OVERNIGHT
FedEx
4380 9535 2846
77099
TX-US
IAH
AB SGRA
FIO 283665 10APR19 GGGA 553C1/D7E6/0C0A

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1910478; 1910480; 1910483; 1911288

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2241 (237388)

General Set Information: There were four field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1910480001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 649380) was less than 1/2 the CRDL. The recovery for the LCS (649381) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 1910837002/03 of Work Order 1910837. 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 649378) is reported from the analysis of the Laboratory Control Sample (LCS – 649381) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Thomas Bosch April 24, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: April 25, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1910478**
Project ID: HS19040652
Purchase Order: HS19040652
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_041019_BIX	1910478001	04/10/19	04/12/19	

ANALYTICAL REPORT

Workorder: 34-1910478
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_041019_BIX**
Lab ID: 1910478001
Matrix: Water
Sampling Site: NA
Media: 125 mL Nalgene
Sampling Parameter: NA
Collected: 04/10/2019
Received: 04/12/2019

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water
Batch: ELMS/2241 (HBN: 237388)
Analyzed: 04/23/2019 09:36
Instrument ID: LCMS04
Percent Solid: NA
Report Basis: Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 04/24/2019 07:51	/S/ Stephen Brose 04/25/2019 07:42

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1910478
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1910478

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2241 (HBN: 237388)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 649380
Analyzed: 04/23/2019 09:20
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 649381
Analyzed: 04/23/2019 08:53
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.01	4.00	100	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1910837001	**MS:**	1910837002				**MSD:**	1910837003			
Analyzed:	04/23/2019 10:30	**Analyzed:**	04/23/2019 10:43				**Analyzed:**	04/23/2019 10:57			
Dilution:	1	**Dilution:**	1				**Dilution:**	1			
Units:	ug/L	**Units:**	ug/L				**Units:**	ug/L			

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.81	4	95.1	78.8	123.8	3.95	98.8	3.74	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
04/24/2019 07:52	04/25/2019 07:42

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

00937633

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Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

COC ID: 11110

1910478

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19040652
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19040652-02**	**LH18/24-SP650_041019_BIX**	**Water**	**10 Apr 2019 14:00**
	SUB_Perch-6850			25 Apr 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: R Cuge Date/Time: 4/11/19 1800

Received By: [signature] Date/Time: 04-12-19 9:55

Cooler ID(s): Temperature(s):

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19040652	***Split:***	**Workorder ID:** 1910478	**Level:** ENV_LVL4	**Requested Analysis**
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly	
Comments:			**Preservatives**	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	COOL	EPA 6850, DoD QSM												
1	04/10/2019 14:00	LH18/24-SP650_041019_BIX	1910478001		Water	A	1		A												
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	04/12/2019 09:55	ALS Sample Receiving	Sample Login
[signature] 4/13/19 1300		STB	Storage
R.33.1 4.22.19/13:05		T. Burch	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

Fri, 04/12/19 12:16 PM

ALSCOCV3.1

00937634

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 191078

Date/Time of Receipt: 04-12-19 9:55

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA		
	Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9309	3 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Tam Van Tassell (Signature) Tam Van Tassell (Printed Name) 04-12-19 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

00937636

Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159469-434 RIT2 EXP 01/20

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 11APR19
ACTWGT: 8.65 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO **PAUL POPE**
ALS LABORATORY GROUP
960 WEST LEVOY DRIVE

SALT LAKE CITY UT 84123
(800) 356-9135
REF: HS19040654/653/652 RJ

FedEx Express

TRK# 0201 **4809 7832 8001**

FRI - 12 APR 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US **SLC**

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Batch Worklist

Batch: ELMS/ 2241 **Created:** 4/23/2019 07:43 **Instrument:** **HBN:** 237388

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1910478 [ENV_LVL4]
Workorder: 1910480 [ENV_LVL4]
Workorder: 1910483 [ENV_LVL4]
Workorder: 1910837 [ENV_LVL4]
Workorder: 1911288 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	649377	CCV for HBN 237388 [ELMS/2241]				CCV	3		E685041C3Q	5311		4/25/2019	
2	649378	RLVS for HBN 237388 [ELMS/2241				RLVS	3		E685041C3Q	5311		4/25/2019	
3	649379	ICS for HBN 237388 [ELMS/2241]				ICS	3		E6850..D3Q	5311		4/25/2019	
4	649380	LMB for HBN 237388 [ELMS/2241]				LMB	3		E6850Q413Q	5311		4/25/2019	
5	649381	LCS for HBN 237388 [ELMS/2241]				LCS	3		E6850Q413Q	5311		4/25/2019	
6	1910478001	LH18/24-SP650_041019_BIX				SAMPLE	3	1910478001-A	E6850Q41.3	5480	5/8/2019	4/25/2019	
7	1910480001	LH18/24-SP140_041019				SAMPLE	3	1910480001-A	E6850Q41.3	5480	5/8/2019	4/25/2019	
8	1910483001	LH18/24-SP650_041019_BIX				SAMPLE	3	1910483001-A	E6850Q41.3	5480	5/8/2019	4/25/2019	
9	1910837001	43MW01				SAMPLE	3	1910837001-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
10	1910837002	43MW01MS				MS	3	1910837002-A	E6850Q413Q	5480		4/25/2019	
11	1910837003	43MW01MSD				MSD	3	1910837003-A	E6850Q413Q	5480		4/25/2019	
12	1910837004	43MW03				SAMPLE	3	1910837004-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
13	1910837005	43MW04				SAMPLE	3	1910837005-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
14	1910837006	43MW05				SAMPLE	3	1910837006-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
15	1910837007	43MW06				SAMPLE	3	1910837007-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
16	649382	CCV for HBN 237388 [ELMS/2241]				CCV	3		E685041C3Q	5311		4/25/2019	
17	1910837008	DUP040919				FLDDUP	3	1910837008-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
18	1910837009	EB041019				EQBK	3	1910837009-A	E6850Q41.3	5480	5/8/2019	4/29/2019	
19	1911288001	LH18/24-SP650_041719_BIX				SAMPLE	3	1911288001-A	E6850Q41.3	5480	5/15/2019	5/2/2019	
20	649383	CCV for HBN 237388 [ELMS/2241]				CCV	3		E685041C3Q	5311		4/25/2019	

00937637

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1910478 (001); 1910480 (001); 1910483 (001); 1911288 (001); 1910837 (001-09) ELMS Batch/HBN ID: 2241 (237388)
Prep Date: 04/22/2019 Analysis Date: 04/23/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\APR\23APR19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by TNB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 41830 was used for LCS 649381; Target = 4.0µg/L. ASTM type II water was used for LMB 649380.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1910837002/03 (Client ID: 43MW01). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field sample 1910480001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\APR\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\237388-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 649378) is reported from the analysis of the Laboratory Control Sample (LCS – 649381) at a level 4.0µg/L.
6) Due to limitations of the Chemstation Software, many of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2241 HBN: 237388 Sample Set IDs if Applicable: 1910478 / 1910480 / 1910483 / 1910837 / 1911288	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SM
Standards traceability checked and meets criteria	TB	SM
Standard curve coefficients evaluated and meet criteria	TB	SM
ICVs analyzed and meet acceptance criteria	TB	SM
CCVs analyzed and meet acceptance criteria	TB	SM
Method Blanks analyzed and meet acceptance criteria	TB	SM
Retention Time Windows checked	TB	SM
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SM
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SM
RLVS analyzed	TB	SM
Preparation and analysis hold times met	TB	SM
Preparation deviations and re-preparations noted when performed	TB	SM
Analysis deviations and re-analyses noted when performed	TB	SM
Sample dilution factors noted on reports	TB	SM
Electronic records in HBN transcription accuracy and completeness checked	TB	SM
Preparation and analysis calculations checked	TB	SM
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SM
Manual integrations checked	TB	SM

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description - 6850 QC WKG STD 100ug/L

Standard: 41831
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
41830	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/09/2019

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 41830
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O — Description - ASTM Type II Water

Standard: 109
MFG: DCL In House
MFG Lot: Not Provided
Part ID: Not Provided

Created By: ALS Support (Lims)
Create Date: 10/06/2005 09:10AM

Amount: 1000 L
Expires: 11/07/2025
Usable: Yes
Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Number: ICC-013
Lot Number: CP-0860

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Number: ICC-013
Lot Number: CP-0860

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

AccuStandard

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	649377 CCV@25	Vial 71	1	Control	1	1.36054e6	8.855	24.00623
*	649381 QC@4.0	Vial 72	1	Control	2	2.53898e5	9.046	4.01121
*	649379 ICS@4.0	Vial 73	1	Control	3	1.82631e5	8.636	3.34158
*	649380 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1910478001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	1910480001 1K	Vial 76	1	Sample	6	3.37161e5	9.026	5552.18188
*	1910483001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1911288001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1910837001	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1910837002 MS	Vial 80	1	Sample	10	2.21785e5	9.050	3.80586
*	1910837003 MSD	Vial 81	1	Sample	11	2.20802e5	9.038	3.95111
*	1910837004	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1910837005	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1910837006	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	649382 CCV@25	Vial 71	1	Control	15	1.31128e6	8.938	24.26925
*	1910837007	Vial 85	1	Sample	16	6.42400e4	9.045	1.26400
*	1910837008	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1910837009	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1909952003 10K	Vial 88	1	Sample	19	5.40192e5	9.131	9.36492e4
*	649383 CCV@25	Vial 71	1	Control	20	1.31963e6	8.922	24.70624

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	649377 CCV@25	Vial 71	1	Control	1	4.18181e5	8.869	24.80861
*	649381 QC@4.0	Vial 72	1	Control	2	8.36399e4	9.058	4.29372
*	649379 ICS@4.0	Vial 73	1	Control	3	6.48502e4	8.654	3.82172
*	649380 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1910478001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	1910480001 1K	Vial 76	1	Sample	6	1.09251e5	9.041	5913.57786
*	1910483001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1911288001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1910837001	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1910837002 MS	Vial 80	1	Sample	10	7.41215e4	9.057	4.12337
*	1910837003 MSD	Vial 81	1	Sample	11	7.23834e4	9.061	4.20632
*	1910837004	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1910837005	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1910837006	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	649382 CCV@25	Vial 71	1	Control	15	4.00971e5	8.953	24.95975
*	1910837007	Vial 85	1	Sample	16	2.34854e4	9.061	1.36511
*	1910837008	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1910837009	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1909952003 10K	Vial 88	1	Sample	19	1.70464e5	9.151	9.83177e4
*	649383 CCV@25	Vial 71	1	Control	20	4.01823e5	8.937	25.30992

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	649377 CCV@25	Vial 71	1	Control	1	1.72840e5	8.867	5.00000
*	649381 QC@4.0	Vial 72	1	Control	2	2.08542e5	9.066	5.00000
*	649379 ICS@4.0	Vial 73	1	Control	3	1.81824e5	8.654	5.00000
*	649380 LMB	Vial 74	1	Control	4	2.16871e5	9.008	5.00000
*	1910478001	Vial 75	1	Sample	5	1.72857e5	8.404	5.00000
*	1910480001 1K	Vial 76	1	Sample	6	1.97149e5	9.050	5000.00000
*	1910483001	Vial 77	1	Sample	7	1.65412e5	8.420	5.00000
*	1911288001	Vial 78	1	Sample	8	1.81749e5	8.489	5.00000

Batch Report: C:\HPCHEM\1\DATA\23APR19D\23APR19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	1910837001	Vial 79	1	Sample	9	1.87599e5	9.028	5.00000
*	1910837002 MS	Vial 80	1	Sample	10	1.92507e5	9.073	5.00000
*	1910837003 MSD	Vial 81	1	Sample	11	1.84256e5	9.062	5.00000
*	1910837004	Vial 82	1	Sample	12	1.80138e5	8.810	5.00000
*	1910837005	Vial 83	1	Sample	13	1.97954e5	9.090	5.00000
*	1910837006	Vial 84	1	Sample	14	1.83017e5	9.051	5.00000
*	649382 CCV@25	Vial 71	1	Control	15	1.64671e5	8.965	5.00000
*	1910837007	Vial 85	1	Sample	16	1.84879e5	9.067	5.00000
*	1910837008	Vial 86	1	Sample	17	1.96777e5	8.752	5.00000
*	1910837009	Vial 87	1	Sample	18	1.91613e5	9.161	5.00000
*	1909952003 10K	Vial 88	1	Sample	19	1.83509e5	9.157	5.00000e4
*	649383 CCV@25	Vial 71	1	Control	20	1.62618e5	8.942	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\APR\23APR19D.S

Sequence Table:

Method and Injection Info Part:

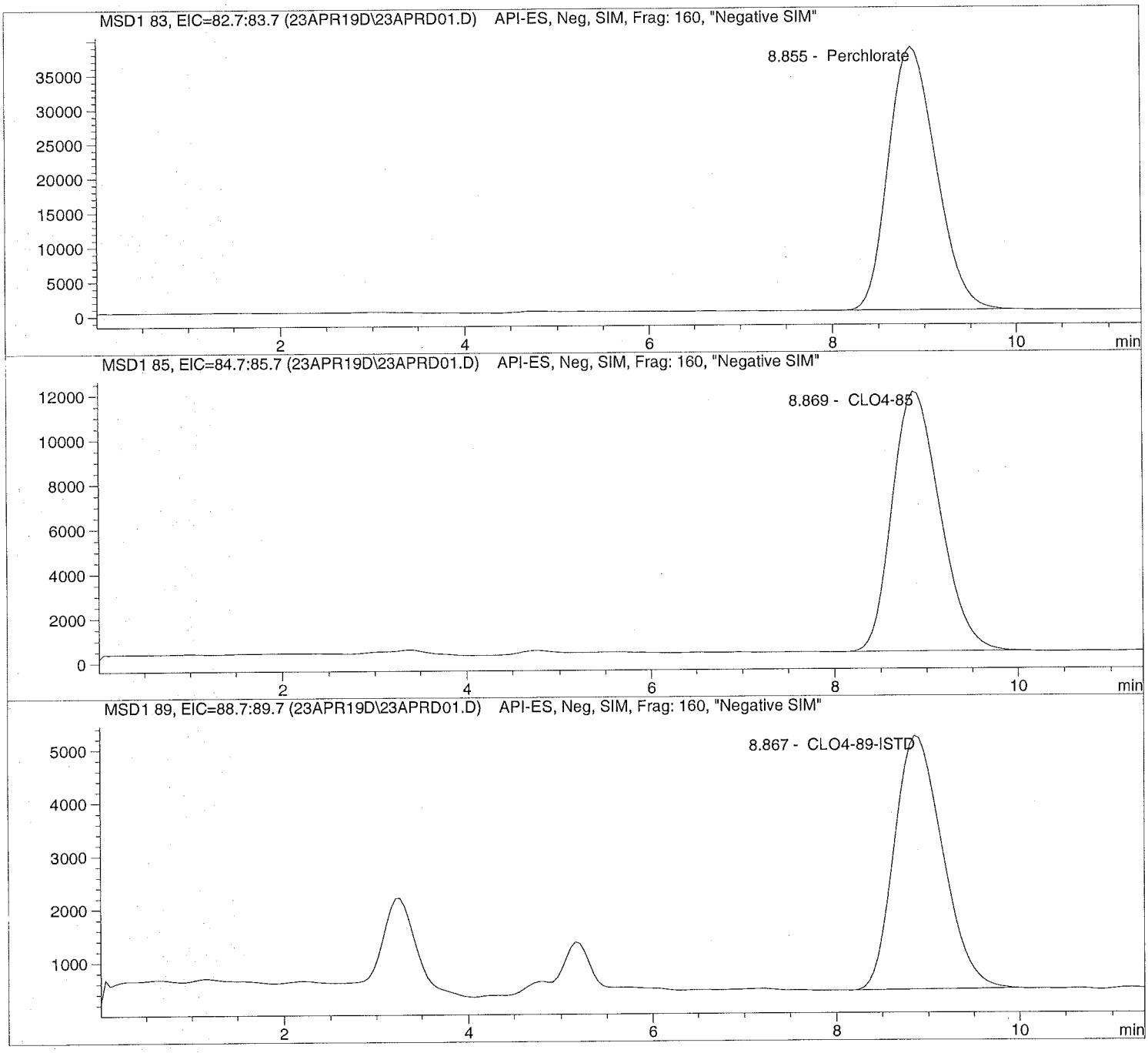
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	649377	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	649381	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	649379	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	649380	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1910478001		CLO4-AQN	1	Sample		
6	Vial 76	1910480001	1K	CLO4-AQN	1	Sample		
7	Vial 77	1910483001		CLO4-AQN	1	Sample		
8	Vial 78	1911288001		CLO4-AQN	1	Sample		
9	Vial 79	1910837001		CLO4-AQN	1	Sample		
10	Vial 80	1910837002	MS	CLO4-AQN	1	Sample		
11	Vial 81	1910837003	MSD	CLO4-AQN	1	Sample		
12	Vial 82	1910837004		CLO4-AQN	1	Sample		
13	Vial 83	1910837005		CLO4-AQN	1	Sample		
14	Vial 84	1910837006		CLO4-AQN	1	Sample		
15	Vial 71	649382	CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1910837007		CLO4-AQN	1	Sample		
17	Vial 86	1910837008		CLO4-AQN	1	Sample		
18	Vial 87	1910837009		CLO4-AQN	1	Sample		
19	Vial 71	649383	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD01.D Sample Name: 649377 CCV@25

Injection Date:	4/23/2019 08:37:56	Seq Line:	1
Sample Name:	649377 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD01.D Sample Name: 649377 CCV@25

Injection Date:	4/23/2019 08:37:56	Seq Line:	1
Sample Name:	649377 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.855	PBA	1360543.6	24.0062	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.869	PBA	418181.2	24.8086	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.867	PBA	172839.5	5.0000	CLO4-89-ISTD

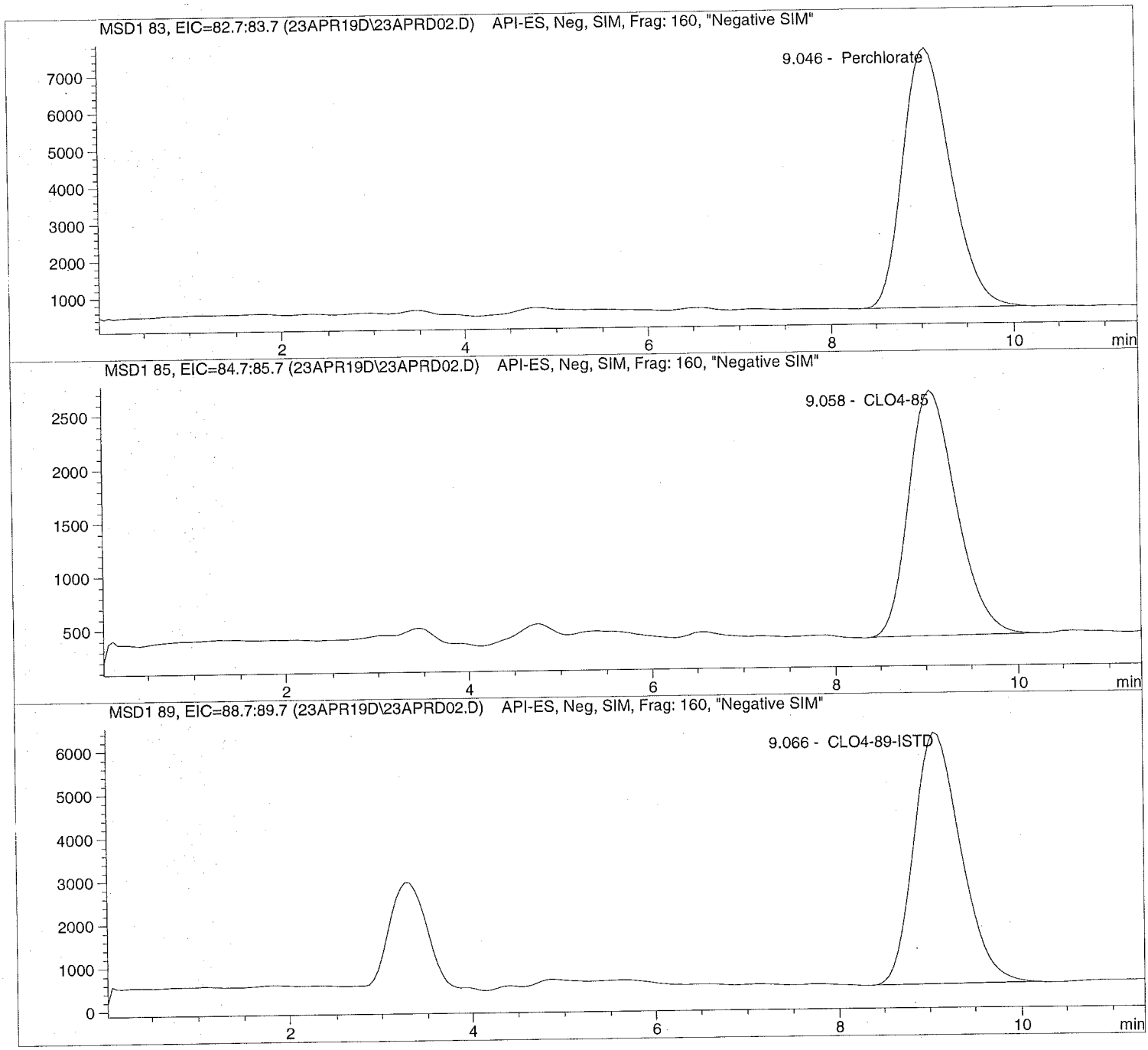
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD02.D Sample Name: 649381 QC@4.0

Injection Date:	4/23/2019 08:53:38	Seq Line:	2
Sample Name:	649381 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD02.D Sample Name: 649381 QC@4.0

Injection Date:	4/23/2019 08:53:38	Seq Line:	2
Sample Name:	649381 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.046	PBA	253897.8	4.0112	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.058	PBA	83639.9	4.2937	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.066	PBA	208541.6	5.0000	CLO4-89-ISTD

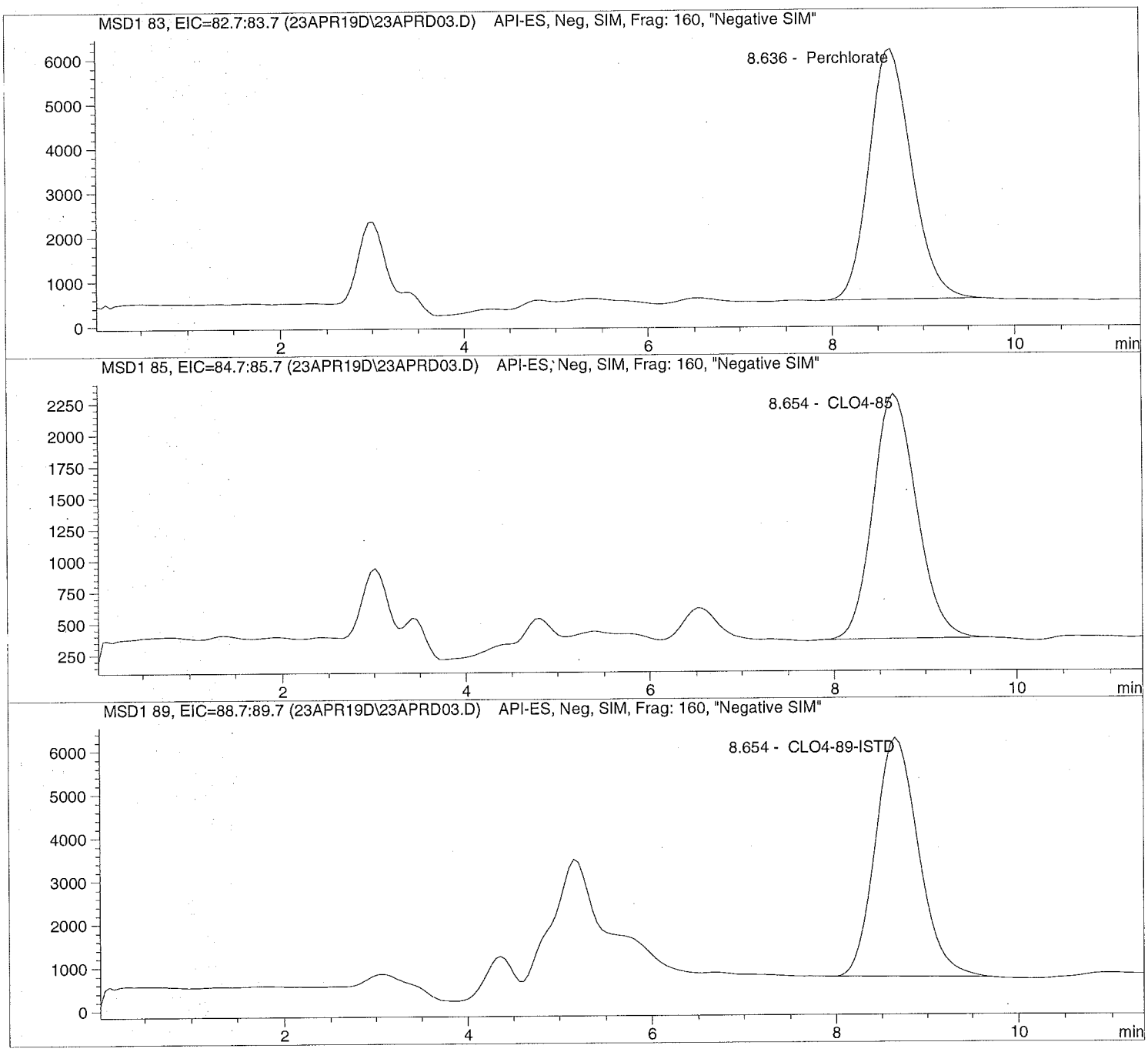
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD03.D Sample Name: 649379 ICS@4.0

Injection Date:	4/23/2019 09:07:01	Seq Line:	3
Sample Name:	649379 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD03.D Sample Name: 649379 ICS@4.0

Injection Date:	4/23/2019 09:07:01	Seq Line:	3
Sample Name:	649379 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.636	PBA	182630.9	3.3416	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.654	PBA	64850.2	3.8217	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.654	PBA	181823.6	5.0000	CLO4-89-ISTD

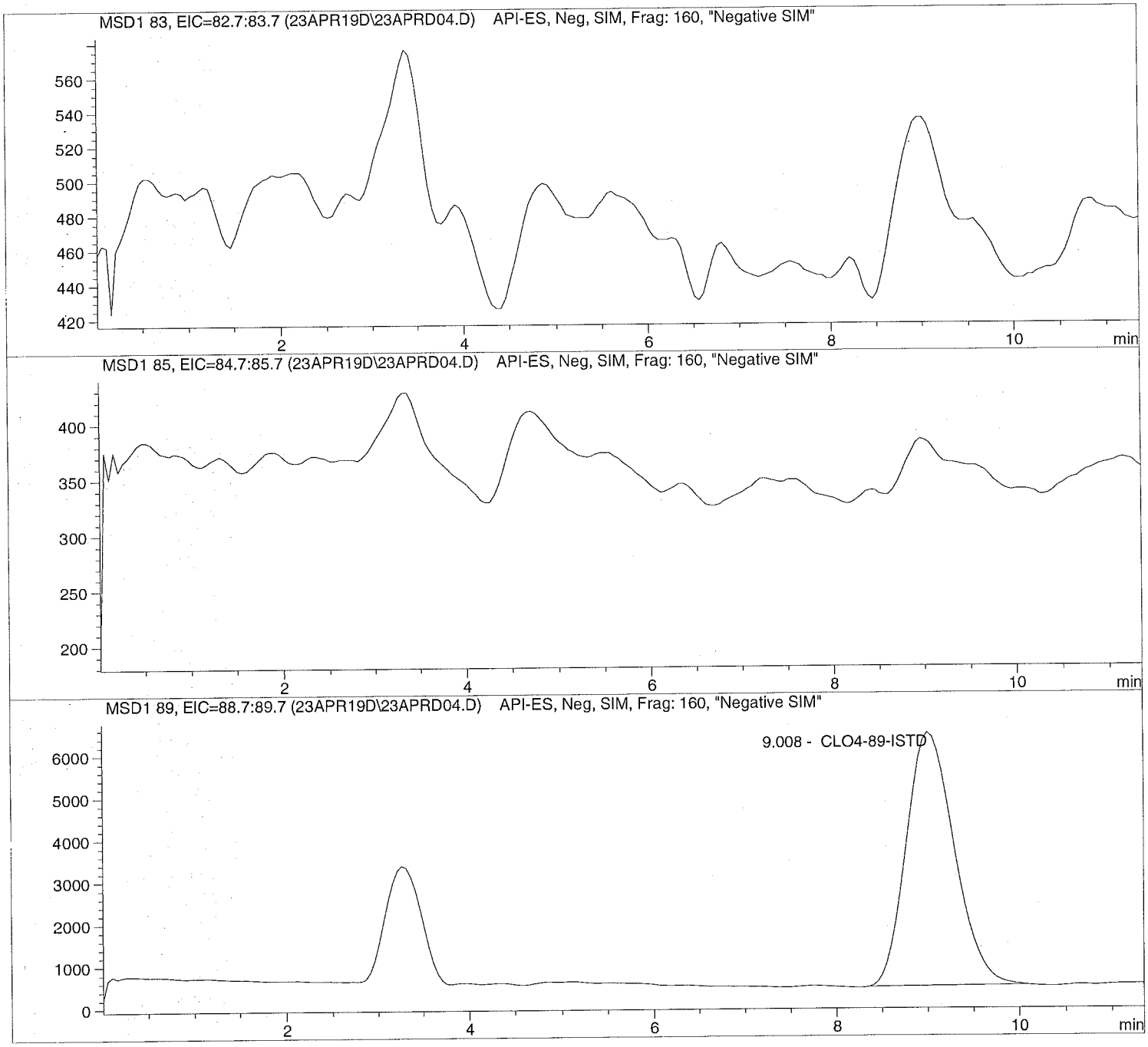
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD04.D Sample Name: 649380 LMB

Injection Date:	4/23/2019 09:20:26	Seq Line:	4
Sample Name:	649380 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD04.D Sample Name: 649380 LMB

Injection Date:	4/23/2019 09:20:26	Seq Line:	4
Sample Name:	649380 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.008	PBA	216871.1	5.0000	CLO4-89-ISTD

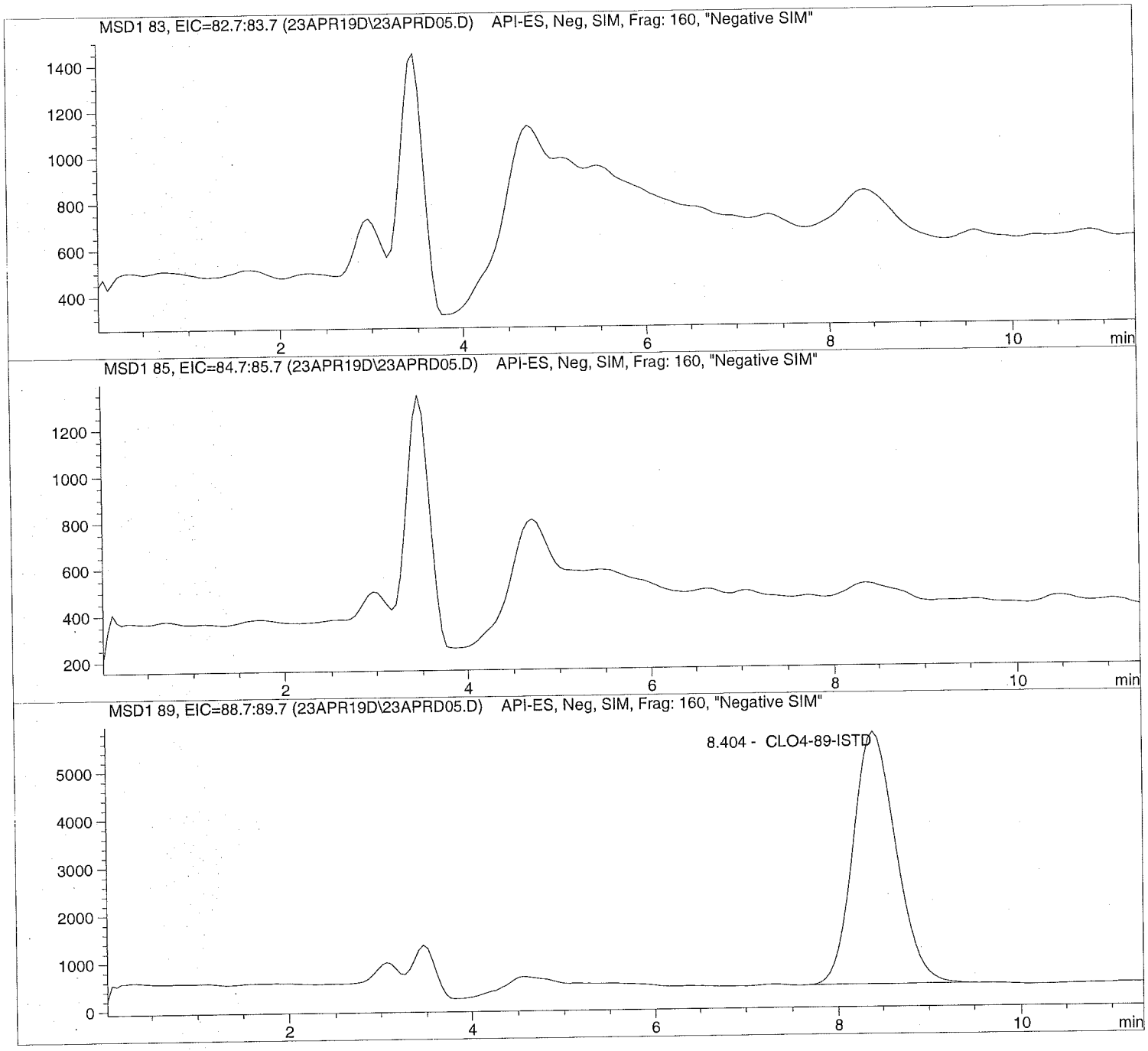
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD05.D Sample Name: 1910478001

Injection Date:	4/23/2019 09:36:37	Seq Line:	5
Sample Name:	1910478001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD05.D Sample Name: 1910478001

Injection Date:	4/23/2019 09:36:37	Seq Line:	5
Sample Name:	1910478001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.404	PBA	172857.1	5.0000	CLO4-89-ISTD

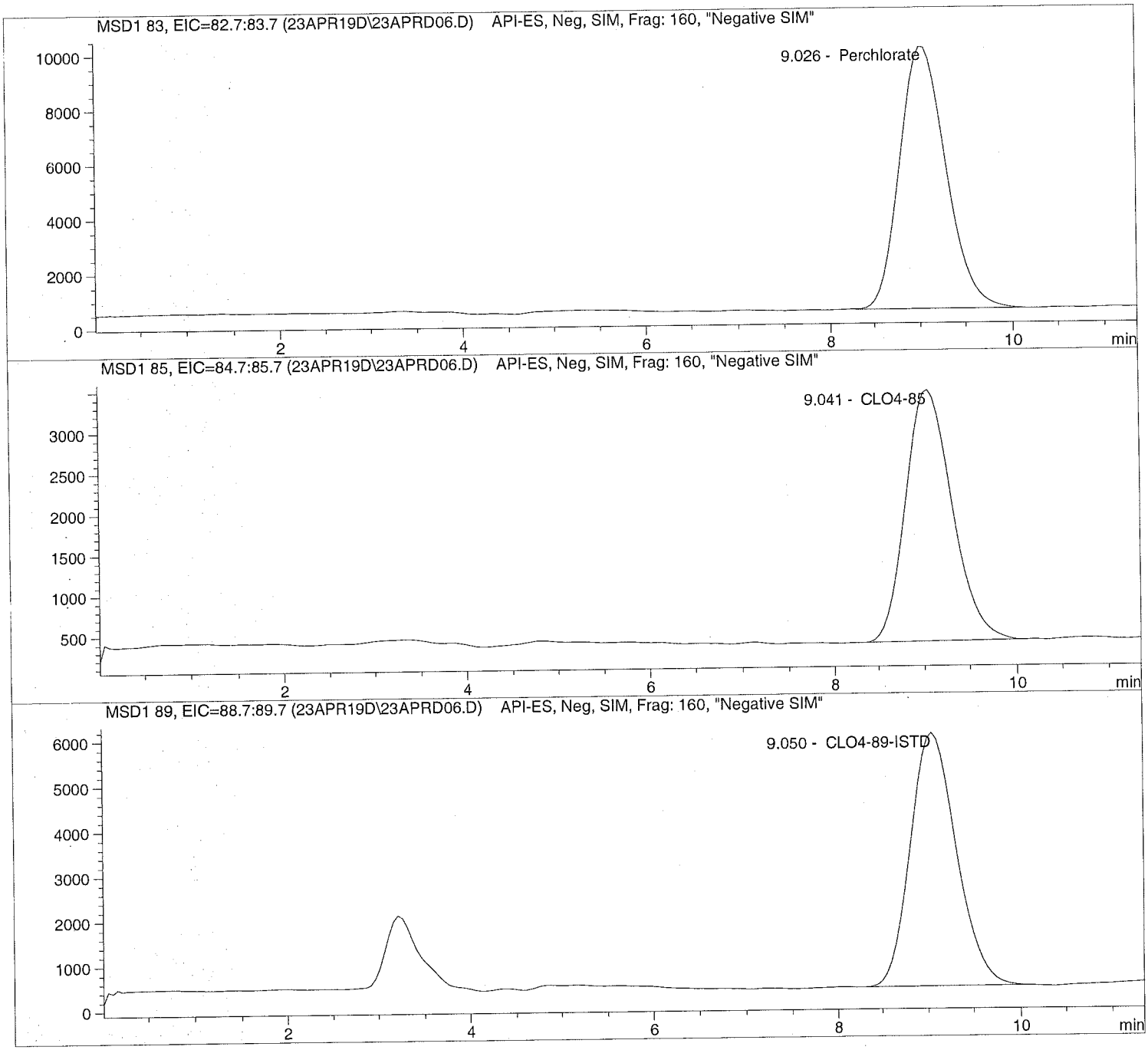
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD06.D Sample Name: 1910480001 1K

Injection Date:	4/23/2019 09:49:59	Seq Line:	6
Sample Name:	1910480001 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD06.D Sample Name: 1910480001 1K

Injection Date:	4/23/2019 09:49:59	Seq Line:	6
Sample Name:	1910480001 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.026	BBA	337160.7	5552.1819	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.041	PBA	109251.5	5913.5779	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.050	PBA	197148.5	5000.0000	CLO4-89-ISTD

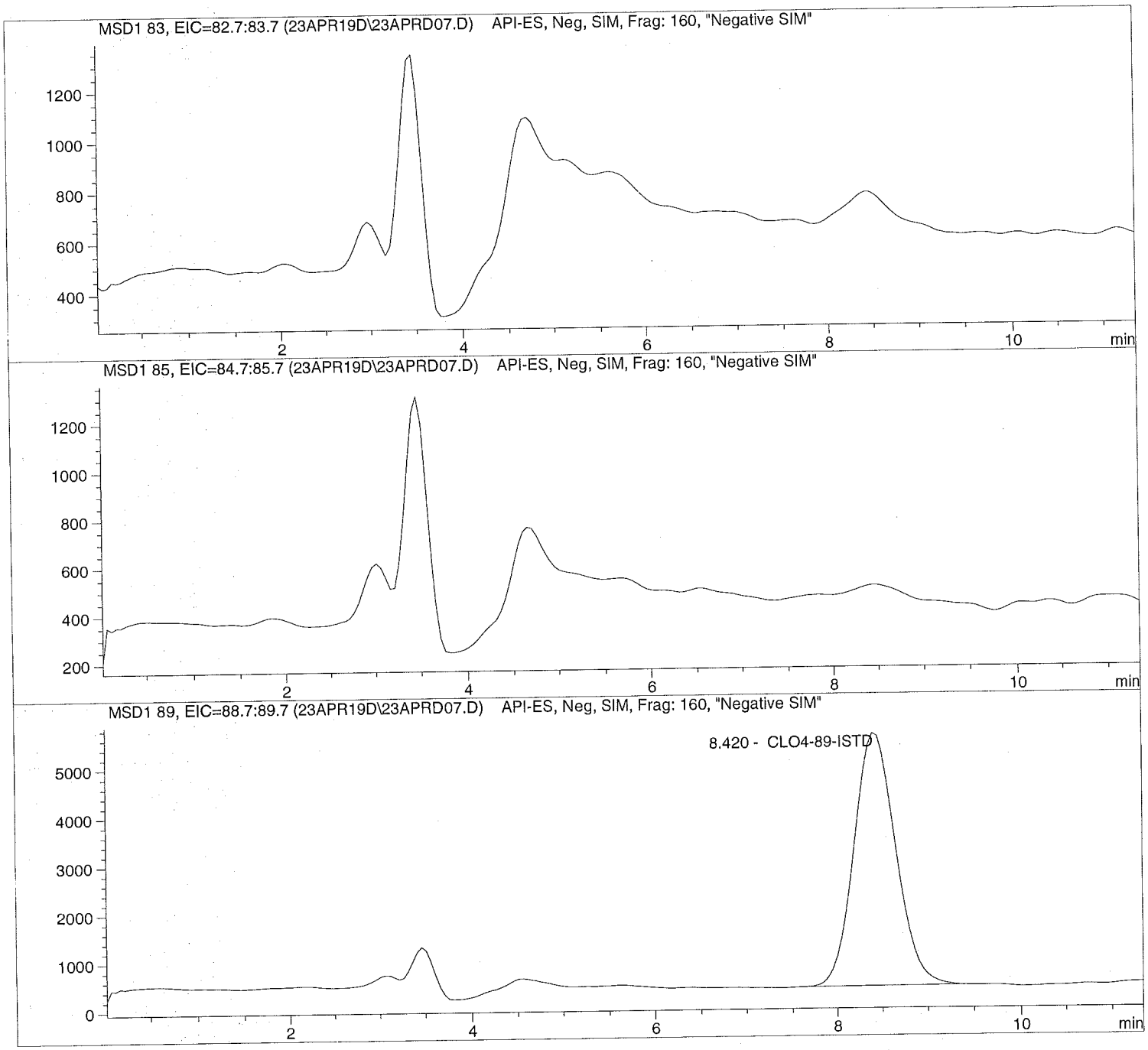
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD07.D Sample Name: 1910483001

Injection Date:	4/23/2019 10:03:26	Seq Line:	7
Sample Name:	1910483001	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD07.D Sample Name: 1910483001

Injection Date:	4/23/2019 10:03:26	Seq Line:	7
Sample Name:	1910483001	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.420	PBA	165412.1	5.0000	CLO4-89-ISTD

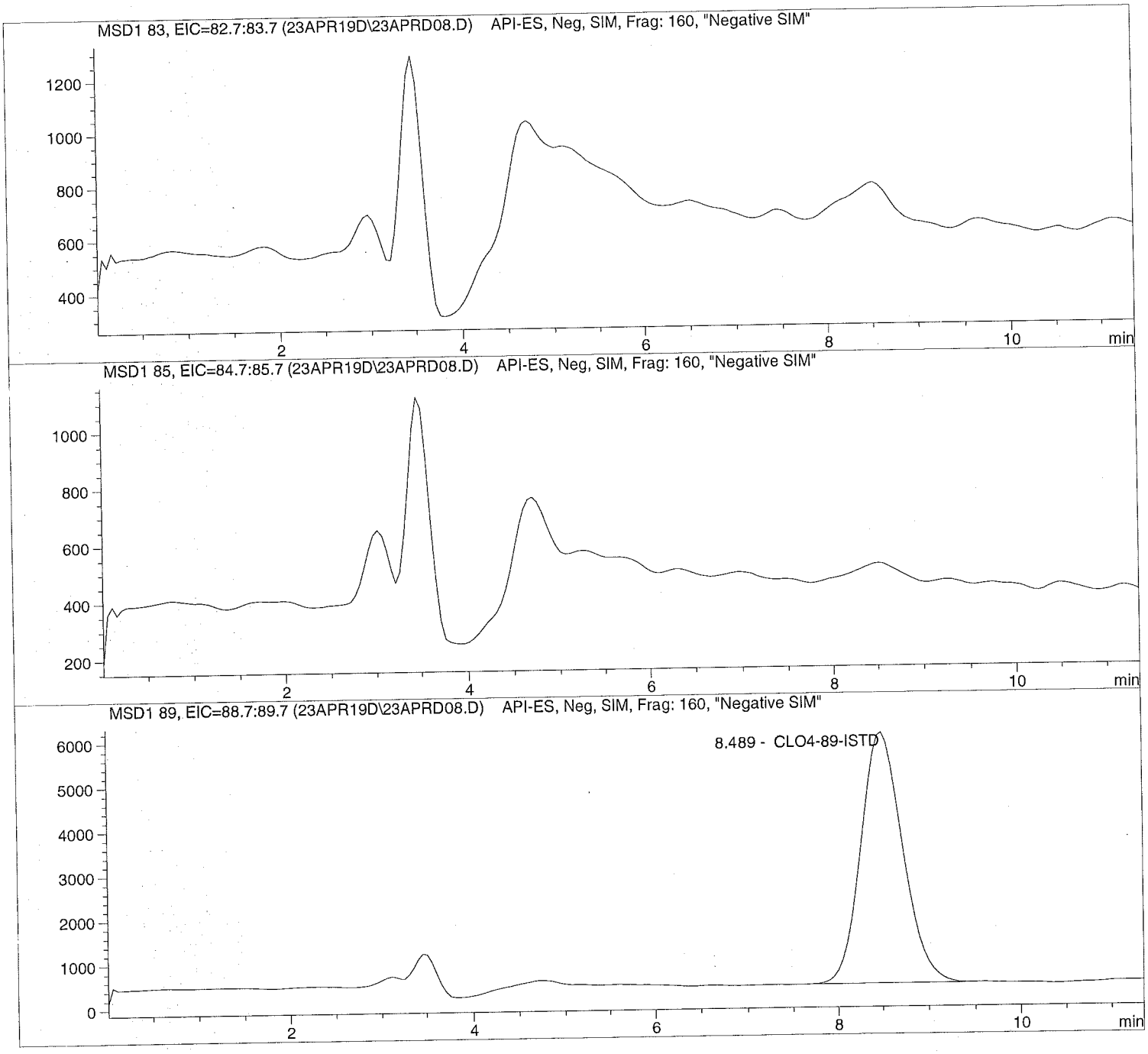
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD08.D Sample Name: 1911288001

Injection Date:	4/23/2019 10:16:48	Seq Line:	8
Sample Name:	1911288001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD08.D Sample Name: 1911288001

Injection Date:	4/23/2019 10:16:48	Seq Line:	8
Sample Name:	1911288001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.489	BBA	181749.4	5.0000	CLO4-89-ISTD

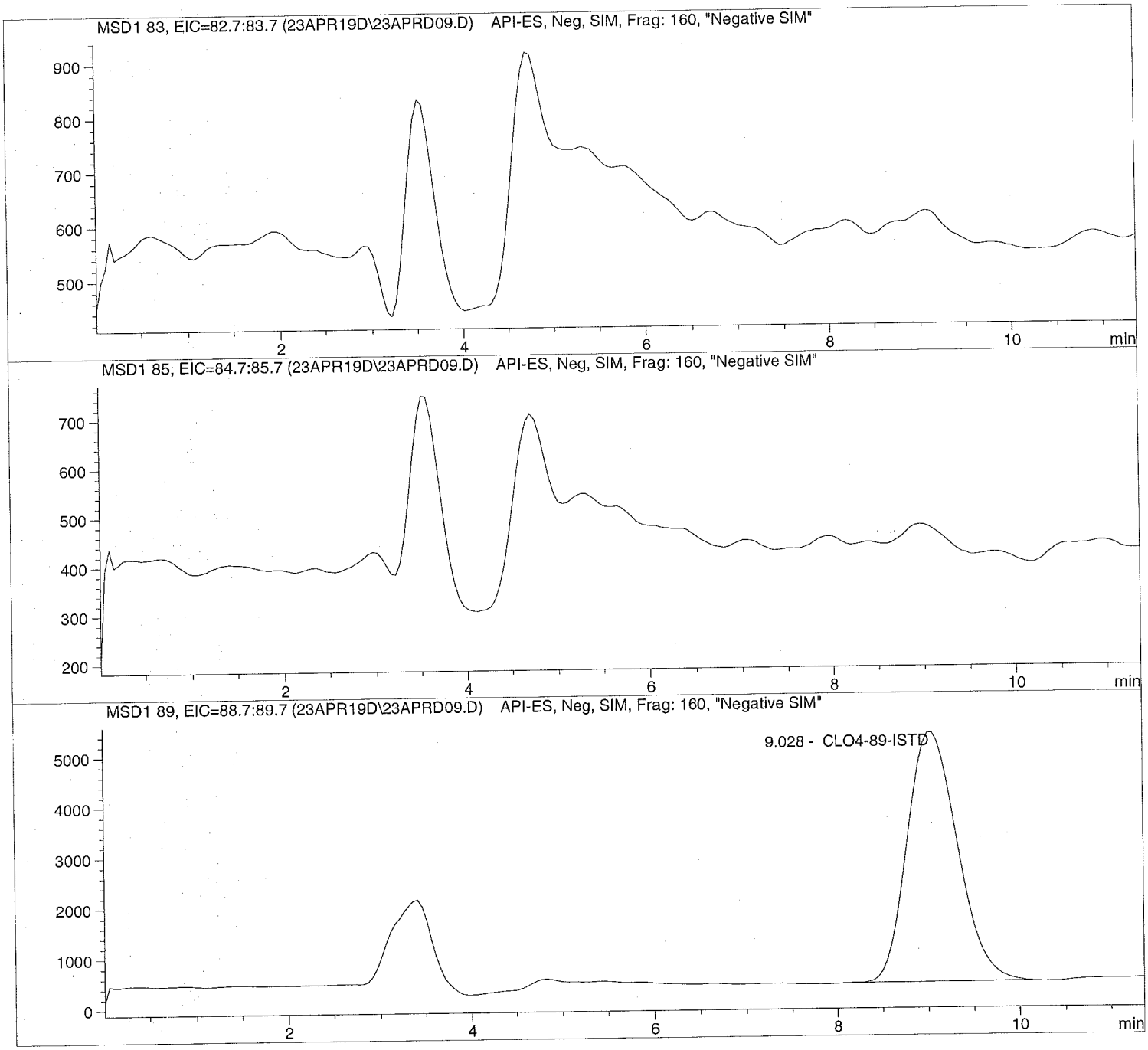
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD09.D Sample Name: 1910837001

Injection Date:	4/23/2019 10:30:16	Seq Line:	9
Sample Name:	1910837001	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD09.D Sample Name: 1910837001

Injection Date:	4/23/2019 10:30:16	Seq Line:	9
Sample Name:	1910837001	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.028	BBA	187599.0	5.0000	CLO4-89-ISTD

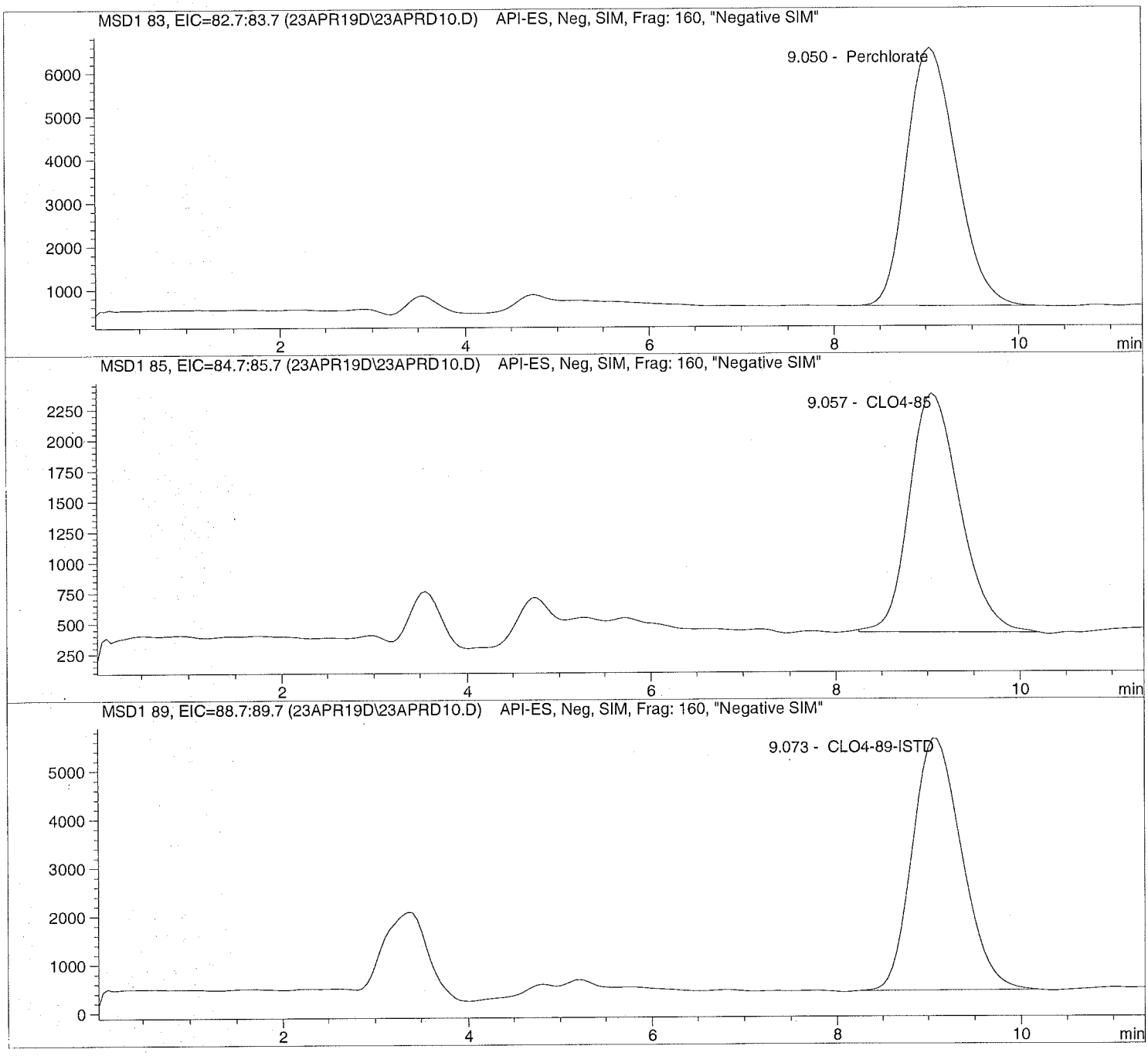
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD10.D Sample Name: 1910837002 MS

Injection Date:	4/23/2019 10:43:43	Seq Line:	10
Sample Name:	1910837002 MS	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD10.D Sample Name: 1910837002 MS

Injection Date:	4/23/2019 10:43:43	Seq Line:	10
Sample Name:	1910837002 MS	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.050	PBA	221785.2	3.8059	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.057	BBA	74121.5	4.1234	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.073	PBA	192506.7	5.0000	CLO4-89-ISTD

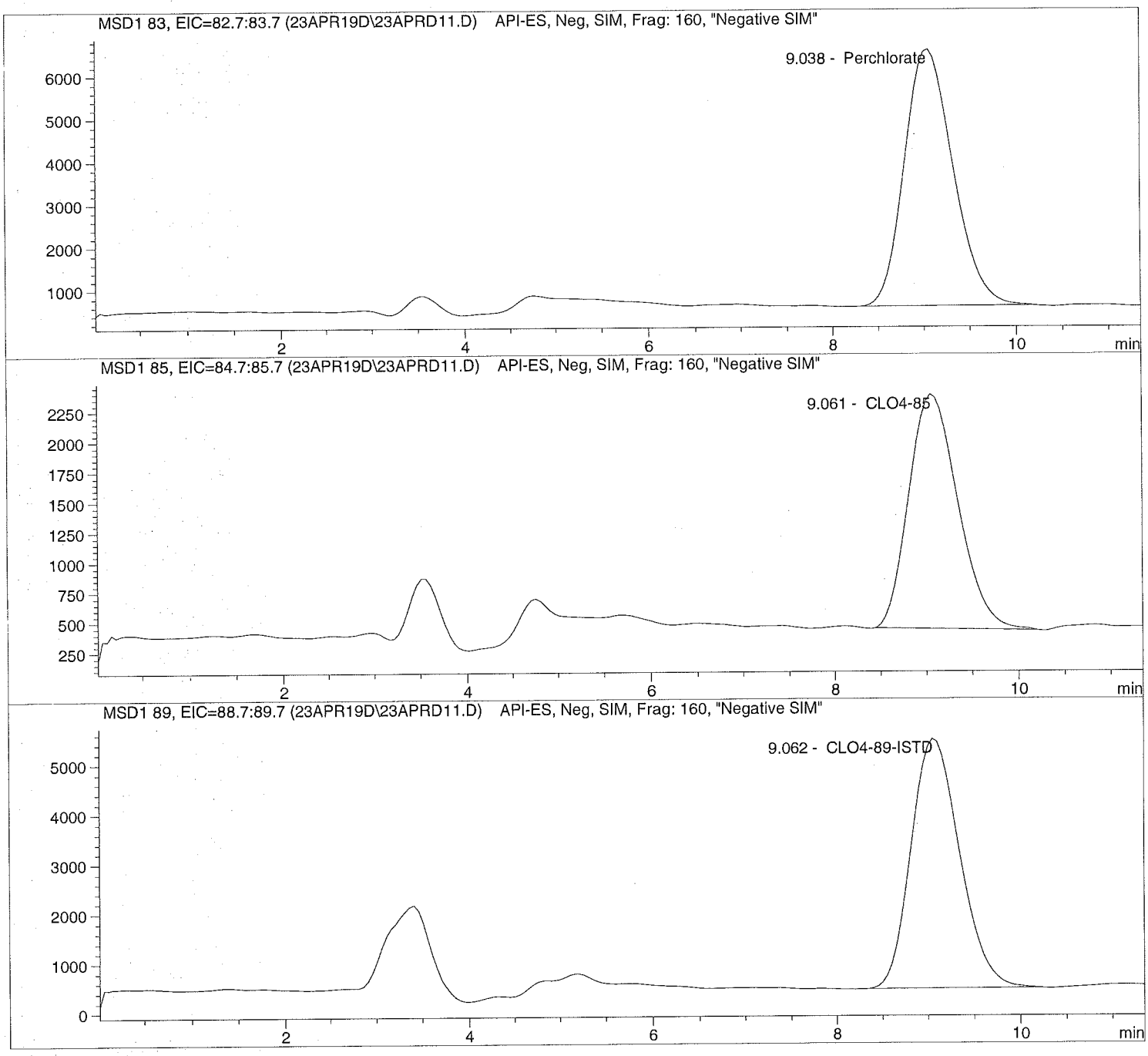
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD11.D Sample Name: 1910837003 MSD

Injection Date:	4/23/2019 10:57:05	Seq Line:	11
Sample Name:	1910837003 MSD	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD11.D Sample Name: 1910837003 MSD

Injection Date:	4/23/2019 10:57:05	Seq Line:	11
Sample Name:	1910837003 MSD	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.038	PBA	220802.4	3.9511	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.061	BBA	72383.4	4.2063	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.062	PBA	184256.2	5.0000	CLO4-89-ISTD

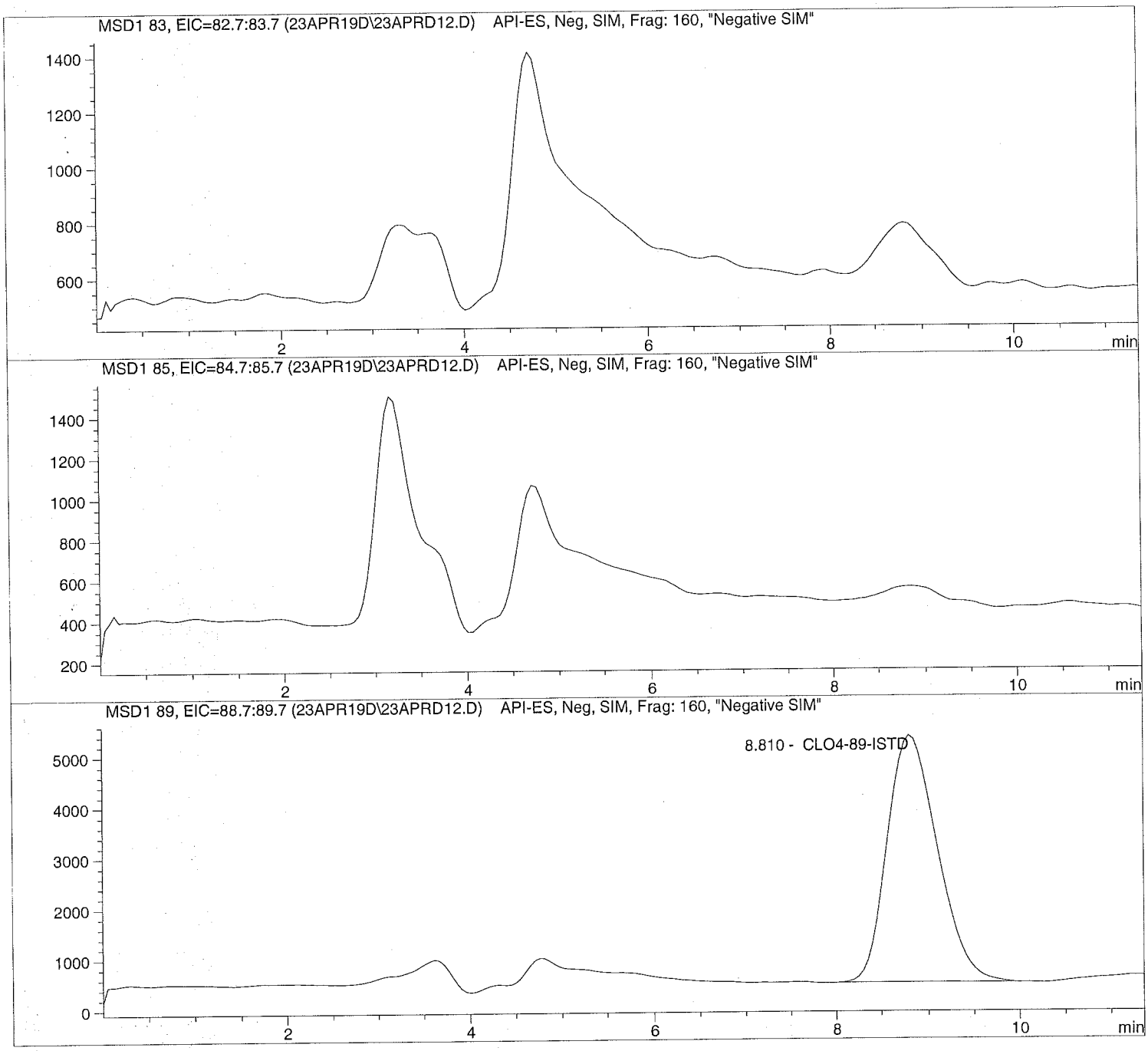
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD12.D Sample Name: 1910837004

Injection Date:	4/23/2019 11:10:26	Seq Line:	12
Sample Name:	1910837004	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD12.D Sample Name: 1910837004

Injection Date:	4/23/2019 11:10:26	Seq Line:	12
Sample Name:	1910837004	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	180138.5	5.0000	CLO4-89-ISTD

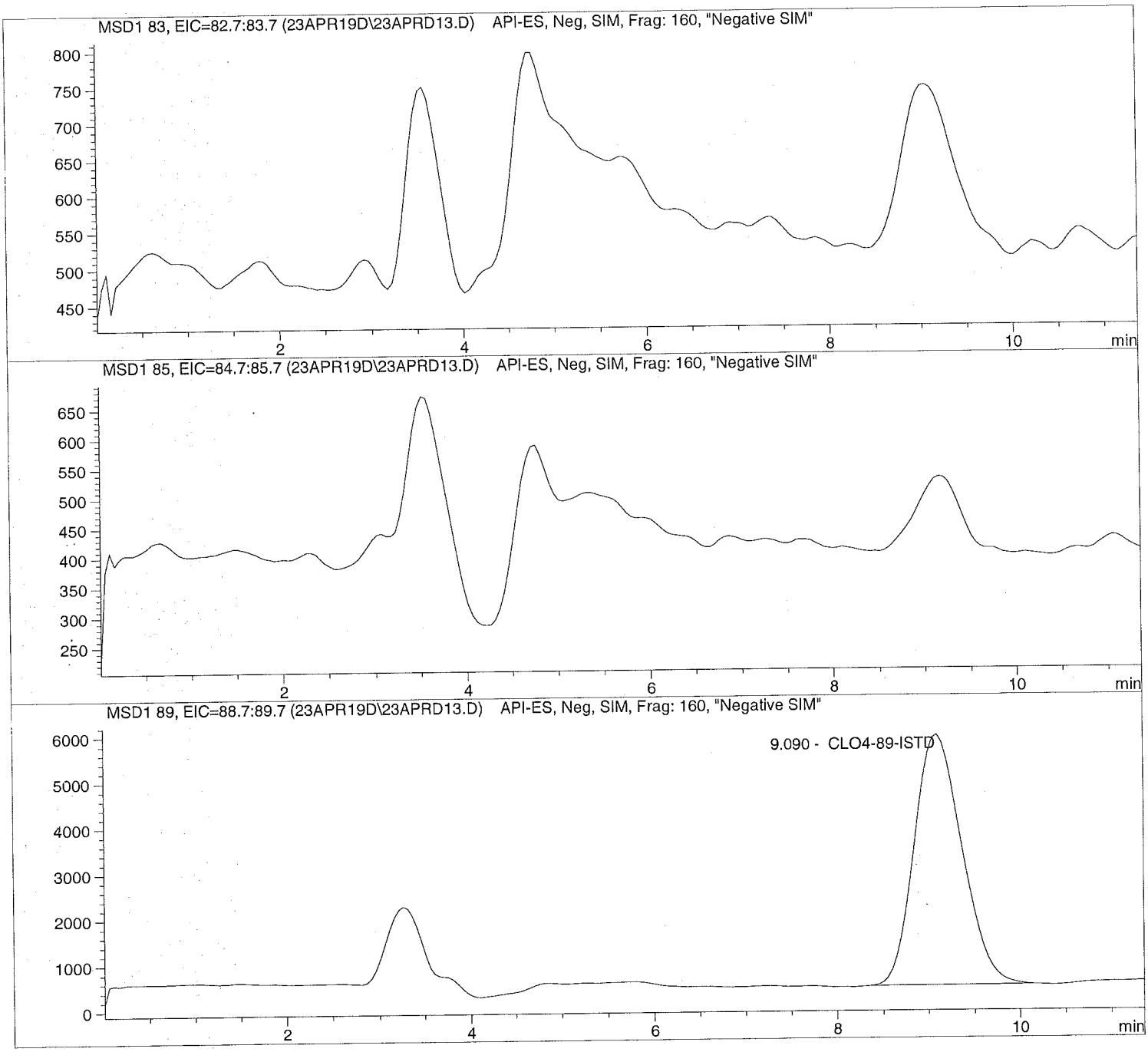
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD13.D Sample Name: 1910837005

Injection Date:	4/23/2019 11:23:52	Seq Line:	13
Sample Name:	1910837005	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD13.D Sample Name: 1910837005

Injection Date:	4/23/2019 11:23:52	Seq Line:	13
Sample Name:	1910837005	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.090	BBA	197954.5	5.0000	CLO4-89-ISTD

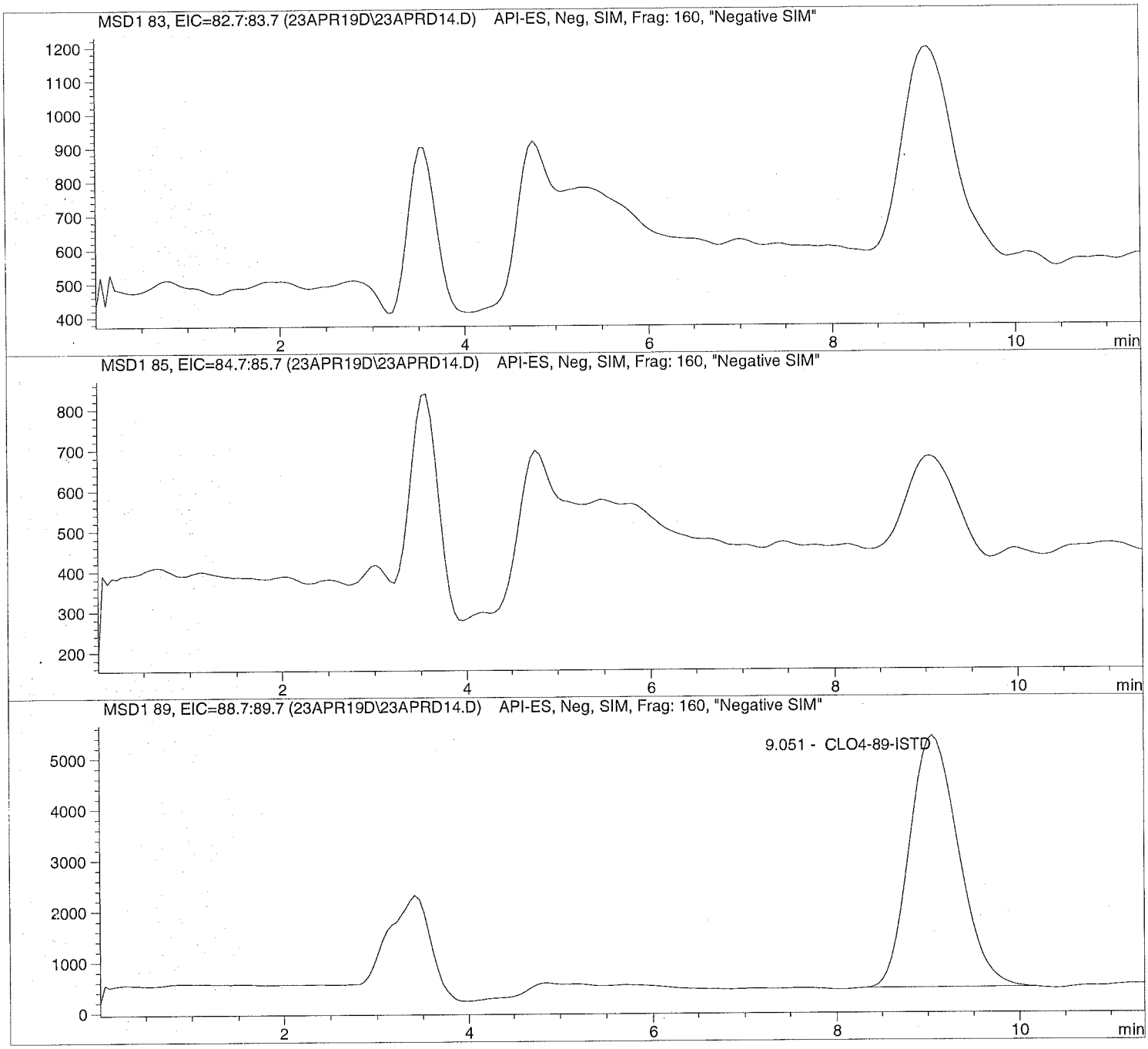
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD14.D Sample Name: 1910837006

Injection Date:	4/23/2019 11:37:15	Seq Line:	14
Sample Name:	1910837006	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD14.D Sample Name: 1910837006

Injection Date:	4/23/2019 11:37:15	Seq Line:	14
Sample Name:	1910837006	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.051	BBA	183017.4	5.0000	CLO4-89-ISTD

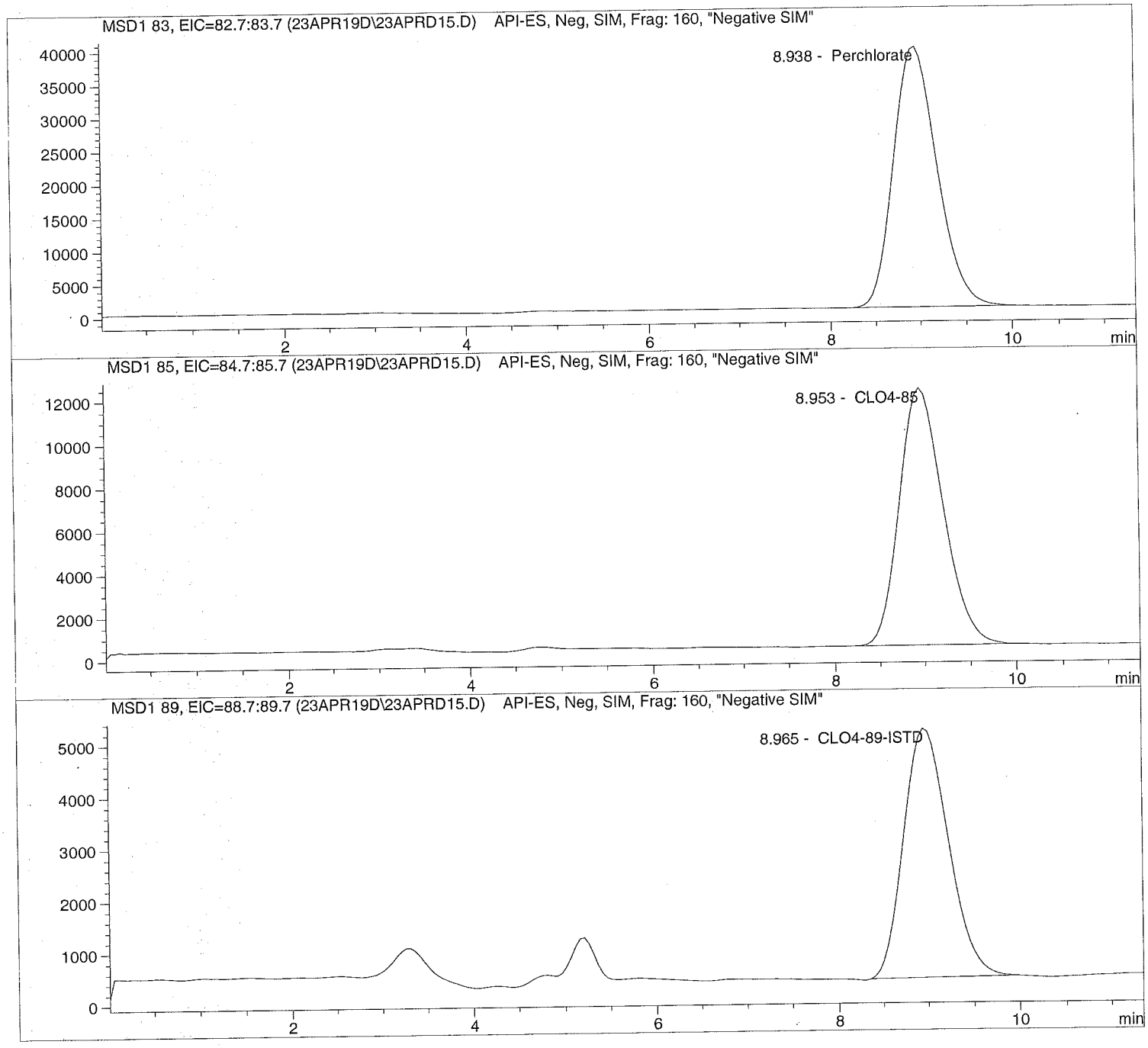
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD15.D Sample Name: 649382 CCV@25

Injection Date:	4/23/2019 11:50:37	Seq Line:	15
Sample Name:	649382 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD15.D Sample Name: 649382 CCV@25

Injection Date:	4/23/2019 11:50:37	Seq Line:	15
Sample Name:	649382 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.938	PBA	1311276.0	24.2693	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.953	BBA	400971.3	24.9597	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.965	PBA	164670.7	5.0000	CLO4-89-ISTD

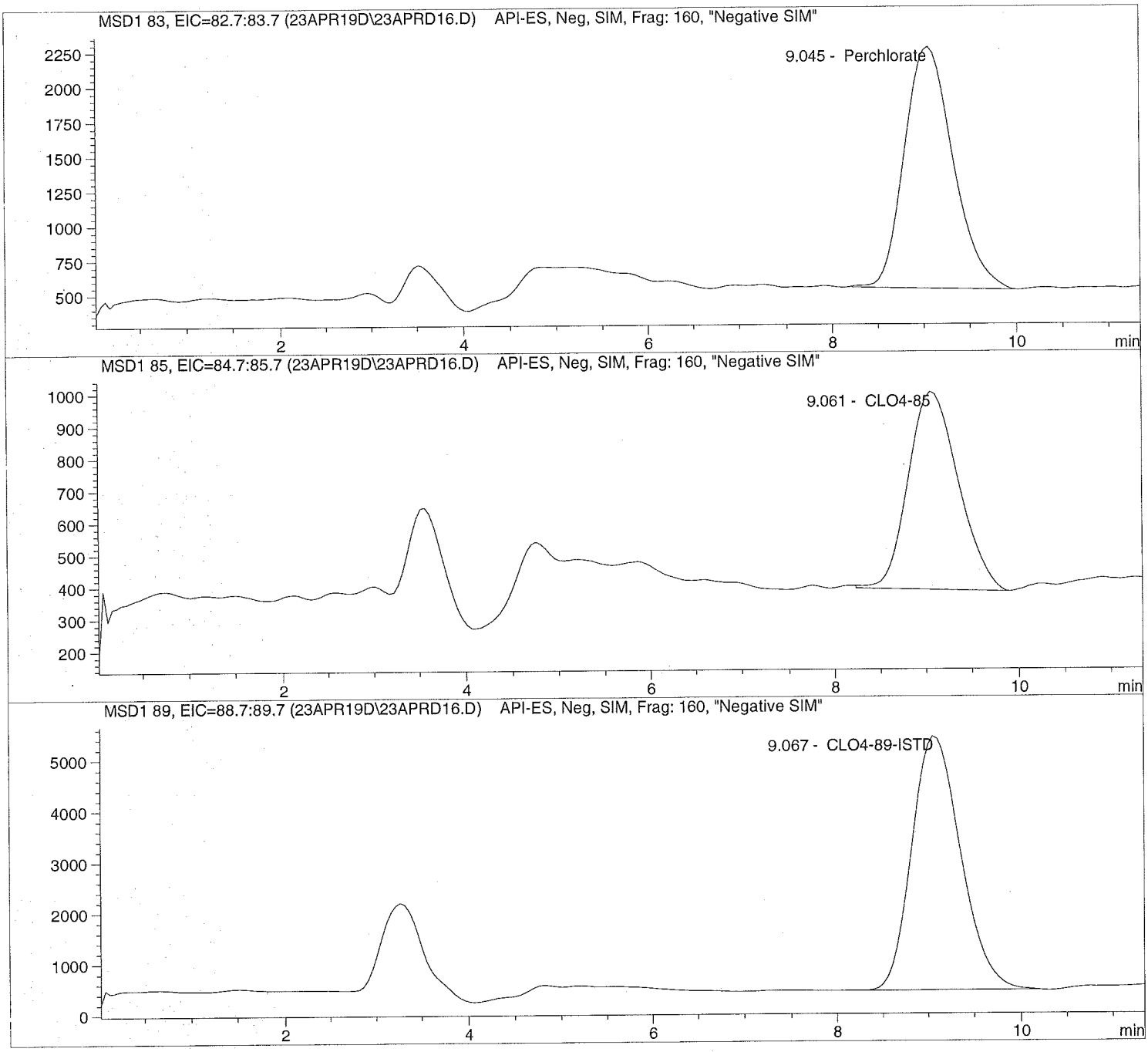
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD16.D Sample Name: 1910837007

Injection Date:	4/23/2019 12:03:59	Seq Line:	16
Sample Name:	1910837007	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD16.D Sample Name: 1910837007

Injection Date:	4/23/2019 12:03:59	Seq Line:	16
Sample Name:	1910837007	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.045	BBA	64240.0	1.2640	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.061	BBA	23485.4	1.3651	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.067	PBA	184879.5	5.0000	CLO4-89-ISTD

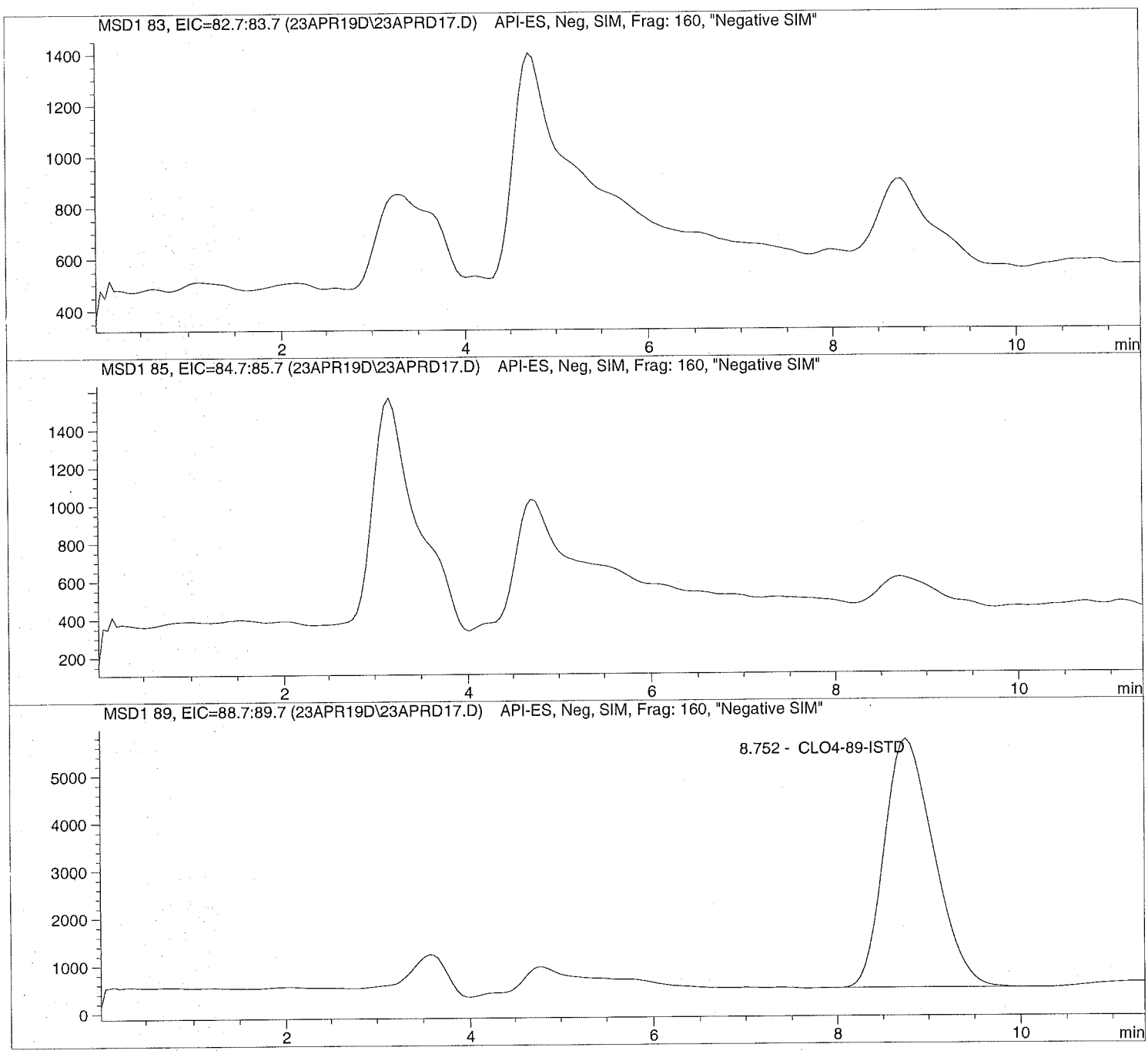
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD17.D Sample Name: 1910837008

Injection Date:	4/23/2019 12:17:22	Seq Line:	17
Sample Name:	1910837008	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD17.D Sample Name: 1910837008

Injection Date:	4/23/2019 12:17:22	Seq Line:	17
Sample Name:	1910837008	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.752	PBA	196776.6	5.0000	CLO4-89-ISTD

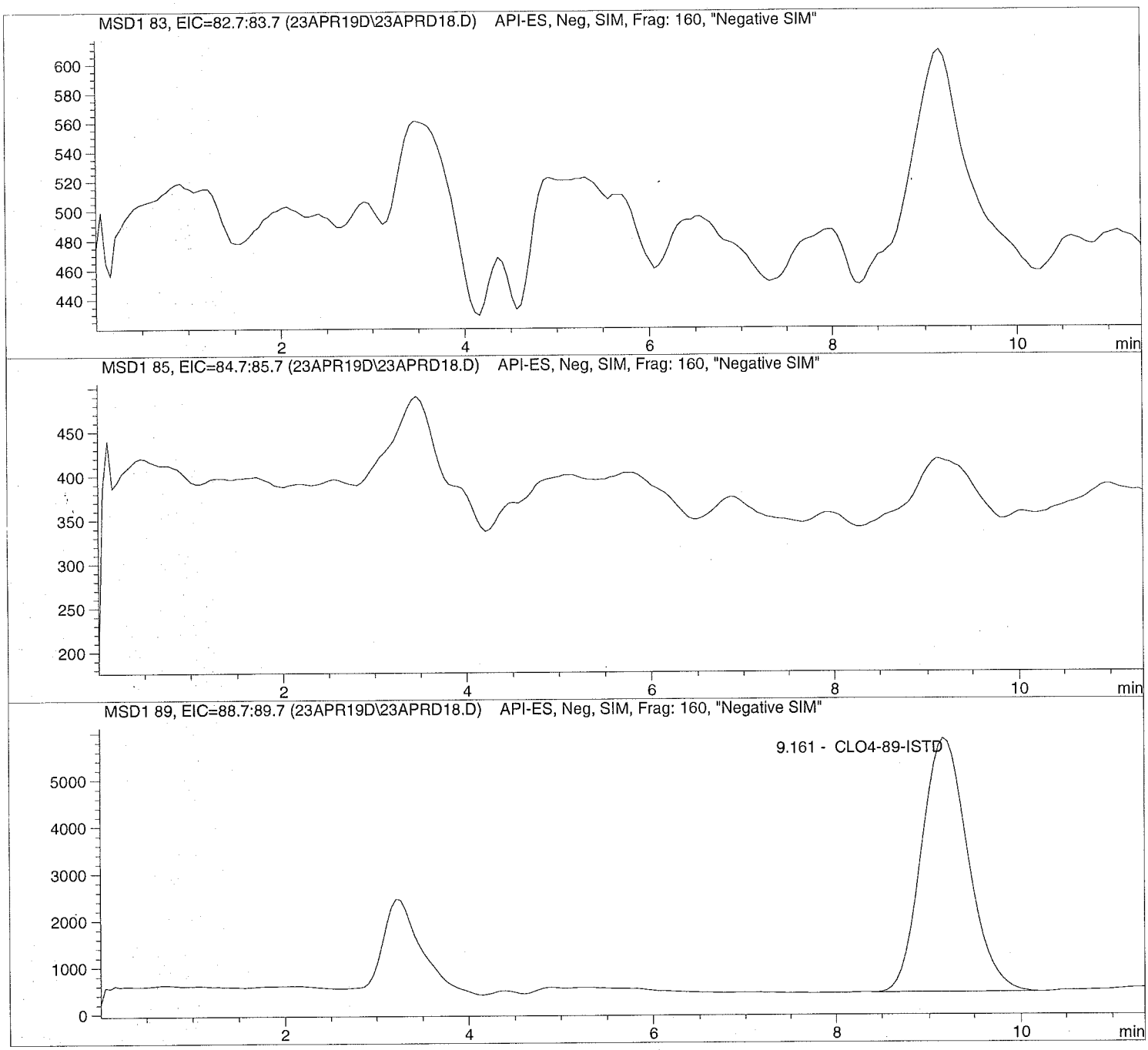
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD18.D Sample Name: 1910837009

Injection Date:	4/23/2019 12:30:43	Seq Line:	18
Sample Name:	1910837009	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD18.D Sample Name: 1910837009

Injection Date:	4/23/2019 12:30:43	Seq Line:	18
Sample Name:	1910837009	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.161	BBA	191613.1	5.0000	CLO4-89-ISTD

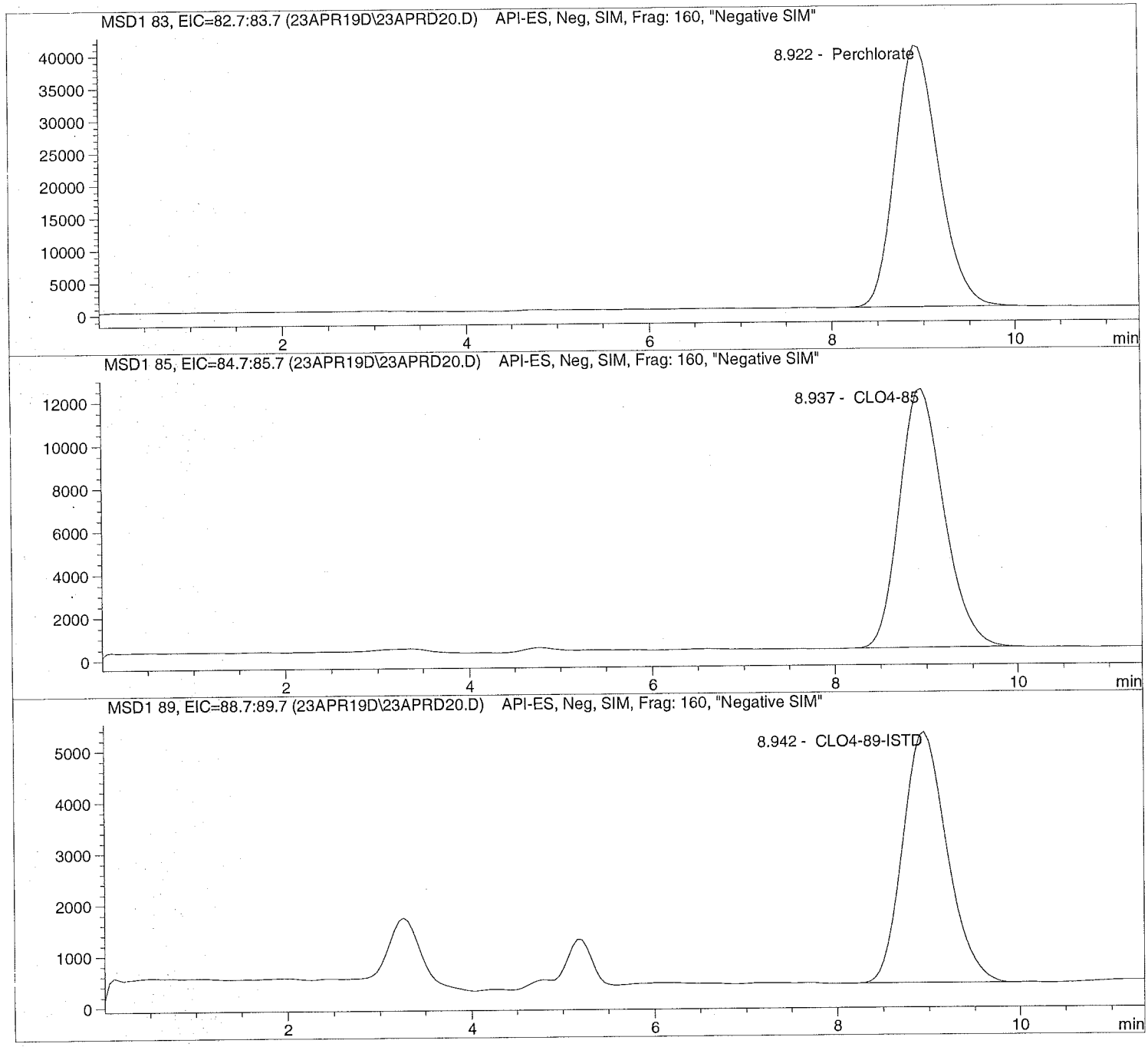
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD20.D Sample Name: 649383 CCV@25

Injection Date:	4/23/2019 13:01:17	Seq Line:	20
Sample Name:	649383 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD20.D Sample Name: 649383 CCV@25

Injection Date:	4/23/2019 13:01:17	Seq Line:	20
Sample Name:	649383 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.922	PBA	1319634.0	24.7062	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.937	PBA	401823.2	25.3099	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.942	PBA	162618.0	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

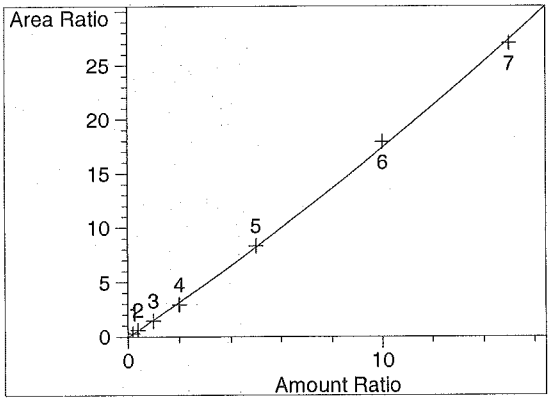
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

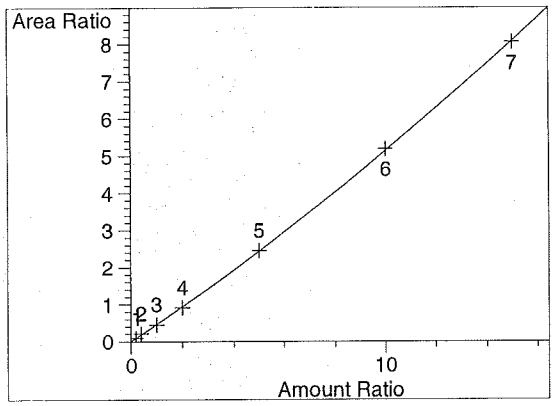
Peak Sum Table

No Entries in table

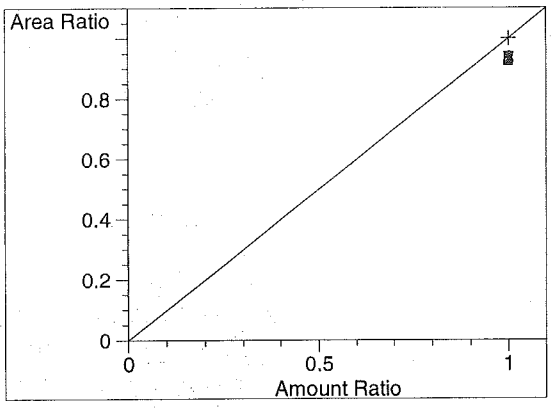
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Report: C:\HPCHEM\1\DATA\19MAR19I\19MAR19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

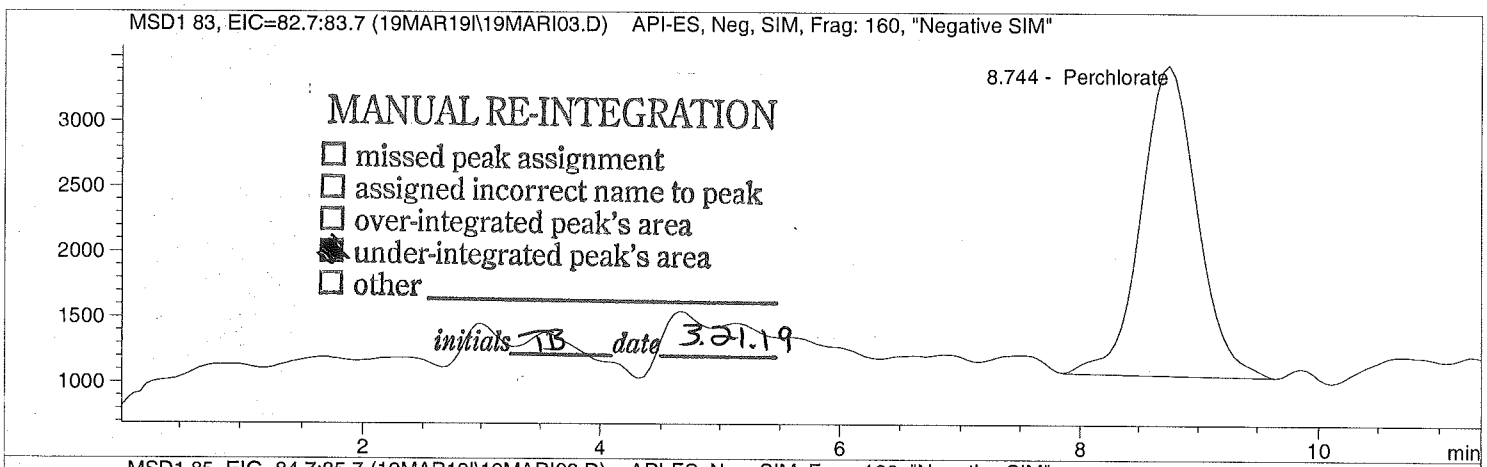
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

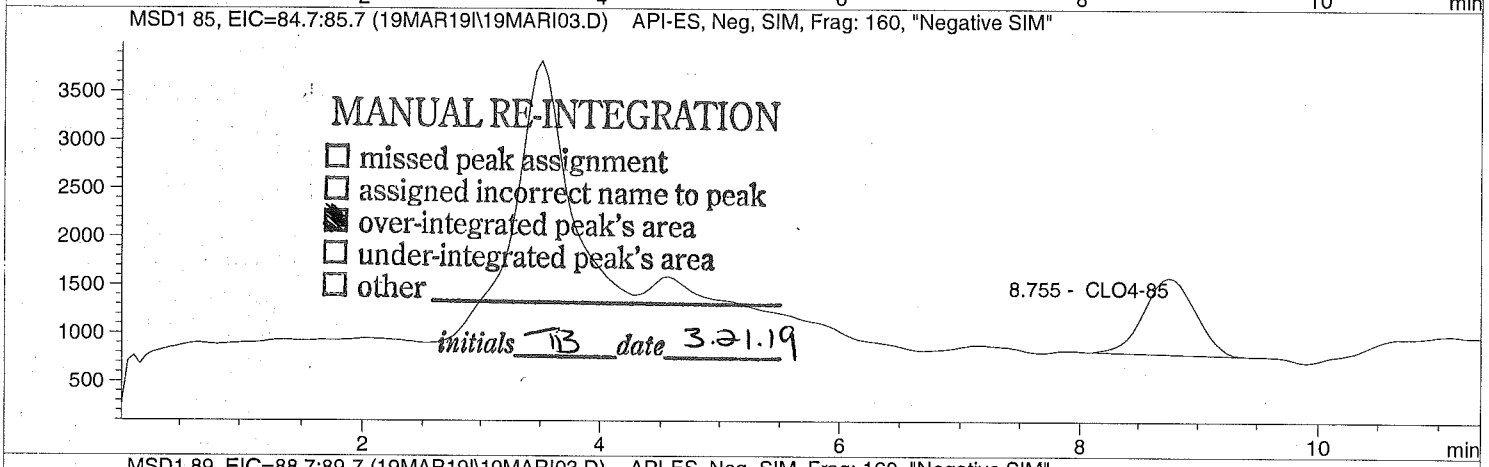
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L 00937703

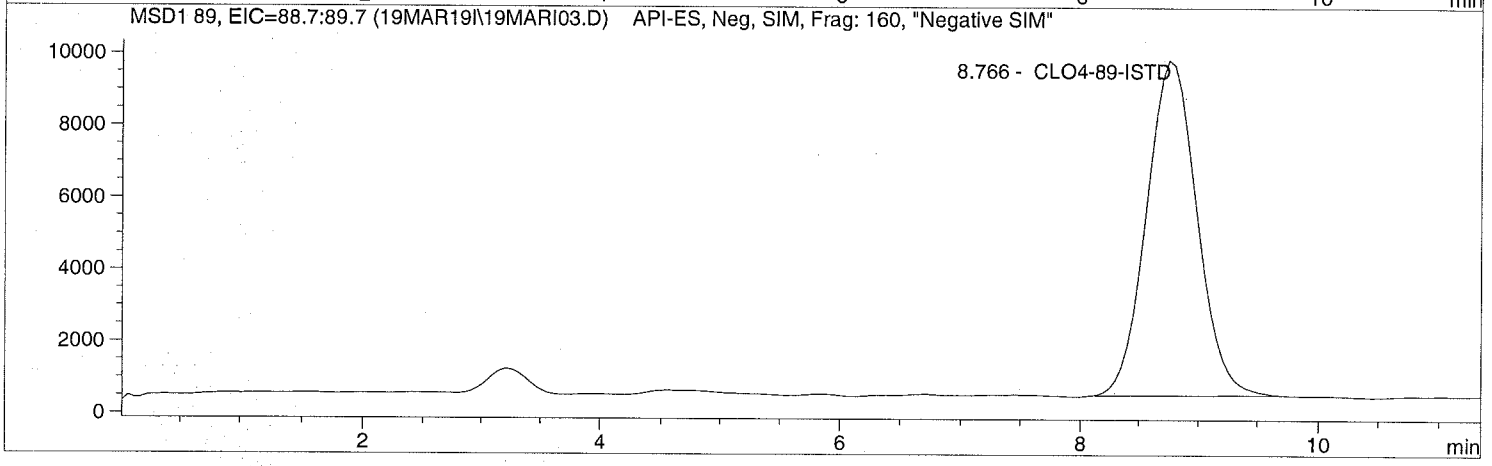
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

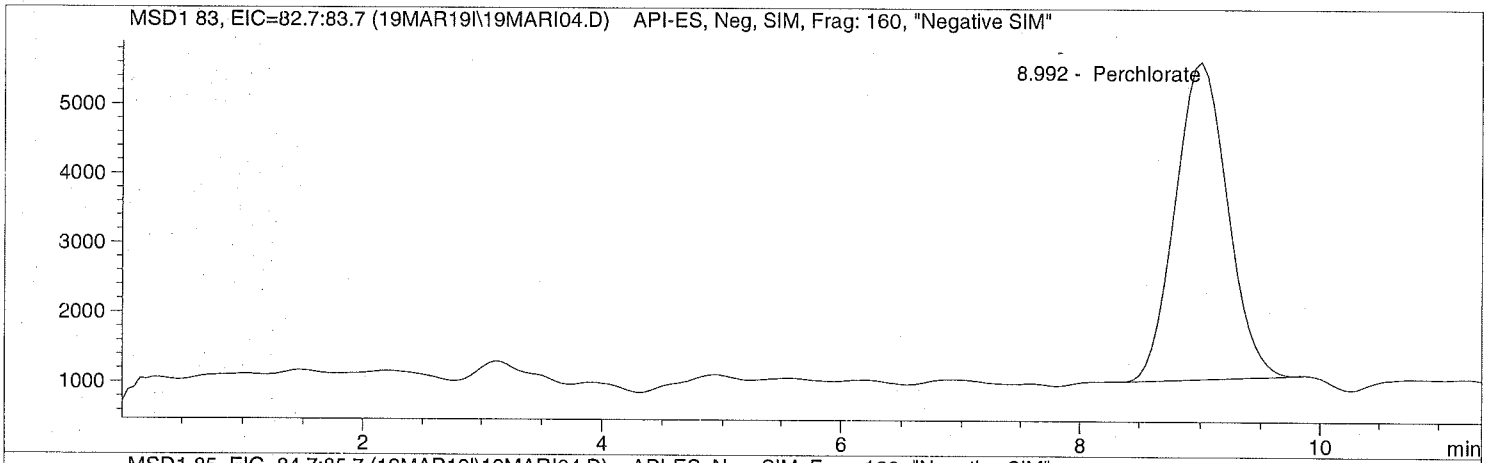
*** End of Report ***

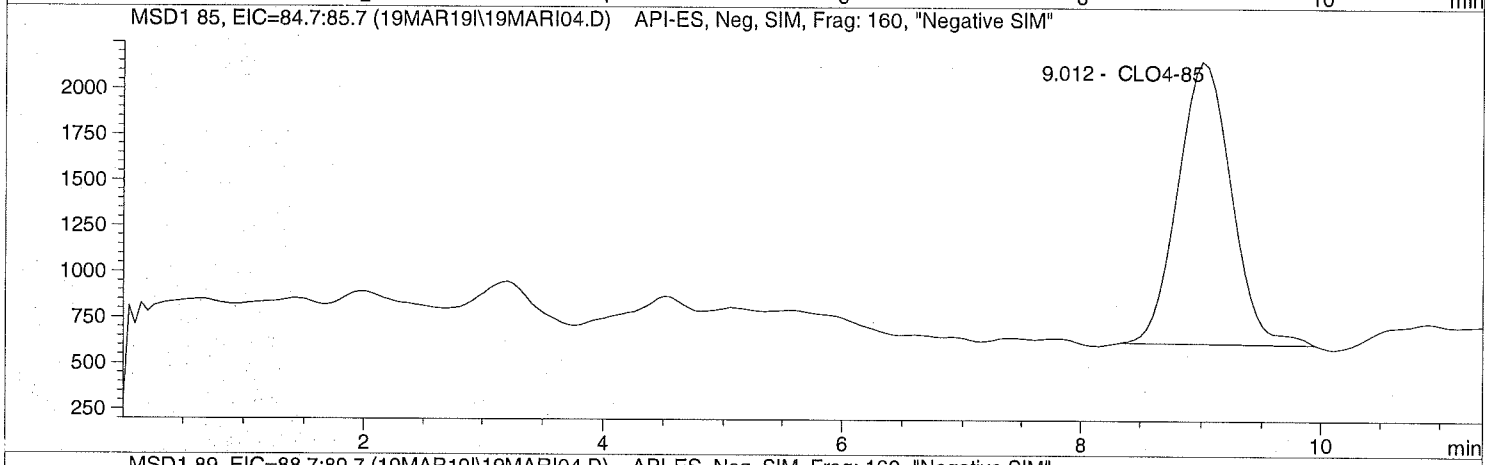
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L 00937705

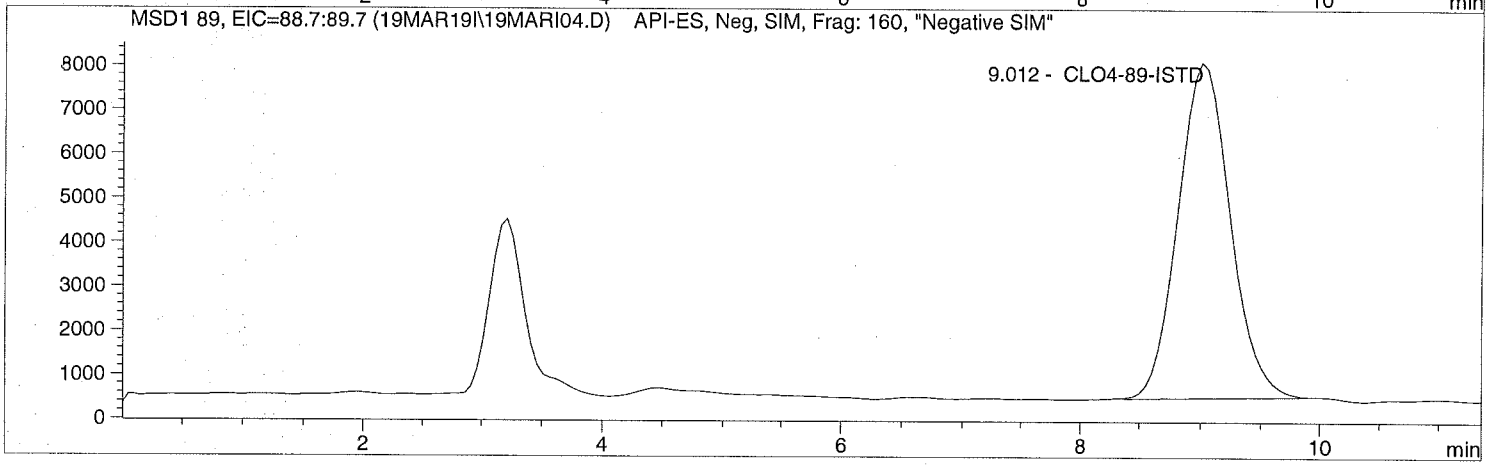
Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

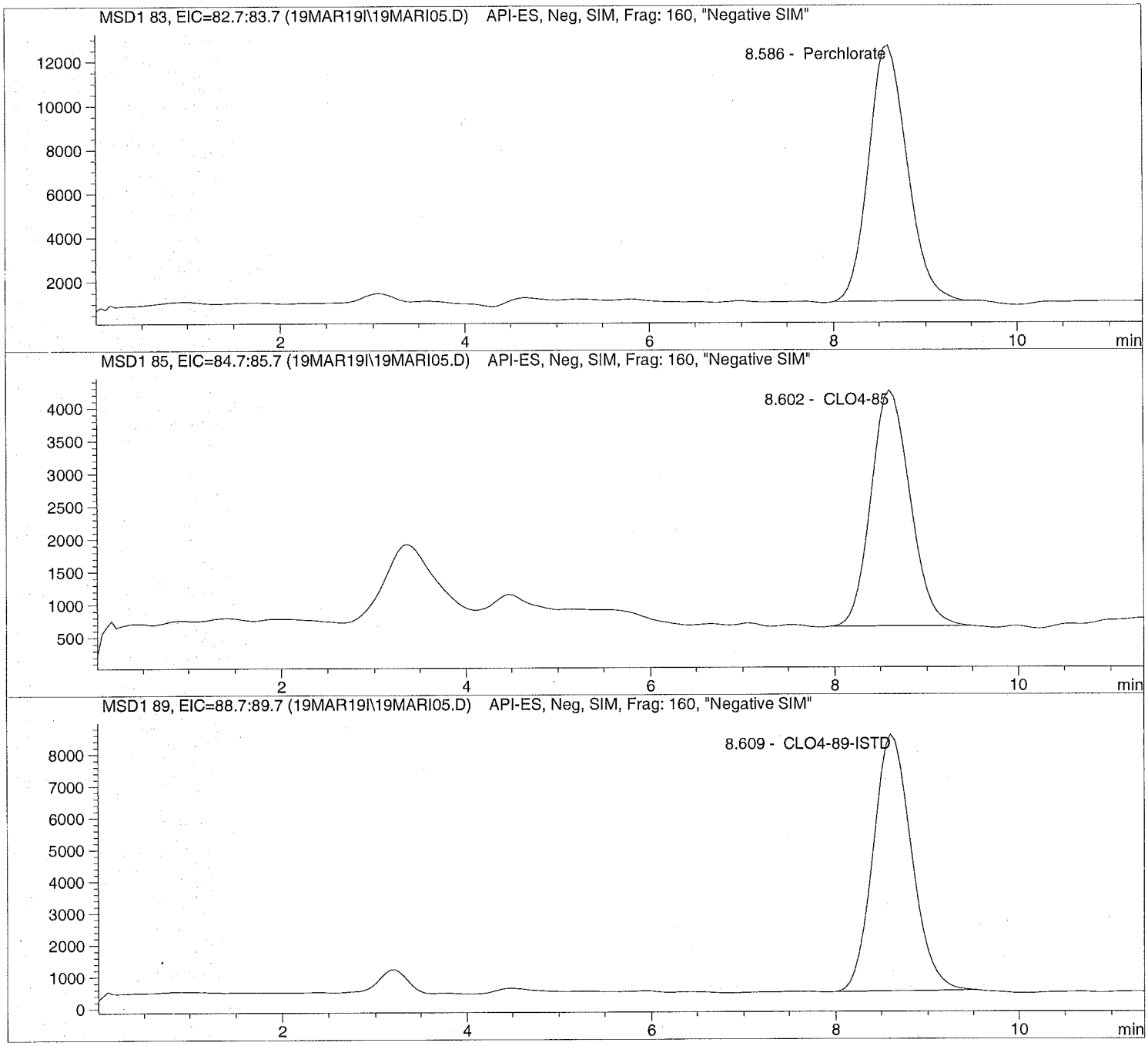
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

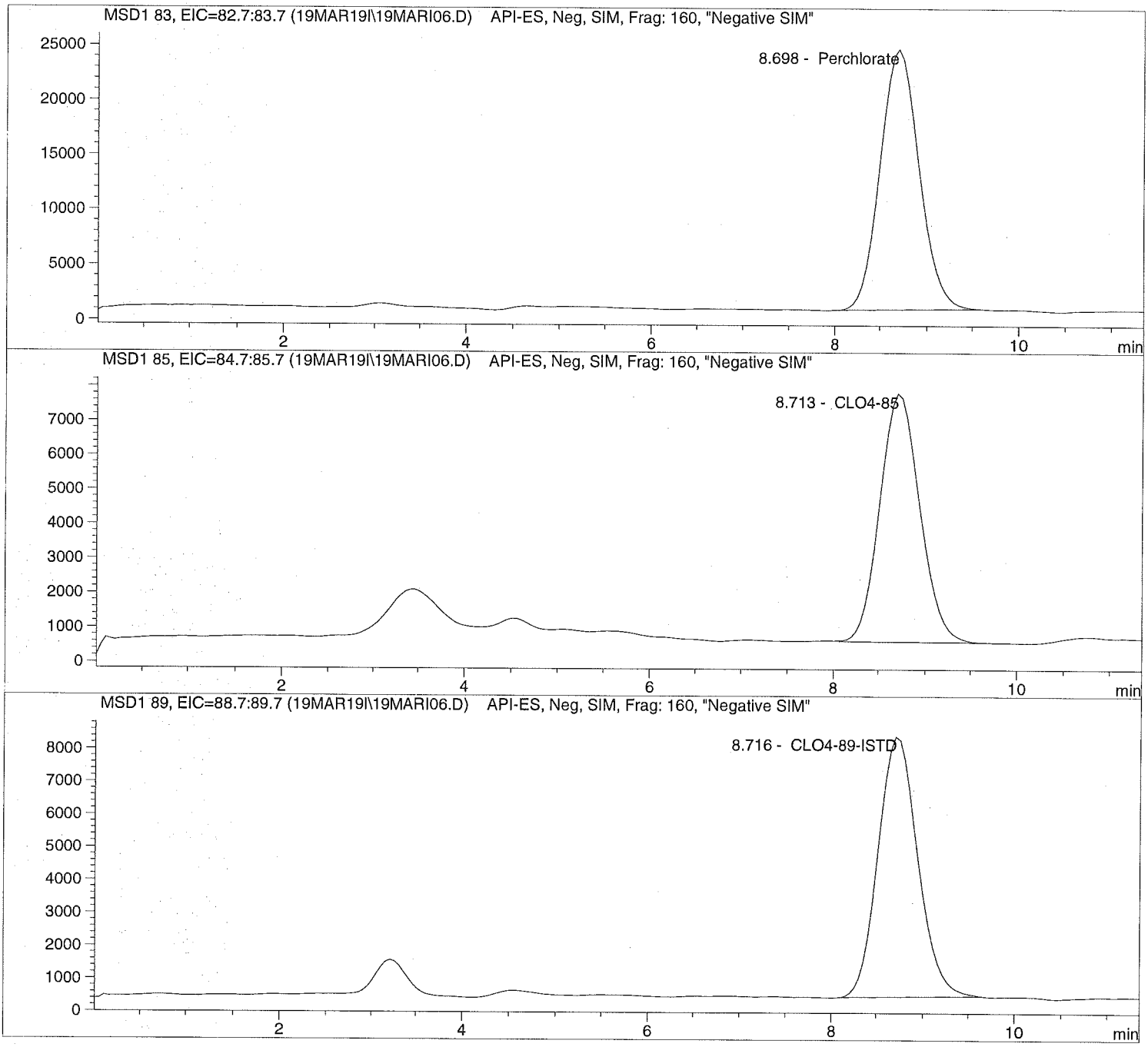
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

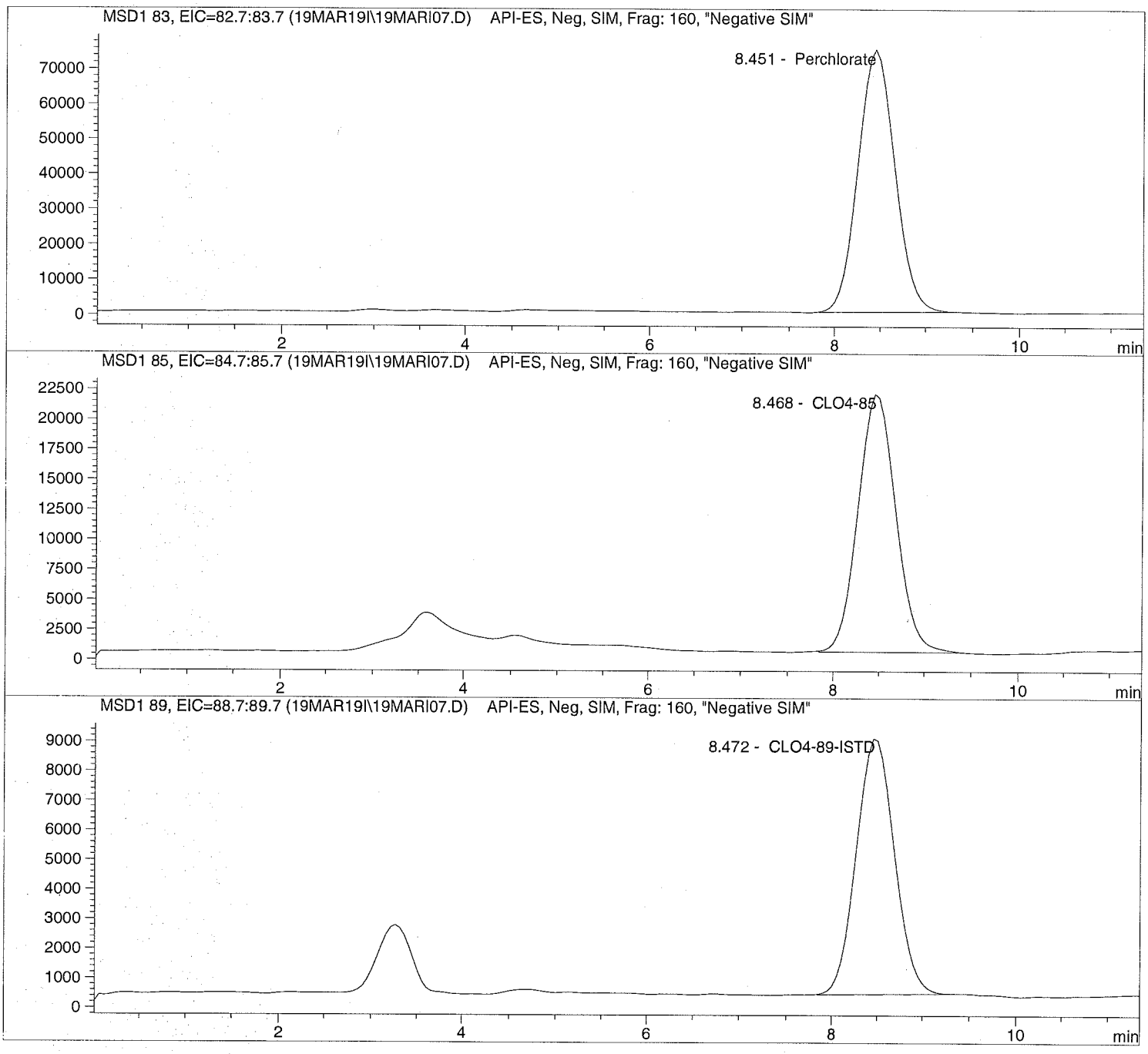
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L 00937711

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

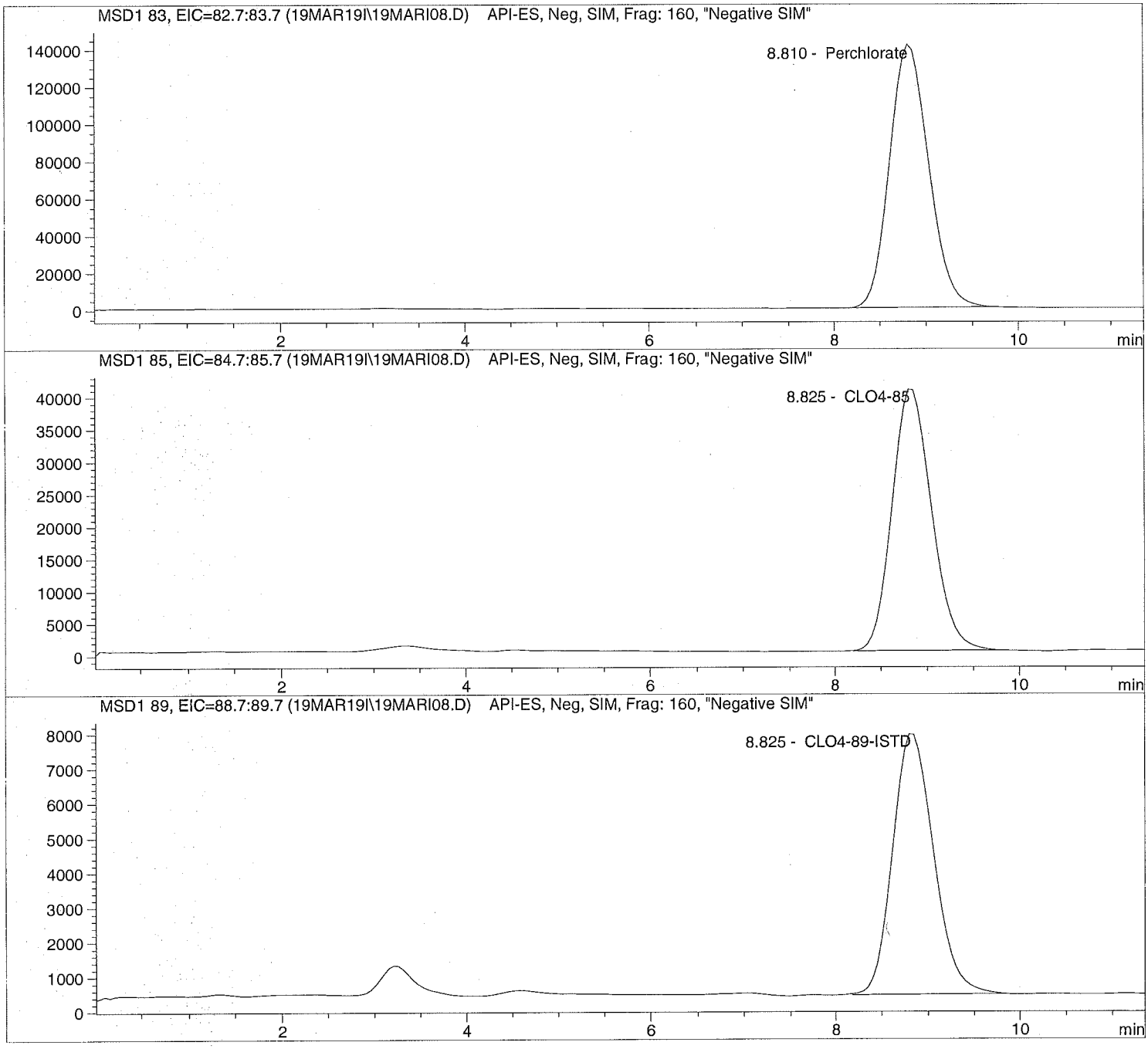
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

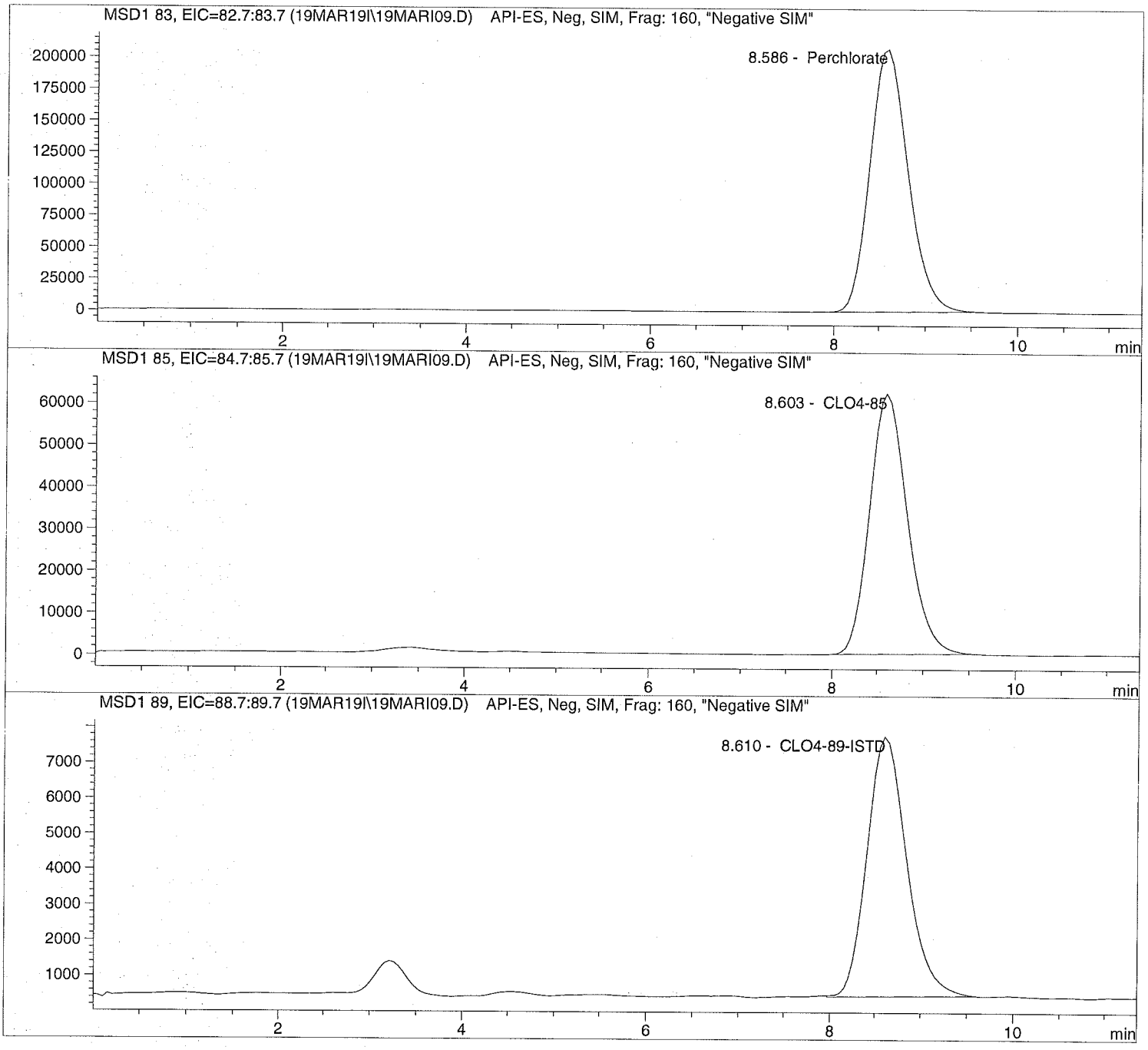
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

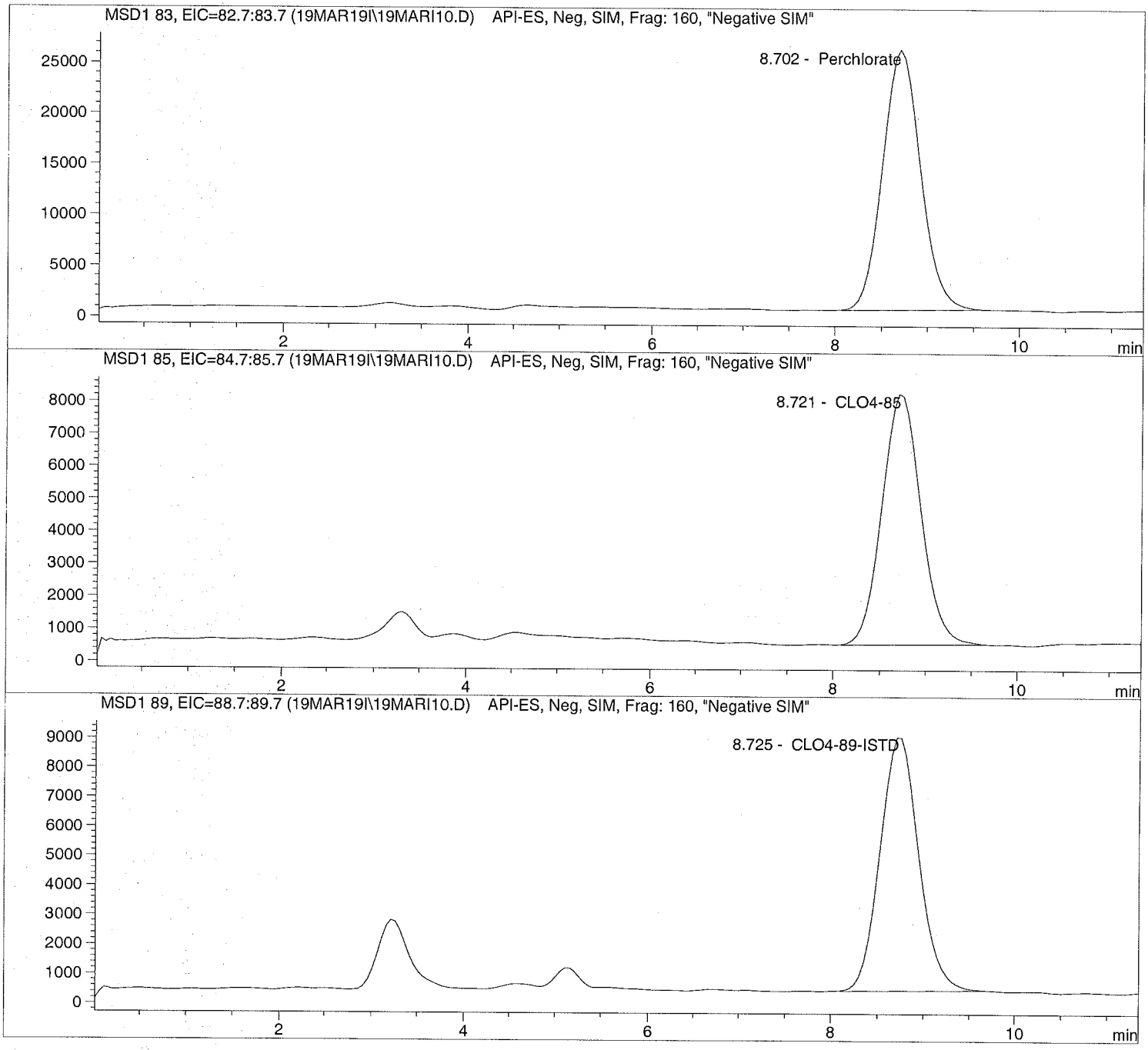
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

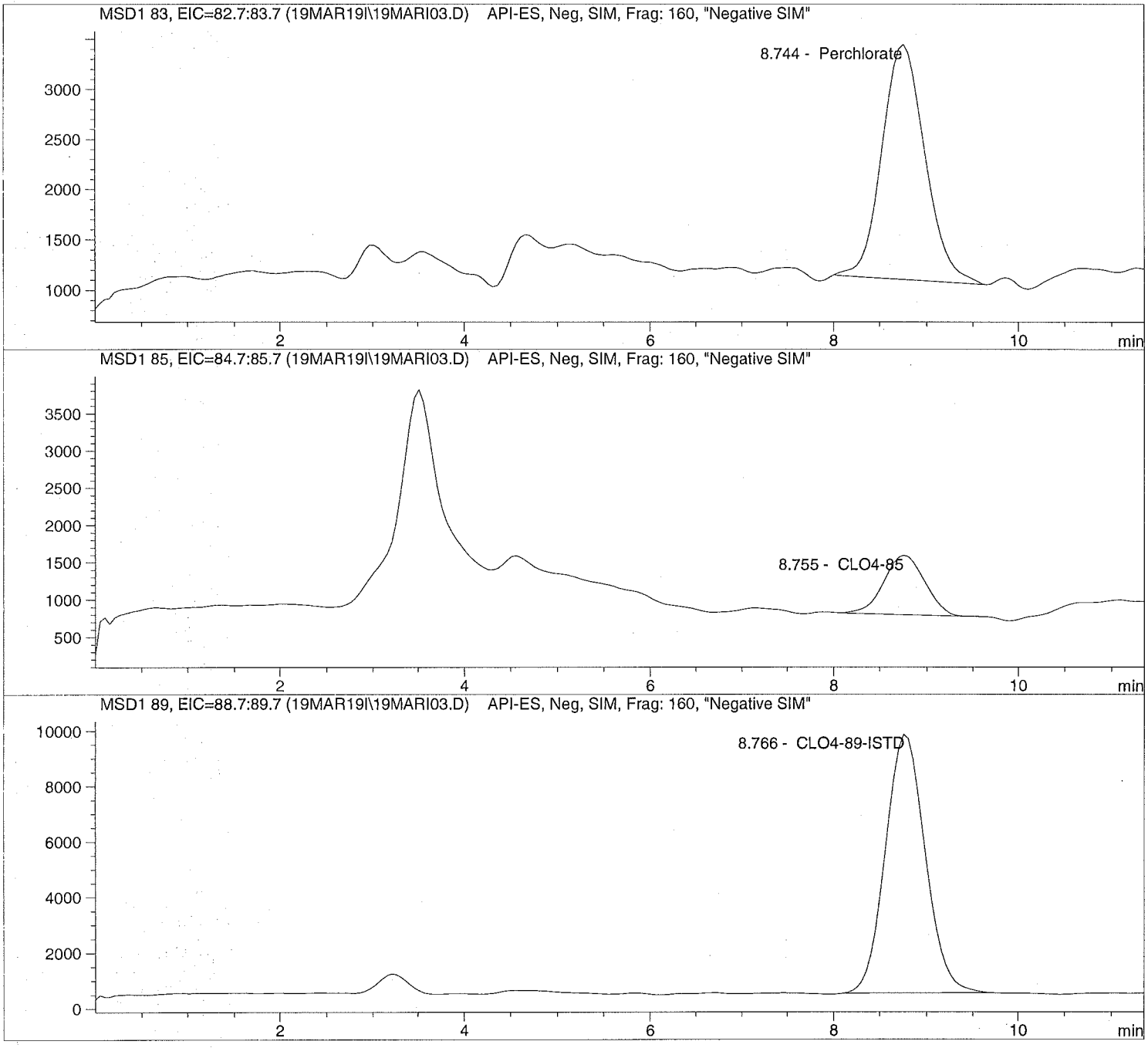
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

10450 Stancliff Rd. Suite 210
Houston, TX 77099
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April 25, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19040653**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Apr 11, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

10450 Stancliff Rd. Suite 210
Houston, TX 77099
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F: +1 281 530 5887

April 29, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19040654**

Laboratory Results for: **LH18/24 GW Treatment Plant Monthly Influent Samples**

Dear Marcia,

ALS Environmental received 1 sample(s) on Apr 11, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

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April 29, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19041072**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Apr 18, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

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F: +1 281 530 5887

May 03, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19041158**

Laboratory Results for: **Longhorn GW Treatment Plant Bi-Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Apr 18, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

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May 17, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19050126**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on May 02, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 17-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19050126

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19050126-01	LH18/24-SP650_050119	Water		01-May-2019 14:00	02-May-2019 12:50	☐
HS19050126-02	LH18/24-SP650_050119_BIX	Water		01-May-2019 14:00	02-May-2019 12:50	☐

ALS Houston, US Date: 17-May-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order:

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

• The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

WetChemistry by Method E350.3

Batch ID: R338033

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E365.3

Batch ID: R337966

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 17-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19050126

Sample ID: LH18/24-SP650_050119 Lab ID:HS19050126-01

Collection Date: 01-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: RG
Nitrogen, Ammonia (As N)	**24**		**0.20**	**0.10**	**0.20**	**mg/L**	1	08-May-2019 12:17
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: MZD
Phosphorus, Total Orthophosphate (As P)	**6.20**		**0.100**	**0.200**	**0.250**	**mg/L**	10	02-May-2019 16:00
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	10-May-2019 18:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19050126

Sample ID: LH18/24-SP650_050119_BIX Lab ID:HS19050126-02

Collection Date: 01-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-May-2019 09:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19050126

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R337966	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3			**Matrix:** Water		
HS19050126-01	LH18/24-SP650_050119	01 May 2019 14:00			02 May 2019 16:00	10
Batch ID R338033	**Test Name :** AMMONIA AS N BY E350.3(ISE)			**Matrix:** Water		
HS19050126-01	LH18/24-SP650_050119	01 May 2019 14:00			08 May 2019 12:17	1
Batch ID R338229	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS			**Matrix:** Water		
HS19050126-01	LH18/24-SP650_050119	01 May 2019 14:00			10 May 2019 18:40	1
Batch ID R338598	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19050126-02	LH18/24-SP650_050119_BIX	01 May 2019 14:00			17 May 2019 09:27	1

ALS Houston, US Date: 17-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19050126

QC BATCH REPORT

Batch ID: R337966 (0) **Instrument: UV-2450** **Method: ORTHO PHOSPHATE (PO4) AS P BY E365.3**

MBLK Sample ID: **MBLK-337966** Units: **mg/L** Analysis Date: **02-May-2019 16:00**
Client ID: Run ID: **UV-2450_337966** SeqNo: **5064814** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0200	0.0250								U

LCS Sample ID: **LCS-337966** Units: **mg/L** Analysis Date: **02-May-2019 16:00**
Client ID: Run ID: **UV-2450_337966** SeqNo: **5064815** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.262	0.0250	0.25	0	105	85 - 115				

MS Sample ID: **HS19050089-01MS** Units: **mg/L** Analysis Date: **02-May-2019 16:00**
Client ID: Run ID: **UV-2450_337966** SeqNo: **5064817** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.243	0.0250	0.25	-0.002	98.0	80 - 120				

MSD Sample ID: **HS19050089-01MSD** Units: **mg/L** Analysis Date: **02-May-2019 16:00**
Client ID: Run ID: **UV-2450_337966** SeqNo: **5064818** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.237	0.0250	0.25	-0.002	95.6	80 - 120	0.243	2.5	20	

The following samples were analyzed in this batch: HS19050126-01

ALS Houston, US Date: 17-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19050126

QC BATCH REPORT

Batch ID: R338033 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R338033** Units: **mg/L** Analysis Date: **08-May-2019 12:17**
Client ID: Run ID: **WetChem_HS_338033** SeqNo: **5066353** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R338033** Units: **mg/L** Analysis Date: **08-May-2019 12:17**
Client ID: Run ID: **WetChem_HS_338033** SeqNo: **5066352** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	9.945	0.20	10	0	99.4	80 - 120				

MS Sample ID: **HS19050180-01MS** Units: **mg/L** Analysis Date: **08-May-2019 12:17**
Client ID: Run ID: **WetChem_HS_338033** SeqNo: **5066470** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.51	0.20	10	0.02978	105	80 - 120				

MSD Sample ID: **HS19050180-01MSD** Units: **mg/L** Analysis Date: **08-May-2019 12:17**
Client ID: Run ID: **WetChem_HS_338033** SeqNo: **5066472** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.35	0.20	10	0.02978	103	80 - 120	10.51	1.53	20	

The following samples were analyzed in this batch: HS19050126-01

ALS Houston, US Date: 17-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS19050126**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 17-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19050126

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19050126-01	LH18/24-SP650_050119	Login	5/2/2019 3:34:28 PM	JRM	WET352
HS19050126-01	LH18/24-SP650_050119	Login	5/2/2019 3:34:28 PM	JRM	WET352
HS19050126-01	LH18/24-SP650_050119	Login	5/2/2019 3:34:28 PM	JRM	Sub
HS19050126-02	LH18/24-SP650_050119_BIX	Login	5/2/2019 3:34:28 PM	JRM	Sub

ALS Houston, US Date: 17-May-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19050126
Date/Time Received: **02-May-2019 12:50**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 2-May-2019 Date
Reviewed by: *RJ Modashia* eSignature 2-May-2019 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.8c/1.8c UC/C	IR11	
Cooler(s)/Kit(s):	43551		
Date/Time sample(s) sent to storage:	05/02/2019 15:44		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modshia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No.
NWO1312.0150.0
16.0001

Job:
GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

Prepared By:
Scott Beesinger

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE							Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_050119	Water	05/01/19 / 14:00		2	X	X									H2SO4	
LH18/24-SP650_050119	Water	05/01/19 / 14:00		1			X								NONE	
LH18/24-SP650_050119_BIX	Water	05/01/19 / 14:00		1				X							NONE	

Additional Remarks: **Standard TAT on all parameters**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	05/01/19	14:30	J Wagner	5/2/19	12:37						

For Lab Use Only

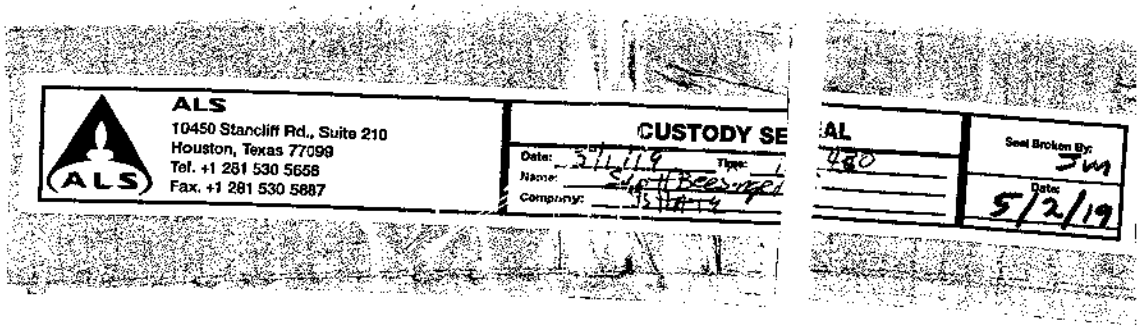
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:
Cooler 43551 IR 11
Temp 1.8 CF 0.0

HS19050126

Bhate Environmental Associates, Inc.
118/24 Longhorn GW Treatment Plant Weekly Sampl

(Word) S:\11-ces\Forms\Chain of Custody - BiWeekly


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5687
CUSTODY SE
Date:
Name:
Company:
AL
480
Seal Broken By:
Jm
Date:
5/2/19

RMA:
FedEx
Express
E
TRK# 4380 0535 4231
FedEx
TRK#
0221 4380 9535 4231
AB SGRA
RETURNS MON-SAT
PRIORITY OVERNIGHT
THU - 02 MAY 10:30
PRIORITY OVERNIGHT
77099
TX-US
IAH

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
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F : +1 360 636 1068
www.alsglobal.com

May 10, 2019

Analytical Report for Service Request No: K1903965

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS19050126

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory May 03, 2019
For your reference, these analyses have been assigned our service request number **K1903965.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

for Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

Table of Contents

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Raw Data
    General Chemistry

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

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ALS Environmental

Client: ALS Environmental - US
Project: HS19050126
Sample Matrix: Water

Service Request: K1903965
Date Received: 05/03/2019

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 05/03/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by _____ Date 05/10/2019

Chain of Custody

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K1903965

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Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **11243**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19050126
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19050126-01**	**LH18/24-SP650_050119**	**Water**	**01 May 2019 14:00**
	TOC Analysis for DOD Level IV			10 May 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 5/2/19 1800

Received By: K Morrow ALS Kelso Date/Time: 5/3/19 1010

Cooler ID(s): _____ Temperature(s): _____

00937749

PC KL

Cooler Receipt and Preservation Form

Client ALS-Houston Service Request *K19* 03965

Received: 5/3/19 Opened: 5/3/19 By: KM Unloaded: 5/3/19 By: KM

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.3	-0.1	2.0	2.2	+0.2	379	11243	480978334533	

4. Packing material: *Inserts* (*Baggies*) (*Bubble Wrap*) *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: RUSH

General Chemistry

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1903965
Project:	HS19050126	**Date Collected:**	05/1/19
Sample Matrix:	Water	**Date Received:**	05/3/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_050119	K1903965-001	**1.51**	0.50	0.20	0.07	1	05/07/19 17:30	
Method Blank	K1903965-MB	ND U	0.50	0.20	0.07	1	05/07/19 15:50	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1903965
Project	HS19050126	**Date Collected:**	05/01/19
Sample Matrix:	Water	**Date Received:**	05/03/19
		Date Analyzed:	05/07/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_050119	**Units:**	mg/L
Lab Code:	K1903965-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K1903965-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	1.51	1.53	1.52	<1	10

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1903965
Project:	HS19050126	**Date Collected:**	05/01/19
Sample Matrix:	Water	**Date Received:**	05/03/19
		Date Analyzed:	05/7/19
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	LH18/24-SP650_050119	**Units:**	mg/L
Lab Code:	K1903965-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1903965-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	1.51	27.5	25.0	104	83-117

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1903965
Project:	HS19050126	**Date Analyzed:**	05/07/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	634658

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1903965-LCS	25.3	25.0	101	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1903965
Project: HS19050126

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	634658	KQ1906023-04	05/07/19 15:21	25.0	25.1	100	90-110
CCV2	634658	KQ1906023-05	05/07/19 19:24	25.0	25.6	102	90-110
CCV3	634658	KQ1906023-06	05/08/19 00:34	25.0	24.8	99	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1903965
Project: HS19050126

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	634658	KQ1906023-01	05/07/19 15:36	0.50	0.20	0.07	ND	U
CCB2	634658	KQ1906023-02	05/07/19 19:38	0.50	0.20	0.07	ND	U
CCB3	634658	KQ1906023-03	05/08/19 00:49	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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Work Request # Original ( ) KM038899, 3947, 3763, 3889, 3965, 3966, 3997, 4006,

Tier: I II II II IV IV I I

Date Analyzed: 5/7/19

Analyst: BCD

Analysis: TOC/DOC

TOC: 634658

Run # DOC: 634659

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	yes/no/NA
2.	Holding times met for all analyses and for all samples?	yes/no/NA
3.	Are calculations correct?	yes/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/NA
5.	All quality control criteria met?	yes/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	yes/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	yes/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	yes/no/NA
9.	Are results for methods blanks all ND?	yes/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/no/NA
11.	Are all exceptions explained?	yes/no/NA
12.	Have all applicable service requests been reviewed?	yes/no/NA
13.	Are all samples labeled correctly?	yes/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	yes/no/NA
15.	Are detection limits and units reported correctly?	yes/no/NA
16.	Is the unused space on the benchsheet crossed out?	yes/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/no/NA

COMMENTS:

Final Approved by: [signature] Date: 05/09/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 634658 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1903763-004	Carbon, Total Organic	N/A		Water	7.05 mg/L	10 mL	705 mg/L	100	7	50			5/7/19 23:10:00	N	II
K1903763-005	Carbon, Total Organic	N/A		Water	7.11 mg/L	10 mL	711 mg/L	100	7	50			5/7/19 23:38:00	N	II
K1903889-001	Carbon, Total Organic	N/A		Water	7.75 mg/L	10 mL	7.75 mg/L	1	0.07	0.50			5/7/19 21:46:00	N	II
K1903889-002	Carbon, Total Organic	N/A		Water	18.69 mg/L	10 mL	18.7 mg/L	1	0.07	0.50			5/7/19 22:14:00	N	II
K1903889-003	Carbon, Total Organic	N/A		Water	14.58 mg/L	10 mL	14.6 mg/L	1	0.07	0.50			5/7/19 22:42:00	N	II
K1903965-001	Carbon, Total Organic	N/A		Water	1.51 mg/L	10 mL	1.51 mg/L	1	0.07	0.50			5/7/19 17:30:00	N	IV
K1903966-001	Carbon, Total Organic	N/A		Ground Water	2.91 mg/L	10 mL	2.91 mg/L	1	0.07	0.50			5/7/19 18:56:00	N	IV
K1903966-002	Carbon, Total Organic	N/A		Ground Water	3.24 mg/L	10 mL	3.24 mg/L	1	0.07	0.50			5/7/19 19:53:00	N	IV
K1903966-003	Carbon, Total Organic	N/A		Ground Water	2.09 mg/L	10 mL	2.09 mg/L	1	0.07	0.50			5/7/19 20:21:00	N	IV
K1903997-002	Carbon, Total Organic	N/A		Drinking Water	0.23 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/7/19 18:28:00	N	I
K1904006-001	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/7/19 16:34:00	N	I
K1904006-002	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/7/19 17:02:00	N	I
KQ1906023-01	Carbon, Total Organic	CCB		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/7/19 15:36:00	N	I
KQ1906023-02	Carbon, Total Organic	CCB		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/7/19 19:38:00	N	I
KQ1906023-03	Carbon, Total Organic	CCB		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/8/19 00:49:00	N	I
KQ1906023-04	Carbon, Total Organic	CCV		Reagent Water	25.09 mg/L	10 mL	25.1 mg/L	1					5/7/19 15:21:00	N	I
KQ1906023-05	Carbon, Total Organic	CCV		Reagent Water	25.59 mg/L	10 mL	25.6 mg/L	1					5/7/19 19:24:00	N	I
KQ1906023-06	Carbon, Total Organic	CCV		Reagent Water	24.77 mg/L	10 mL	24.8 mg/L	1					5/8/19 00:34:00	N	I
KQ1906023-07	Carbon, Total Organic	MB		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/7/19 15:50:00	N	I
KQ1906023-08	Carbon, Total Organic	LCS		Reagent Water	25.33 mg/L	10 mL	25.3 mg/L	1	0.07	0.50	101		5/7/19 16:05:00	N	I
KQ1906023-09	Carbon, Total Organic	MS	K1903965-001	Water	27.53 mg/L	10 mL	27.5 mg/L	1	0.07	0.50	104		5/7/19 17:59:00	N	IV
KQ1906023-10	Carbon, Total Organic	DUP	K1904006-001	Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	5/7/19 16:34:00	N	I
KQ1906023-11	Carbon, Total Organic	DUP	K1904006-002	Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	5/7/19 17:02:00	N	I
KQ1906023-12	Carbon, Total Organic	DUP	K1903965-001	Water	1.53 mg/L	10 mL	1.53 mg/L	1	0.07	0.50		<1	5/7/19 17:30:00	N	IV
KQ1906023-13	Carbon, Total Organic	DUP	K1903997-002	Drinking Water	0.19 mg/L	10 mL	0.19 mg/L J	1	0.07	0.50		NC	5/7/19 18:28:00	N	I
KQ1906023-14	Carbon, Total Organic	DUP	K1903966-001	Ground Water	2.94 mg/L	10 mL	2.94 mg/L	1	0.07	0.50		<1	5/7/19 18:56:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

05/09/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 634658 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1906023-15	Carbon, Total Organic	DUP	K1903966-002	Ground Water	3.06 mg/L	10 mL	3.06 mg/L	1	0.07	0.50		6	5/7/19 19:53:00	N	IV
KQ1906023-16	Carbon, Total Organic	DUP	K1903966-003	Ground Water	1.97 mg/L	10 mL	1.97 mg/L	1	0.07	0.50		6	5/7/19 20:21:00	N	IV
KQ1906023-17	Carbon, Total Organic	DUP	K1903889-001	Water	7.70 mg/L	10 mL	7.70 mg/L	1	0.07	0.50		<1	5/7/19 21:46:00	N	II
KQ1906023-18	Carbon, Total Organic	DUP	K1903889-002	Water	18.53 mg/L	10 mL	18.5 mg/L	1	0.07	0.50		<1	5/7/19 22:14:00	N	II
KQ1906023-19	Carbon, Total Organic	DUP	K1903889-003	Water	14.36 mg/L	10 mL	14.4 mg/L	1	0.07	0.50		2	5/7/19 22:42:00	N	II
KQ1906023-20	Carbon, Total Organic	DUP	K1903763-004	Water	7.05 mg/L	10 mL	705 mg/L	100	7	50		<1	5/7/19 23:10:00	N	II
KQ1906023-21	Carbon, Total Organic	DUP	K1903763-005	Water	6.92 mg/L	10 mL	692 mg/L	100	7	50		3	5/7/19 23:38:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 634659 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1903899-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.57 mg/L	10 mL	0.57 mg/L	1	0.07	0.50			5/8/19 01:47:00	N	I
K1903899-002	Carbon, Dissolved Organic (DOC)	N/A		Water	19.98 mg/L	10 mL	40.0 mg/L	2	0.2	1.0			5/8/19 02:44:00	N	I
K1903947-001	Carbon, Dissolved Organic (DOC)	N/A		Effluent	1.72 mg/L	10 mL	1.72 mg/L	1	0.07	0.50			5/7/19 20:49:00	N	II
K1903947-002	Carbon, Dissolved Organic (DOC)	N/A		Effluent	1.41 mg/L	10 mL	1.41 mg/L	1	0.07	0.50			5/7/19 21:17:00	N	II
KQ1906022-01	Carbon, Dissolved Organic (DOC)	CCB		Effluent	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/7/19 19:38:00	N	II
KQ1906022-02	Carbon, Dissolved Organic (DOC)	CCB		Effluent	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/8/19 00:49:00	N	II
KQ1906022-03	Carbon, Dissolved Organic (DOC)	CCB		Effluent	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/8/19 03:55:00	N	II
KQ1906022-04	Carbon, Dissolved Organic (DOC)	CCV		Effluent	25.09 mg/L	10 mL	25.1 mg/L	1					5/7/19 19:24:00	N	II
KQ1906022-05	Carbon, Dissolved Organic (DOC)	CCV		Effluent	25.59 mg/L	10 mL	25.6 mg/L	1					5/8/19 00:34:00	N	II
KQ1906022-06	Carbon, Dissolved Organic (DOC)	CCV		Effluent	24.60 mg/L	10 mL	24.6 mg/L	1					5/8/19 03:41:00	N	II
KQ1906022-07	Carbon, Dissolved Organic (DOC)	MS	K1903899-001	Water	26.19 mg/L	10 mL	26.2 mg/L	1	0.07	0.50	102		5/8/19 02:15:00	N	I
KQ1906022-08	Carbon, Dissolved Organic (DOC)	DUP	K1903899-001	Water	0.60 mg/L	10 mL	0.60 mg/L	1	0.07	0.50		4	5/8/19 01:47:00	N	I
KQ1906022-09	Carbon, Dissolved Organic (DOC)	DUP	K1903899-002	Water	19.75 mg/L	10 mL	39.5 mg/L	2	0.2	1.0		1	5/8/19 02:44:00	N	I
KQ1906022-10	Carbon, Dissolved Organic (DOC)	DUP	K1903947-001	Effluent	1.72 mg/L	10 mL	1.72 mg/L	1	0.07	0.50		<1	5/7/19 20:49:00	N	II
KQ1906022-11	Carbon, Dissolved Organic (DOC)	DUP	K1903947-002	Effluent	1.39 mg/L	10 mL	1.39 mg/L	1	0.07	0.50		1	5/7/19 21:17:00	N	II
KQ1906022-12	Carbon, Dissolved Organic (DOC)	MB		Effluent	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/8/19 01:03:00	N	II
KQ1906022-13	Carbon, Dissolved Organic (DOC)	LCS		Effluent	25.33 mg/L	10 mL	25.3 mg/L	1	0.07	0.50	101		5/8/19 01:18:00	N	II

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05/09/19

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	25.087	0.0000	25.0871	25.0871	25.1	5/7/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/7/2019
4	MB1	1	0.000	0.0000	0.0000	0	<0.5	5/7/2019
5	[TOC] LCS [24ppm]	1	25.331	0.0000	25.3309	25.3309	25.3	5/7/2019
6	K1904006-001	1	0.000	0.0000	0.0000	0	<0.5	5/7/2019
7	K1904006-001d	1	0.000	0.0000	0.0000	0	<0.5	5/7/2019
8	K1904006-002	1	0.000	0.0000	0.0000	0	<0.5	5/7/2019
9	K1904006-002d	1	0.000	0.0000	0.0000	0	<0.5	5/7/2019
10	K1903965-001	1	1.514	0.0000	1.5136	1.5136	1.51	5/7/2019
11	K1903965-001d	1	1.525	0.0000	1.5251	1.5251	1.5	5/7/2019
12	K1903965-001ms	1	27.527	0.0000	27.5274	27.5274	27.53	5/7/2019
13	K1903997-002	1	0.234	0.0000	0.2341	0.2341	<0.5	5/7/2019
14	K1903997-002d	1	0.188	0.0000	0.1882	0.1882	<0.5	5/7/2019
15	K1903966-001	1	2.909	0.0000	2.9090	2.909	2.9	5/7/2019
16	K1903966-001d	1	2.938	0.0000	2.9382	2.9382	2.9	5/7/2019
17	C] CCV 25 ppm [25 p	1	25.595	0.0000	25.5949	25.5949	25.59	5/7/2019
18	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/7/2019
19	K1903966-002	1	3.244	0.0000	3.2436	3.2436	3.2	5/7/2019
20	K1903966-002d	1	3.056	0.0000	3.0563	3.0563	3.06	5/7/2019
21	K1903966-003	1	2.094	0.0000	2.0936	2.0936	2.09	5/7/2019
22	K1903966-003d	1	1.973	0.0000	1.9725	1.9725	2.0	5/7/2019
23	K1903889-001	1	7.745	0.0000	7.7454	7.7454	7.7	5/7/2019
24	K1903889-001d	1	7.704	0.0000	7.7043	7.7043	7.70	5/7/2019
25	K1903889-002	1	18.694	0.0000	18.6941	18.6941	18.69	5/7/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: BD		Date Analyzed 5/7/19	
Reviewed By: [signature]		Date Reviewed 05/09/19	

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1903889-002d	1	18.527	0.0000	18.5272	18.5272	18.53	5/7/2019
27	K1903889-003	1	14.578	0.0000	14.5782	14.5782	14.58	5/7/2019
28	K1903889-003d	1	14.359	0.0000	14.3593	14.3593	14.4	5/7/2019
29	K1903763-004	100	7.047	0.0000	7.0467	704.67	704.7	5/7/2019
30	K1903763-004d	100	7.049	0.0000	7.0489	704.89	704.9	5/7/2019
31	K1903763-005	100	7.110	0.0000	7.1097	710.97	711.0	5/7/2019
32	K1903763-005d	100	6.923	0.0000	6.9234	692.34	692.3	5/7/2019
33	C] CCV 25 ppm [25 p	1	24.769	0.0000	24.7687	24.7687	24.8	5/8/2019
34	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/8/2019
35		1		0.0000	0.0000	0	<0.5	
36		1		0.0000	0.0000	0	<0.5	
37		1		0.0000	0.0000	0	<0.5	
38		1		0.0000	0.0000	0	<0.5	
39		1		0.0000	0.0000	0	<0.5	
40		1		0.0000	0.0000	0	<0.5	
41		1		0.0000	0.0000	0	<0.5	
42		1		0.0000	0.0000	0	<0.5	
43		1		0.0000	0.0000	0	<0.5	
44		1		0.0000	0.0000	0	<0.5	
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By: KCD	Date Analyzed 5/7/19
Reviewed By:	Date Reviewed 05/09/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	25.595	0.0000	25.5949	25.5949	25.6	5/7/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/7/2019
4	K1903947-001	1	1.718	0.0000	1.7176	1.7176	1.7	5/7/2019
5	K1903947-001d	1	1.717	0.0000	1.7166	1.7166	1.7	5/7/2019
6	K1903947-002	1	1.410	0.0000	1.4096	1.4096	1.41	5/7/2019
7	K1903947-002d	1	1.391	0.0000	1.3912	1.3912	1.4	5/7/2019
8	C] CCV 25 ppm [25 p	1	24.769	0.0000	24.7687	24.7687	25	5/8/2019
9	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/8/2019
10	MB2	1	0.000	0.0000	0.0000	0	<0.5	5/8/2019
11	[TOC] LCS [24ppm]	1	25.084	0.0000	25.0838	25.0838	25.1	5/8/2019
12	K1903899-001	1	0.575	0.0000	0.5749	0.5749	0.57	5/8/2019
13	K1903899-001d	1	0.597	0.0000	0.5970	0.597	0.60	5/8/2019
14	K1903899-001ms	1	26.188	0.0000	26.1881	26.1881	26.19	5/8/2019
15	K1903899-002	2	19.983	0.0000	19.9825	39.965	40.0	5/8/2019
16	K1903899-002d	2	19.747	0.0000	19.7471	39.4942	39.5	5/8/2019
17	C] CCV 25 ppm [25 p	1	24.602	0.0000	24.6022	24.6022	24.60	5/8/2019
18	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/8/2019
19		1		0.0000	0.0000	0	<0.5	
20		1		0.0000	0.0000	0	<0.5	
21		1		0.0000	0.0000	0	<0.5	
22		1		0.0000	0.0000	0	<0.5	
23		1		0.0000	0.0000	0	<0.5	
24		1		0.0000	0.0000	0	<0.5	
25		1		0.0000	0.0000	0	<0.5	

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: BCD	Date Analyzed 5/7/19		
Reviewed By: [signature]	Date Reviewed 05/09/19		

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

TOC: 634658
DOC: 634659

Schedule: Daily Run Method 010711

Version: 73
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/05/07 17:17 - Tuesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1904006-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1904006-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K1903965-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	K1903965-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
7	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
8	Sample	K1903997-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1903966-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1903966-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1903966-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1903947-001.03 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1903947-002.03 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1903889-001.18	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1903889-002.18	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1903889-003.18	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1903763-004.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1903763-005.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	FB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
22	Sample	K1903899-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1903899-001.01 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
24	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
25	Sample	K1903899-002.01 doc 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

05/09/19

Printed on: May 8, 2019 13:29:16

Fusion Report - Daily Run Method 010711 Tuesday, May 07, 2019 01:17 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/05/08 13:29 - Wednesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	Daily Run Method 010711	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v72) Fusion1 (Fusion1) (v73)		
Comment:			

Report Results

05/09/19

Sample Type: Clean — From Schedule Version 72

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/05/07 13:17

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	15.02	18.20	3.18	49.67	05:27
2	TC Clean	18.18	21.33	3.15	49.78	07:17
3	TC Clean	2.88	5.93	3.05	49.86	07:03
4	TC Clean	1.89	5.02	3.13	50.02	03:50

Sample Type: Clean — From Schedule Version 72

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/05/07 13:45

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.15	4.12	2.97	49.61	05:15
2	TC Clean	4.52	7.64	3.12	49.87	07:14
3	TC Clean	1.56	4.66	3.10	50.01	03:47
4	TC Clean	1.10	4.11	3.01	50.03	03:50

Sample Type: Clean — From Schedule Version 72

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/05/07 14:10

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.72	3.62	2.90	49.71	05:13
2	TC Clean	3.80	6.60	2.80	50.01	04:04
3	TC Clean	1.46	4.45	2.99	50.00	03:48
4	TC Clean	1.30	4.20	2.90	50.01	03:49

Sample Type: Blank (Creating v1253) — From Schedule Version 72

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2019/05/07 14:32

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.83	3.79	2.96	49.69	05:25
2	TC Clean	3.69	6.70	3.01	50.02	04:05
3	TC Clean	1.84	4.72	2.88	50.04	03:50
4	TC Clean	1.34	4.28	2.94	50.03	03:56
5	Reagent Blank	4.03	7.02	3.00	50.02	05:07
6	Acid Blank	1.19	4.24	3.05	49.65	05:29

Sample Type: Sample — From Schedule Version 72

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/07 15:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.34	11.47	3.13	50.15	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 72

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.0871 ppm (PASS)	0.0000 ppm	0%	2019/05/07 15:21

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.0871	250.8707	179.75	182.77	3.02	50.10	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 72

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/07 15:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.82	9.78	2.96	50.14	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 72

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/07 15:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.98	10.03	3.04	50.16	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 72

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.3309 ppm (PASS)	0.0000 ppm	0%	2019/05/07 16:05

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

	Type									
C	TOC	25.0 ppm	1	25.3309	253.3088	181.41	184.42	3.01	50.11	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 72

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/07 16:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.36	11.40	3.04	50.15	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K1904006-001.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/07 16:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.80	8.61	2.81	50.17	10:29
2	TOC	0.0000	0.0000	6.00	8.81	2.81	50.19	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1904006-002.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/07 17:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.72	8.65	2.93	50.20	10:31
2	TOC	0.0000	0.0000	5.83	8.72	2.88	50.26	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Sample — From Schedule Version 73

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K1903965-001.01	1.5194 ppm	0.0081 ppm	0.5300%	2019/05/07 17:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5136	15.1361	19.06	22.10	3.04	50.20	10:29

2	TOC	1.5251	15.2510	19.14	21.98	2.84	50.22	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1903965-001.01 ms	27.5274 ppm	0.0000 ppm	0.0000%	2019/05/07 17:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.5274	275.2739	195.64	198.75	3.11	50.23	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/07 18:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.87	9.75	2.88	50.22	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1903997-002.01	0.2112 ppm	0.0325 ppm	15.3900%	2019/05/07 18:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2341	2.3413	10.37	13.22	2.85	50.22	10:29
2	TOC	0.1882	1.8817	10.06	13.08	3.02	50.18	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1903966-001.01	2.9236 ppm	0.0206 ppm	0.7100%	2019/05/07 18:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9090	29.0903	28.53	31.45	2.92	50.07	10:28
2	TOC	2.9382	29.3819	28.73	31.64	2.91	50.03	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 73

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.5949 ppm (PASS)	0.0000 ppm	0%	2019/05/07 19:24

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.5949	255.9488	183.20	186.12	2.92	49.99	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 73

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/07 19:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.81	9.62	2.81	49.94	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 73

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K1903966-002.01	3.1500 ppm	0.1324 ppm	4.2000%	2019/05/07 19:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.2436	32.4359	30.80	33.67	2.87	49.91	10:29
2	TOC	3.0563	30.5635	29.53	32.51	2.97	49.92	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K1903966-003.01	2.0331 ppm	0.0856 ppm	4.2100%	2019/05/07 20:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0936	20.9361	23.00	25.79	2.79	49.90	10:26
2	TOC	1.9725	19.7251	22.17	25.11	2.94	49.88	10:29

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1903947-001.03 doc	1.7171 ppm	0.0007 ppm	0.0400%	2019/05/07 20:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7176	17.1765	20.44	23.25	2.81	49.88	10:29
2	TOC	1.7166	17.1662	20.44	23.33	2.89	49.88	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1903947-002.03 doc	1.4004 ppm	0.0130 ppm	0.9300%	2019/05/07 21:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4096	14.0960	18.35	21.27	2.92	49.88	10:28
2	TOC	1.3912	13.9119	18.23	21.18	2.95	49.90	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1903889-001.18	7.7248 ppm	0.0291 ppm	0.3800%	2019/05/07 21:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.7454	77.4540	61.36	64.31	2.95	49.95	10:26
2	TOC	7.7043	77.0429	61.08	64.04	2.95	49.92	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1903889-002.18	18.6106 ppm	0.1180 ppm	0.6300%	2019/05/07 22:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	18.6941	186.9408	135.68	138.58	2.90	49.93	10:26
2	TOC	18.5272	185.2716	134.55	137.69	3.14	49.92	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1903889-003.18	14.4688 ppm	0.1548 ppm	1.0700%	2019/05/07 22:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.5782	145.7825	107.74	110.49	2.75	49.95	10:29
2	TOC	14.3593	143.5933	106.26	109.26	3.01	49.96	10:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1903763-004.01 100x	7.0478 ppm	0.0016 ppm	0.0200%	2019/05/07 23:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.0467	70.4666	56.62	59.72	3.10	49.99	10:26
2	TOC	7.0489	70.4887	56.63	59.56	2.93	50.00	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K1903763-005.01 100x	7.0165 ppm	0.1318 ppm	1.8800%	2019/05/07 23:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.1097	71.0971	57.04	59.88	2.84	50.01	10:28
2	TOC	6.9234	69.2335	55.78	58.54	2.76	50.01	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/08 00:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.84	8.76	2.92	50.02	10:31
2	TOC	0.0000	0.0000	5.71	8.51	2.80	50.04	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 73

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.7687 ppm (PASS)	0.0000 ppm	0%	2019/05/08 00:34

Pos	Base Analysis	ID	Rep	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run

	Type		#							Time
B	TOC	25 ppm	1	24.7687	247.6871	177.59	180.54	2.95	50.04	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 73

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/08 00:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.94	9.03	3.09	50.05	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 73

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/08 01:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.15	9.21	3.06	50.06	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 73

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.0838 ppm (PASS)	0.0000 ppm	0%	2019/05/08 01:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.0838	250.8382	179.73	182.56	2.83	50.06	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample From Schedule Version 73

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	21	TOC	FB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/08 01:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.46	10.42	2.96	50.07	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	K1903899-001.01 doc	0.5859 ppm	0.0156 ppm	2.6700%	2019/05/08 01:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5749	5.7489	12.69	15.55	2.86	50.07	10:28
2	TOC	0.5970	5.9698	12.84	15.85	3.02	50.08	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	K1903899-001.01 ms doc	26.1881 ppm	0.0000 ppm	0.0000%	2019/05/08 02:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.1881	261.8810	186.55	189.41	2.86	50.10	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/08 02:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.09	9.08	3.00	50.10	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	K1903899-002.01 doc 2x	19.8648 ppm	0.1665 ppm	0.8400%	2019/05/08 02:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	19.9825	199.8254	144.42	147.36	2.94	50.10	10:28
2	TOC	19.7471	197.4712	142.83	145.99	3.16	50.12	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	RB	0.0802 ppm	0.1134 ppm	141.4200%	2019/05/08 03:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1603	1.6033	9.87	12.85	2.98	50.14	10:28
2	TOC	0.0000	0.0000	6.86	9.94	3.08	50.10	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7847 (IC) (v1253)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 73

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6022 ppm (PASS)	0.0000 ppm	0%	2019/05/08 03:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6022	246.0223	176.46	179.42	2.96	50.11	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 73

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/08 03:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.27	9.28	3.01	50.14	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1252	1.0447	0.7470	0.0000	0.0000	0.0000	2019/05/01 17:45	Fusion1 (Fusion1)
v1253	1.3423	1.1900	0.0000	0.0000	0.0000	2019/05/07 15:06	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v30
Ver Creation: 2019/03/05 17:42
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC
Calibration curve formula: TOC: y = 6.788x + 9.463
r^2 value: TOC: r^2 = 0.99963

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4
Ver Creation: 2019/02/21 17:57
Comment:
Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig

SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/05/08 04:11

ALS Environmental

StarLIMS Run: 634658, 634659

Analysis: TOC

Method: 415.1, SM 5310 C, 9060, 9060A

CCV: 11-GEN-05-77K 50 ppm LCS: 11-GEN-05-77D 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-77M

21 % H3PO4: 11-GEN-05-77L

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: NA

Analyzed By: BD	Date Analyzed: 5/7/19
Reviewed By: [signature]	Date Reviewed: 05/09/19

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1912778, 1913240

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2246 (238759)

General Set Information: There were 7 field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1913240002/004 were analyzed and reported from 1:10 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 652190) was less than 1/2 the CRDL. The recovery for the LCS (652191) was within acceptable parameters.

MS/MSD Analysis: MS/MSD (652192/93) was performed on samples 1912778001. 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 652188) is reported from the analysis of the Laboratory Control Sample (LCS – 652191) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Stephen Brose — May 16, 2019
Analyst — Date

ANALYTICAL REPORT

Report Date: May 16, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1912778**
Project ID: 11242
Purchase Order: NA
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_050119_BIX Water	1912778001	05/01/19	05/03/19	11242

ANALYTICAL REPORT

Workorder: 34-1912778
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_050119_BIX Water**
Lab ID: 1912778001
Matrix: Water

Sampling Site: 11242
Media: 125 mL Nalgene
Sampling Parameter: NA

Collected: 05/01/2019
Received: 05/03/2019

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable

Analysis: EPA 6850, DoD QSM Water
Batch: ELMS/2246 (HBN: 238759)
Analyzed: 05/11/2019 15:37

Instrument ID: LCMS04
Percent Solid: NA
Report Basis: Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1.1	1.0	2.0	4.0	1	J

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 238759)**

Field samples 1913240002/004 were analyzed and reported from 1:10 dilutions. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Stephen Brose 05/16/2019 10:41	/S/ Thomas T. McKay 05/16/2019 14:26

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1912778
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1912778

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2246 (HBN: 238759)
		Prepared By:	NA	**Analyzed By:**	Stephen Brose

Blank

LMB: 652190
Analyzed: 05/11/2019 15:24
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 652191
Analyzed: 05/11/2019 14:57
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	3.79	4.00	94.6	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1912778001	**MS:**	652192
Analyzed:	05/11/2019 15:37	**Analyzed:**	05/11/2019 15:51
Dilution:	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L

	MSD:	652193
	Analyzed:	05/11/2019 16:04
	Dilution:	1
	Units:	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	1.10	3.47	4	86.8	78.8	123.8	3.38	84.4	2.84	0.0	20.0

Comments

Field samples 1913240002/004 were analyzed and reported from 1:10 dilutions. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Stephen Brose	/S/ Thomas T. McKay
05/16/2019 10:45	05/16/2019 14:26

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◓ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

1912778

1912778

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: Dept of Defense **COC ID:** 11242

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19050126
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19050126-02**	**LH18/24-SP650_050119_BIX**	**Water**	**01 May 2019 14:00**
	SUB_Perch-6850			10 May 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 5/2/19 1800

Received By: Jamaal Russell Date/Time: 05-03-19 9:45

Cooler ID(s): _____ Temperature(s): _____

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task:	**Split:**	**Workorder ID:** 1912778	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	05/01/2019 14:00	LH18/24-SP650_050119_BIX Water	1912778001		Water	A	1	A
2								
3								
4								
5								
6								
7								
8								
9								
10								

63 of 153

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
VanTassell, Tami	05/03/2019 09:45	ALS Sample Receiving	Sample Login
Tami VanTassell	05-03-19 15:20	15C	Storage
15C	5/9/19 7:30		Clay Analysis

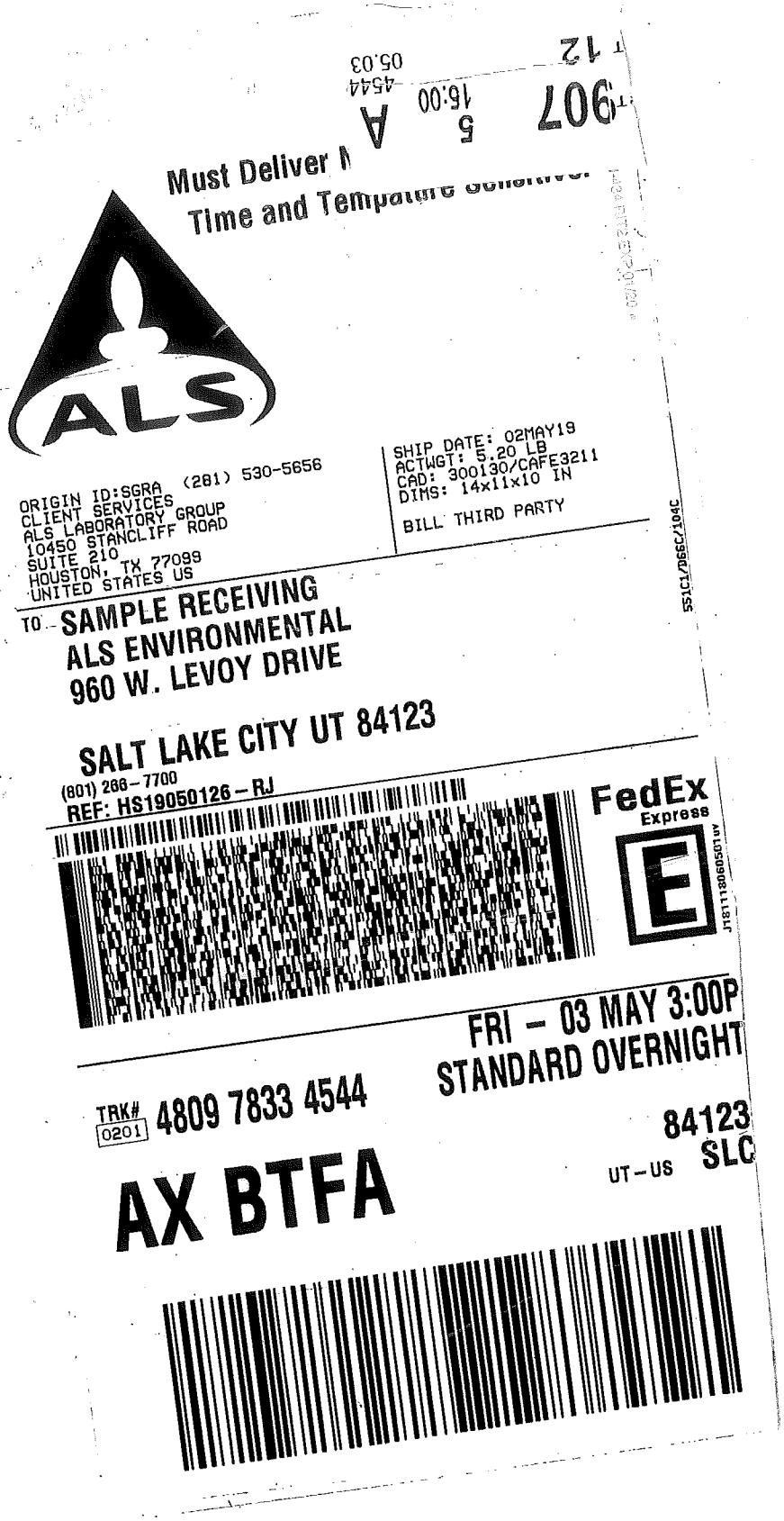
SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ **Lab Notebook No.:** _____

Prepared / Analyzed by: _____ **Date / Time:** _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00937788



907 5 A 16:00 4544 05.03 T 12

Must Deliver M
Time and Temperature Sensitive

ALS

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 02MAY19
ACTWGT: 5.20 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19050126 - RJ

FedEx Express

FRI - 03 MAY 3:00P
STANDARD OVERNIGHT

TRK# 0201 4809 7833 4544

84123
UT-US SLC

AX BTFA

SS1C1/D66C/104C

JI811180605010V

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: _____

Date/Time of Receipt: 05-03-19 9:45

Number of Coolers Received: 1

Condition of Coolers:	(Acceptable)/Unacceptable	Temperature Control:	(Present)/Not Included
Cooler Custody Seals:	(Present)/Absent/NA		
	(Intact)/Broken/NA	Location Temp Taken:	(Control)/Between Samples
Container Custody Seals:	Present/(Absent)/NA		
	Intact/Broken/(NA)	Are all temperatures within project specific guidelines?	Yes/No/(NA)
Ice Present:	(Yes)/No/NA		
	(Frozen)/Melted/NA	VOA Headspace Present?	Yes/No/(NA)

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9369	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Tamra Tassell (Signature) Tamra Tassell (Printed Name) 05-03-19 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

Batch Worklist

Batch: ELMS/ 2246
Rule: EPA 6850, DoD QSM Water
Created: 5/9/2019 11:22
Analyst: S. Brose
Instrument:
Status: WP
HBN: 238759

Workorder: 1912778 [ENV_LVL4]
Workorder: 1913240 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	652187	CCV for HBN 238759 [ELMS/2246]				CCV	3		E685041C3Q	6214		5/16/2019	
2	652188	RLVS for HBN 238759 [ELMS/2246				RLVS	3		E685041C3Q	6214		5/16/2019	
3	652189	ICS for HBN 238759 [ELMS/2246]				ICS	3		E6850..D3Q	6214		5/16/2019	
4	652190	LMB for HBN 238759 [ELMS/2246]				LMB	3		E6850Q413Q	6214		5/16/2019	
5	652191	LCS for HBN 238759 [ELMS/2246]				LCS	3		E6850Q413Q	6214		5/16/2019	
6	1912778001	LH18/24-SP650_050119_BIX Water				SAMPLE	3	1912778001-A	E6850Q41.3	5480	5/29/2019	5/16/2019	
7	652192	LH18/24-SP650...(1912778001MS)				MS	3		E6850Q413Q	6214		5/16/2019	
8	652193	LH18/24-SP65...(1912778001MSD)				MSD	3		E6850Q413Q	6214		5/16/2019	
9	1913240001	50WW06-190506				SAMPLE	3	1913240001-A	E6850Q41.3	5480	6/3/2019	5/21/2019	
10	1913240002	50WW11-190506				SAMPLE	3	1913240002-A	E6850Q41.3	5480	6/3/2019	5/21/2019	
11	1913240003	50WW14-190506				SAMPLE	3	1913240003-A	E6850Q41.3	5480	6/3/2019	5/21/2019	
12	1913240004	50WW13-190506				SAMPLE	3	1913240004-A	E6850Q41.3	5480	6/3/2019	5/21/2019	
13	1913240005	50WW22-190506				SAMPLE	3	1913240005-A	E6850Q41.3	5480	6/3/2019	5/21/2019	
14	1913240006	50WW16-190506				SAMPLE	3	1913240006-A	E6850Q41.3	5480	6/3/2019	5/21/2019	
15	652194	CCV for HBN 238759 [ELMS/2246]				CCV	3		E685041C3Q	6214		5/16/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1912778(001), 1913240(001-006)
ELMS Batch/HBN ID: 2246 (238759)
Prep Date: 05/11/2019 Analysis Date: 05/11/2019 Analyst: S. Brose
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\MAY\11MAY19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by SAB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 652191; Target = 4.0µg/L. ASTM type II water was used for LMB 652190.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1912778001 (Client ID: LH18/24-SP650_050119_BIX Water). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:
1) Results reported in µg/L. Field samples 1913240002/004 were analyzed and reported from 1:10 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\MAY\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\238759-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 652188) is reported from the analysis of the Laboratory Control Sample (LCS – 652191) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, many of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2246 HBN 238759 Sample Set IDs if Applicable: 1912778, 1913240	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	SB	
Standards traceability checked and meets criteria	SB	
Standard curve coefficients evaluated and meet criteria	SB	
ICVs analyzed and meet acceptance criteria	SB	
CCVs analyzed and meet acceptance criteria	SB	
Retention Time Windows checked	SB	
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	
Surrogate recoveries checked and appropriately addressed	SB	
Method Preparation Blanks analyzed and meet acceptance criteria	SB	
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	SB	
RLVS analyzed	SB	
Preparation and analysis hold times met	SB	
Preparation deviations and re-preparations noted when performed	SB	
Analysis deviations and re-analyses noted when performed	SB	
Sample dilution factors noted on reports	SB	
Electronic records in HBN transcription accuracy and completeness checked	SB	
Preparation and analysis calculations checked	SB	
NCRs are completed as necessary NC/CAR#	—	
Report forms are complete and accurate	SB	
Manual integrations checked	SB	

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L
Standard: 43702	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/18/2018 02:09PM	**Expires:** 09/18/2019
MFG Lot: TNB: 09/18/2018		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL
Standard: 43659	**Created By:** Thomas Bosch	**Amount:** 100 mL
MFG: AccuStandard	**Create Date:** 09/17/2018 09:09AM	**Expires:** 07/25/2020
MFG Lot: 218065075		**Usable:** No
Part ID: IC-PER-10X-1		**Lab Lot:** CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025
MFG Lot: Not Provided		**Usable:** Yes
Part ID: Not Provided		**Lab Lot:** LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC INT

CLO4 QC INT	Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025
MFG Lot: Not Provided		**Usable:** Yes
Part ID: Not Provided		**Lab Lot:** LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK	Description - 6850 QC WKG STD 100ug/L

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025
MFG Lot: Not Provided		**Usable:** Yes
Part ID: Not Provided		**Lab Lot:** LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		Description - 6850 QC Stock STD 1,000ug/mL
Standard: 36748	**Created By:** Thomas Bosch	**Amount:** 100 mL
MFG: Ultra Scientific	**Create Date:** 05/11/2017 01:05PM	**Expires:** 03/31/2020
MFG Lot: CP-0860		**Usable:** Yes
Part ID: ICC-013		**Lab Lot:** CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L
Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		**Description - Perchlorate ISTD Stock**
Standard: 43729	**Created By:** Thomas Bosch	**Amount:** 1 mL
MFG: Cambridge Isotope	**Create Date:** 09/20/2018 09:09AM	**Expires:** 04/28/2026
MFG Lot: SDFF-012A	**Verified By:** Thomas Bosch	**Usable:** Yes
Part ID: OLM-7310-S	**Verify Date:**	**Lab Lot:** CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
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www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

Ustandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

Page 1 of 1

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

QR-ORG/INO-001
Rev. 5/18

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-PR2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	652187 CCV@25	Vial 71	1	Control	1	1.94996e6	8.885	24.87225
*	652191 QC@4.0	Vial 72	1	Control	2	3.64428e5	9.007	3.78501
*	652189 ICS@4.0	Vial 73	1	Control	3	2.68113e5	8.748	3.44195
*	652190 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1912778001	Vial 75	1	Sample	5	7.53303e4	8.536	1.10946
*	652192 MS	Vial 76	1	Sample	6	2.69491e5	8.479	3.47235
*	652193 SD	Vial 77	1	Sample	7	2.70470e5	8.544	3.37509
*	1913240001	Vial 78	1	Sample	8	4.01114e5	8.877	4.25158
*	1913240002 10X	Vial 79	1	Sample	9	3.90096e6	8.822	453.25091
*	1913240003	Vial 80	1	Sample	10	3.55168e4	8.432	5.69921e-1
*	1913240004 10X	Vial 81	1	Sample	11	1.24291e6	8.724	157.85203
*	1913240005	Vial 82	1	Sample	12	4.25340e4	8.340	8.04157e-1
*	1913240006	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	652194 CCV@25	Vial 71	1	Control	14	1.88465e6	8.932	24.16769

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	652187 CCV@25	Vial 71	1	Control	1	5.91244e5	8.900	25.24495
*	652191 QC@4.0	Vial 72	1	Control	2	1.17923e5	9.031	4.01248
*	652189 ICS@4.0	Vial 73	1	Control	3	9.96403e4	8.769	4.18546
*	652190 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1912778001	Vial 75	1	Sample	5	2.69706e4	8.555	1.24500
*	652192 MS	Vial 76	1	Sample	6	8.93023e4	8.504	3.76346
*	652193 SD	Vial 77	1	Sample	7	9.34108e4	8.562	3.81120
*	1913240001	Vial 78	1	Sample	8	1.31381e5	8.892	4.57235
*	1913240002 10X	Vial 79	1	Sample	9	1.17056e6	8.839	458.01109
*	1913240003	Vial 80	1	Sample	10	1.43885e4	8.420	6.86391e-1
*	1913240004 10X	Vial 81	1	Sample	11	3.77433e5	8.743	159.87183
*	1913240005	Vial 82	1	Sample	12	1.70179e4	8.352	9.89957e-1
*	1913240006	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	652194 CCV@25	Vial 71	1	Control	14	5.69187e5	8.947	24.43230

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	652187 CCV@25	Vial 71	1	Control	1	2.40557e5	8.905	5.00000
*	652191 QC@4.0	Vial 72	1	Control	2	3.12971e5	9.026	5.00000
*	652189 ICS@4.0	Vial 73	1	Control	3	2.53565e5	8.771	5.00000
*	652190 LMB	Vial 74	1	Control	4	2.93417e5	9.141	5.00000
*	1912778001	Vial 75	1	Sample	5	2.25140e5	8.555	5.00000
*	652192 MS	Vial 76	1	Sample	6	2.52604e5	8.502	5.00000
*	652193 SD	Vial 77	1	Sample	7	2.60936e5	8.566	5.00000
*	1913240001	Vial 78	1	Sample	8	3.06124e5	8.903	5.00000
*	1913240002 10X	Vial 79	1	Sample	9	2.51361e5	8.840	50.00000
*	1913240003	Vial 80	1	Sample	10	2.10601e5	8.453	5.00000
*	1913240004 10X	Vial 81	1	Sample	11	2.47229e5	8.744	50.00000
*	1913240005	Vial 82	1	Sample	12	1.76759e5	8.364	5.00000
*	1913240006	Vial 83	1	Sample	13	2.28541e5	8.741	5.00000
*	652194 CCV@25	Vial 71	1	Control	14	2.39698e5	8.955	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	652187	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	652191	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	652189	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	652190	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1912778001		CLO4-AQN	1	Sample		
6	Vial 76	652192	MS	CLO4-AQN	1	Sample		
7	Vial 77	652193	SD	CLO4-AQN	1	Sample		
8	Vial 78	1913240001		CLO4-AQN	1	Sample		
9	Vial 79	1913240002	10X	CLO4-AQN	1	Sample		
10	Vial 80	1913240003		CLO4-AQN	1	Sample		
11	Vial 81	1913240004	10X	CLO4-AQN	1	Sample		
12	Vial 82	1913240005		CLO4-AQN	1	Sample		
13	Vial 83	1913240006		CLO4-AQN	1	Sample		
14	Vial 71	652194	CCV@25	CLO4-AQN	1	Ctrl Samp		

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	652187	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	652191	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	652189	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	652190	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1912778001		CLO4-AQN	1	Sample		
6	Vial 76	652192	MS	CLO4-AQN	1	Sample		
7	Vial 77	652193	SD	CLO4-AQN	1	Sample		
8	Vial 78	1913240001		CLO4-AQN	1	Sample		
9	Vial 79	1913240002	10X	CLO4-AQN	1	Sample		
10	Vial 80	1913240003		CLO4-AQN	1	Sample		
11	Vial 81	1913240004	10X	CLO4-AQN	1	Sample		
12	Vial 82	1913240005		CLO4-AQN	1	Sample		
13	Vial 83	1913240006		CLO4-AQN	1	Sample		
14	Vial 71	652194	CCV@25	CLO4-AQN	1	Ctrl Samp		

00937817

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-PR2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount	
	CCV@25	Vial 71	1	Control	1	1.91635e6	8.882	24.97443	
1912778001	100	Vial 72	1	Sample	2	0.00000	0.000	0.00000	lx
1913240001	100	Vial 73	1	Sample	3	2.10623e4	9.044	2.62221e-1	lx
1913240002	100	Vial 74	1	Sample	4	3.40575e5	9.004	3.82326	ωx
1913240003	100	Vial 75	1	Sample	5	2.45169e4	9.019	2.94033e-1	lx
1913240004	100	Vial 76	1	Sample	6	1.26007e5	9.014	1.47512	ωx
1913240005	100	Vial 77	1	Sample	7	0.00000	0.000	0.00000	lx
1913240006	100	Vial 78	1	Sample	8	0.00000	0.000	0.00000	lx

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
	CCV@25	Vial 71	1	Control	1	5.80696e5	8.899	25.33477
1912778001	100	Vial 72	1	Sample	2	0.00000	0.000	0.00000
1913240001	100	Vial 73	1	Sample	3	0.00000	0.000	0.00000
1913240002	100	Vial 74	1	Sample	4	1.08556e5	9.016	3.99291
1913240003	100	Vial 75	1	Sample	5	0.00000	0.000	0.00000
1913240004	100	Vial 76	1	Sample	6	4.48596e4	9.034	1.67221
1913240005	100	Vial 77	1	Sample	7	0.00000	0.000	0.00000
1913240006	100	Vial 78	1	Sample	8	0.00000	0.000	0.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
	CCV@25	Vial 71	1	Control	1	2.35383e5	8.903	5.00000
1912778001	100	Vial 72	1	Sample	2	3.22725e5	9.015	5.00000
1913240001	100	Vial 73	1	Sample	3	2.83809e5	9.044	5.00000
1913240002	100	Vial 74	1	Sample	4	2.89515e5	9.027	5.00000
1913240003	100	Vial 75	1	Sample	5	2.91977e5	8.997	5.00000
1913240004	100	Vial 76	1	Sample	6	2.81689e5	9.037	5.00000
1913240005	100	Vial 77	1	Sample	7	2.91318e5	8.988	5.00000
1913240006	100	Vial 78	1	Sample	8	2.72875e5	9.099	5.00000

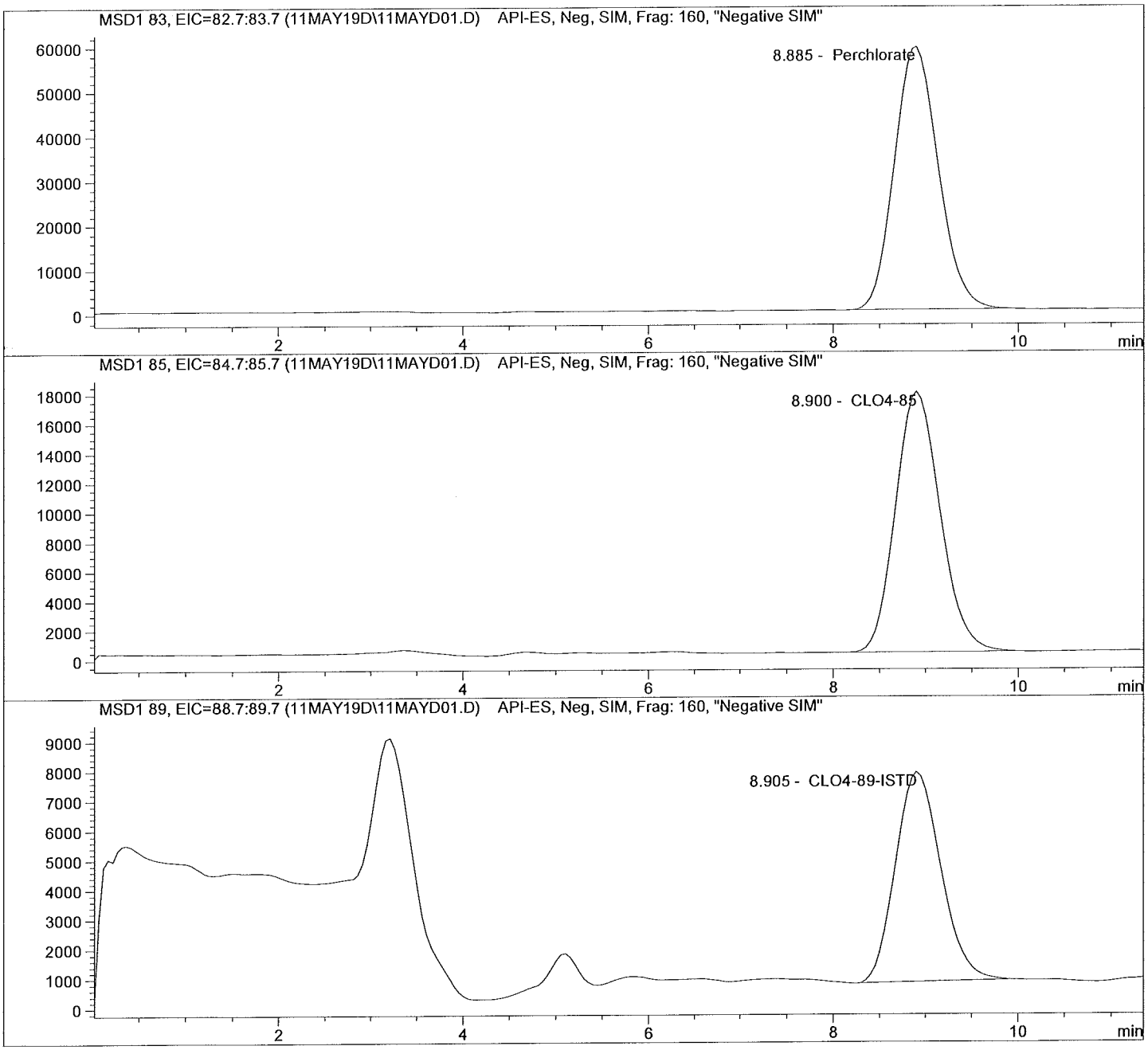
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD01.D Sample Name: 652187 CCV@25

Injection Date:	5/11/2019 14:44:14	Seq Line:	1
Sample Name:	652187 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLQ4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD01.D Sample Name: 652187 CCV@25

Injection Date:	5/11/2019 14:44:14	Seq Line:	1
Sample Name:	652187 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.885	PBA	1949964.1	24.8722	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.900	PBA	591243.8	25.2450	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.905	PBA	240557.2	5.0000	CLO4-89-ISTD

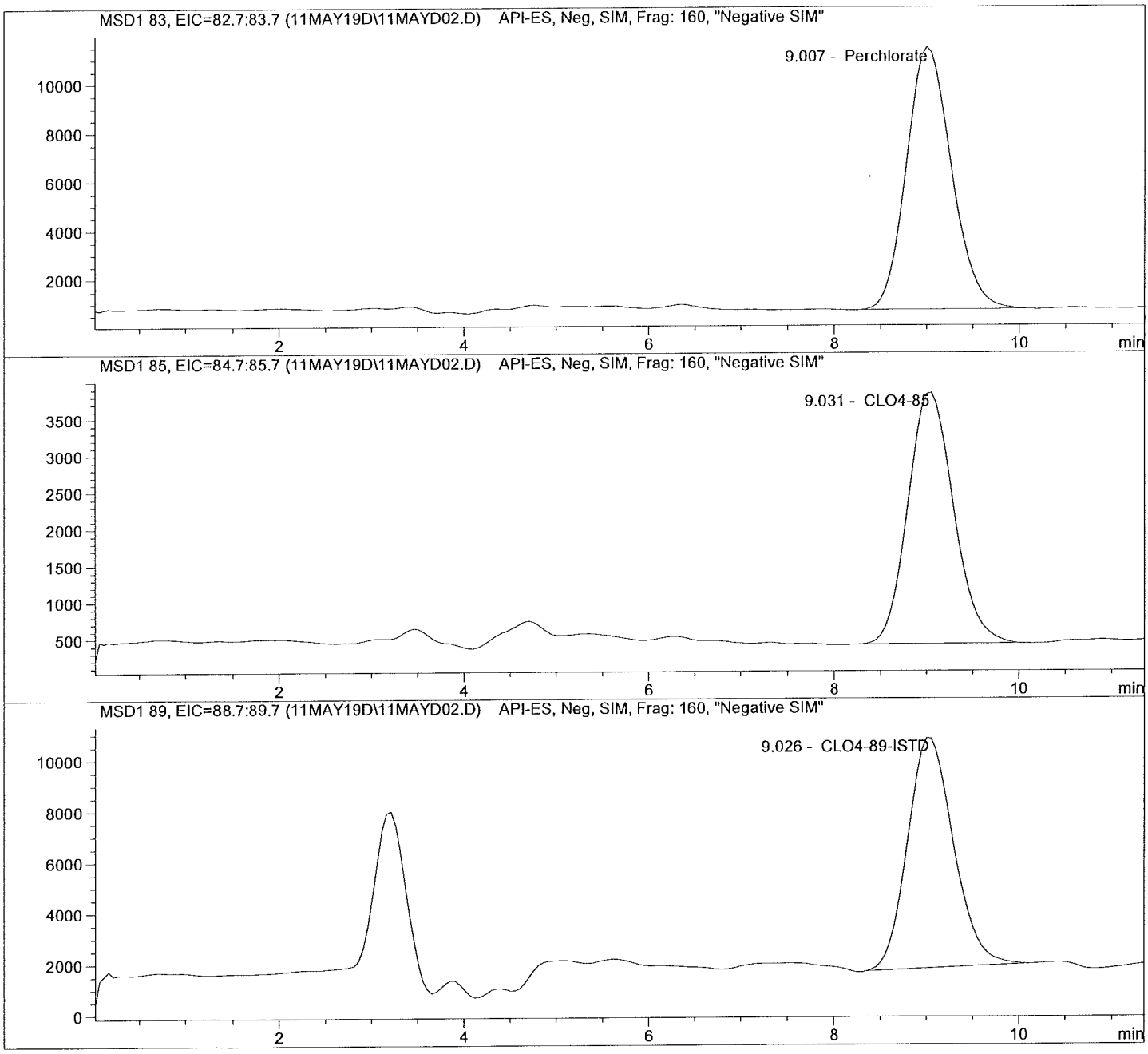
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD02.D Sample Name: 652191 QC@4.0

Injection Date:	5/11/2019 14:57:36	Seq Line:	2
Sample Name:	652191 QC@4.0	Location:	Vial 72
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD02.D Sample Name: 652191 QC@4.0

Injection Date:	5/11/2019 14:57:36	Seq Line:	2
Sample Name:	652191 QC@4.0	Location:	Vial 72
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.007	PBA	364428.2	3.7850	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.031	PBA	117922.8	4.0125	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.026	PBA	312970.7	5.0000	CLO4-89-ISTD

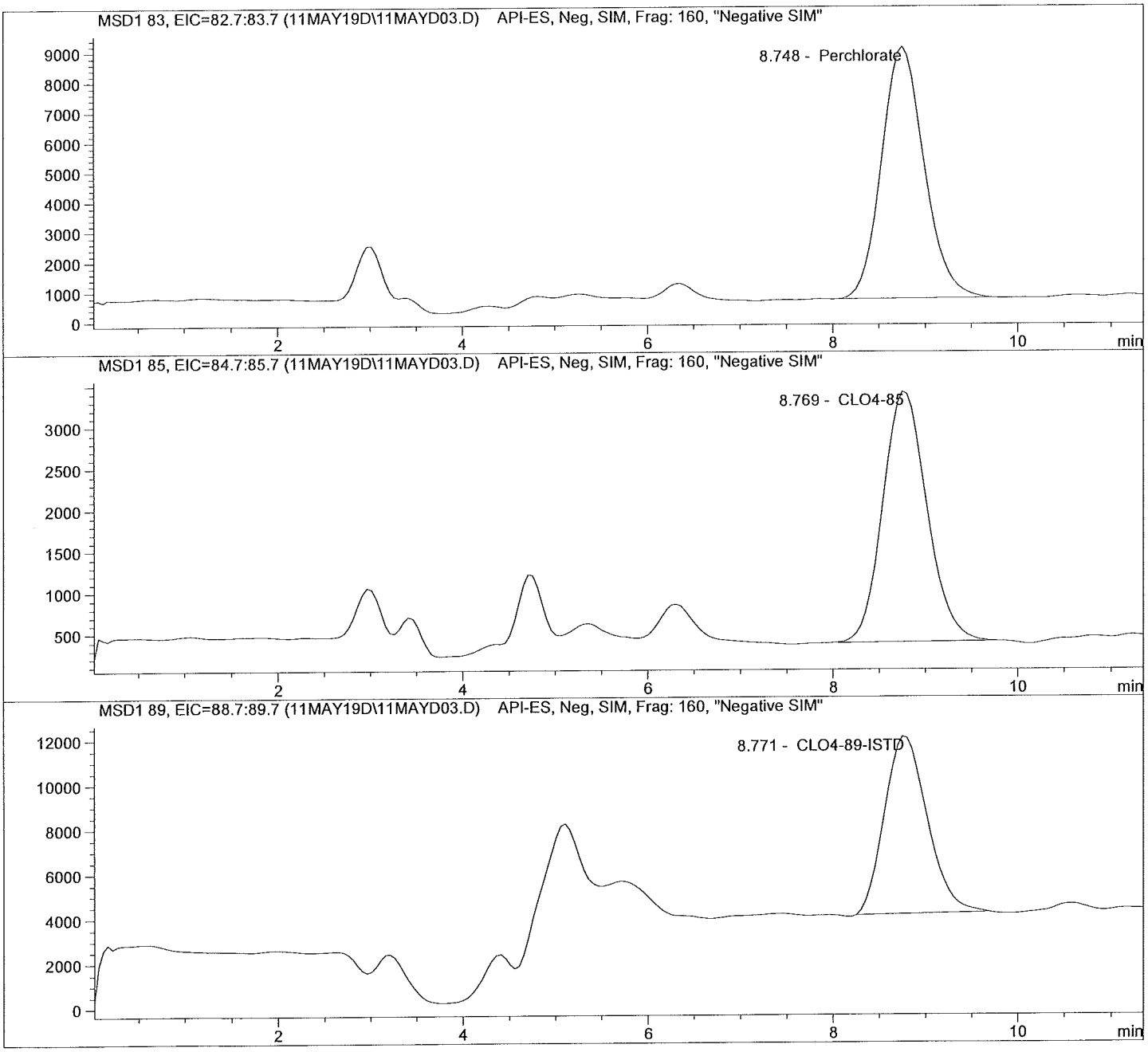
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD03.D Sample Name: 652189 ICS@4.0

Injection Date:	5/11/2019 15:10:58	Seq Line:	3
Sample Name:	652189 ICS@4.0	Location:	Vial 73
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD03.D Sample Name: 652189 ICS@4.0

Injection Date:	5/11/2019 15:10:58	Seq Line:	3
Sample Name:	652189 ICS@4.0	Location:	Vial 73
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 33, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.748	BBA	268113.1	3.4419	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.769	BBA	99640.3	4.1855	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.771	PBA	253564.8	5.0000	CLO4-89-ISTD

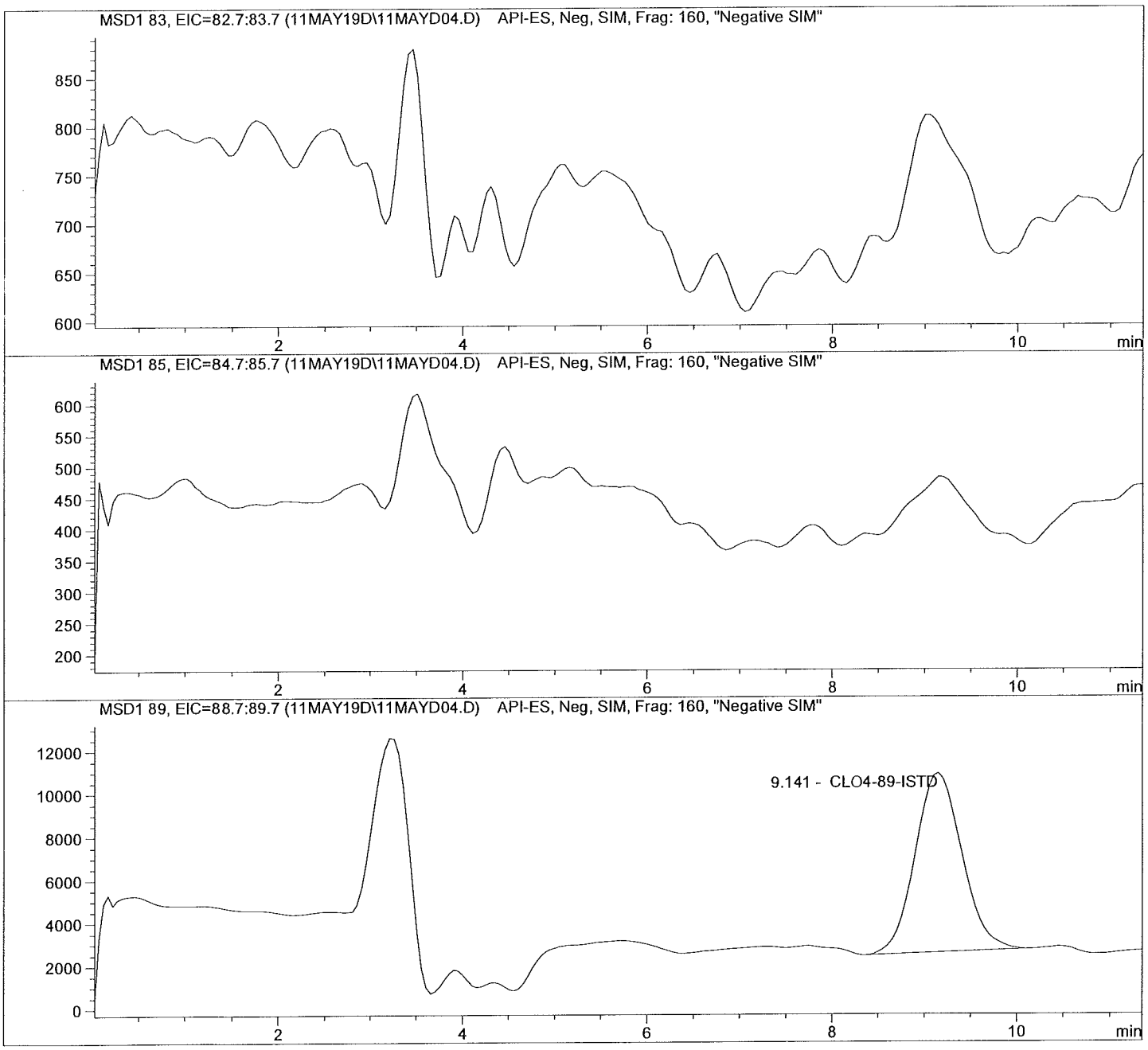
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD04.D Sample Name: 652190 LMB

Injection Date:	5/11/2019 15:24:33	Seq Line:	4
Sample Name:	652190 LMB	Location:	Vial 74
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD04.D Sample Name: 652190 LMB

Injection Date:	5/11/2019 15:24:33	Seq Line:	4
Sample Name:	652190 LMB	Location:	Vial 74
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed:	3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.141	PBA	293417.4	5.0000	CLO4-89-ISTD

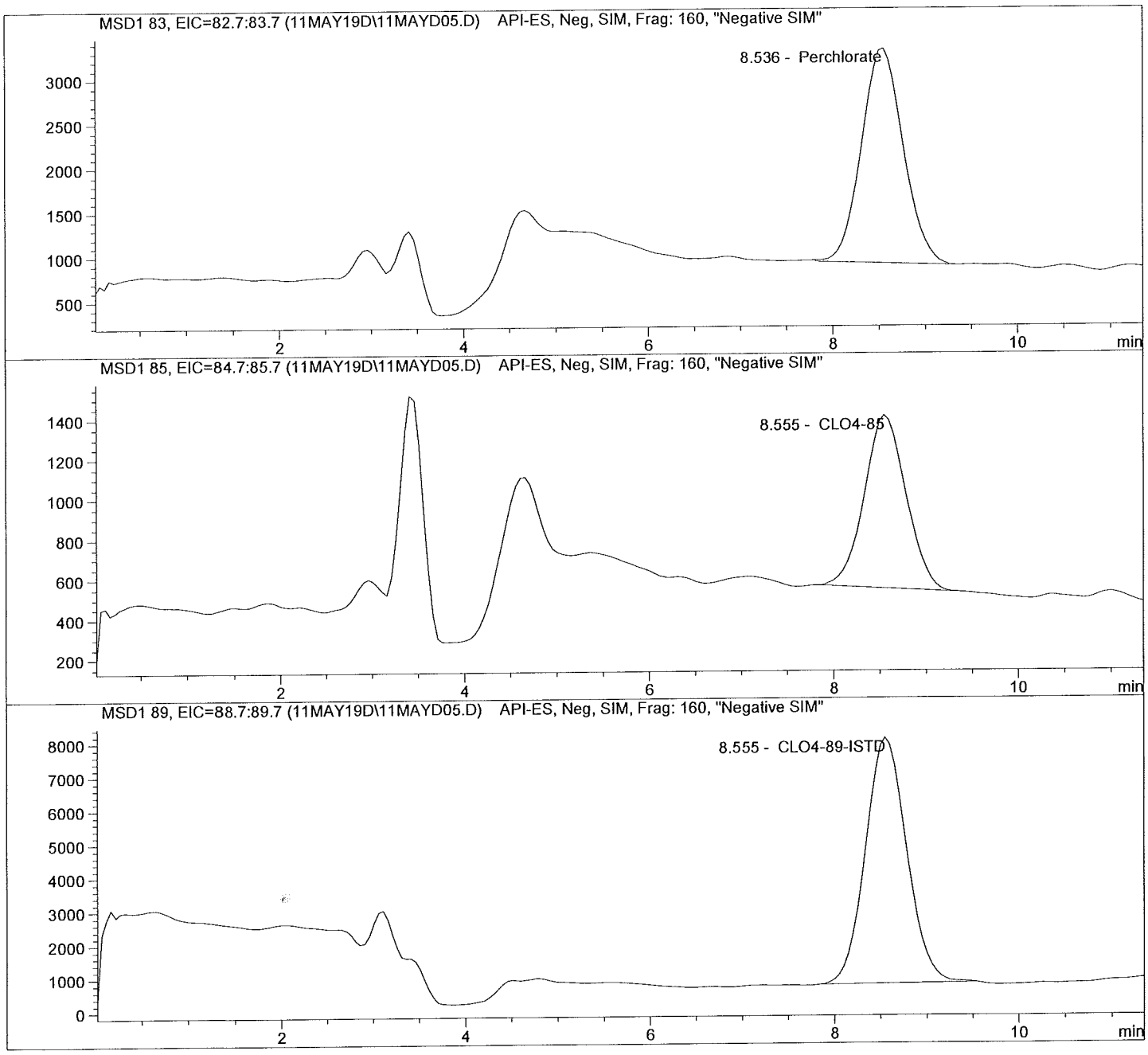
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD05.D Sample Name: 1912778001

Injection Date:	5/11/2019 15:37:55	Seq Line:	5
Sample Name:	1912778001	Location:	Vial 75
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD05.D Sample Name: 1912778001

Injection Date:	5/11/2019 15:37:55	Seq Line:	5
Sample Name:	1912778001	Location:	Vial 75
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed:	3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.536	BBA	75330.3	1.1095	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.555	PBA	26970.6	1.2450	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.555	PBA	225139.6	5.0000	CLO4-89-ISTD

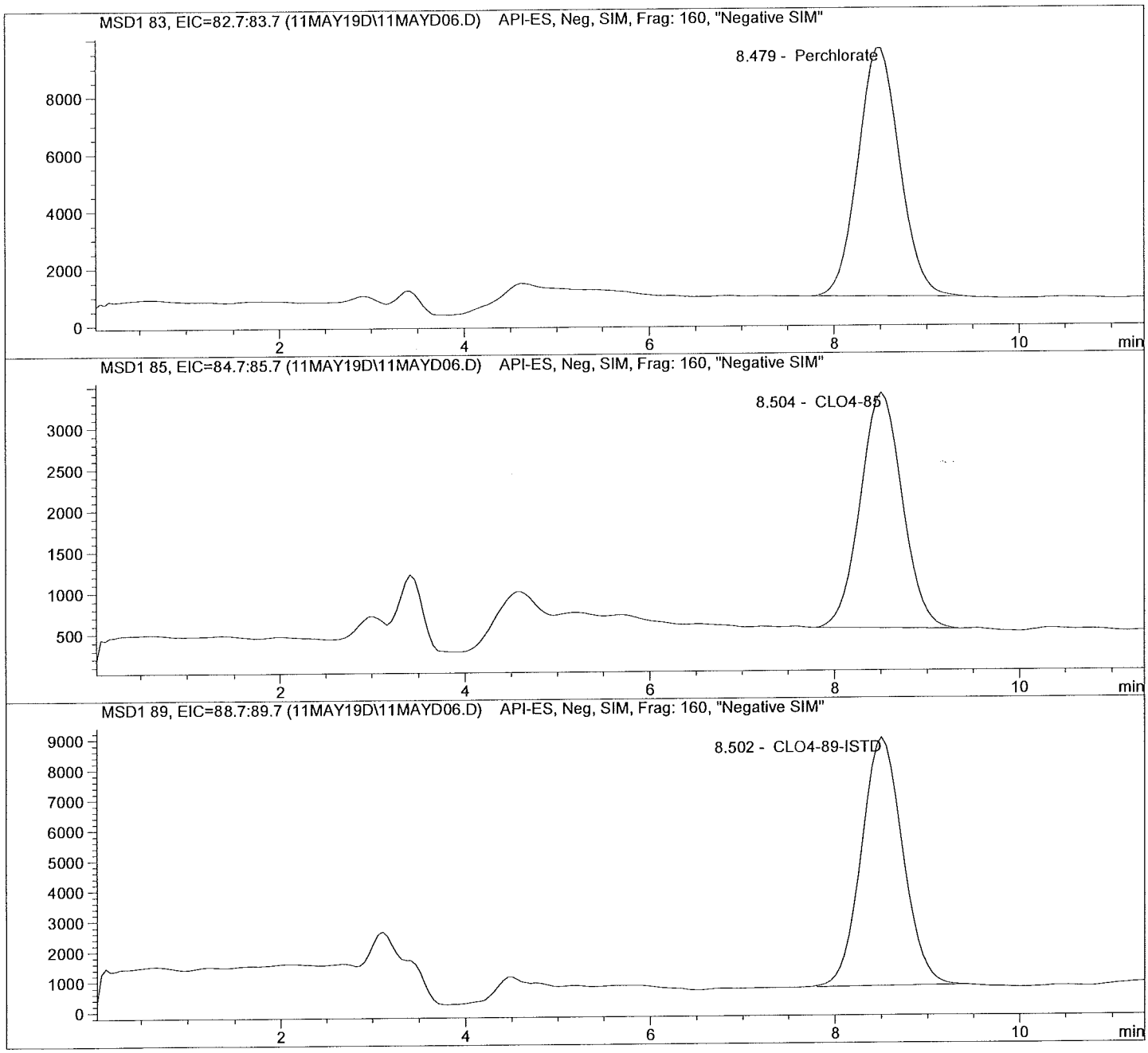
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD06.D Sample Name: 652192 MS

Injection Date:	5/11/2019 15:51:17	Seq Line:	6
Sample Name:	652192 MS	Location:	Vial 76
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD06.D Sample Name: 652192 MS

Injection Date:	5/11/2019 15:51:17	Seq Line:	6
Sample Name:	652192 MS	Location:	Vial 76
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.479	PBA	269491.3	3.4723	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.504	PBA	89302.3	3.7635	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	BBA	252603.7	5.0000	CLO4-89-ISTD

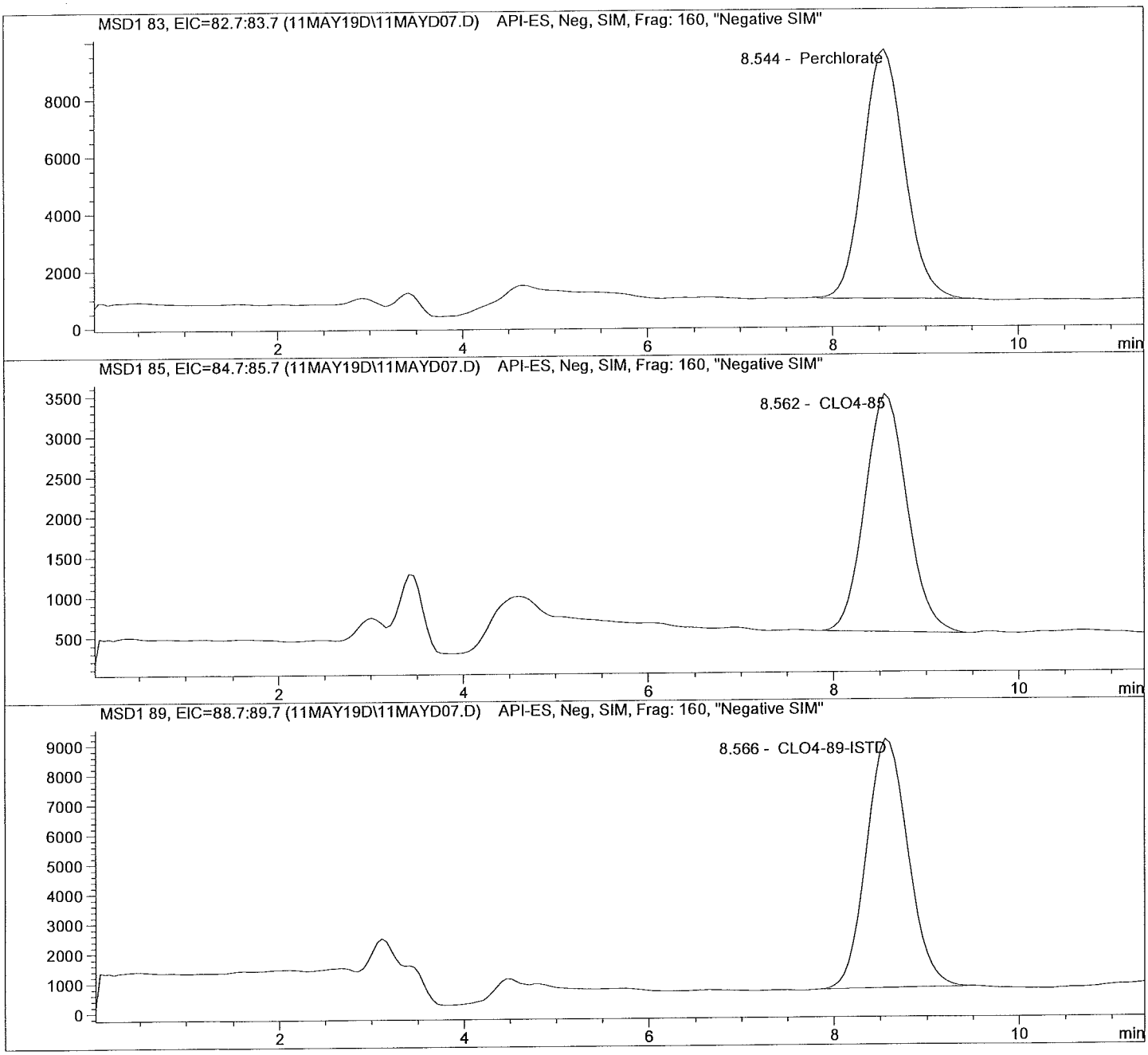
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD07.D Sample Name: 652193 SD

Injection Date:	5/11/2019 16:04:48	Seq Line:	7
Sample Name:	652193 SD	Location:	Vial 77
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD07.D Sample Name: 652193 SD

Injection Date:	5/11/2019 16:04:48	Seq Line:	7
Sample Name:	652193 SD	Location:	Vial 77
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.544	BBA	270469.7	3.3751	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.562	PBA	93410.8	3.8112	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.566	PBA	260935.7	5.0000	CLO4-89-ISTD

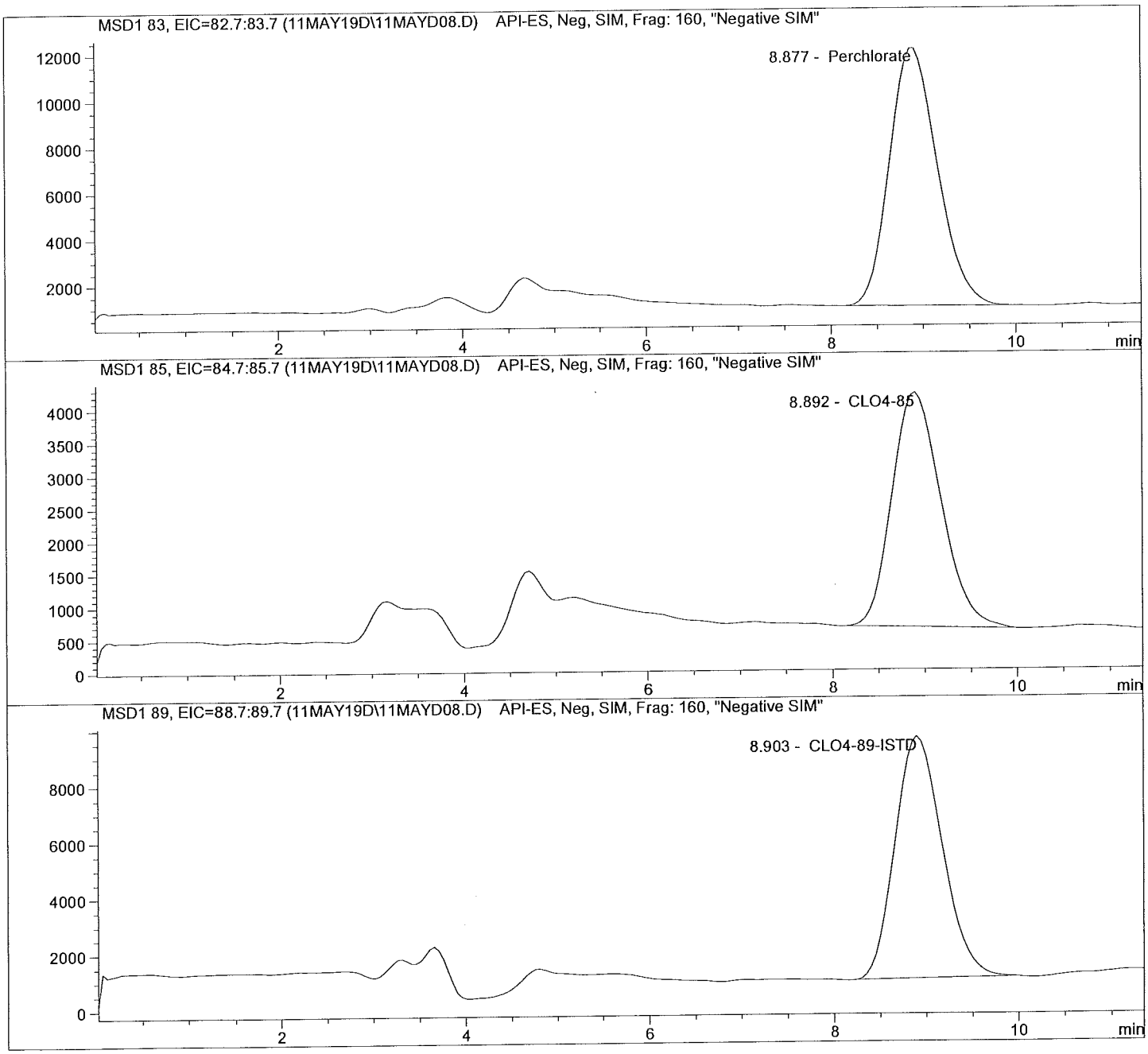
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD08.D Sample Name: 1913240001

Injection Date:	5/11/2019 16:18:10	Seq Line:	8
Sample Name:	1913240001	Location:	Vial 78
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD08.D Sample Name: 1913240001

Injection Date:	5/11/2019 16:18:10	Seq Line:	8
Sample Name:	1913240001	Location:	Vial 78
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,03:02:18 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.877	PBA	401113.9	4.2516	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.892	PBA	131380.7	4.5723	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.903	PBA	306123.7	5.0000	CLO4-89-ISTD

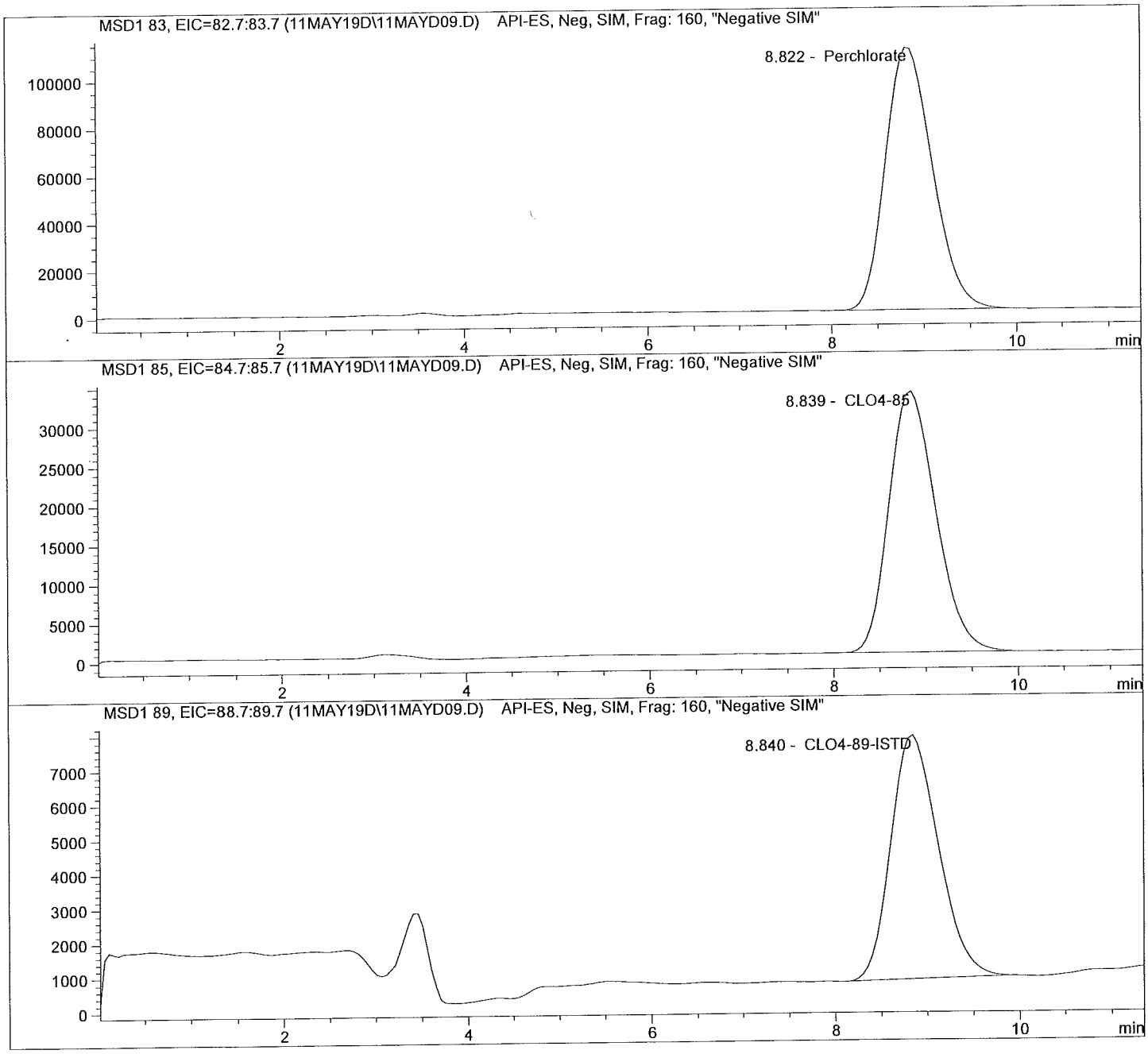
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD09.D Sample Name: 1913240002 10X

Injection Date:	5/11/2019 16:31:33	Seq Line:	9
Sample Name:	1913240002 10X	Location:	Vial 79
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD09.D Sample Name: 1913240002 10X

Injection Date:	5/11/2019 16:31:33	Seq Line:	9
Sample Name:	1913240002 10X	Location:	Vial 79
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.822	PBA	3900960.2	453.2509	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.839	PBA	1170561.0	458.0111	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.840	PBA	251360.6	50.0000	CLO4-89-ISTD

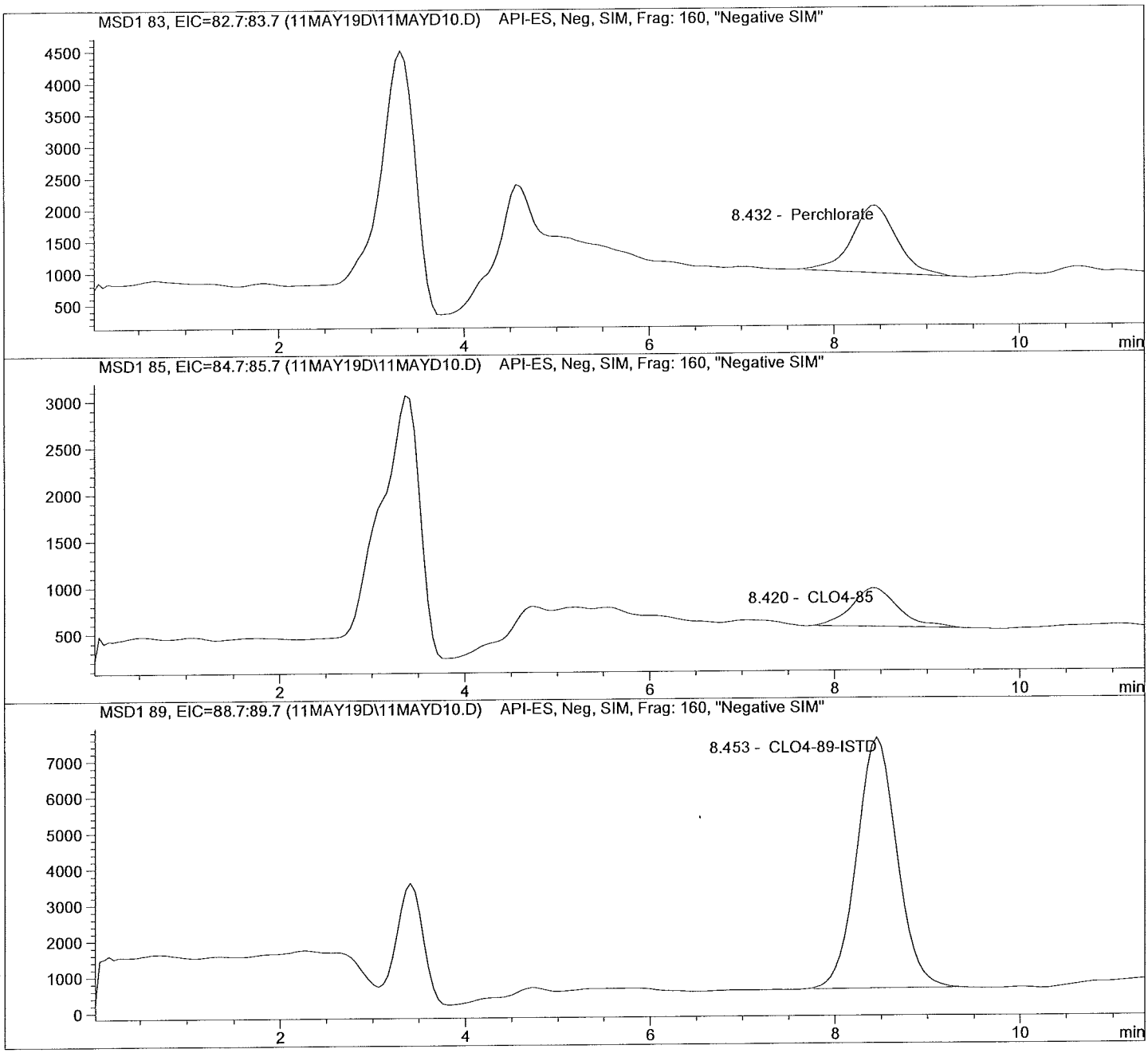
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD10.D Sample Name: 1913240003

Injection Date:	5/11/2019 16:44:58	Seq Line:	10
Sample Name:	1913240003	Location:	Vial 80
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD10.D Sample Name: 1913240003

Injection Date:	5/11/2019 16:44:58	Seq Line:	10
Sample Name:	1913240003	Location:	Vial 80
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed:	3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.432	BBA	35516.8	0.5699	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.420	PBA	14388.5	0.6864	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.453	BBA	210600.8	5.0000	CLO4-89-ISTD

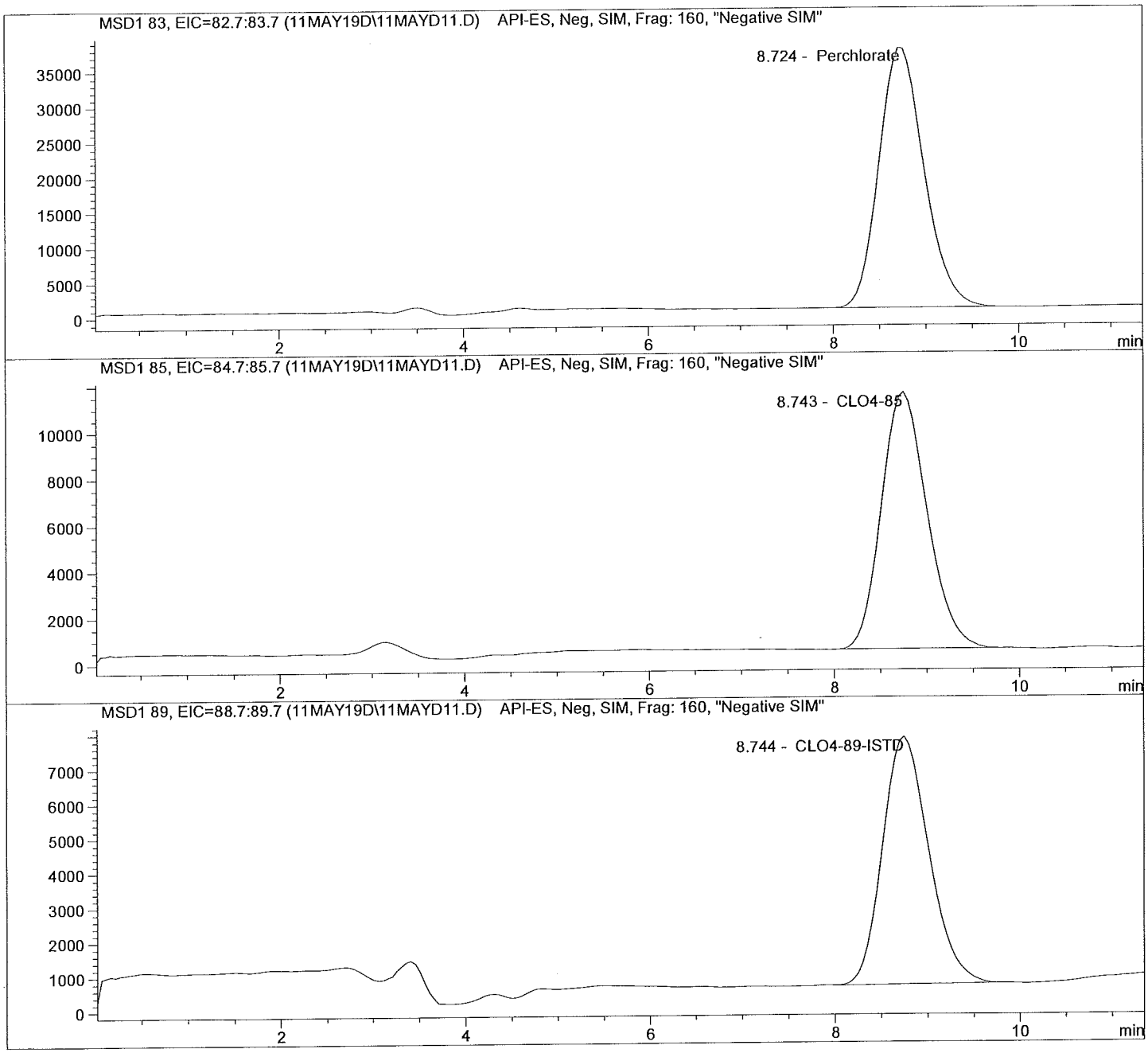
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD11.D Sample Name: 1913240004 10X

Injection Date:	5/11/2019 16:58:21	Seq Line:	11
Sample Name:	1913240004 10X	Location:	Vial 81
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD11.D Sample Name: 1913240004 10X

Injection Date:	5/11/2019 16:58:21	Seq Line:	11
Sample Name:	1913240004 10X	Location:	Vial 81
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.724	PBA	1242909.1	157.8520	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.743	PBA	377432.6	159.8718	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	247229.1	50.0000	CLO4-89-ISTD

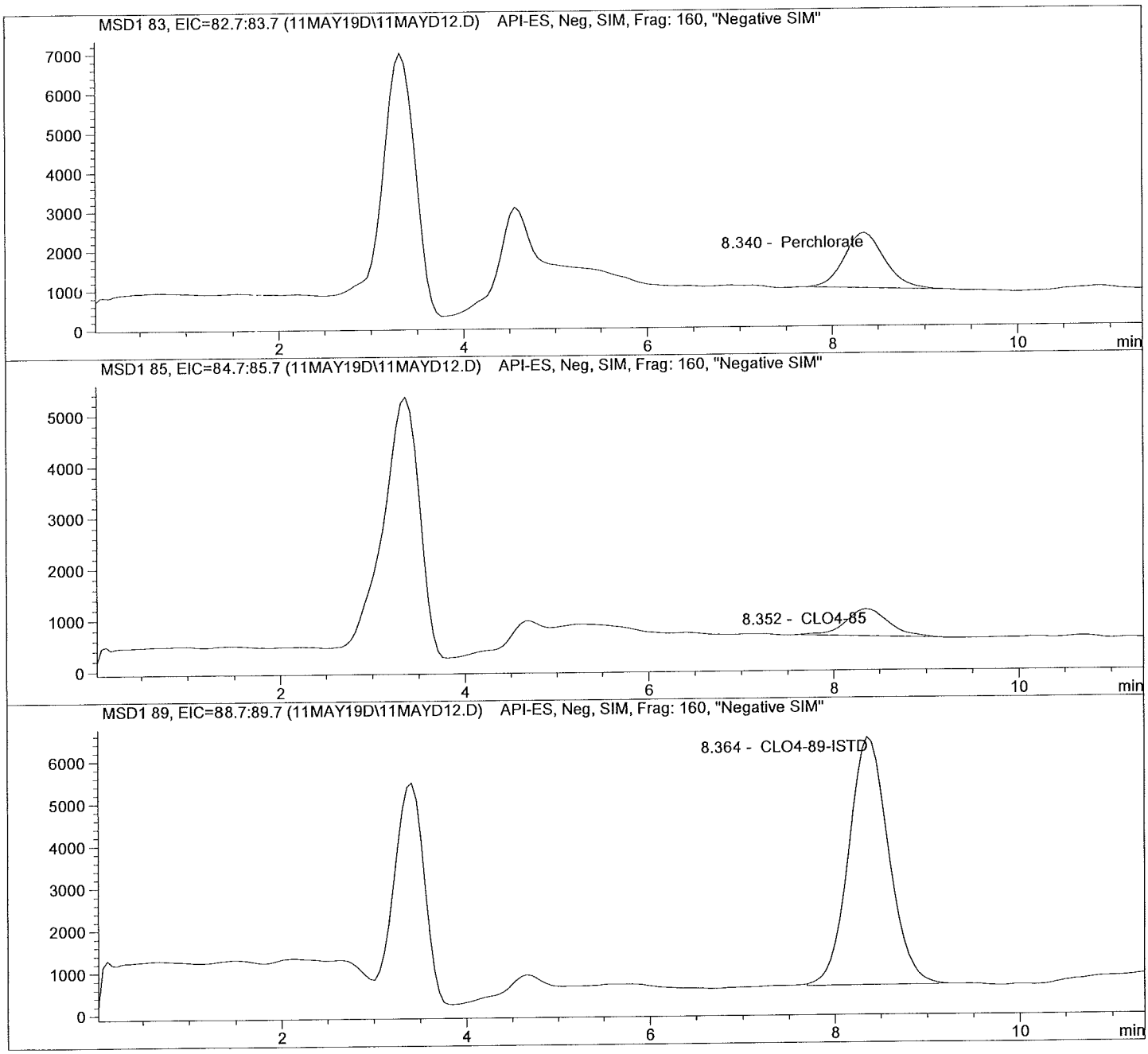
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD12.D Sample Name: 1913240005

Injection Date:	5/11/2019 17:11:40	Seq Line:	12
Sample Name:	1913240005	Location:	Vial 82
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD12.D Sample Name: 1913240005

Injection Date:	5/11/2019 17:11:40	Seq Line:	12
Sample Name:	1913240005	Location:	Vial 82
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.340	BBA	42534.0	0.8042	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.352	BBA	17017.9	0.9900	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.364	BBA	176758.8	5.0000	CLO4-89-ISTD

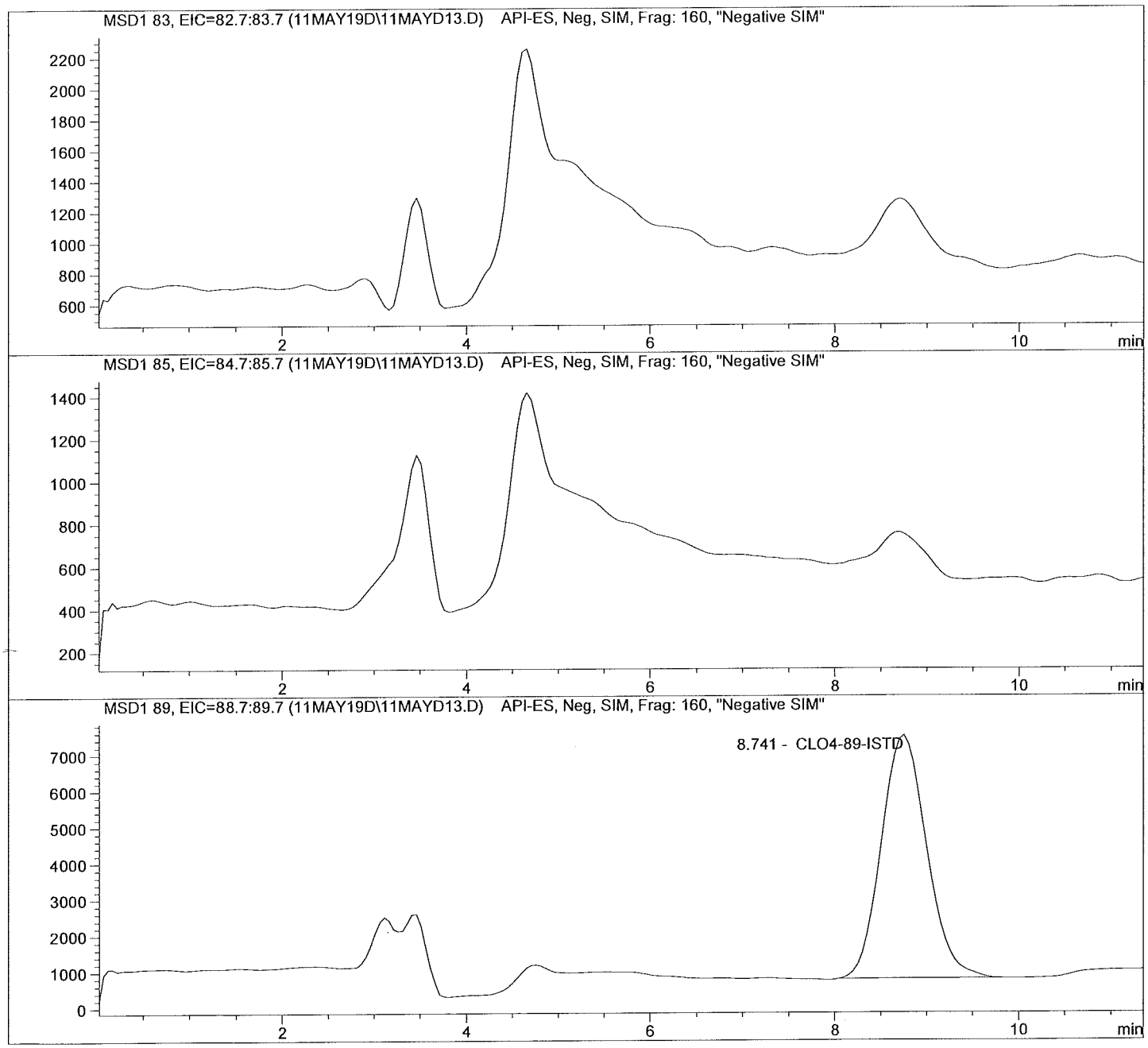
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD13.D Sample Name: 1913240006

Injection Date:	5/11/2019 17:25:01	Seq Line:	13
Sample Name:	1913240006	Location:	Vial 83
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD13.D Sample Name: 1913240006

Injection Date:	5/11/2019 17:25:01	Seq Line:	13
Sample Name:	1913240006	Location:	Vial 83
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed:	3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.741	BBA	228540.6	5.0000	CLO4-89-ISTD

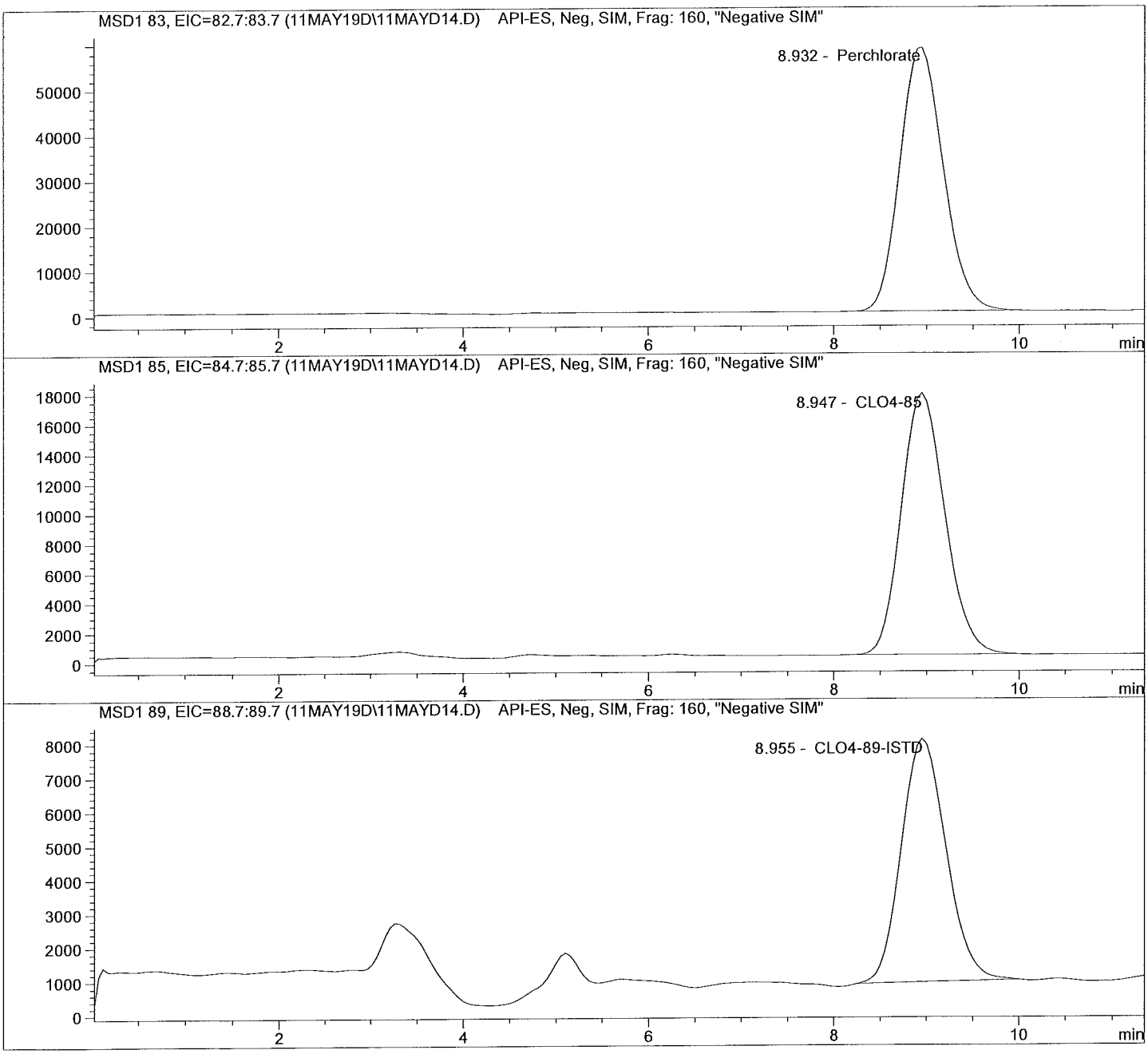
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD14.D Sample Name: 652194 CCV@25

Injection Date:	5/11/2019 17:38:23	Seq Line:	14
Sample Name:	652194 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11MAY19D\11MAYD14.D Sample Name: 652194 CCV@25

Injection Date:	5/11/2019 17:38:23	Seq Line:	14
Sample Name:	652194 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.932	BBA	1884651.9	24.1677	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.947	BBA	569187.4	24.4323	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.955	PBA	239698.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 3:02:18 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.851	1	1	2.00000e-1	1.81450e4	1.10223e-5		1	Perchlorate
		2	5.00000e-1	3.21972e4	1.55293e-5			
		3	1.00000	7.76263e4	1.28822e-5			
		4	2.00000	1.35273e5	1.47849e-5			
		5	5.00000	3.37764e5	1.48033e-5			
		6	10.00000	6.83454e5	1.46316e-5			
		7	25.00000	2.08433e6	1.19943e-5			
		8	50.00000	4.13334e6	1.20968e-5			
		9	75.00000	5.99313e6	1.25143e-5			
8.865	2	1	2.00000e-1	6104.14795	3.27646e-5		1	CLO4-85
		2	5.00000e-1	1.30663e4	3.82665e-5			
		3	1.00000	2.36911e4	4.22099e-5			
		4	2.00000	4.69486e4	4.25998e-5			
		5	5.00000	1.06124e5	4.71147e-5			
		6	10.00000	2.13523e5	4.68335e-5			
		7	25.00000	6.14295e5	4.06971e-5			
		8	50.00000	1.19814e6	4.17315e-5			
		9	75.00000	1.78355e6	4.20509e-5			
8.871	3	1	5.00000	2.49686e5	2.00252e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.51653e5	1.98686e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		3	5.00000	2.73208e5	1.83011e-5			
		4	5.00000	2.24886e5	2.22335e-5			
		5	5.00000	2.33196e5	2.14412e-5			
		6	5.00000	2.34454e5	2.13262e-5			
		7	5.00000	2.50568e5	1.99547e-5			
		8	5.00000	2.30977e5	2.16472e-5			
		9	5.00000	2.21509e5	2.25725e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 4.682 min To 11.682 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.4
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.008
  - Level 8 : 0.004
  - Level 9 : 0.002667

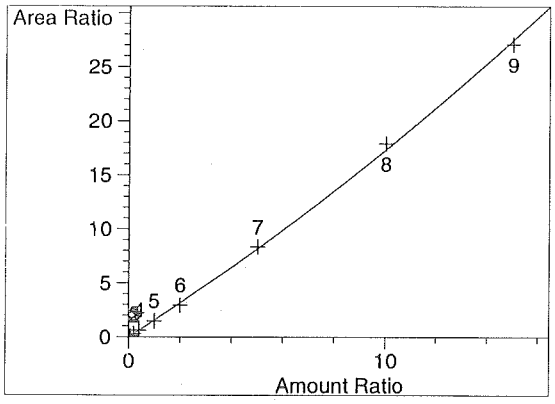
Compound: CLO4-85
- Time Window : From 4.688 min To 11.688 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.4
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.008
  - Level 8 : 0.004
  - Level 9 : 0.002667

Compound: CLO4-89-ISTD
- Time Window : From 4.685 min To 11.685 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1
  - Level 8 : 1
  - Level 9 : 1

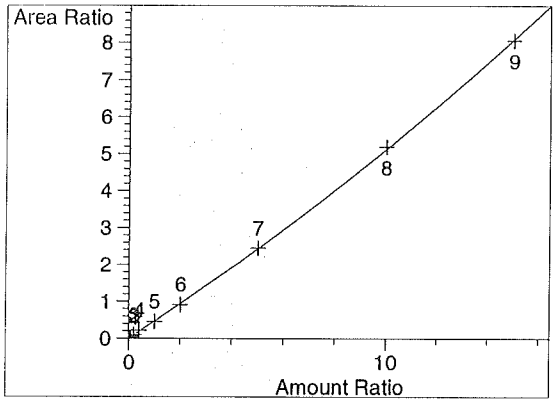
Peak Sum Table

No Entries in table

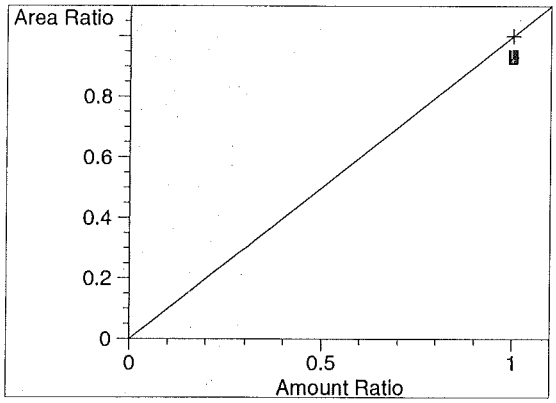
Calibration Curves



Perchlorate at exp. RT: 8.851
MSD1 83, EIC=82.7:83.7
Correlation: 0.99950
Residual Std. Dev.: 0.29306
Formula: $y = ax^2 + bx + c$
a: 2.00258e-2
b: 1.53115
c: -6.14208e-3
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.4
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.008
Level 8 : 0.004
Level 9 : 0.002667



CLO4-85 at exp. RT: 8.865
MSD1 85, EIC=84.7:85.7
Correlation: 0.99984
Residual Std. Dev.: 0.03219
Formula: $y = ax^2 + bx + c$
a: 5.36525e-3
b: 4.58662e-1
c: 5.25596e-3
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.4
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.008
Level 8 : 0.004
Level 9 : 0.002667



CLO4-89-ISTD at exp. RT: 8.871
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1
Level 8 : 1
Level 9 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-PR2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 0.2ug/L	Vial 71	1	Control	1	1.81450e4	8.851	2.57194e-1
#*	CLO4@ 0.5ug/L	Vial 72	1	Control	2	3.21972e4	8.907	4.37356e-1
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76263e4	8.744	9.45547e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	1.97413
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.69227
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.31250
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.48505
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.51493
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.03431
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.29435

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 0.2ug/L	Vial 71	1	Control	1	2.49686e5	8.871	5.00000
#*	CLO4@ 0.5ug/L	Vial 72	1	Control	2	2.51653e5	8.924	5.00000
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21509e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 0.2ug/L	Vial 71	1	Control	1	6104.14795	8.865	2.09108e-1
#*	CLO4@ 0.5ug/L	Vial 72	1	Control	2	1.30663e4	8.952	5.08112e-1
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36911e4	8.755	8.86167e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.20712
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.84870
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.65276
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.18450
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.51944
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.67276
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54934

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

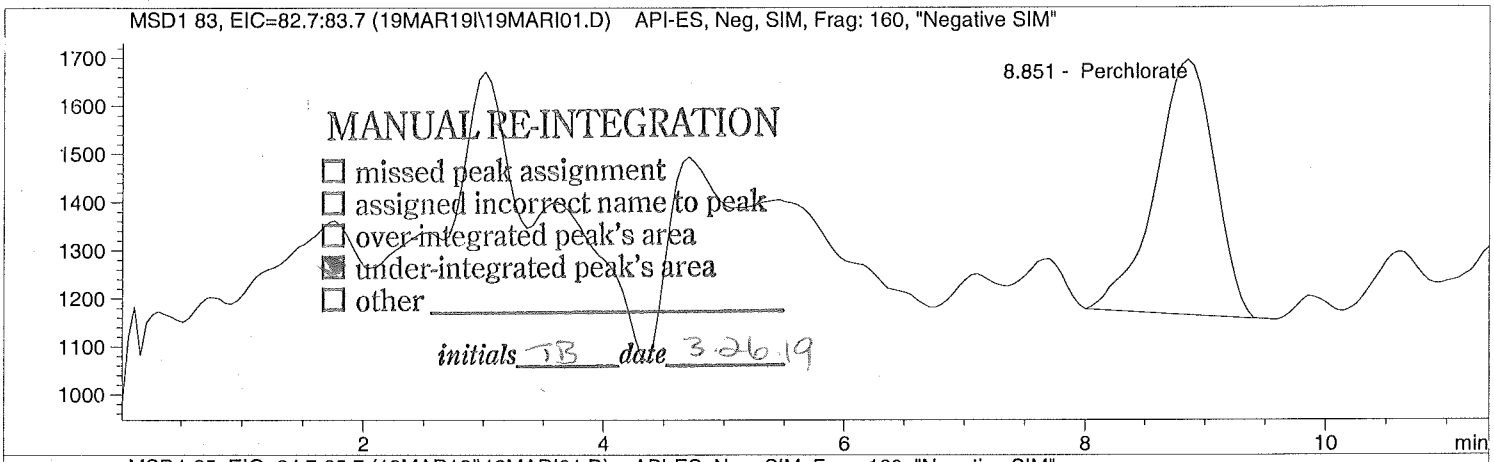
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

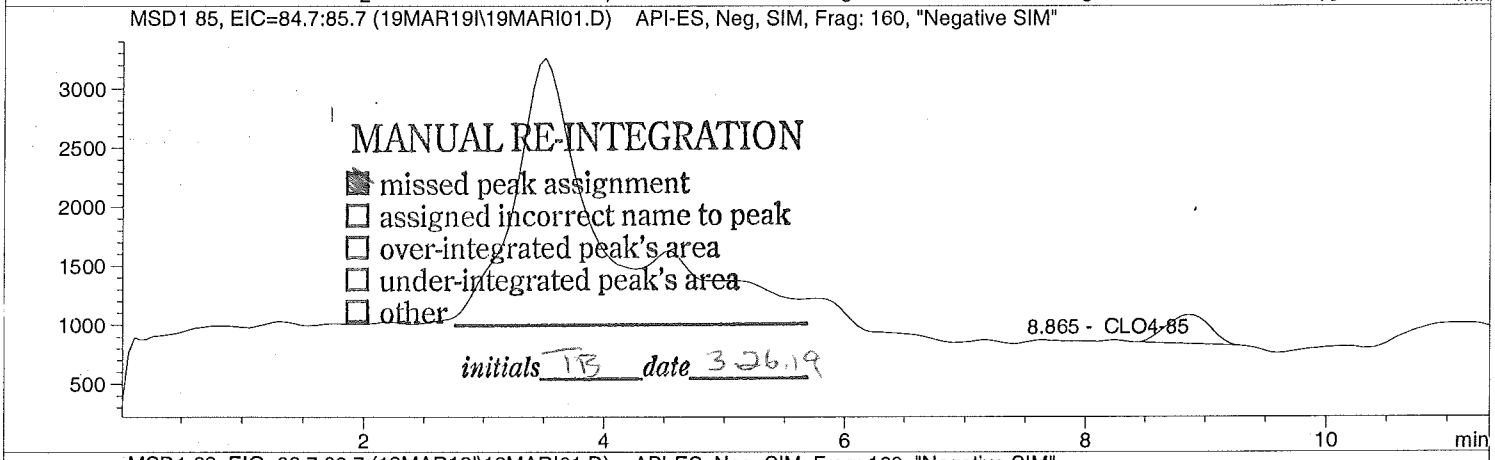
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI01.D Sample Name: CLO4@ 0.2ug/L

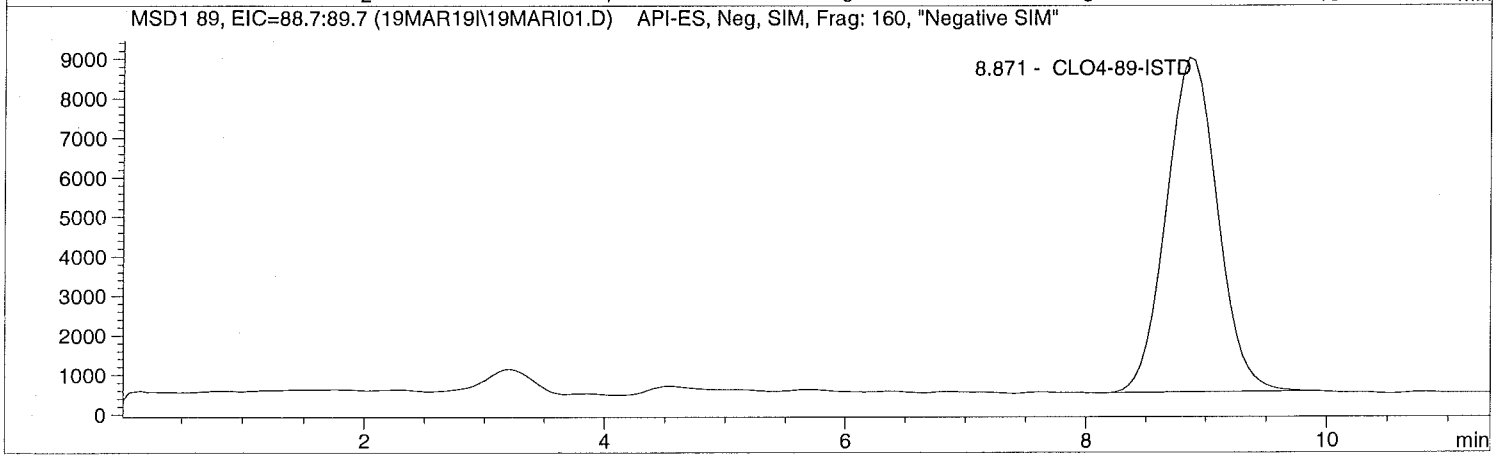
Injection Date:	3/19/2019 09:13:09	Seq Line:	1
Sample Name:	CLO4@ 0.2ug/L	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis







Injection Date:	3/19/2019 09:13:09	Seq Line:	1
Sample Name:	CLO4@ 0.2ug/L	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.200

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.851	MM	18145.0	0.2572	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.865	MM	6104.1	0.2091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.871	PBA	249685.7	5.0000	CLO4-89-ISTD

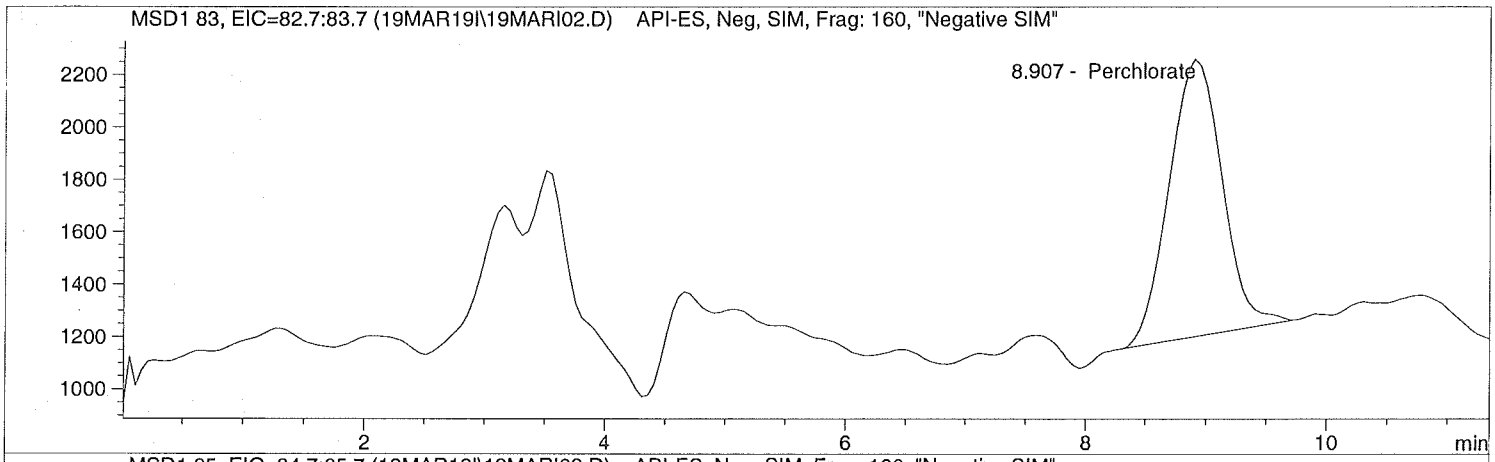
*** End of Report ***

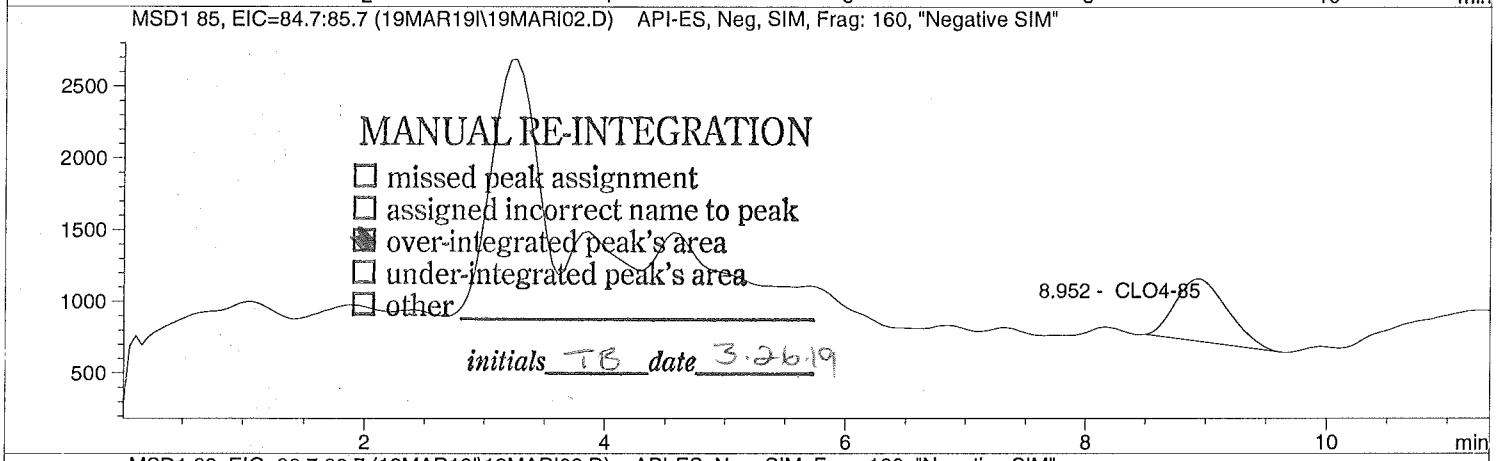
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI02.D Sample Name: CLO4@ 0.5ug/L 00937854

Injection Date:	3/19/2019 09:26:25	Seq Line:	2
Sample Name:	CLO4@ 0.5ug/L	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

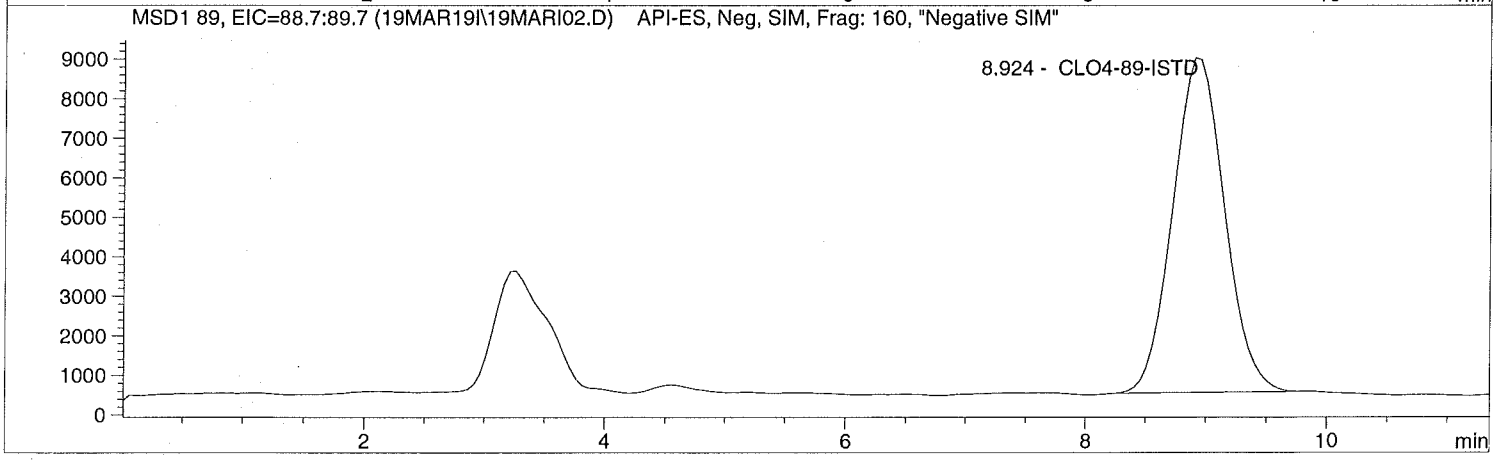
Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis





MANUAL RE-INTEGRATION
☐ missed peak assignment
☐ assigned incorrect name to peak
☒ over-integrated peak's area
☐ under-integrated peak's area
☐ other _____
initials TB *date* 3.26.19



Injection Date:	3/19/2019 09:26:25	Seq Line:	2
Sample Name:	CLO4@ 0.5ug/L	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.500

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.907	PBA	32197.2	0.4374	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.952	MM	13066.3	0.5081	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.924	PBA	251653.1	5.0000	CLO4-89-ISTD

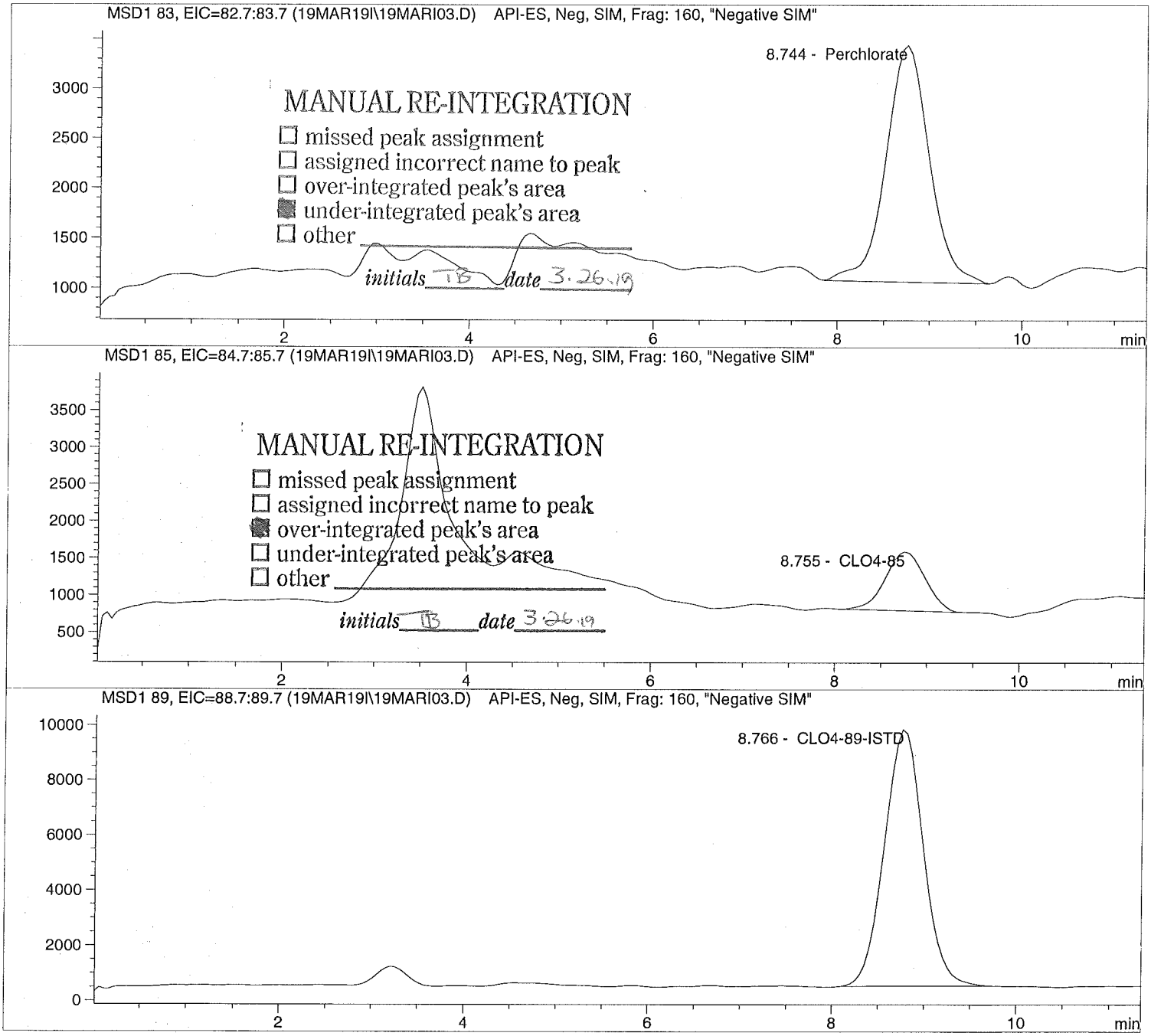
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,03:02:18 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77626.3	0.9455	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23691.1	0.8862	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

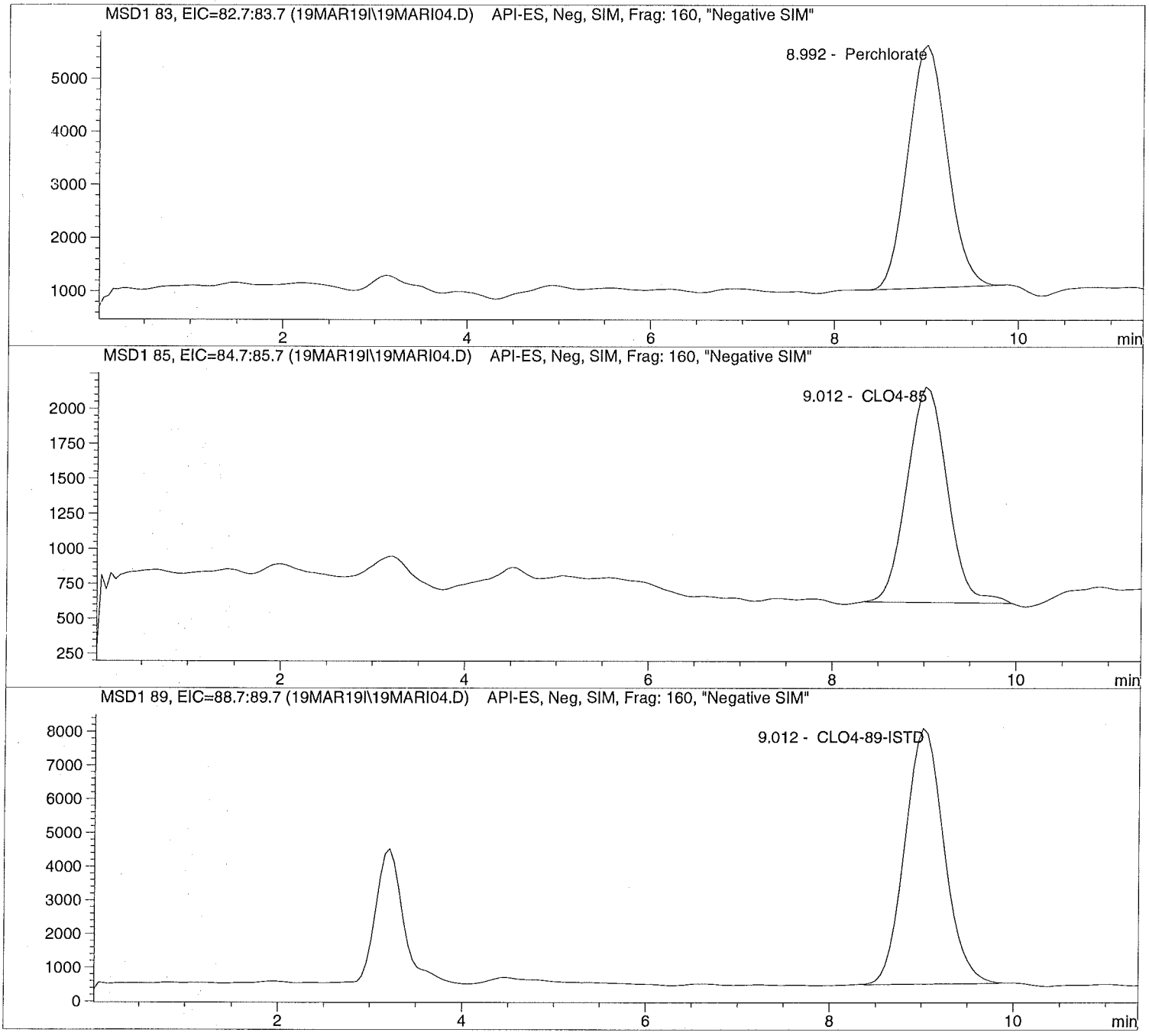
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	1.9741	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2071	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

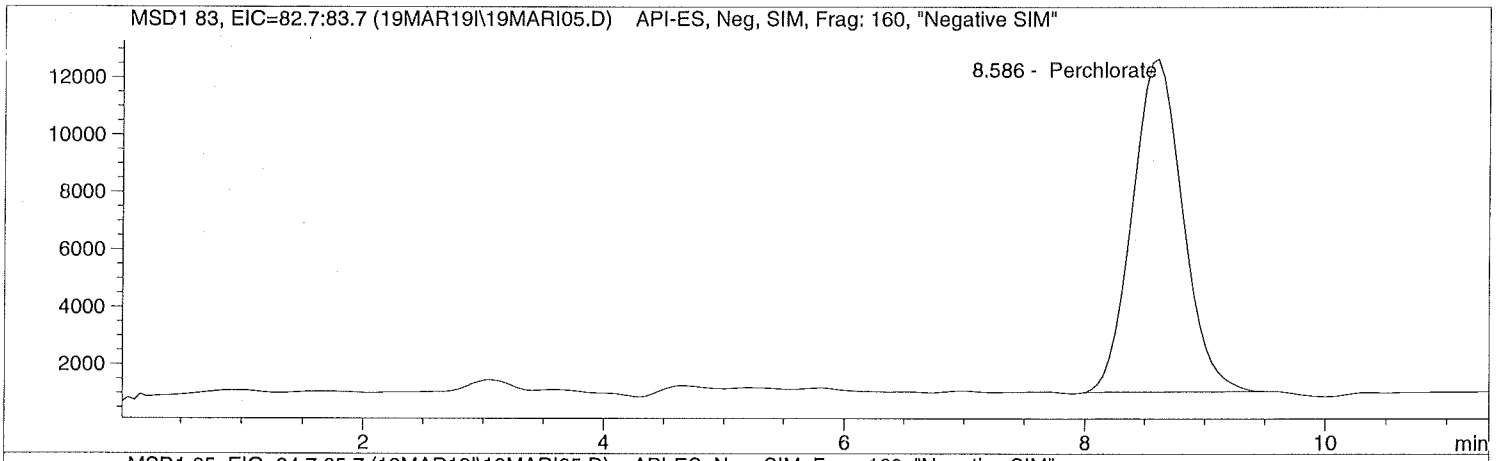
*** End of Report ***

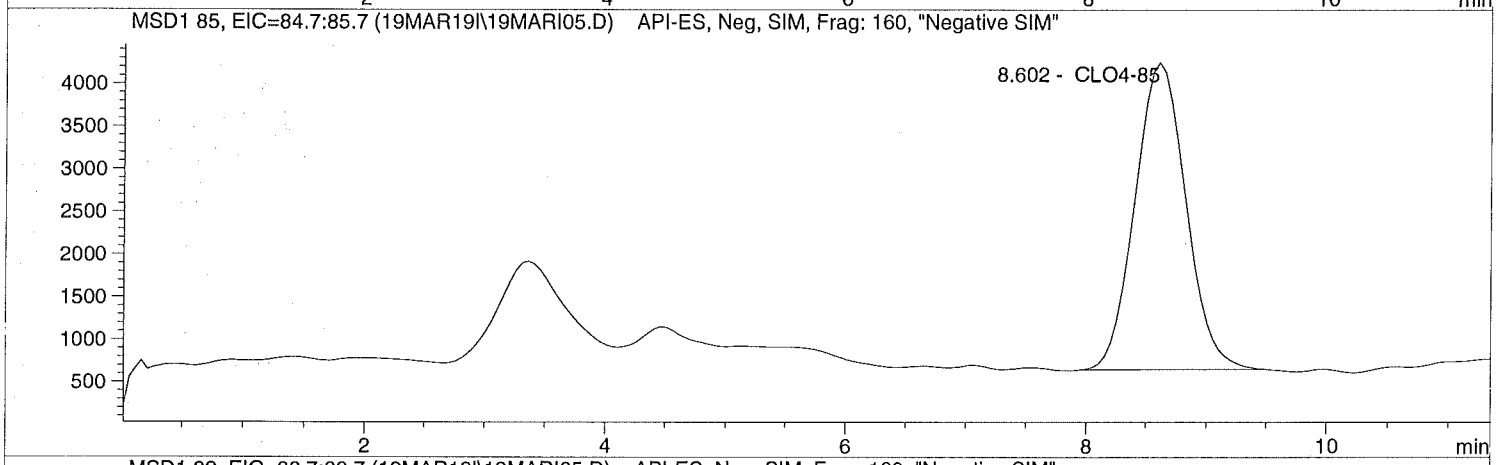
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L 00937860

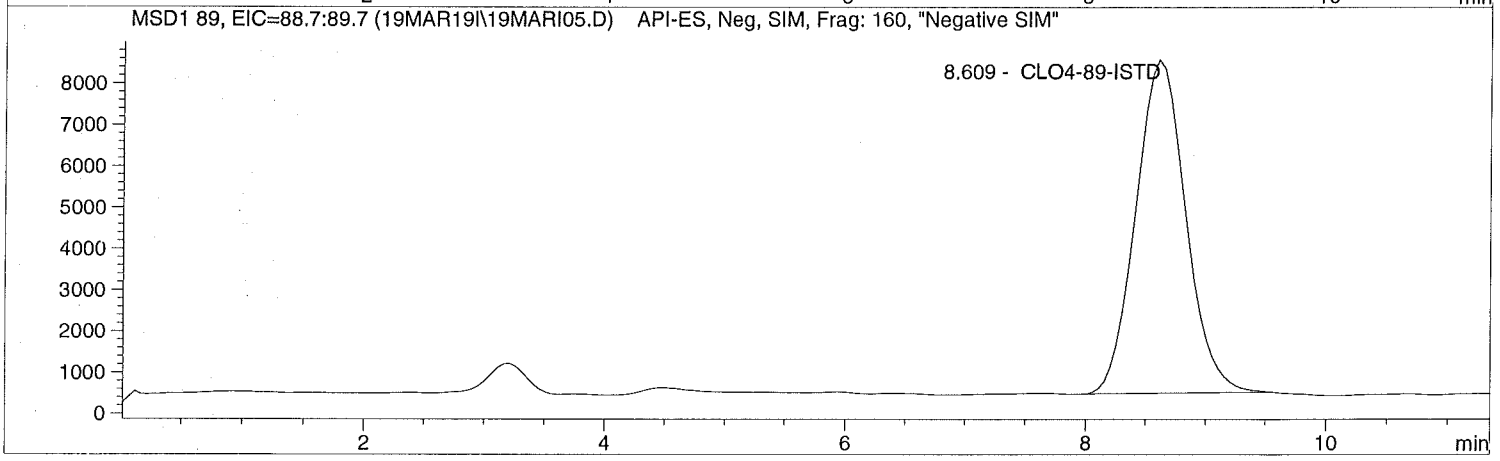
Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed:	3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.6923	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

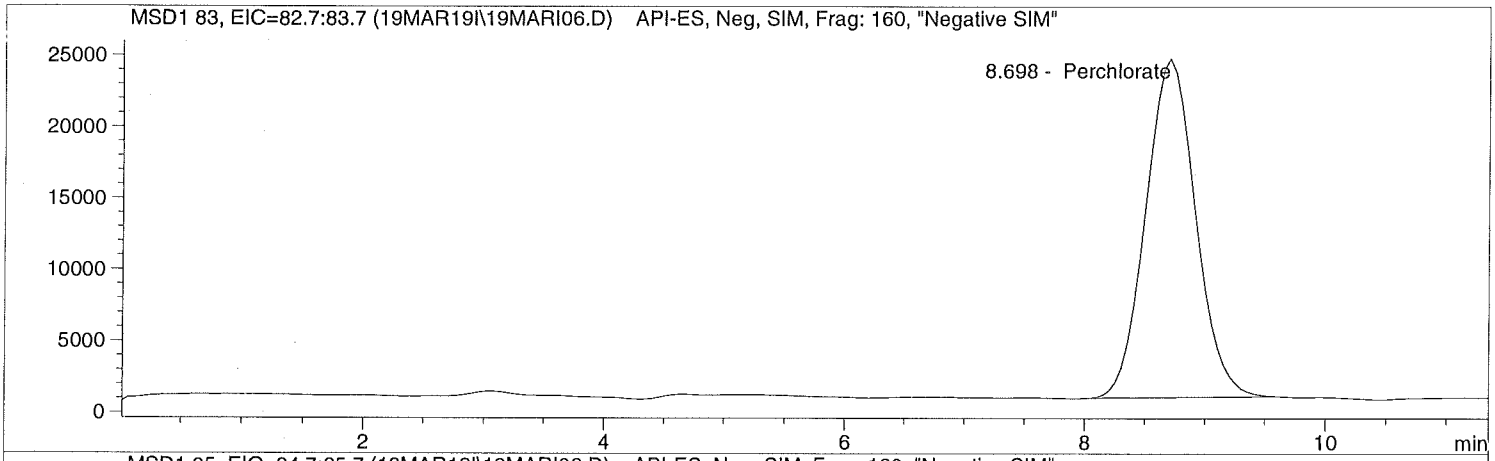
*** End of Report ***

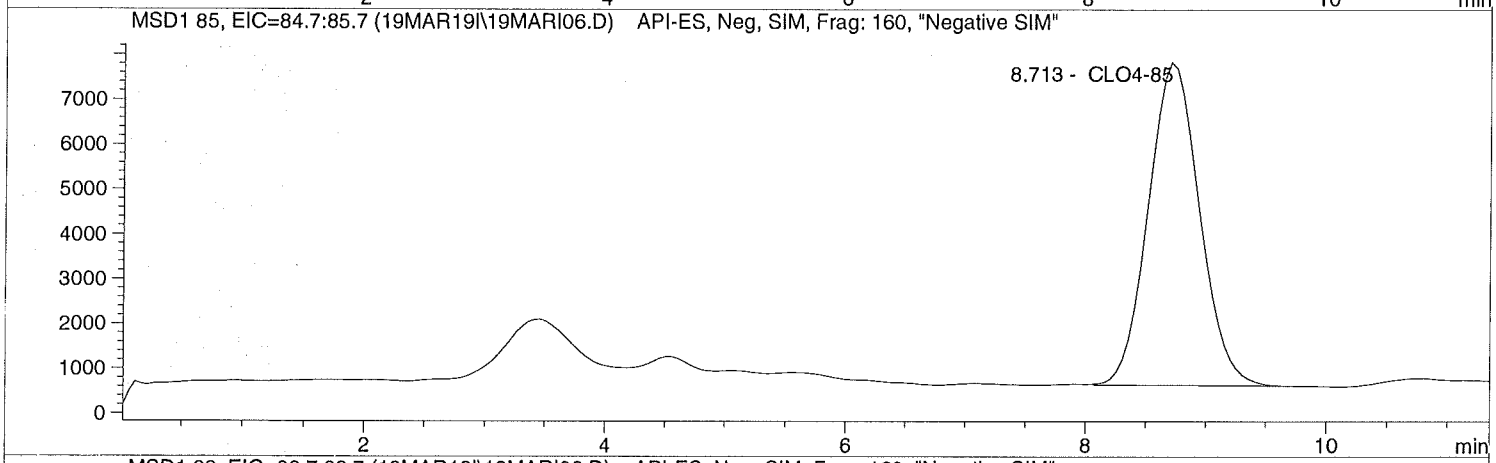
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

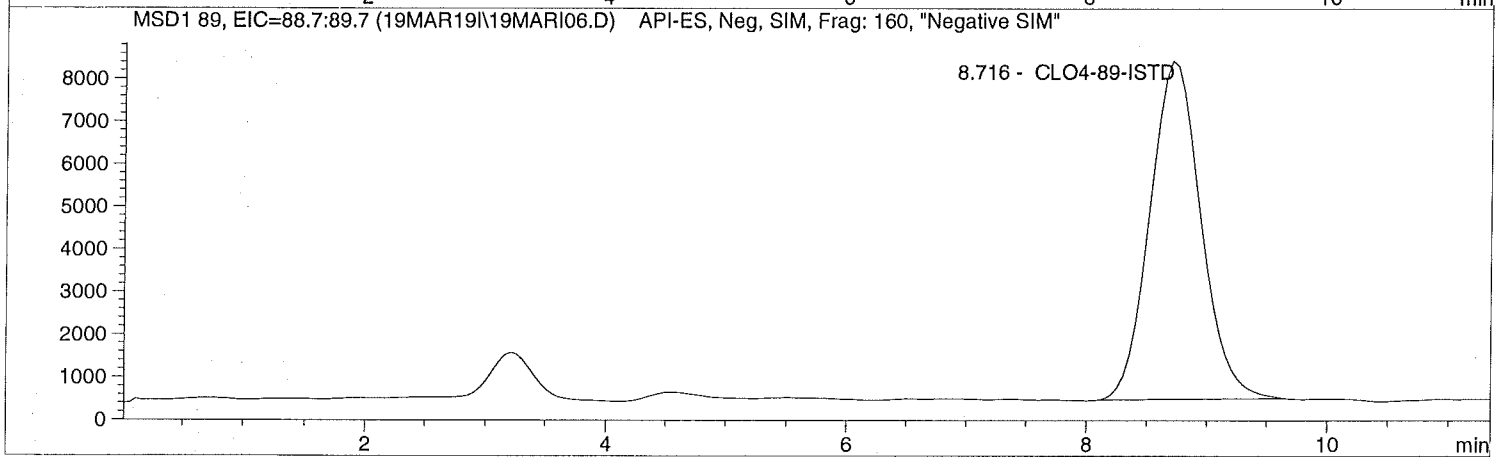
Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.3125	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6528	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

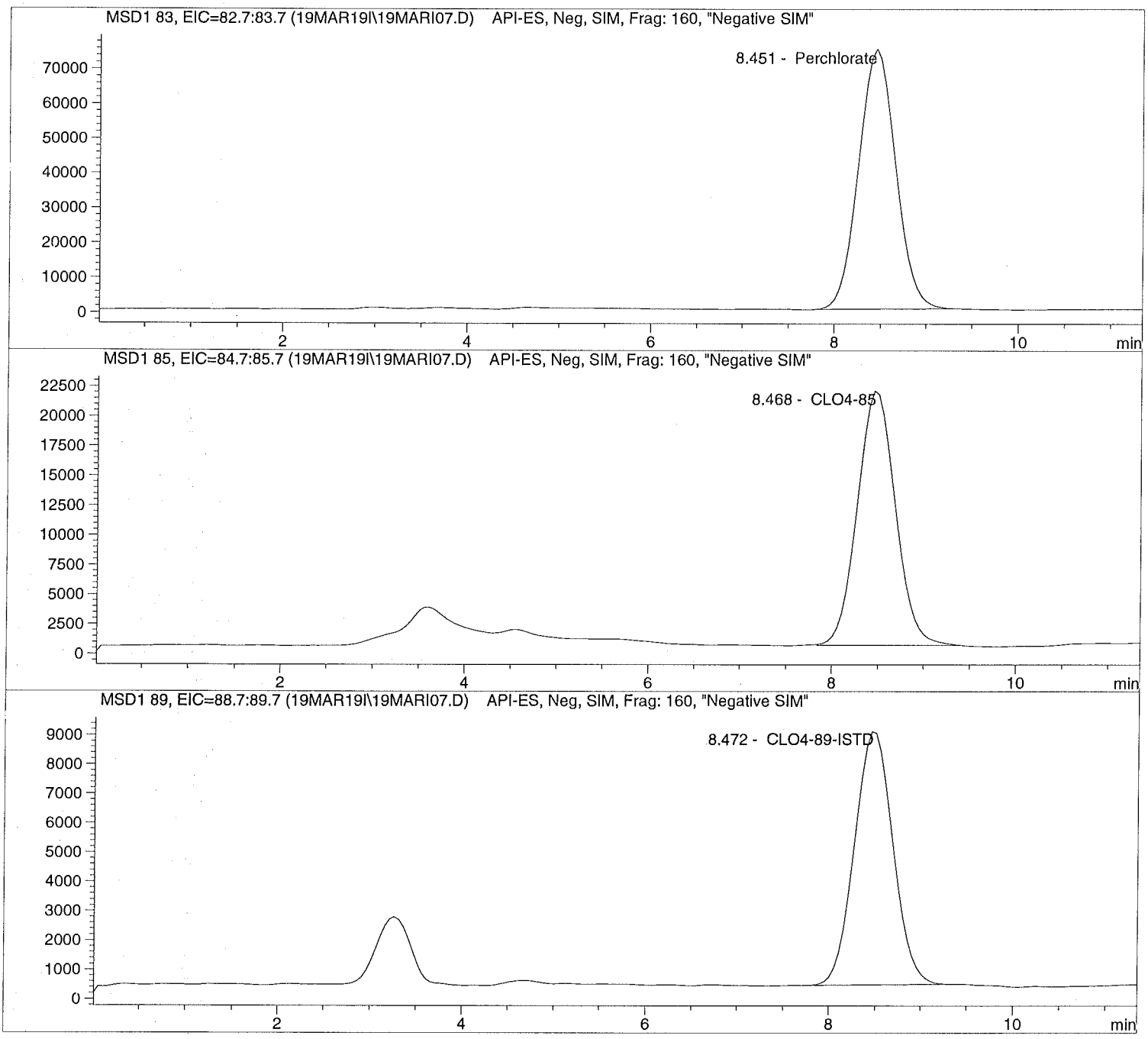
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.4851	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1845	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

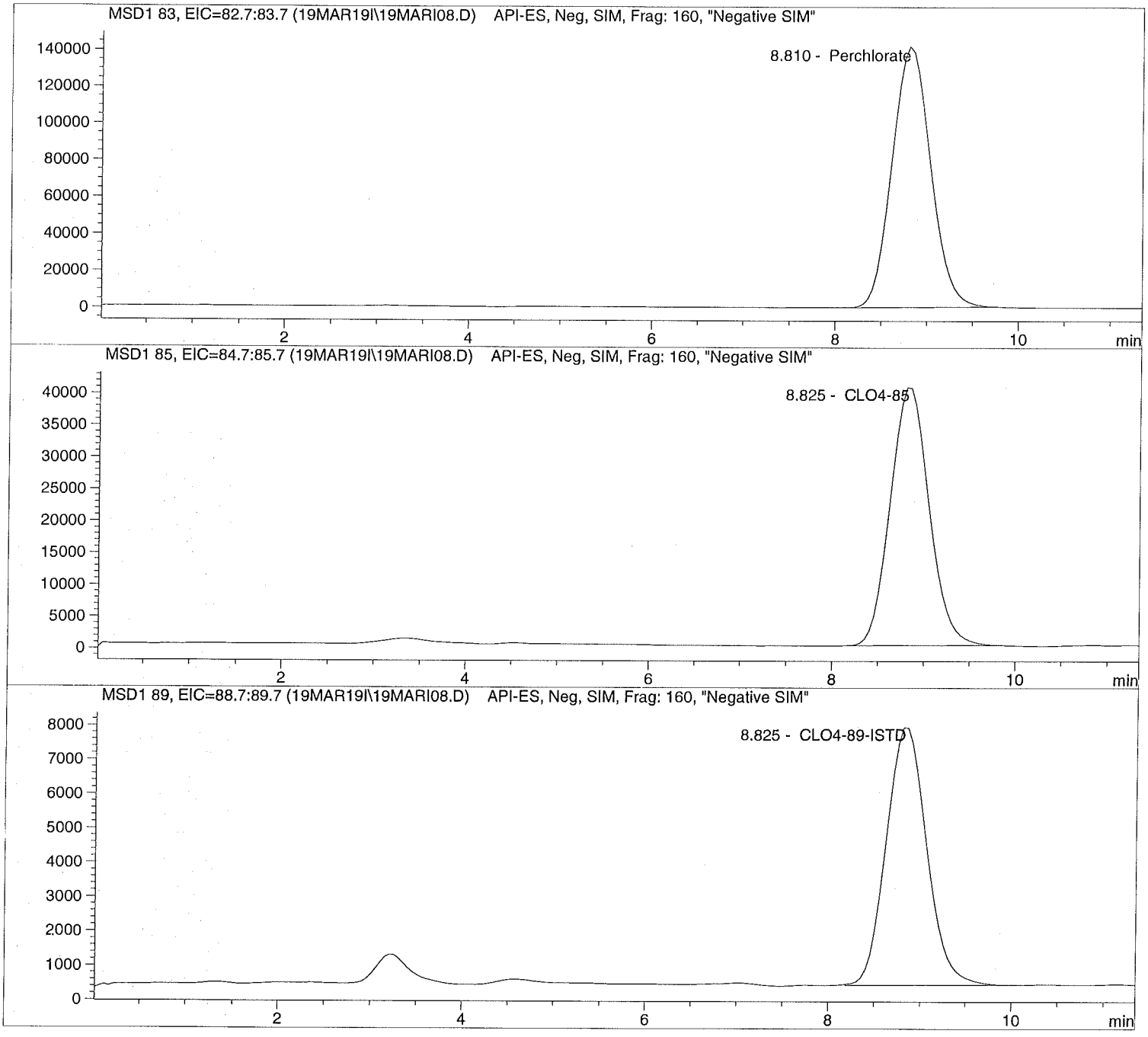
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L 00937866

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.3	51.5149	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.5194	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

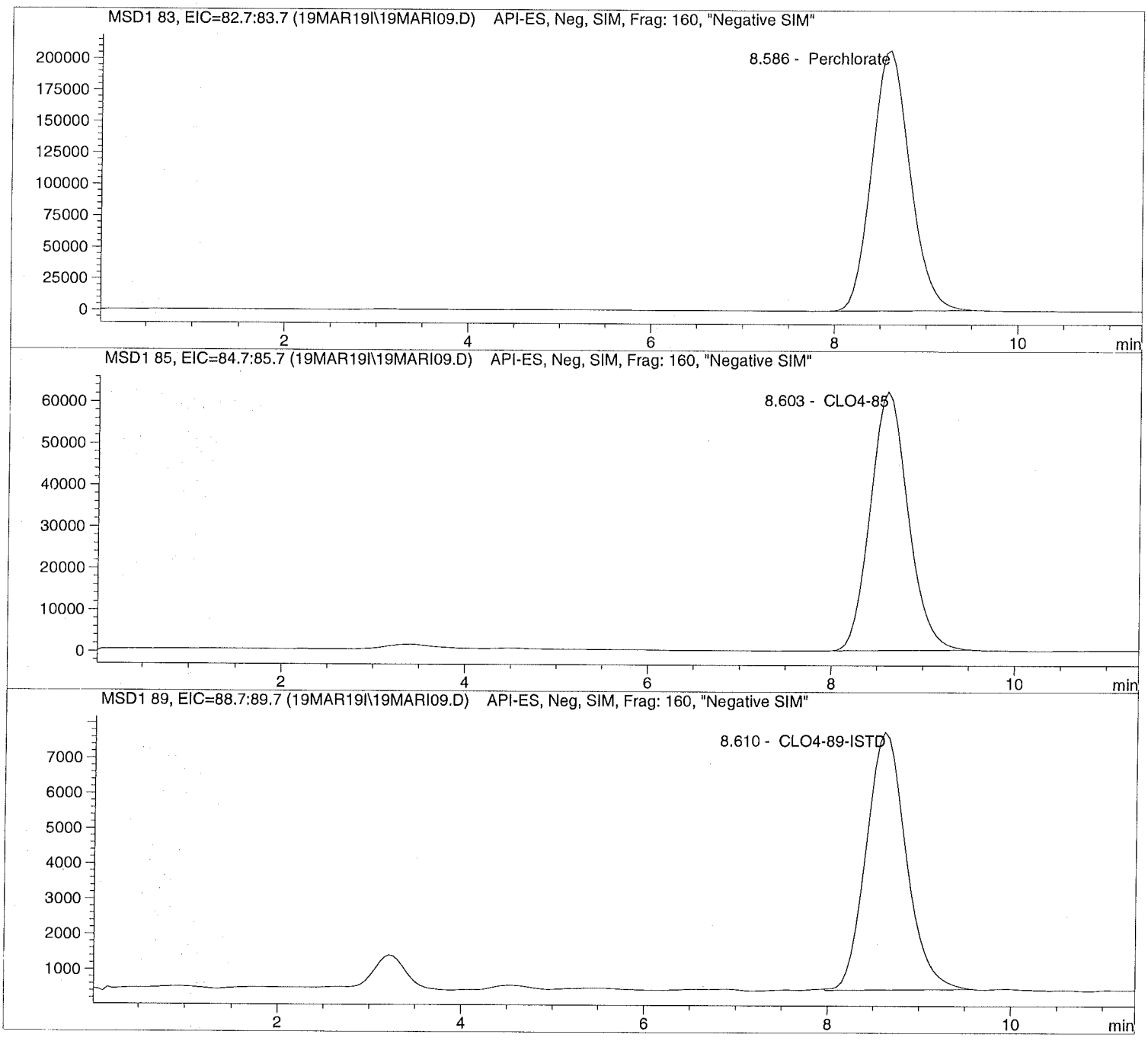
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L 00937868

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.0343	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.6728	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221508.9	5.0000	CLO4-89-ISTD

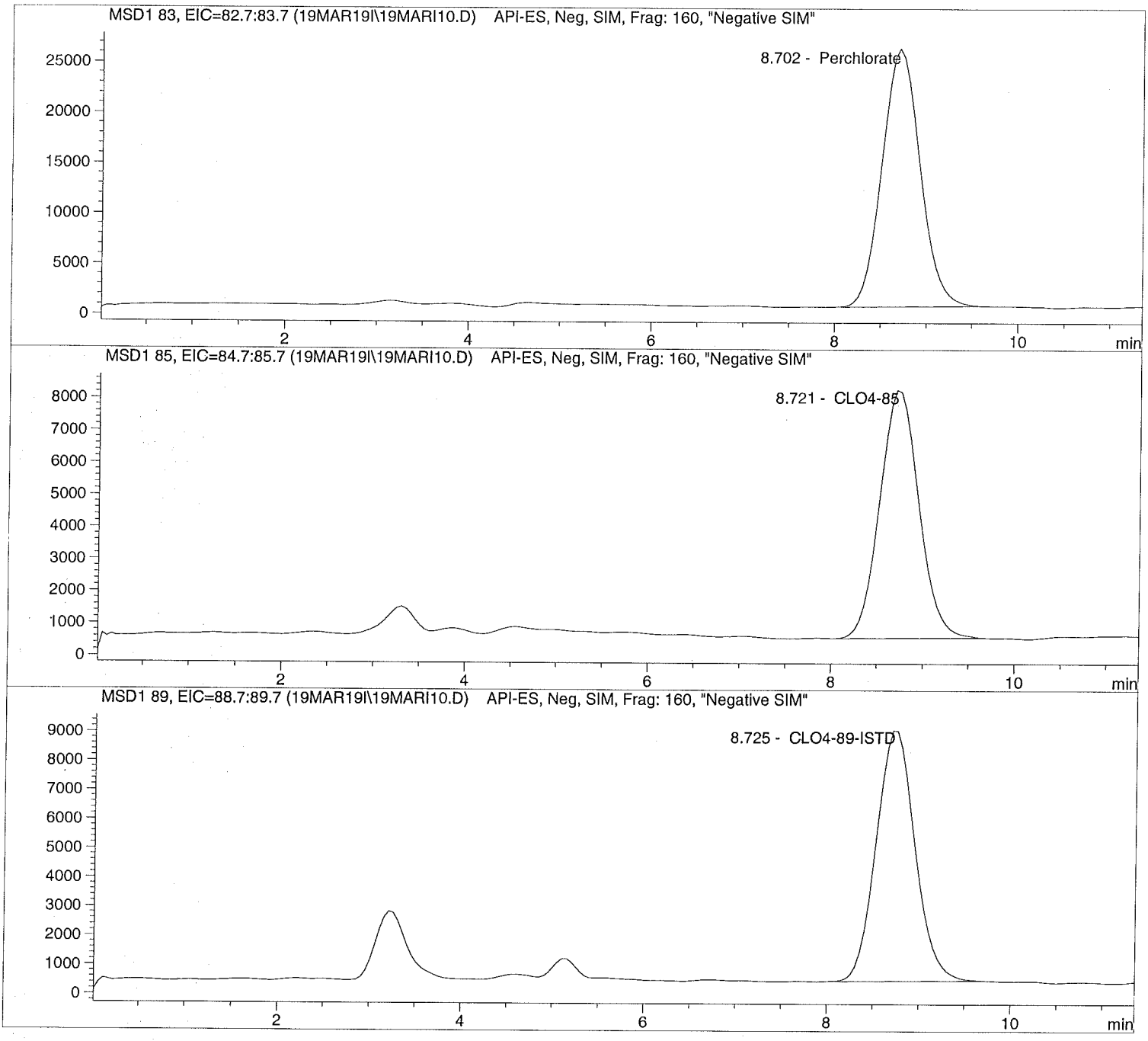
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L 00937870

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2944	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

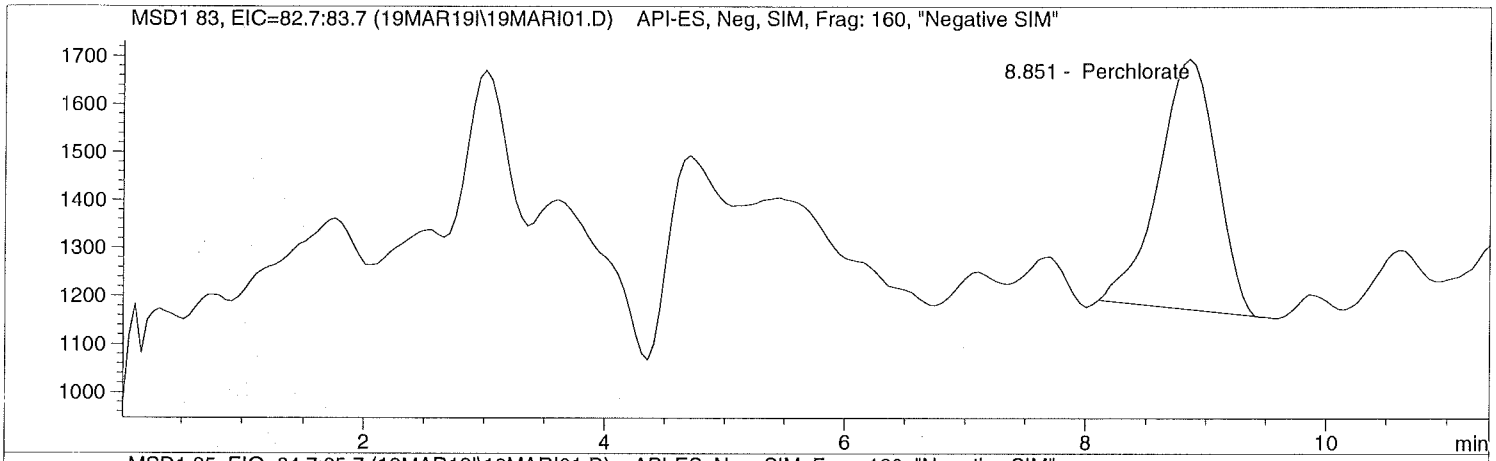
Unmodified

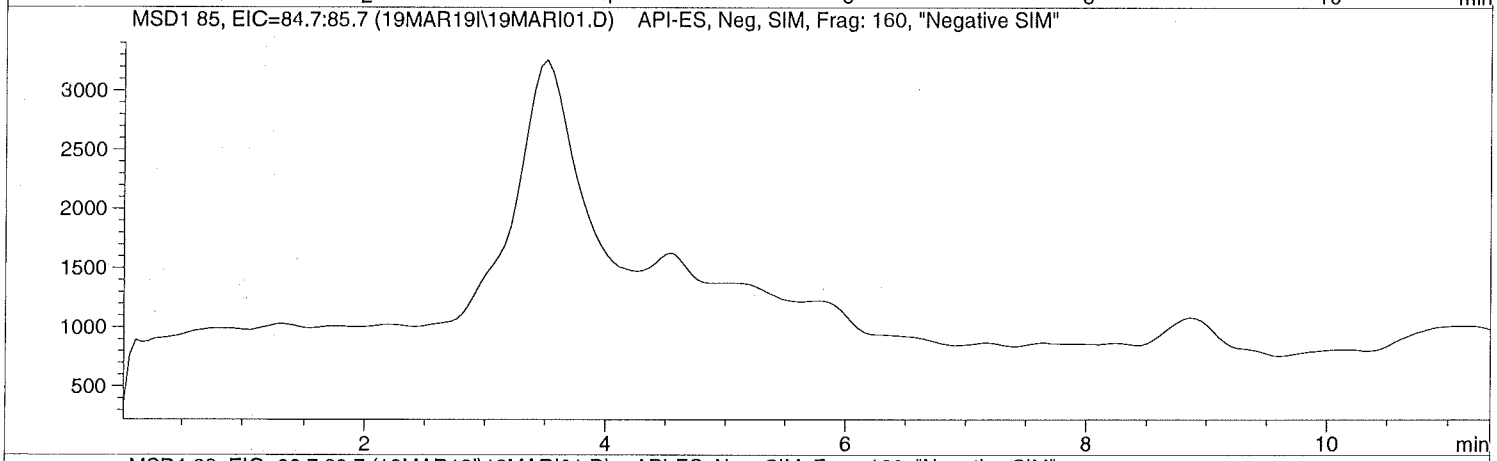
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI01.D Sample Name: CLO4@ 0.2ug/L 00937873

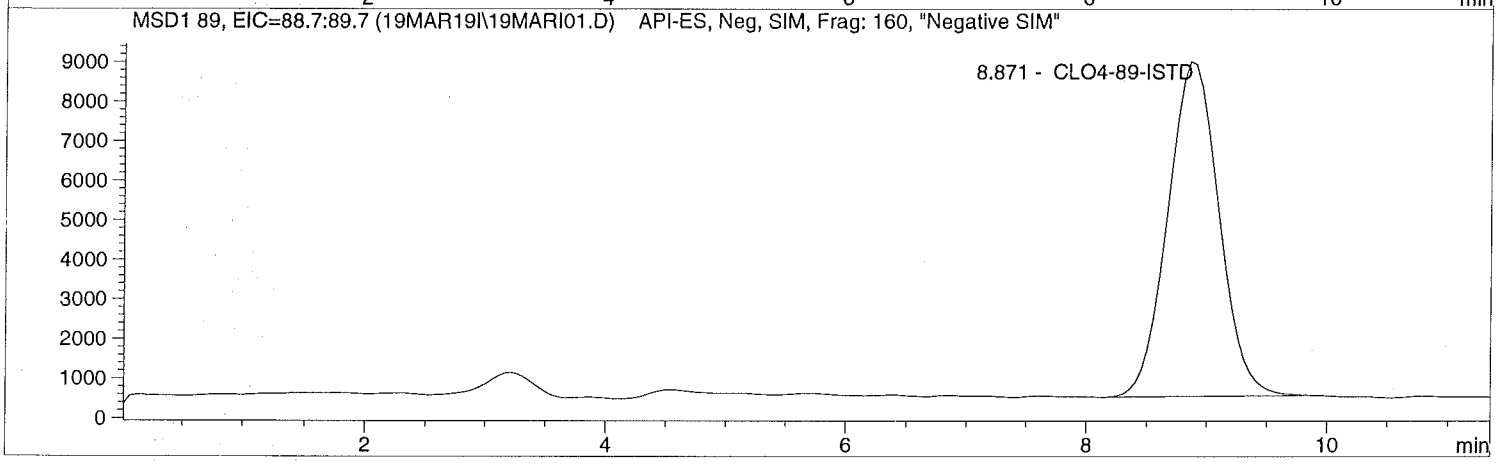
Injection Date:	3/19/2019 09:13:09	Seq Line:	1
Sample Name:	CLO4@ 0.2ug/L	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI01.D Sample Name: CLO4@ 0.2ug/L

Injection Date:	3/19/2019 09:13:09	Seq Line:	1
Sample Name:	CLO4@ 0.2ug/L	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.200

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.851	PBA	17375.8	0.2471	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.871	PBA	249685.7	5.0000	CLO4-89-ISTD

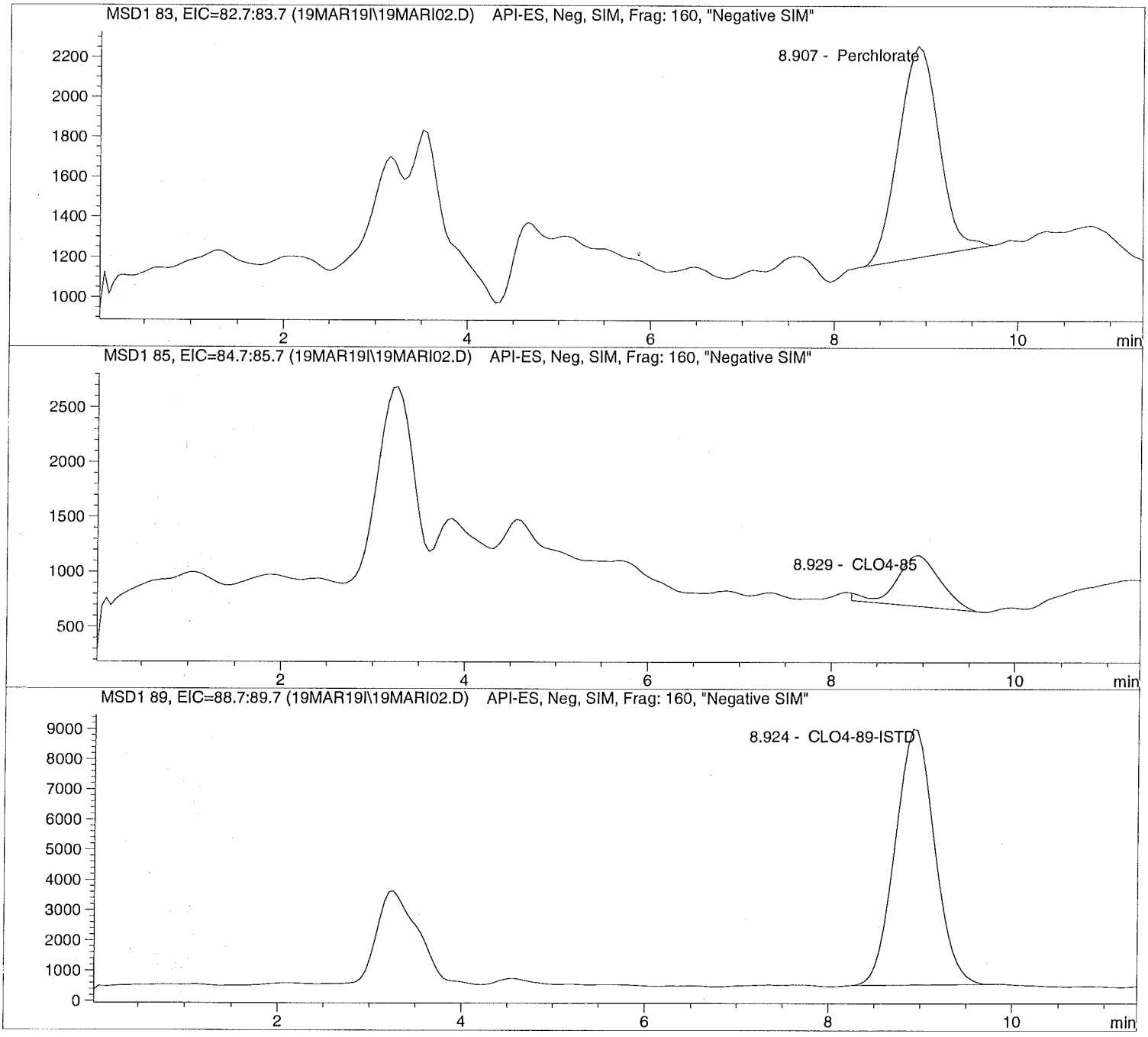
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI02.D Sample Name: CLO4@ 0.5ug/L 00937875

Injection Date:	3/19/2019 09:26:25	Seq Line:	2
Sample Name:	CLO4@ 0.5ug/L	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI02.D Sample Name: CLO4@ 0.5ug/L

Injection Date:	3/19/2019 09:26:25	Seq Line:	2
Sample Name:	CLO4@ 0.5ug/L	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed:	3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.500

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.907	PBA	32197.2	0.4374	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.929	BBA	15150.0	0.5981	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.924	PBA	251653.1	5.0000	CLO4-89-ISTD

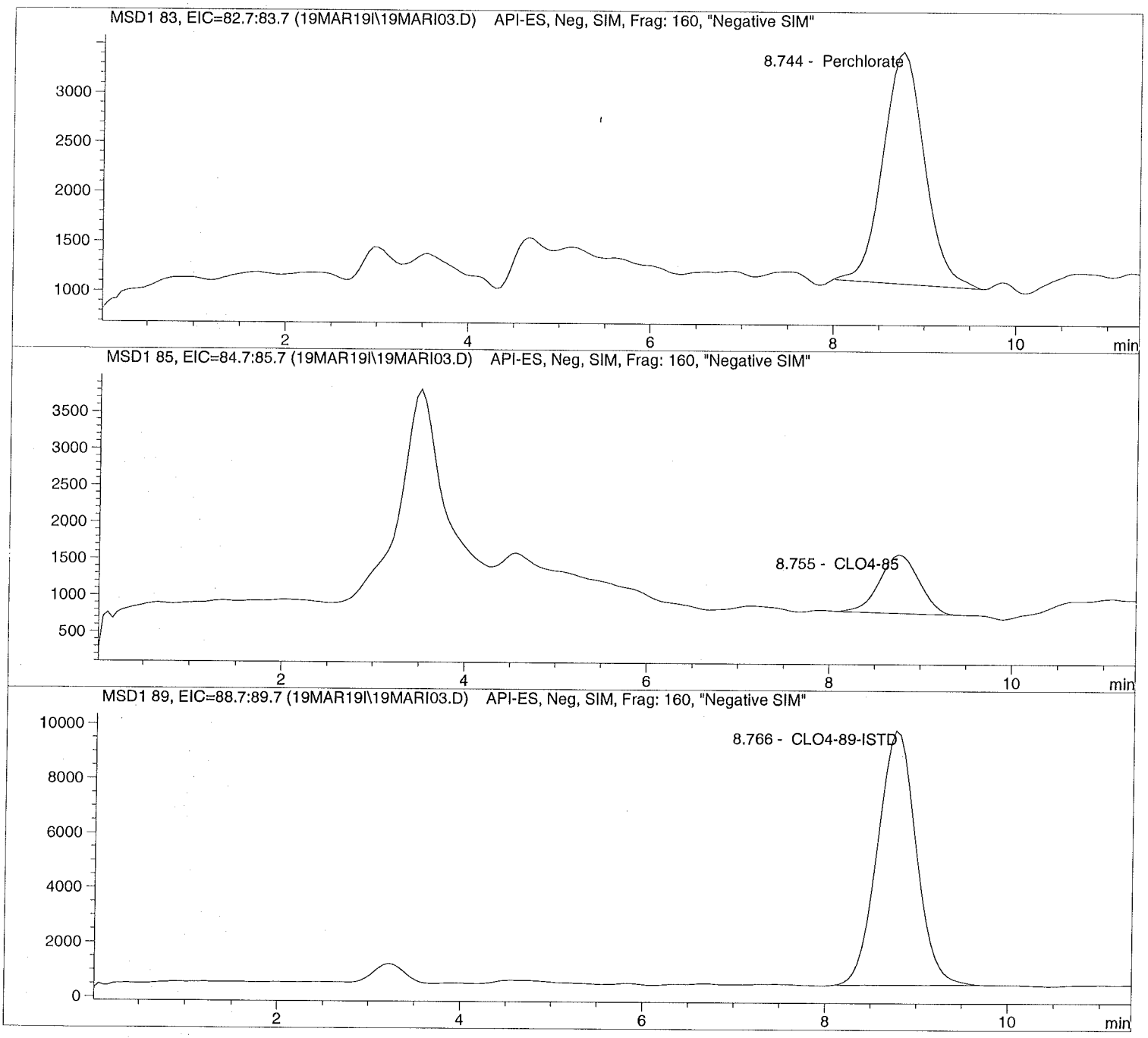
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L 00937877

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis



Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-PR2.M
Last Changed: 3/19/2019 15:02:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,03:02:18 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.4	0.9044	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9039	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19041158

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19041158-01	LH18/24-SP650_041719	Water		17-Apr-2019 14:00	18-Apr-2019 09:33	☐
HS19041158-02	Trip Blank	Water	ALS 022719-23	17-Apr-2019 00:00	18-Apr-2019 09:33	☐

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19041158

GCMS Volatiles by Method SW8260

Batch ID: R337183

Sample ID: LH18/24-SP650_041719(HS19041158-01MS)

- MS/MSD failed QC limits for some compounds

WetChemistry by Method SW9056

Batch ID: R337759

Sample ID: HS19041343-10MS

- MS and MSD are for an unrelated sample (Chloride)

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19041158
Sample ID: LH18/24-SP650_041719 Lab ID:HS19041158-01
Collection Date: 17-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:28
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	23-Apr-2019 17:28
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	23-Apr-2019 17:28
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:28
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	23-Apr-2019 17:28
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	23-Apr-2019 17:28
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	23-Apr-2019 17:28
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19041158
Sample ID: LH18/24-SP650_041719 Lab ID:HS19041158-01
Collection Date: 17-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	23-Apr-2019 17:28
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	23-Apr-2019 17:28
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	23-Apr-2019 17:28
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:28
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Styrene	**37**		**0.30**	**0.50**	**1.0**	**UG/L**	1	23-Apr-2019 17:28
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Toluene	**1.8**		**0.20**	**0.50**	**1.0**	**UG/L**	1	23-Apr-2019 17:28
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:28
Surr: 1,2-Dichloroethane-d4	*89.3*			**0**	*81-118*	*%REC*	*1*	*23-Apr-2019 17:28*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*1*	*23-Apr-2019 17:28*
Surr: Dibromofluoromethane	*89.8*			**0**	*80-119*	*%REC*	*1*	*23-Apr-2019 17:28*
Surr: Toluene-d8	*98.7*			**0**	*89-112*	*%REC*	*1*	*23-Apr-2019 17:28*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: AJH
Chloride	**344**		**2.00**	**5.00**	**5.00**	**mg/L**	10	01-May-2019 22:31
Sulfate	**25.6**		**2.00**	**5.00**	**5.00**	**mg/L**	10	01-May-2019 22:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19041158
Sample ID: Trip Blank Lab ID:HS19041158-02
Collection Date: 17-Apr-2019 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:04
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	23-Apr-2019 17:04
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	23-Apr-2019 17:04
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:04
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	23-Apr-2019 17:04
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	23-Apr-2019 17:04
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	23-Apr-2019 17:04
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19041158
Sample ID: Trip Blank Lab ID:HS19041158-02
Collection Date: 17-Apr-2019 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	23-Apr-2019 17:04
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	23-Apr-2019 17:04
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	23-Apr-2019 17:04
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-Apr-2019 17:04
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	23-Apr-2019 17:04
Surr: 1,2-Dichloroethane-d4	*91.0*			**0**	*81-118*	*%REC*	*1*	*23-Apr-2019 17:04*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*23-Apr-2019 17:04*
Surr: Dibromofluoromethane	*90.8*			**0**	*80-119*	*%REC*	*1*	*23-Apr-2019 17:04*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*23-Apr-2019 17:04*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

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ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19041158

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R337183	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19041158-01	LH18/24-SP650_041719	17 Apr 2019 14:00			23 Apr 2019 17:28	1
HS19041158-02	Trip Blank	17 Apr 2019 00:00			23 Apr 2019 17:04	1
Batch ID R337759	**Test Name :** ANIONS BY SW9056A			**Matrix:** Water		
HS19041158-01	LH18/24-SP650_041719	17 Apr 2019 14:00			01 May 2019 22:31	10

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ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19041158

QC BATCH REPORT

Batch ID: R337183 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190423** Units: **UG/L** Analysis Date: **23-Apr-2019 16:40**
Client ID: Run ID: **VOA6_337183** SeqNo: **5047952** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19041158

QC BATCH REPORT

Batch ID: R337183 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190423** Units: **UG/L** Analysis Date: **23-Apr-2019 16:40**
Client ID: Run ID: **VOA6_337183** SeqNo: **5047952** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.67*	*1.0*	*50*	*0*	*89.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.24*	*1.0*	*50*	*0*	*100*	*85 - 114*				
Surr: Dibromofluoromethane	*45.25*	*1.0*	*50*	*0*	*90.5*	*80 - 119*				
Surr: Toluene-d8	*49.72*	*1.0*	*50*	*0*	*99.4*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19041158

QC BATCH REPORT

Batch ID: R337183 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190423** Units: **UG/L** Analysis Date: **23-Apr-2019 15:28**
Client ID: Run ID: **VOA6_337183** SeqNo: **5047951** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.6	1.0	20	0	98.0	78 - 124				
1,1,1-Trichloroethane	19.32	1.0	20	0	96.6	74 - 131				
1,1,2,2-Tetrachloroethane	19.79	1.0	20	0	99.0	71 - 121				
1,1,2-Trichloroethane	19.46	1.0	20	0	97.3	80 - 119				
1,1-Dichloroethane	18.81	1.0	20	0	94.1	77 - 125				
1,1-Dichloroethene	18.52	1.0	20	0	92.6	71 - 131				
1,1-Dichloropropene	17.94	1.0	20	0	89.7	78 - 125				
1,2,3-Trichlorobenzene	25.05	1.0	20	0	125	69 - 129				
1,2,3-Trichloropropane	19.74	1.0	20	0	98.7	73 - 122				
1,2,4-Trichlorobenzene	21.01	1.0	20	0	105	69 - 130				
1,2,4-Trimethylbenzene	19.48	1.0	20	0	97.4	76 - 124				
1,2-Dibromo-3-chloropropane	20.8	1.0	20	0	104	62 - 128				
1,2-Dibromoethane	19.73	1.0	20	0	98.6	77 - 121				
1,2-Dichlorobenzene	19.84	1.0	20	0	99.2	80 - 119				
1,2-Dichloroethane	18.8	1.0	20	0	94.0	73 - 128				
1,2-Dichloropropane	19.84	1.0	20	0	99.2	78 - 122				
1,3,5-Trimethylbenzene	19.11	1.0	20	0	95.5	75 - 124				
1,3-Dichlorobenzene	19.41	1.0	20	0	97.0	80 - 119				
1,3-Dichloropropane	18.99	1.0	20	0	94.9	80 - 119				
1,4-Dichlorobenzene	19.08	1.0	20	0	95.4	79 - 118				
2,2-Dichloropropane	19.1	1.0	20	0	95.5	60 - 139				
2-Butanone	40.32	2.0	40	0	101	56 - 143				
2-Chlorotoluene	18.71	1.0	20	0	93.6	79 - 122				
2-Hexanone	39.02	2.0	40	0	97.6	57 - 139				
4-Chlorotoluene	19.05	1.0	20	0	95.3	78 - 122				
4-Isopropyltoluene	18.85	1.0	20	0	94.3	77 - 127				
4-Methyl-2-pentanone	38.62	2.0	40	0	96.5	67 - 130				
Acetone	43.91	2.0	40	0	110	39 - 160				
Benzene	18.93	1.0	20	0	94.6	79 - 120				
Bromobenzene	19.7	1.0	20	0	98.5	80 - 120				
Bromochloromethane	18.9	1.0	20	0	94.5	78 - 123				
Bromodichloromethane	18.92	1.0	20	0	94.6	79 - 125				
Bromoform	20.47	1.0	20	0	102	66 - 130				
Bromomethane	23.1	1.0	20	0	115	53 - 141				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19041158

QC BATCH REPORT

Batch ID: R337183 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190423** Units: **UG/L** Analysis Date: **23-Apr-2019 15:28**
Client ID: Run ID: **VOA6_337183** SeqNo: **5047951** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	37.54	2.0	40	0	93.8	64 - 133				
Carbon tetrachloride	19.36	1.0	20	0	96.8	72 - 136				
Chlorobenzene	19.21	1.0	20	0	96.0	82 - 118				
Chloroethane	18.81	1.0	20	0	94.1	60 - 138				
Chloroform	19.26	1.0	20	0	96.3	79 - 124				
Chloromethane	18.04	1.0	20	0	90.2	50 - 139				
cis-1,2-Dichloroethene	19.49	1.0	20	0	97.4	78 - 123				
cis-1,3-Dichloropropene	19.21	1.0	20	0	96.0	75 - 124				
Dibromochloromethane	18.77	1.0	20	0	93.9	74 - 126				
Dibromomethane	19.04	1.0	20	0	95.2	79 - 123				
Dichlorodifluoromethane	18.76	1.0	20	0	93.8	32 - 152				
Ethylbenzene	18.7	1.0	20	0	93.5	79 - 121				
Hexachlorobutadiene	24.29	1.0	20	0	121	66 - 134				
Isopropylbenzene	18.7	1.0	20	0	93.5	72 - 131				
m,p-Xylene	37.96	2.0	40	0	94.9	80 - 121				
Methylene chloride	19.62	2.0	20	0	98.1	74 - 124				
Naphthalene	23.81	1.0	20	0	119	61 - 128				
n-Butylbenzene	18.7	1.0	20	0	93.5	75 - 128				
n-Propylbenzene	18.61	1.0	20	0	93.1	76 - 126				
o-Xylene	19.14	1.0	20	0	95.7	78 - 122				
sec-Butylbenzene	18.76	1.0	20	0	93.8	77 - 126				
Styrene	19.17	1.0	20	0	95.9	78 - 123				
tert-Butylbenzene	18.98	1.0	20	0	94.9	78 - 124				
Tetrachloroethene	19.22	1.0	20	0	96.1	74 - 129				
Toluene	18.92	1.0	20	0	94.6	80 - 121				
trans-1,2-Dichloroethene	19.15	1.0	20	0	95.8	75 - 124				
trans-1,3-Dichloropropene	19.27	1.0	20	0	96.3	73 - 127				
Trichloroethene	19.21	1.0	20	0	96.0	79 - 123				
Trichlorofluoromethane	18.64	1.0	20	0	93.2	65 - 141				
Vinyl chloride	17.68	1.0	20	0	88.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.54*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.58*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*52.26*	*1.0*	*50*	*0*	*105*	*80 - 119*				
Surr: Toluene-d8	*47.14*	*1.0*	*50*	*0*	*94.3*	*89 - 112*				

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ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19041158

QC BATCH REPORT

Batch ID: R337183 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19041158-01MS** Units: **UG/L** Analysis Date: **23-Apr-2019 20:19**
Client ID: **LH18/24-SP650_041719** Run ID: **VOA6_337183** SeqNo: **5047959** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	16.8	1.0	20	0	84.0	78 - 124				
1,1,1-Trichloroethane	15.9	1.0	20	0	79.5	74 - 131				
1,1,2,2-Tetrachloroethane	15.87	1.0	20	0	79.4	71 - 121				
1,1,2-Trichloroethane	16.15	1.0	20	0	80.7	80 - 119				
1,1-Dichloroethane	14.78	1.0	20	0	73.9	77 - 125				S
1,1-Dichloroethene	16.04	1.0	20	0	80.2	71 - 131				
1,1-Dichloropropene	16.55	1.0	20	0	82.7	78 - 125				
1,2,3-Trichlorobenzene	16.53	1.0	20	0	82.6	69 - 129				
1,2,3-Trichloropropane	15.77	1.0	20	0	78.8	73 - 122				
1,2,4-Trichlorobenzene	15.15	1.0	20	0	75.8	69 - 130				
1,2,4-Trimethylbenzene	17.23	1.0	20	0	86.2	76 - 124				
1,2-Dibromo-3-chloropropane	15.18	1.0	20	0	75.9	62 - 128				
1,2-Dibromoethane	16.33	1.0	20	0	81.7	77 - 121				
1,2-Dichlorobenzene	16.47	1.0	20	0	82.4	80 - 119				
1,2-Dichloroethane	15.47	1.0	20	0	77.3	73 - 128				
1,2-Dichloropropane	16.49	1.0	20	0	82.4	78 - 122				
1,3,5-Trimethylbenzene	17.56	1.0	20	0	87.8	75 - 124				
1,3-Dichlorobenzene	16.62	1.0	20	0	83.1	80 - 119				
1,3-Dichloropropane	15.94	1.0	20	0	79.7	80 - 119				S
1,4-Dichlorobenzene	16.34	1.0	20	0	81.7	79 - 118				
2,2-Dichloropropane	15.62	1.0	20	0	78.1	60 - 139				
2-Butanone	32.01	2.0	40	0	80.0	56 - 143				
2-Chlorotoluene	16.62	1.0	20	0	83.1	79 - 122				
2-Hexanone	31.32	2.0	40	0	78.3	57 - 139				
4-Chlorotoluene	16.8	1.0	20	0	84.0	78 - 122				
4-Isopropyltoluene	17.97	1.0	20	0	89.8	77 - 127				
4-Methyl-2-pentanone	32	2.0	40	0	80.0	67 - 130				
Acetone	30.43	2.0	40	0	76.1	39 - 160				
Benzene	16	1.0	20	0	80.0	79 - 120				
Bromobenzene	16.58	1.0	20	0	82.9	80 - 120				
Bromochloromethane	14.63	1.0	20	0	73.1	78 - 123				S
Bromodichloromethane	15.48	1.0	20	0	77.4	79 - 125				S
Bromoform	16.22	1.0	20	0	81.1	66 - 130				
Bromomethane	14.45	1.0	20	0	72.2	53 - 141				

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ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19041158

QC BATCH REPORT

Batch ID: R337183 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19041158-01MS** Units: **UG/L** Analysis Date: **23-Apr-2019 20:19**
Client ID: **LH18/24-SP650_041719** Run ID: **VOA6_337183** SeqNo: **5047959** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	39.07	2.0	40	0	97.7	64 - 133				
Carbon tetrachloride	18	1.0	20	0	90.0	72 - 136				
Chlorobenzene	16.59	1.0	20	0	82.9	82 - 118				
Chloroethane	14.76	1.0	20	0	73.8	60 - 138				
Chloroform	14.95	1.0	20	0	74.8	79 - 124				S
Chloromethane	16.8	1.0	20	0	84.0	50 - 139				
cis-1,2-Dichloroethene	16.81	1.0	20	0	84.0	78 - 123				
cis-1,3-Dichloropropene	15.54	1.0	20	0	77.7	75 - 124				
Dibromochloromethane	15.74	1.0	20	0	78.7	74 - 126				
Dibromomethane	15.58	1.0	20	0	77.9	79 - 123				S
Dichlorodifluoromethane	17.46	1.0	20	0	87.3	32 - 152				
Ethylbenzene	16.87	1.0	20	0	84.3	79 - 121				
Hexachlorobutadiene	18.99	1.0	20	0	95.0	66 - 134				
Isopropylbenzene	17.59	1.0	20	0	87.9	72 - 131				
m,p-Xylene	33.71	2.0	40	0	84.3	80 - 121				
Methylene chloride	14.81	2.0	20	0	74.0	74 - 124				
Naphthalene	15.71	1.0	20	0	78.6	61 - 128				
n-Butylbenzene	17.62	1.0	20	0	88.1	75 - 128				
n-Propylbenzene	17.46	1.0	20	0	87.3	76 - 126				
o-Xylene	16.98	1.0	20	0	84.9	78 - 122				
sec-Butylbenzene	17.82	1.0	20	0	89.1	77 - 126				
Styrene	16.55	1.0	20	37.33	-104	78 - 123				S
tert-Butylbenzene	17.94	1.0	20	0	89.7	78 - 124				
Tetrachloroethene	18.23	1.0	20	0	91.2	74 - 129				
Toluene	16.88	1.0	20	1.754	75.6	80 - 121				S
trans-1,2-Dichloroethene	15.9	1.0	20	0	79.5	75 - 124				
trans-1,3-Dichloropropene	15.43	1.0	20	0	77.1	73 - 127				
Trichloroethene	17.13	1.0	20	0	85.7	79 - 123				
Trichlorofluoromethane	16.58	1.0	20	0	82.9	65 - 141				
Vinyl chloride	16.04	1.0	20	0	80.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.1*	*1.0*	*50*	*0*	*90.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.66*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*46.19*	*1.0*	*50*	*0*	*92.4*	*80 - 119*				
Surr: Toluene-d8	*48.87*	*1.0*	*50*	*0*	*97.7*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19041158

QC BATCH REPORT

Batch ID: R337183 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19041158-01MSD** Units: **UG/L** Analysis Date: **23-Apr-2019 20:43**
Client ID: **LH18/24-SP650_041719** Run ID: **VOA6_337183** SeqNo: **5047960** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	16.54	1.0	20	0	82.7	78 - 124	16.8	1.6	20	
1,1,1-Trichloroethane	15.14	1.0	20	0	75.7	74 - 131	15.9	4.95	20	
1,1,2,2-Tetrachloroethane	17.27	1.0	20	0	86.4	71 - 121	15.87	8.44	20	
1,1,2-Trichloroethane	16.32	1.0	20	0	81.6	80 - 119	16.15	1.05	20	
1,1-Dichloroethane	14.12	1.0	20	0	70.6	77 - 125	14.78	4.57	20	S
1,1-Dichloroethene	14.93	1.0	20	0	74.7	71 - 131	16.04	7.14	20	
1,1-Dichloropropene	15.57	1.0	20	0	77.9	78 - 125	16.55	6.06	20	S
1,2,3-Trichlorobenzene	18.28	1.0	20	0	91.4	69 - 129	16.53	10.1	20	
1,2,3-Trichloropropane	16.68	1.0	20	0	83.4	73 - 122	15.77	5.59	20	
1,2,4-Trichlorobenzene	16.81	1.0	20	0	84.1	69 - 130	15.15	10.4	20	
1,2,4-Trimethylbenzene	18.19	1.0	20	0	90.9	76 - 124	17.23	5.4	20	
1,2-Dibromo-3-chloropropane	16.62	1.0	20	0	83.1	62 - 128	15.18	9.12	20	
1,2-Dibromoethane	16.49	1.0	20	0	82.4	77 - 121	16.33	0.931	20	
1,2-Dichlorobenzene	17.63	1.0	20	0	88.1	80 - 119	16.47	6.76	20	
1,2-Dichloroethane	15.11	1.0	20	0	75.5	73 - 128	15.47	2.34	20	
1,2-Dichloropropane	15.59	1.0	20	0	78.0	78 - 122	16.49	5.58	20	S
1,3,5-Trimethylbenzene	18.4	1.0	20	0	92.0	75 - 124	17.56	4.67	20	
1,3-Dichlorobenzene	17.9	1.0	20	0	89.5	80 - 119	16.62	7.45	20	
1,3-Dichloropropane	15.98	1.0	20	0	79.9	80 - 119	15.94	0.252	20	S
1,4-Dichlorobenzene	17.43	1.0	20	0	87.1	79 - 118	16.34	6.43	20	
2,2-Dichloropropane	14.7	1.0	20	0	73.5	60 - 139	15.62	6.09	20	
2-Butanone	31.46	2.0	40	0	78.6	56 - 143	32.01	1.74	20	
2-Chlorotoluene	17.61	1.0	20	0	88.1	79 - 122	16.62	5.8	20	
2-Hexanone	32.63	2.0	40	0	81.6	57 - 139	31.32	4.1	20	
4-Chlorotoluene	17.63	1.0	20	0	88.2	78 - 122	16.8	4.84	20	
4-Isopropyltoluene	18.85	1.0	20	0	94.3	77 - 127	17.97	4.82	20	
4-Methyl-2-pentanone	32.07	2.0	40	0	80.2	67 - 130	32	0.214	20	
Acetone	29.99	2.0	40	0	75.0	39 - 160	30.43	1.46	20	
Benzene	15.33	1.0	20	0	76.7	79 - 120	16	4.29	20	S
Bromobenzene	17.96	1.0	20	0	89.8	80 - 120	16.58	7.99	20	
Bromochloromethane	13.84	1.0	20	0	69.2	78 - 123	14.63	5.53	20	S
Bromodichloromethane	15.11	1.0	20	0	75.5	79 - 125	15.48	2.44	20	S
Bromoform	16.7	1.0	20	0	83.5	66 - 130	16.22	2.92	20	
Bromomethane	12.37	1.0	20	0	61.9	53 - 141	14.45	15.5	20	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19041158

QC BATCH REPORT

Batch ID: R337183 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19041158-01MSD** Units: **UG/L** Analysis Date: **23-Apr-2019 20:43**
Client ID: **LH18/24-SP650_041719** Run ID: **VOA6_337183** SeqNo: **5047960** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	32.63	2.0	40	0	81.6	64 - 133	39.07	18	20	
Carbon tetrachloride	17.3	1.0	20	0	86.5	72 - 136	18	4	20	
Chlorobenzene	16.24	1.0	20	0	81.2	82 - 118	16.59	2.13	20	S
Chloroethane	14.51	1.0	20	0	72.5	60 - 138	14.76	1.71	20	
Chloroform	14.47	1.0	20	0	72.3	79 - 124	14.95	3.29	20	S
Chloromethane	18.33	1.0	20	0	91.6	50 - 139	16.8	8.69	20	
cis-1,2-Dichloroethene	16.4	1.0	20	0	82.0	78 - 123	16.81	2.44	20	
cis-1,3-Dichloropropene	15.19	1.0	20	0	76.0	75 - 124	15.54	2.22	20	
Dibromochloromethane	16.04	1.0	20	0	80.2	74 - 126	15.74	1.88	20	
Dibromomethane	15.36	1.0	20	0	76.8	79 - 123	15.58	1.43	20	S
Dichlorodifluoromethane	16.09	1.0	20	0	80.5	32 - 152	17.46	8.13	20	
Ethylbenzene	16.44	1.0	20	0	82.2	79 - 121	16.87	2.58	20	
Hexachlorobutadiene	21.25	1.0	20	0	106	66 - 134	18.99	11.2	20	
Isopropylbenzene	17.07	1.0	20	0	85.4	72 - 131	17.59	2.97	20	
m,p-Xylene	33.08	2.0	40	0	82.7	80 - 121	33.71	1.88	20	
Methylene chloride	14.24	2.0	20	0	71.2	74 - 124	14.81	3.89	20	S
Naphthalene	17.46	1.0	20	0	87.3	61 - 128	15.71	10.5	20	
n-Butylbenzene	18.86	1.0	20	0	94.3	75 - 128	17.62	6.77	20	
n-Propylbenzene	18.27	1.0	20	0	91.3	76 - 126	17.46	4.5	20	
o-Xylene	16.76	1.0	20	0	83.8	78 - 122	16.98	1.25	20	
sec-Butylbenzene	18.86	1.0	20	0	94.3	77 - 126	17.82	5.71	20	
Styrene	16.32	1.0	20	37.33	-105	78 - 123	16.55	1.39	20	S
tert-Butylbenzene	18.79	1.0	20	0	94.0	78 - 124	17.94	4.64	20	
Tetrachloroethene	18.09	1.0	20	0	90.5	74 - 129	18.23	0.753	20	
Toluene	16.76	1.0	20	1.754	75.0	80 - 121	16.88	0.681	20	S
trans-1,2-Dichloroethene	14.81	1.0	20	0	74.1	75 - 124	15.9	7.07	20	S
trans-1,3-Dichloropropene	15.1	1.0	20	0	75.5	73 - 127	15.43	2.16	20	
Trichloroethene	16.34	1.0	20	0	81.7	79 - 123	17.13	4.75	20	
Trichlorofluoromethane	15.18	1.0	20	0	75.9	65 - 141	16.58	8.81	20	
Vinyl chloride	14.64	1.0	20	0	73.2	58 - 137	16.04	9.13	20	
Surr: 1,2-Dichloroethane-d4	*45.29*	*1.0*	*50*	*0*	*90.6*	*81 - 118*	*45.1*	*0.429*	*20*	
Surr: 4-Bromofluorobenzene	*49.33*	*1.0*	*50*	*0*	*98.7*	*85 - 114*	*50.66*	*2.67*	*20*	
Surr: Dibromofluoromethane	*45.6*	*1.0*	*50*	*0*	*91.2*	*80 - 119*	*46.19*	*1.29*	*20*	
Surr: Toluene-d8	*49.55*	*1.0*	*50*	*0*	*99.1*	*89 - 112*	*48.87*	*1.38*	*20*	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 03-May-19

Client:	Bhate Environmental Associates, Inc.
Project:	Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder:	HS19041158

QC BATCH REPORT

Batch ID:	**R337183 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19041158-01 HS19041158-02

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19041158

QC BATCH REPORT

Batch ID: R337759 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW-043019** Units: **mg/L** Analysis Date: **01-May-2019 21:32**
Client ID: Run ID: **ICS2100_337759** SeqNo: **5060505** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW2-043019** Units: **mg/L** Analysis Date: **01-May-2019 21:47**
Client ID: Run ID: **ICS2100_337759** SeqNo: **5060506** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.86	0.500	20	0	99.3	80 - 120				
Sulfate	19.62	0.500	20	0	98.1	80 - 120				

LCSD Sample ID: **WLCSDW2-043019** Units: **mg/L** Analysis Date: **01-May-2019 22:02**
Client ID: Run ID: **ICS2100_337759** SeqNo: **5060507** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.1	0.500	20	0	101	80 - 120	19.86	1.21	20	
Sulfate	19.99	0.500	20	0	100.0	80 - 120	19.62	1.87	20	

MS Sample ID: **HS19041343-10MS** Units: **mg/L** Analysis Date: **02-May-2019 01:12**
Client ID: Run ID: **ICS2100_337759** SeqNo: **5060520** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	3619	5.00	100	3606	12.8	80 - 120				SEO
Sulfate	344.8	5.00	100	248.2	96.6	80 - 120				

MSD Sample ID: **HS19041343-10MSD** Units: **mg/L** Analysis Date: **02-May-2019 01:27**
Client ID: Run ID: **ICS2100_337759** SeqNo: **5060521** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	3567	5.00	100	3606	-38.8	80 - 120	3619	1.44	20	SEO
Sulfate	344.7	5.00	100	248.2	96.4	80 - 120	344.8	0.0528	20	

The following samples were analyzed in this batch: HS19041158-01

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ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: **HS19041158**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

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ALS Houston, US Date: 03-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19041158

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19041158-01	LH18/24-SP650_041719	Login	4/19/2019 3:03:49 PM	JRM	WET309
HS19041158-01	LH18/24-SP650_041719	Login	4/19/2019 3:03:49 PM	JRM	VOA166
HS19041158-02	Trip Blank	Login	4/19/2019 3:03:49 PM	JRM	VOA166

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ALS Houston, US Date: 03-May-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19041158
Date/Time Received: **18-Apr-2019 09:33**
Received by: **NDR**

Checklist completed by: *Jared R. Makan* eSignature 19-Apr-2019 Date
Reviewed by: *RJ Modashia* eSignature 19-Apr-2019 Date

Matrices: **Water**
Carrier name: **ALS Courier**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	0.5c/0.5c UC/C	IR11	
Cooler(s)/Kit(s):	42885		
Date/Time sample(s) sent to storage:	04/19/2019 15:34		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210, Houston, Tx. 77099 ATTN: R.J. Modashia

Page 1 of 1

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No.
NWO1312.0150.0
16.0001

Job:
GROUNDWATER TREATMENT PLANT
BI-WEEKLY SAMPLES

Prepared By:
Scott Beesinger

P.O Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC	Analyses: CHLORIDE, SULFATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_041719	Water	04/17/19 / 14:00		3	3		HCL	
LH18/24-SP650_041719	Water	04/17/19 / 14:00		1		1	NONE	
Trip Blank	Water	04/17/19		2	2		HCL	

HS19041158
Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Bi-Weekly Samples

Additional Remarks: **STANDARD TAT ON ALL PARAMETERS.**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	04/17/19	14:30	NR	04/18/19	09:33						

9For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
NR	4/18/19	09.33	4330 9532 5267	NR	4/19/19	07.23	0.5		IN OK

Remarks

CLP

Container 2 585

(Word) S:\U-ces\Forms\Chain of Custody - Bi\Weekly

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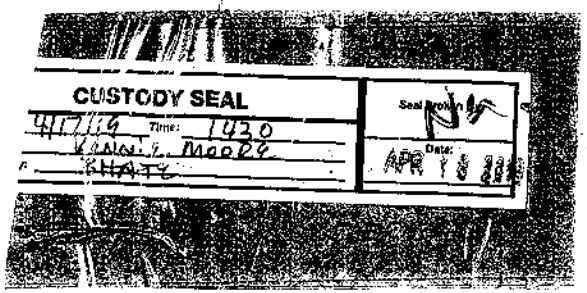

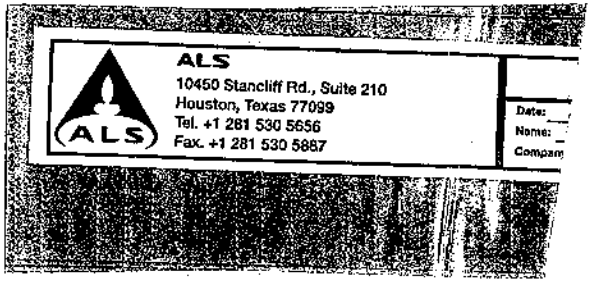

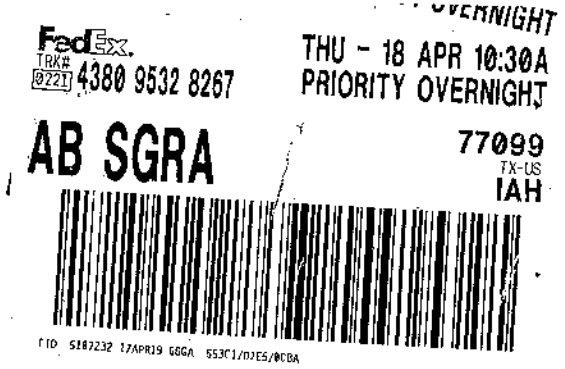

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ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19041072

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19041072-01	LH18/24-SP650_041719	Water		17-Apr-2019 14:00	18-Apr-2019 09:33	☐
HS19041072-02	LH18/24-SP650_041719_BIX	Water		17-Apr-2019 14:00	18-Apr-2019 09:33	☐

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order:

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

• The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA. Final Report attached.

WetChemistry by Method E350.3

Batch ID: R337210

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E365.3

Batch ID: R337124

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.

ANALYTICAL REPORT

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19041072

Sample ID: LH18/24-SP650_041719 Lab ID:HS19041072-01

Collection Date: 17-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: KVL
Nitrogen, Ammonia (As N)	**17**		**0.20**	**0.10**	**0.20**	**mg/L**	1	24-Apr-2019 12:20
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: KVL
Phosphorus, Total Orthophosphate (As P)	**4.37**		**0.100**	**0.200**	**0.250**	**mg/L**	10	18-Apr-2019 17:40
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	26-Apr-2019 17:59

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.

ANALYTICAL REPORT

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19041072

Sample ID: LH18/24-SP650_041719_BIX Lab ID:HS19041072-02

Collection Date: 17-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	25-Apr-2019 17:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19041072

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R337124	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3			**Matrix:** Water		
HS19041072-01	LH18/24-SP650_041719	17 Apr 2019 14:00			18 Apr 2019 17:40	10
Batch ID R337210	**Test Name :** AMMONIA AS N BY E350.3(ISE)			**Matrix:** Water		
HS19041072-01	LH18/24-SP650_041719	17 Apr 2019 14:00			24 Apr 2019 12:20	1
Batch ID R337297	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19041072-02	LH18/24-SP650_041719_BIX	17 Apr 2019 14:00			25 Apr 2019 17:26	1
Batch ID R337373	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS			**Matrix:** Water		
HS19041072-01	LH18/24-SP650_041719	17 Apr 2019 14:00			26 Apr 2019 17:59	1

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19041072

QC BATCH REPORT

Batch ID: R337124 (0) **Instrument: UV-2450** **Method: ORTHO PHOSPHATE (PO4) AS P BY E365.3**

MBLK Sample ID: **MBLK-R337124** Units: **mg/L** Analysis Date: **18-Apr-2019 17:40**
Client ID: Run ID: **UV-2450_337124** SeqNo: **5046437** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0200	0.0250								U

LCS Sample ID: **LCS-R337124** Units: **mg/L** Analysis Date: **18-Apr-2019 17:40**
Client ID: Run ID: **UV-2450_337124** SeqNo: **5046436** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.249	0.0250	0.25	0	99.6	85 - 115				

LCSD Sample ID: **LCSD-R337124** Units: **mg/L** Analysis Date: **18-Apr-2019 17:40**
Client ID: Run ID: **UV-2450_337124** SeqNo: **5046435** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.251	0.0250	0.25	0	100	85 - 115	0.249	0.8	20	

MS Sample ID: **HS19041082-01MS** Units: **mg/L** Analysis Date: **18-Apr-2019 17:40**
Client ID: Run ID: **UV-2450_337124** SeqNo: **5046439** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.311	0.0250	0.25	0.065	98.4	80 - 120				

MSD Sample ID: **HS19041082-01MSD** Units: **mg/L** Analysis Date: **18-Apr-2019 17:40**
Client ID: Run ID: **UV-2450_337124** SeqNo: **5046438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.316	0.0250	0.25	0.065	100	80 - 120	0.311	1.59	20	

The following samples were analyzed in this batch: HS19041072-01

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19041072

QC BATCH REPORT

Batch ID: R337210 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R337210** Units: **mg/L** Analysis Date: **24-Apr-2019 12:20**
Client ID: Run ID: **WetChem_HS_337210** SeqNo: **5048433** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R337210** Units: **mg/L** Analysis Date: **24-Apr-2019 12:20**
Client ID: Run ID: **WetChem_HS_337210** SeqNo: **5048429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	9.971	0.20	10	0	99.7	80 - 120				

MS Sample ID: **HS19041148-01MS** Units: **mg/L** Analysis Date: **24-Apr-2019 12:20**
Client ID: Run ID: **WetChem_HS_337210** SeqNo: **5048424** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	9.456	0.20	10	0.157	93.0	80 - 120				

MSD Sample ID: **HS19041148-01MSD** Units: **mg/L** Analysis Date: **24-Apr-2019 12:20**
Client ID: Run ID: **WetChem_HS_337210** SeqNo: **5048423** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	9.899	0.20	10	0.157	97.4	80 - 120	9.456	4.58	20	

The following samples were analyzed in this batch: HS19041072-01

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS19041072**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

ALS Houston, US Date: 29-Apr-19

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19041072

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19041072-01	LH18/24-SP650_041719	Login	4/18/2019 1:54:23 PM	NDR	WET270
HS19041072-01	LH18/24-SP650_041719	Login	4/18/2019 1:54:23 PM	NDR	WET270
HS19041072-01	LH18/24-SP650_041719	Login	4/18/2019 1:54:23 PM	NDR	Sub
HS19041072-02	LH18/24-SP650_041719_BIX	Login	4/18/2019 1:54:23 PM	NDR	Sub

00937912

ALS Houston, US Date: 29-Apr-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19041072
Date/Time Received: **18-Apr-2019 09:33**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 18-Apr-2019 Date
Reviewed by: *RJ Modashia* eSignature — 18-Apr-2019 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.5C uc/c	IR 11
Cooler(s)/Kit(s):	42885	
Date/Time sample(s) sent to storage:	04/18/2019 2:30PM	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes: Sample Bottle count does not match COC= 4 Rec'd = 5

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

00937913

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modshia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. NWO1312.0150.0 16.0001

Job: GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_041719	Water	04/17/19 / 14:00		2	X	X			H2SO4	
LH18/24-SP650_041719	Water	04/17/19 / 14:00		1			X		NONE	
LH18/24-SP650_041719_BIX	Water	04/17/19 / 14:00		1				X	NONE	

HS19041072
Bhate Environmental Associates, Inc.
LH18/24 Longhorn GW Treatment Plant Weekly Sar

Additional Remarks: **Standard TAT on all parameters**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	04/17/19	14:30	NR	04/18/19	09:33						

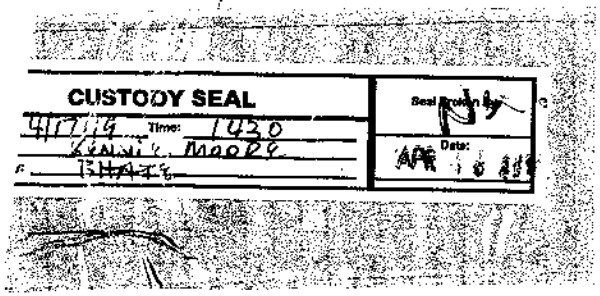
For Lab Use Only

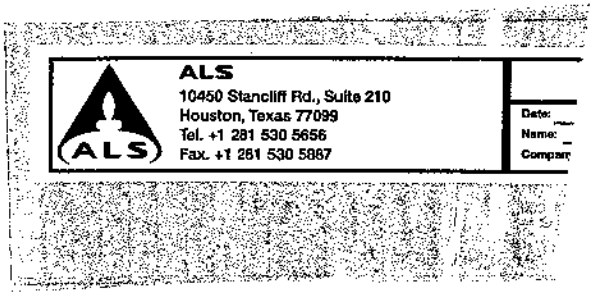
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
NR	4/18/19	09:33	4329 9532 9267	NR	4/18/19	09:33	0-5		W & W cliff 9

Remarks:

Cooler # 42585

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly


CUSTODY SEAL
Time: 1430
Date:
APR


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5867
Date:
Name:
Company

OVERNIGHT
FedEx
TRK# 0221 4380 9532 8267
THU - 18 APR 10:30A
PRIORITY OVERNIGHT
AB SGRA
77099
TX-US
IAH
FTO 5107232 17APR19 GGGA 5531/0765/0C8A

ALS Environmental
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April 26, 2019

Analytical Report for Service Request No: K1903542

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS19041072

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory April 19, 2019
For your reference, these analyses have been assigned our service request number **K1903542.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
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1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client: ALS Environmental - US
Project: HS19041072
Sample Matrix: Water

Service Request: K1903542
Date Received: 04/19/2019

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 04/19/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 04/26/2019

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
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K1903542

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Houston, TX 77099
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F: +1 281 530 5887
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Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **11163**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19041072
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19041072-01**	**LH18/24-SP650_041719**	**Water**	**17 Apr 2019 14:00**
	TOC Analysis for DOD Level IV			26 Apr 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 4/18/19 1800

Received By: K Monroe ALS Kelso Date/Time: 4/19/19 0952

Cooler ID(s): _____ Temperature(s): _____

00937924

PC KV

Cooler Receipt and Preservation Form

Client ALS-Houston Service Request K19 03542

Received: 4/19/19 Opened: 4/19/19 By: KM Unloaded: 4/19/19 By: [illegible]

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.3	-0.3	0.2	0.2	0	395	11163	480978329372	

4. Packing material: *Inserts* (*Baggies*) *Bubble Wrap* *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: RUSH

7/25/16 *Page* ____ *of* ____

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1903542
Project:	HS19041072	**Date Collected:**	04/17/19
Sample Matrix:	Water	**Date Received:**	04/19/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	MRL	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_041719	K1903542-001	**1.89**	0.50	0.07	1	04/25/19 15:43	
Method Blank	K1903542-MB	ND U	0.50	0.07	1	04/25/19 14:59	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1903542
Project	HS19041072	**Date Collected:**	04/17/19
Sample Matrix:	Water	**Date Received:**	04/19/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	MRL	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
LH18/24-SP650_041719	K1903542-001DUP	0.50	0.07	1.89	1.87	1.88	1	10	04/25/19

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1903542
Project:	HS19041072	**Date Collected:**	N/A
Sample Matrix:	Water	**Date Received:**	N/A
		Date Analyzed:	04/26/19
		Date Extracted:	NA

Duplicate Matrix Spike Summary
Carbon, Total Organic

Sample Name:	Batch QC	**Units:**	mg/L
Lab Code:	K1903601-008	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

		Matrix Spike			Duplicate Matrix Spike					
		K1903601-008MS			K1903601-008DMS					
Analyte Name	**Sample Result**	**Result**	**Spike Amount**	**% Rec**	**Result**	**Spike Amount**	**% Rec**	**% Rec Limits**	**RPD**	**RPD Limit**
Carbon, Total Organic	43.2	246	200	101	248	200	102	83-117	<1	10

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1903542
Project:	HS19041072	**Date Analyzed:**	04/25/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	632947

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1903542-LCS	26.3	25.0	105	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1903542
Project: HS19041072

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	632947	KQ1905282-36	04/25/19 14:30	25.0	25.8	103	90-110
CCV2	632947	KQ1905282-37	04/25/19 19:00	25.0	25.5	102	90-110
CCV3	632947	KQ1905282-38	04/25/19 23:56	25.0	25.6	102	90-110
CCV4	632947	KQ1905282-39	04/26/19 04:13	25.0	24.7	99	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1903542
Project: HS19041072

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	MRL	MDL	Result	Q
CCB1	632947	KQ1905282-30	04/25/19 14:45	0.50	0.07	ND	U
CCB2	632947	KQ1905282-31	04/25/19 19:00	0.50	0.07	ND	U
CCB3	632947	KQ1905282-32	04/26/19 00:11	0.50	0.07	ND	U
CCB4	632947	KQ1905282-33	04/26/19 04:28	0.50	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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General Chemistry

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Work Request # (Original) K1903542, 3517, 3498, 3409, 3601, 3613, 3624, 3648

Tier: IV I II II IV II II

Date Analyzed: 4/25/19

Analyst: BCD / CES

Run # 632947, 633273

Analysis: TOC

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	yes/no/NA
2.	Holding times met for all analyses and for all samples?	yes/no/NA
3.	Are calculations correct?	yes/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/NA
5.	All quality control criteria met?	yes/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	yes/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	yes/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	yes/no/NA
9.	Are results for methods blanks all ND?	yes/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/no/NA
11.	Are all exceptions explained?	yes/no/NA
12.	Have all applicable service requests been reviewed?	yes/no/NA
13.	Are all samples labeled correctly?	yes/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	yes/no/NA
15.	Are detection limits and units reported correctly?	yes/no/NA
16.	Is the unused space on the benchsheet crossed out?	yes/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/no/NA

COMMENTS:

3517-3 RPD not within acceptance limits. The sample result is less than 5x the MRL.

Final Approved by: [signature] Date: 04/26/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 632947 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1903409-002	Carbon, Total Organic	N/A		Water	4.24 mg/L	10 mL	424 mg/L	100	7	50			4/25/19 18:32:05	N	II
K1903409-003	Carbon, Total Organic	N/A		Water	3.46 mg/L	10 mL	346 mg/L	100	7	50			4/25/19 19:29:36	N	II
K1903409-004	Carbon, Total Organic	N/A		Water	3.57 mg/L	10 mL	357 mg/L	100	7	50			4/25/19 19:57:49	N	II
K1903498-001	Carbon, Total Organic	N/A		Water	7.35 mg/L	10 mL	14.7 mg/L	2	0.2	1.0			4/25/19 17:08:02	N	II
K1903498-002	Carbon, Total Organic	N/A		Water	0.95 mg/L	10 mL	0.95 mg/L	1	0.07	0.50			4/25/19 18:04:00	N	II
K1903517-003	Carbon, Total Organic	N/A		Drinking Water	0.54 mg/L	10 mL	0.54 mg/L	1	0.07	0.50			4/25/19 16:11:52	N	I
K1903517-004	Carbon, Total Organic	N/A		Drinking Water	0.21 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/25/19 16:39:53	N	I
K1903542-001	Carbon, Total Organic	N/A		Water	1.89 mg/L	10 mL	1.89 mg/L	1	0.07	0.50			4/25/19 15:43:47	N	IV
K1903601-002	Carbon, Total Organic	N/A		Water	3.92 mg/L	10 mL	3.92 mg/L	1	0.07	0.50			4/25/19 20:40:23	N	IV
K1903601-003	Carbon, Total Organic	N/A		Water	9.51 mg/L	10 mL	9.51 mg/L	1	0.07	0.50			4/25/19 21:08:24	N	IV
K1903601-004	Carbon, Total Organic	N/A		Water	12.62 mg/L	10 mL	12.6 mg/L	1	0.07	0.50			4/25/19 21:36:25	N	IV
K1903601-005	Carbon, Total Organic	N/A		Water	8.05 mg/L	10 mL	8.05 mg/L	1	0.07	0.50			4/25/19 22:04:29	N	IV
K1903601-006	Carbon, Total Organic	N/A		Water	8.62 mg/L	10 mL	8.62 mg/L	1	0.07	0.50			4/25/19 22:32:30	N	IV
K1903601-007	Carbon, Total Organic	N/A		Water	9.41 mg/L	10 mL	9.41 mg/L	1	0.07	0.50			4/25/19 23:00:26	N	IV
K1903601-008	Carbon, Total Organic	N/A		Water	10.80 mg/L	10 mL	43.2 mg/L	4	0.3	2.0			4/25/19 23:28:32	Y	IV
K1903613-001	Carbon, Total Organic	N/A		Water	8.39 mg/L	10 mL	8.39 mg/L	1	0.07	0.50			4/26/19 01:51:31	N	II
K1903624-001	Carbon, Total Organic	N/A		Water	6.89 mg/L	10 mL	689 mg/L	100	7	50			4/26/19 02:19:54	N	II
KQ1905282-10	Carbon, Total Organic	DUP	K1903542-001	Water	1.87 mg/L	10 mL	1.87 mg/L	1	0.07	0.50		1	4/25/19 15:43:47	N	IV
KQ1905282-11	Carbon, Total Organic	DUP	K1903517-003	Drinking Water	0.48 mg/L	10 mL	0.48 mg/L J	1	0.07	0.50		12*	4/25/19 16:11:52	N	I
KQ1905282-12	Carbon, Total Organic	DUP	K1903517-004	Drinking Water	0.22 mg/L	10 mL	0.22 mg/L J	1	0.07	0.50		NC	4/25/19 16:39:53	N	I
KQ1905282-13	Carbon, Total Organic	DUP	K1903498-001	Water	7.34 mg/L	10 mL	14.7 mg/L	2	0.2	1.0		<1	4/25/19 17:08:02	N	II
KQ1905282-14	Carbon, Total Organic	DUP	K1903498-002	Water	0.91 mg/L	10 mL	0.91 mg/L	1	0.07	0.50		4	4/25/19 18:04:00	N	II
KQ1905282-15	Carbon, Total Organic	DUP	K1903409-002	Water	4.31 mg/L	10 mL	431 mg/L	100	7	50		2	4/25/19 18:32:05	N	II
KQ1905282-16	Carbon, Total Organic	DUP	K1903409-003	Water	3.45 mg/L	10 mL	345 mg/L	100	7	50		<1	4/25/19 19:29:36	N	II
KQ1905282-17	Carbon, Total Organic	DUP	K1903409-004	Water	3.60 mg/L	10 mL	360 mg/L	100	7	50		<1	4/25/19 19:57:49	N	II
KQ1905282-19	Carbon, Total Organic	DUP	K1903601-002	Water	3.89 mg/L	10 mL	3.89 mg/L	1	0.07	0.50		<1	4/25/19 20:40:23	N	IV
KQ1905282-20	Carbon, Total Organic	DUP	K1903601-003	Water	9.55 mg/L	10 mL	9.55 mg/L	1	0.07	0.50		<1	4/25/19 21:08:24	N	IV
KQ1905282-21	Carbon, Total Organic	DUP	K1903601-004	Water	12.78 mg/L	10 mL	12.8 mg/L	1	0.07	0.50		1	4/25/19 21:36:25	N	IV
KQ1905282-22	Carbon, Total Organic	DUP	K1903601-005	Water	7.84 mg/L	10 mL	7.84 mg/L	1	0.07	0.50		3	4/25/19 22:04:29	N	IV
KQ1905282-23	Carbon, Total Organic	DUP	K1903601-006	Water	8.59 mg/L	10 mL	8.59 mg/L	1	0.07	0.50		<1	4/25/19 22:32:30	N	IV
KQ1905282-24	Carbon, Total Organic	DUP	K1903601-007	Water	9.31 mg/L	10 mL	9.31 mg/L	1	0.07	0.50		1	4/25/19 23:00:26	N	IV
KQ1905282-25	Carbon, Total Organic	DUP	K1903601-008	Water	10.92 mg/L	10 mL	43.7 mg/L	4	0.3	2.0		1	4/25/19 23:28:32	N	IV
KQ1905282-26	Carbon, Total Organic	DUP	K1903613-001	Water	8.45 mg/L	10 mL	8.45 mg/L	1	0.07	0.50		<1	4/26/19 01:51:31	N	II
KQ1905282-27	Carbon, Total Organic	DUP	K1903624-001	Water	6.95 mg/L	10 mL	695 mg/L	100	7	50		<1	4/26/19 02:19:54	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

04/26/19

Printed 4/26/19 11:51

Results Summary CES 4/26/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 632947 **Method/Testcode:** 415.1/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1905282-30	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/25/19 14:45:03	N	IV
KQ1905282-30	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/25/19 14:45:03	N	IV
KQ1905282-31	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/25/19 19:00:10	N	IV
KQ1905282-31	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/25/19 19:00:10	N	IV
KQ1905282-32	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/26/19 00:11:20	N	IV
KQ1905282-32	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/26/19 00:11:20	N	IV
KQ1905282-33	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/26/19 04:28:00	N	IV
KQ1905282-33	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/26/19 04:28:00	N	IV
KQ1905282-36	Carbon, Total Organic	CCV		Water	25.83 mg/L	10 mL	25.8 mg/L	1					4/25/19 14:30:17	N	IV
KQ1905282-36	Carbon, Total Organic	CCV		Water	25.83 mg/L	10 mL	25.8 mg/L	1					4/25/19 14:30:17	N	IV
KQ1905282-37	Carbon, Total Organic	CCV		Water	25.52 mg/L	10 mL	25.5 mg/L	1					4/25/19 19:00:10	N	IV
KQ1905282-37	Carbon, Total Organic	CCV		Water	25.52 mg/L	10 mL	25.5 mg/L	1					4/25/19 19:00:10	N	IV
KQ1905282-38	Carbon, Total Organic	CCV		Water	25.58 mg/L	10 mL	25.6 mg/L	1					4/25/19 23:56:37	N	IV
KQ1905282-38	Carbon, Total Organic	CCV		Water	25.58 mg/L	10 mL	25.6 mg/L	1					4/25/19 23:56:37	N	IV
KQ1905282-39	Carbon, Total Organic	CCV		Water	24.73 mg/L	10 mL	24.7 mg/L	1					4/26/19 04:13:24	N	IV
KQ1905282-39	Carbon, Total Organic	CCV		Water	24.73 mg/L	10 mL	24.7 mg/L	1					4/26/19 04:13:24	N	IV
KQ1905282-40	Carbon, Total Organic	LCS		Water	26.25 mg/L	10 mL	26.3 mg/L	1	0.07	0.50	105		4/25/19 15:14:26	N	IV
KQ1905282-40	Carbon, Total Organic	LCS		Water	26.25 mg/L	10 mL	26.3 mg/L	1	0.07	0.50	105		4/25/19 15:14:26	N	IV
KQ1905282-41	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/25/19 14:59:49	N	IV
KQ1905282-41	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/25/19 14:59:49	N	IV
KQ1905282-45	Carbon, Total Organic	MS	K1903601-008	Water	30.72 mg/L	10 mL	246 mg/L	8	0.6	4.0	101		4/26/19 00:55:18	N	IV
KQ1905282-46	Carbon, Total Organic	DMS	K1903601-008	Water	30.99 mg/L	10 mL	248 mg/L	8	0.6	4.0	102	<1	4/26/19 00:55:18	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 633273 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1903648-001	Carbon, Total Organic	N/A		Water	0.49 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/26/19 02:48:07	N	II
K1903648-002	Carbon, Total Organic	N/A		Water	0.63 mg/L	10 mL	0.63 mg/L	1	0.07	0.50			4/26/19 03:45:15	N	II
K1903648-003	Carbon, Total Organic	N/A		Water	0.54 mg/L	10 mL	0.54 mg/L	1	0.07	0.50			4/26/19 04:42:46	N	II
K1903648-004	Carbon, Total Organic	N/A		Water	0.55 mg/L	10 mL	0.55 mg/L	1	0.07	0.50			4/26/19 05:10:52	N	II
KQ1905407-01	Carbon, Total Organic	MS	K1903648-001	Water	26.12 mg/L	10 mL	26.1 mg/L	1	0.07	0.50	104		4/26/19 03:16:08	N	II
KQ1905407-02	Carbon, Total Organic	DUP	K1903648-001	Water	0.41 mg/L	10 mL	0.41 mg/L J	1	0.07	0.50		NC	4/26/19 02:48:07	N	II
KQ1905407-03	Carbon, Total Organic	DUP	K1903648-002	Water	0.67 mg/L	10 mL	0.67 mg/L	1	0.07	0.50		5	4/26/19 03:45:15	N	II
KQ1905407-04	Carbon, Total Organic	DUP	K1903648-003	Water	0.59 mg/L	10 mL	0.59 mg/L	1	0.07	0.50		8	4/26/19 04:42:46	N	II
KQ1905407-05	Carbon, Total Organic	DUP	K1903648-004	Water	0.54 mg/L	10 mL	0.54 mg/L	1	0.07	0.50		2	4/26/19 05:10:52	N	II
KQ1905407-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/26/19 00:11:20	N	II
KQ1905407-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/26/19 04:28:00	N	II
KQ1905407-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/26/19 05:53:37	N	II
KQ1905407-09	Carbon, Total Organic	CCV		Water	25.58 mg/L	10 mL	25.6 mg/L	1					4/25/19 23:56:37	N	II
KQ1905407-10	Carbon, Total Organic	CCV		Water	24.73 mg/L	10 mL	24.7 mg/L	1					4/26/19 04:13:24	N	II
KQ1905407-11	Carbon, Total Organic	CCV		Water	24.53 mg/L	10 mL	24.5 mg/L	1					4/26/19 05:38:56	N	II
KQ1905407-12	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			4/26/19 00:26:11	N	II
KQ1905407-13	Carbon, Total Organic	LCS		Water	25.32 mg/L	10 mL	25.3 mg/L	1	0.07	0.50	101		4/26/19 00:40:41	N	II

CES 4/26/19

04/26/19

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ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L		
CBA	RB	1			0.0000	0	<0.5		
2	C] CCV 25 ppm [25 p	1	25.827	0.0000	25.8272	25.8272	25.8	2:30:17	4/25/2019 PM
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	2:45:03	4/25/2019
4	MB1	1	0.000	0.0000	0.0000	0	<0.5	2:59:49	4/25/2019
5	[TOC] LCS [24ppm]	1	26.253	0.0000	26.2530	26.253	26.3	3:14:26	4/25/2019
6	K1903542-001	1	1.893	0.0000	1.8931	1.8931	1.89	3:43:47	4/25/2019
7	K1903542-001d	1	1.873	0.0000	1.8730	1.873	1.9	3:43:47	4/25/2019
8	K1903517-003	1	0.544	0.0000	0.5436	0.5436	1	4:11:52	4/25/2019
9	K1903517-003d	1	0.481	0.0000	0.4809	0.4809	<0.5	4:11:52	4/25/2019
10	K1903517-004	1	0.212	0.0000	0.2116	0.2116	<0.5	4:39:53	4/25/2019
11	K1903517-004d	1	0.218	0.0000	0.2183	0.2183	<0.5	4:39:53	4/25/2019
12	K1903498-001	2	7.349	0.0000	7.3485	14.697	14.70	5:08:02	4/25/2019
13	K1903498-001d	2	7.342	0.0000	7.3420	14.684	14.68	5:08:02	4/25/2019
14	K1903498-002	1	0.946	0.0000	0.9458	0.9458	0.95	6:04:00	4/25/2019
15	K1903498-002d	1	0.908	0.0000	0.9084	0.9084	0.9	6:04:00	4/25/2019
16	K1903409-002	100	4.236	0.0000	4.2355	423.55	423.6	6:52:05	4/25/2019
17	K1903409-002d	100	4.306	0.0000	4.3062	430.62	430.62	↓	4/25/2019
18	C] CCV 25 ppm [25 p	1	25.524	0.0000	25.5243	25.5243	25.5	7:00:10	4/25/2019
19	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	7:14:50	4/25/2019
20	K1903409-003	100	3.456	0.0000	3.4556	345.56	345.56	7:29:36	4/25/2019
21	K1903409-003d	100	3.454	0.0000	3.4544	345.44	345.44	↓	4/25/2019
22	K1903409-004	100	3.569	0.0000	3.5687	356.87	356.9	7:57:49	4/25/2019
23	K1903409-004d	100	3.597	0.0000	3.5965	359.65	359.7	↓	4/25/2019
24	K1903601-002	1	3.919	0.0000	3.9187	3.9187	3.92	8:40:23	4/25/2019
25	K1903601-002d	1	3.890	0.0000	3.8900	3.89	3.89	↓	4/25/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

			date	time
Analyzed By:	CES	Date Analyzed	4/25/19	14:30
Reviewed By:	[signature]	Date Reviewed	04/26/19	

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L		
26	K1903601-003	1	9.506	0.0000	9.5057	9.5057	9.51	9:08:24	4/25/2019
27	K1903601-003d	1	9.546	0.0000	9.5455	9.5455	9.55	↓	4/25/2019
28	K1903601-004	1	12.618	0.0000	12.6180	12.618	12.6	9:36:25	4/25/2019
29	K1903601-004d	1	12.780	0.0000	12.7796	12.7796	12.8	↓	4/25/2019
30	K1903601-005	1	8.050	0.0000	8.0497	8.0497	8.0	10:04:29	4/25/2019
31	K1903601-005d	1	7.838	0.0000	7.8383	7.8383	7.8	↓	4/25/2019
32	K1903601-006	1	8.620	0.0000	8.6200	8.62	8.6	10:32:30	4/25/2019
33	K1903601-006d	1	8.594	0.0000	8.5939	8.5939	8.6	↓	4/25/2019
34	K1903601-007	1	9.411	0.0000	9.4105	9.4105	9.4	11:00:26	4/25/2019
35	K1903601-007d	1	9.306	0.0000	9.3055	9.3055	9.3	↓	4/25/2019
36	K1903601-008	4	10.798	0.0000	10.7975	43.19	43.2	11:28:32	4/25/2019
37	K1903601-008d	4	10.921	0.0000	10.9210	43.684	43.7	11:28:32	4/25/2019
38	C] CCV 25 ppm [25 p	1	25.580	0.0000	25.5796	25.5796	25.6	11:56:37	4/25/2019
39	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	12:11:20	4/26/2019
40	K1903601-008ms	8	30.719	0.0000	30.7186	245.7488	245.7	12:55:18	4/26/2019
41	K1903601-008msd	8	30.995	0.0000	30.9947	247.9576	248.0	↓	4/26/2019
42	K1903613-001	1	8.395	0.0000	8.3945	8.3945	8.4	1:51:31	4/26/2019
43	K1903613-001d	1	8.447	0.0000	8.4469	8.4469	8.4	↓	4/26/2019
44	K1903624-001	100	6.892	0.0000	6.8924	689.24	689.2	2:19:54	4/26/2019
45	K1903624-001d	100	6.949	0.0000	6.9485	694.85	694.9	↓	4/26/2019
46	C] CCV 25 ppm [25 p	1	24.728	0.0000	24.7283	24.7283	24.7	4:13:24	4/26/2019
47	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	4:28:00	4/26/2019
~~48~~		1		0.0000	0.0000	0	<0.5		
49		1		0.0000	0.0000	0	<0.5		
~~50~~		1		0.0000	0.0000	0	<0.5		

PM ↓ AM

Analyzed By:	CES	Date Analyzed	4/25/19
Reviewed By:	[signature]	Date Reviewed	04/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	25.580	0.0000	25.5796	25.5796	25.6	11:56:37 4/25/2019 PM
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	12:11:20 4/26/2019 AM
4	MB2	1	0.000	0.0000	0.0000	0	<0.5	12:26:11 4/26/2019
5	[TOC] LCS [24ppm]	1	25.319	0.0000	25.3185	25.3185	25.3	12:40:41 4/26/2019
6	K1903648-001	1	0.487	0.0000	0.4865	0.4865	<0.5	2:48:07 4/26/2019
7	K1903648-001d	1	0.408	0.0000	0.4081	0.4081	<0.5	↓ 4/26/2019
8	K1903648-001ms	1	26.120	0.0000	26.1203	26.1203	26	3:16:08 4/26/2019
9	K1903648-002	1	0.631	0.0000	0.6314	0.6314	0.63	3:45:15 4/26/2019
10	K1903648-002d	1	0.667	0.0000	0.6668	0.6668	0.67	↓ 4/26/2019
11	C] CCV 25 ppm [25 p	1	24.728	0.0000	24.7283	24.7283	24.7	4:13:24 4/26/2019
12	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	4:28:00 4/26/2019
13	K1903648-003	1	0.544	0.0000	0.5436	0.5436	0.54	4:42:46 4/26/2019
14	K1903648-003d	1	0.589	0.0000	0.5886	0.5886	0.59	↓ 4/26/2019
15	K1903648-004	1	0.550	0.0000	0.5501	0.5501	0.6	5:10:52 4/26/2019
16	K1903648-004d	1	0.537	0.0000	0.5371	0.5371	0.5	↓ 4/26/2019
17	C] CCV 25 ppm [25 p	1	24.530	0.0000	24.5302	24.5302	24.53	5:38:56 4/26/2019
18	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5:53:37 4/26/2019
19		1		0.0000	0.0000	0	<0.5	
20		1		0.0000	0.0000	0	<0.5	
21		1		0.0000	0.0000	0	<0.5	
22		1		0.0000	0.0000	0	<0.5	
23		1		0.0000	0.0000	0	<0.5	
24		1		0.0000	0.0000	0	<0.5	
25		1		0.0000	0.0000	0	<0.5	

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: CES	Date Analyzed	4/25/19	11:56
Reviewed By:	Date Reviewed	04/26/19	

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

TOC: 632947, 633273

Schedule: 04252019

Version: 3
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/04/25 11:51 - Thursday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1903542-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1903517-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K1903517-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	K1903498-001.01 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1903498-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1903409-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1903409-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1903409-004.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
13	Sample	K1903601-002.09	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1903601-003.09	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1903601-004.09	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1903601-005.09	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1903601-006.09	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1903601-007.09	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1903601-008.10 4x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1903601-008.10 ms 8x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1903613-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1903624-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1903648-001.10	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1903648-001.10 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
27	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
28	Sample	K1903648-002.10	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1903648-003.10	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1903648-004.10	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

04/26/19

Fusion Report - 04252019
Thursday, April 25, 2019 11:41 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/04/26 09:38 - Friday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	04252019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3)		
Comment:			

Report Results

04/26/19

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/04/25 11:41

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	14.08	17.05	2.97	49.91	08:00
2	TC Clean	6.32	9.27	2.95	49.71	07:16
3	TC Clean	3.12	5.99	2.87	49.71	07:01
4	TC Clean	2.05	4.73	2.68	49.72	07:01

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/04/25 12:15

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.70	3.72	3.02	49.87	08:00
2	TC Clean	5.21	8.07	2.85	49.66	07:18
3	TC Clean	1.99	4.86	2.87	49.65	07:02
4	TC Clean	1.51	4.36	2.85	49.63	07:01

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/04/25 12:49

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.04	3.73	2.68	49.78	08:00
2	TC Clean	4.60	7.41	2.81	49.61	07:16
3	TC Clean	2.00	4.89	2.89	49.60	07:02
4	TC Clean	1.68	4.53	2.85	49.58	07:01

Sample Type: Blank (Creating v1250) — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2019/04/25 13:24

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.84	3.63	2.79	49.74	07:58
2	TC Clean	5.11	7.75	2.65	49.58	07:16
3	TC Clean	2.08	4.82	2.74	49.56	07:00
4	TC Clean	1.72	4.59	2.87	49.54	07:04
5	Reagent Blank	6.96	9.69	2.73	49.56	08:11
6	Acid Blank	1.41	4.26	2.85	49.72	08:01

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.1962 ppm	0.0000 ppm	0.0000%	2019/04/25 14:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1962	1.9624	10.31	13.20	2.89	49.72	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.8272 ppm (PASS)	0.0000 ppm	0%	2019/04/25 14:30

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.8272	258.2720	184.78	187.52	2.74	49.68	10:31

Completion State: Success - Criteria met.
Success Action: Do Nothing
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)
STD Conc - Pos B: 50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/04/25 14:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.85	10.69	2.84	49.81	10:29

Completion State: Success - Criteria met.
Success Action: Do Nothing
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)
STD Conc - Pos D: 0 ppmC

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/04/25 14:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.17	9.89	2.72	49.73	10:31

Dilution: 1:10
Blank Contribution: (TC) 8.9799 (IC) (v1250)
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	26.2530 ppm (PASS)	0.0000 ppm	0%	2019/04/25 15:14

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

	Type									
C	TOC	25.0 ppm	1	26.2530	262.5296	187.67	190.55	2.89	49.74	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.1319 ppm	0.0000 ppm	0.0000%	2019/04/25 15:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1319	1.3187	9.88	12.72	2.84	49.75	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K1903542-001.01	1.8831 ppm	0.0142 ppm	0.7500%	2019/04/25 15:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8931	18.9308	21.83	24.66	2.83	49.86	10:29
2	TOC	1.8730	18.7304	21.69	24.54	2.84	49.75	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1903517-003.01	0.5122 ppm	0.0444 ppm	8.6600%	2019/04/25 16:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5436	5.4362	12.67	15.37	2.70	49.84	10:28
2	TOC	0.4809	4.8087	12.24	14.97	2.72	49.77	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K1903517-004.01	0.2150 ppm	0.0048 ppm	2.2300%	2019/04/25 16:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2116	2.1157	10.42	13.16	2.74	49.83	10:28
2	TOC	0.2183	2.1834	10.46	13.37	2.91	49.76	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC)	CAS_salt_010711	CAS_salt_010711

(v1250) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1903498-001.01 2x	7.3452 ppm	0.0046 ppm	0.0600%	2019/04/25 17:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.3485	73.4849	58.86	61.69	2.83	49.84	10:28
2	TOC	7.3420	73.4200	58.82	61.68	2.87	49.78	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/04/25 17:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.03	9.88	2.85	49.80	10:29
2	TOC	0.0000	0.0000	7.12	9.99	2.88	49.77	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1903498-002.01	0.9271 ppm	0.0265 ppm	2.8500%	2019/04/25 18:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9458	9.4581	15.40	18.24	2.84	49.76	10:33
2	TOC	0.9084	9.0839	15.15	17.98	2.83	49.73	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1903409-002.01 100x	4.2708 ppm	0.0500 ppm	1.1700%	2019/04/25 18:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.2355	42.3547	37.73	40.52	2.79	49.71	10:28
2	TOC	4.3062	43.0618	38.21	41.01	2.80	49.71	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.5243 ppm (PASS)	0.0000 ppm	0%	2019/04/25 19:00

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.5243	255.2431	182.72	185.57	2.85	49.70	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/04/25 19:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.07	9.93	2.86	49.69	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K1903409-003.01 100x	3.4550 ppm	0.0008 ppm	0.0200%	2019/04/25 19:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.4556	34.5555	32.44	35.35	2.91	49.69	10:28
2	TOC	3.4544	34.5438	32.43	35.32	2.89	49.69	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K1903409-004.01 100x	3.5826 ppm	0.0197 ppm	0.5500%	2019/04/25 19:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5687	35.6870	33.20	36.09	2.89	49.71	10:30
2	TOC	3.5965	35.9654	33.39	36.32	2.93	49.73	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/04/25 20:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.58	9.41	2.83	49.73	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1903601-002.09	3.9044 ppm	0.0203 ppm	0.5200%	2019/04/25 20:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9187	39.1873	35.58	38.50	2.92	49.73	10:29
2	TOC	3.8900	38.9000	35.38	38.25	2.87	49.74	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1903601-003.09	9.5256 ppm	0.0281 ppm	0.3000%	2019/04/25 21:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.5057	95.0569	73.50	76.49	2.98	49.74	10:27
2	TOC	9.5455	95.4547	73.77	76.68	2.90	49.75	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1903601-004.09	12.6988 ppm	0.1143 ppm	0.9000%	2019/04/25 21:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.6180	126.1798	94.63	97.61	2.98	49.78	10:27
2	TOC	12.7796	127.7959	95.73	98.51	2.79	49.79	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1903601-005.09	7.9440 ppm	0.1495 ppm	1.8800%	2019/04/25 22:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.0497	80.4973	63.62	66.42	2.80	49.81	10:26
2	TOC	7.8383	78.3833	62.19	64.88	2.69	49.81	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1903601-006.09	8.6070 ppm	0.0184 ppm	0.2100%	2019/04/25 22:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.6200	86.2001	67.49	70.31	2.82	49.85	10:24
2	TOC	8.5939	85.9393	67.32	69.96	2.64	49.85	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K1903601-007.09	9.3580 ppm	0.0743 ppm	0.7900%	2019/04/25 23:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.4105	94.1053	72.86	75.84	2.99	49.86	10:31
2	TOC	9.3055	93.0549	72.15	75.13	2.98	49.88	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K1903601-008.10 4x	10.8593 ppm	0.0873 ppm	0.8000%	2019/04/25 23:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.7975	107.9754	82.27	85.11	2.84	49.89	10:29
2	TOC	10.9210	109.2100	83.11	86.05	2.94	49.90	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.5796 ppm (PASS)	0.0000 ppm	0%	2019/04/25 23:56

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.5796	255.7956	183.10	185.89	2.79	49.94	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria	Do Nothing	CAS_salt_010711	CAS_salt_010711	50 ppmC

met. (v4) (v30)

Sample Type: Check Standard --> CCB

From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/04/26 00:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.15	10.04	2.89	49.92	10:34

Completion State: Success - Criteria met.
Success Action: Do Nothing
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)
STD Conc - Pos D: 0 ppmC

Sample Type: Sample

From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/04/26 00:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.91	8.91	3.00	49.93	10:32

Dilution: 1:10
Blank Contribution: (TC) 8.9799 (IC) (v1250)
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS

From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.3185 ppm (PASS)	0.0000 ppm	0%	2019/04/26 00:40

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.3185	253.1850	181.32	184.00	2.68	49.98	10:31

Completion State: Success - Criteria met.
Success Action: Do Nothing
Method: CAS_salt_010711 (v4)
Calibration: CAS_salt_010711 (v30)
STD Conc - Pos C: 25 ppmC

Sample Type: Sample

From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◆	21	TOC	K1903601-008.10 ms 8x	30.8566 ppm	0.1952 ppm	0.6300%	2019/04/26 00:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	30.7186	307.1861	217.50	220.37	2.87	50.00	10:27
2	TOC	30.9947	309.9469	219.37	222.19	2.82	50.00	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/04/26 01:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.45	10.33	2.88	50.02	10:27
2	TOC	0.0000	0.0000	6.18	9.12	2.94	50.03	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	K1903613-001.01	8.4207 ppm	0.0371 ppm	0.4400%	2019/04/26 01:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.3945	83.9446	65.96	69.02	3.06	50.03	10:28
2	TOC	8.4469	84.4691	66.32	69.27	2.95	50.03	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	K1903624-001.01 100x	6.9204 ppm	0.0397 ppm	0.5700%	2019/04/26 02:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.8924	68.9238	55.76	58.68	2.92	50.07	10:31
2	TOC	6.9485	69.4851	56.15	59.21	3.07	50.05	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	K1903648-001.10	0.4473 ppm	0.0554 ppm	12.3900%	2019/04/26 02:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4865	4.8646	12.28	14.99	2.71	50.06	10:29
2	TOC	0.4081	4.0809	11.75	14.74	2.99	50.07	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1903648-001.10 ms	26.1203 ppm	0.0000 ppm	0.0000%	2019/04/26 03:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.1203	261.2031	186.28	189.06	2.78	50.08	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/04/26 03:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.17	9.07	2.90	50.09	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1903648-002.10	0.6491 ppm	0.0250 ppm	3.8500%	2019/04/26 03:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6314	6.3143	13.27	16.15	2.89	50.08	10:29
2	TOC	0.6668	6.6678	13.51	16.28	2.77	50.11	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.7283 ppm (PASS)	0.0000 ppm	0%	2019/04/26 04:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.7283	247.2834	177.32	180.14	2.82	50.17	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/04/26 04:28

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.85	8.73	2.88	50.11	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1903648-003.10	0.5661 ppm	0.0318 ppm	5.6100%	2019/04/26 04:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5436	5.4362	12.67	15.57	2.90	50.14	10:26
2	TOC	0.5886	5.8856	12.98	15.83	2.86	50.09	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K1903648-004.10	0.5436 ppm	0.0092 ppm	1.6900%	2019/04/26 05:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5501	5.5011	12.71	15.66	2.95	50.10	10:28
2	TOC	0.5371	5.3714	12.63	15.45	2.82	50.13	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9799 (IC) (v1250)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.5302 ppm (PASS)	0.0000 ppm	0%	2019/04/26 05:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5302	245.3020	175.97	179.03	3.06	50.09	10:28

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Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/04/26 05:53

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.89	8.75	2.86	50.15	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1249	2.9333	1.7730	0.0000	0.0000	0.0000	2019/04/24 12:54	Fusion1 (Fusion1)
v1250	2.3183	1.4080	0.0000	0.0000	0.0000	2019/04/25 14:15	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version:	v30	Calibration curve formula:	TOC: y = 6.788x + 9.463
Ver Creation:	2019/03/05 17:42	r^2 value:	TOC: r^2 = 0.99963
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44

00937955

5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4 Operator: Fusion1 (Fusion1)

Ver Creation: 2019/02/21 17:57

Comment:

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

00937956

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/04/26 06:09

StarLIMS Run: 632947, 633273

Analysis: TOC

Method: 415.1, SM 5310 C

CCV: 11-GEN-05-77C 50 ppm LCS: 11-GEN-05-77D 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

Spike ID: 11-GEN-05-70O 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-77M

21 % H3PO4: 11-GEN-05-77L

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: NA

Analyzed By: CES	Date Analyzed: 4/25/19
Reviewed By: [signature]	Date Reviewed: 04/26/19

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1910478; 1910480; 1910483; 1911288

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2241 (237388)

General Set Information: There were four field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1910480001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 649380) was less than 1/2 the CRDL. The recovery for the LCS (649381) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 1910837002/03 of Work Order 1910837. 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 649378) is reported from the analysis of the Laboratory Control Sample (LCS – 649381) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Thomas Bosch April 24, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: April 25, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1911288**
Project ID: HS19041072
Purchase Order: HS19041072
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_041719_BIX	1911288001	04/17/19	04/19/19	

ANALYTICAL REPORT

Workorder: 34-1911288
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_041719_BIX**
Lab ID: 1911288001
Matrix: Water
Sampling Site: NA
Media: 125 mL Nalgene
Sampling Parameter: NA
Collected: 04/17/2019
Received: 04/19/2019

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water
Batch: ELMS/2241 (HBN: 237388)
Analyzed: 04/23/2019 10:16
Instrument ID: LCMS04
Percent Solid: NA
Report Basis: Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 04/24/2019 07:51	/S/ Stephen Brose 04/25/2019 07:42

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1911288
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1911288

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2241 (HBN: 237388)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 649380
Analyzed: 04/23/2019 09:20
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 649381
Analyzed: 04/23/2019 08:53
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.01	4.00	100	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1910837001	**MS:**	1910837002	**MSD:**	1910837003
Analyzed:	04/23/2019 10:30	**Analyzed:**	04/23/2019 10:43	**Analyzed:**	04/23/2019 10:57
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.81	4	95.1	78.8	123.8	3.95	98.8	3.74	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
04/24/2019 07:52	04/25/2019 07:42

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

10450 Stancliff Rd, Ste 210
Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **11164**

1911288

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19041072
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19041072-02**	**LH18/24-SP650_041719_BIX**	**Water**	**17 Apr 2019 14:00**
	SUB_Perch-6850			26 Apr 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Modashia Date/Time: 4/18/19 18:20

Received By: _____ Date/Time: _____

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19041072	Split:	Workorder ID: 1911288	Level: ENV_LVL4	Requested Analysis
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly	
Comments:			Preservatives	
			COOL	
			Containers	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count	EPA 6850, DoD QSM
1	04/17/2019 14:00	LH18/24-SP650_041719_BIX	1911288001		Water	A	1	A
2								
3								
4								
5								
6								
7								
8								
9								
10								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath/Julie	04/19/2019 10:05	ALS Sample Receiving	Sample Login
Julie Worath	4/19/19 1410	STB	storage
R.33.1	4.22.19/13:05	T. Bosch	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 911288

Date/Time of Receipt: 19-Apr-2019 1005

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Location Temp Taken:	Cooler/Between Samples
Container Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA	VOA Headspace Present?	Yes/No/NA
	Frozen/Melted/NA		

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 93334	2.3 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Penny A. Foote (Signature) Penny A. Foote (Printed Name) 19-Apr-2019 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ No ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

00937967

Part # 159469-434 REV2 EXP 01/20

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 18APR19
ACTWGT: 9.65 LB
CAD: 3001307CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19041072 RJ

FedEx Express

TRK# 4809 7832 9383

TRI - 19 APR 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

RT 907
ST 22

5
15:00

A
9383
04.19

STODY SEAL

Time: 18:30

Date:

Batch Worklist

Batch: ELMS/ 2241 **Created:** 4/23/2019 07:43 **Instrument:** **HBN:** 237388

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1910478 [ENV_LVL4]
Workorder: 1910480 [ENV_LVL4]
Workorder: 1910483 [ENV_LVL4]
Workorder: 1910837 [ENV_LVL4]
Workorder: 1911288 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	649377	CCV for HBN 237388 [ELMS/2241]				CCV	3		E685041C3Q	5311		4/25/2019	
2	649378	RLVS for HBN 237388 [ELMS/2241				RLVS	3		E685041C3Q	5311		4/25/2019	
3	649379	ICS for HBN 237388 [ELMS/2241]				ICS	3		E6850..D3Q	5311		4/25/2019	
4	649380	LMB for HBN 237388 [ELMS/2241]				LMB	3		E6850Q413Q	5311		4/25/2019	
5	649381	LCS for HBN 237388 [ELMS/2241]				LCS	3		E6850Q413Q	5311		4/25/2019	
6	1910478001	LH18/24-SP650_041019_BIX				SAMPLE	3	1910478001-A	E6850Q41.3	5480	5/8/2019	4/25/2019	
7	1910480001	LH18/24-SP140_041019				SAMPLE	3	1910480001-A	E6850Q41.3	5480	5/8/2019	4/25/2019	
8	1910483001	LH18/24-SP650_041019_BIX				SAMPLE	3	1910483001-A	E6850Q41.3	5480	5/8/2019	4/25/2019	
9	1910837001	43MW01				SAMPLE	3	1910837001-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
10	1910837002	43MW01MS				MS	3	1910837002-A	E6850Q413Q	5480		4/25/2019	
11	1910837003	43MW01MSD				MSD	3	1910837003-A	E6850Q413Q	5480		4/25/2019	
12	1910837004	43MW03				SAMPLE	3	1910837004-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
13	1910837005	43MW04				SAMPLE	3	1910837005-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
14	1910837006	43MW05				SAMPLE	3	1910837006-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
15	1910837007	43MW06				SAMPLE	3	1910837007-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
16	649382	CCV for HBN 237388 [ELMS/2241]				CCV	3		E685041C3Q	5311		4/25/2019	
17	1910837008	DUP040919				FLDDUP	3	1910837008-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
18	1910837009	EB041019				EQBK	3	1910837009-A	E6850Q41.3	5480	5/8/2019	4/29/2019	
19	1911288001	LH18/24-SP650_041719_BIX				SAMPLE	3	1911288001-A	E6850Q41.3	5480	5/15/2019	5/2/2019	
20	649383	CCV for HBN 237388 [ELMS/2241]				CCV	3		E685041C3Q	5311		4/25/2019	

00937968

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1910478 (001); 1910480 (001); 1910483 (001); 1911288 (001); 1910837 (001-09) ELMS Batch/HBN ID: 2241 (237388)
Prep Date: 04/22/2019 Analysis Date: 04/23/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\APR\23APR19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by TNB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 41830 was used for LCS 649381; Target = 4.0µg/L. ASTM type II water was used for LMB 649380.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1910837002/03 (Client ID: 43MW01). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field sample 1910480001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\APR\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\237388-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 649378) is reported from the analysis of the Laboratory Control Sample (LCS – 649381) at a level 4.0µg/L.
6) Due to limitations of the Chemstation Software, many of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2241 HBN: 237388 Sample Set IDs if Applicable: 1910478 / 1910480 / 1910483 / 1910837 / 1911288	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SM
Standards traceability checked and meets criteria	TB	SM
Standard curve coefficients evaluated and meet criteria	TB	SM
ICVs analyzed and meet acceptance criteria	TB	SM
CCVs analyzed and meet acceptance criteria	TB	SM
Method Blanks analyzed and meet acceptance criteria	TB	SM
Retention Time Windows checked	TB	SM
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SM
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SM
RLVS analyzed	TB	SM
Preparation and analysis hold times met	TB	SM
Preparation deviations and re-preparations noted when performed	TB	SM
Analysis deviations and re-analyses noted when performed	TB	SM
Sample dilution factors noted on reports	TB	SM
Electronic records in HBN transcription accuracy and completeness checked	TB	SM
Preparation and analysis calculations checked	TB	SM
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SM
Manual integrations checked	TB	SM

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/18/2018 02:09PM	**Expires:** 09/18/2019
MFG Lot: TNB: 09/18/2018		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK	Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659	Created By: Thomas Bosch	Amount: 100 mL
MFG: AccuStandard	Create Date: 09/17/2018 09:09AM	Expires: 07/25/2020
MFG Lot: 218065075		Usable: No
Part ID: IC-PER-10X-1		Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109		Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House		Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided			Usable: Yes
Part ID: Not Provided			Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/18/2018 02:09PM	**Expires:** 09/18/2019
MFG Lot: TNB: 09/18/2018		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description: 6850 QC WKG STD 100ug/L

Standard: 41831
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
41830	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/09/2019

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 41830
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description -ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK Description: 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

AccuStandard®

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

AccuStandard

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	649377 CCV@25	Vial 71	1	Control	1	1.36054e6	8.855	24.00623
*	649381 QC@4.0	Vial 72	1	Control	2	2.53898e5	9.046	4.01121
*	649379 ICS@4.0	Vial 73	1	Control	3	1.82631e5	8.636	3.34158
*	649380 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1910478001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	1910480001 1K	Vial 76	1	Sample	6	3.37161e5	9.026	5552.18188
*	1910483001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1911288001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1910837001	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1910837002 MS	Vial 80	1	Sample	10	2.21785e5	9.050	3.80586
*	1910837003 MSD	Vial 81	1	Sample	11	2.20802e5	9.038	3.95111
*	1910837004	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1910837005	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1910837006	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	649382 CCV@25	Vial 71	1	Control	15	1.31128e6	8.938	24.26925
*	1910837007	Vial 85	1	Sample	16	6.42400e4	9.045	1.26400
*	1910837008	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1910837009	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1909952003 10K	Vial 88	1	Sample	19	5.40192e5	9.131	9.36492e4
*	649383 CCV@25	Vial 71	1	Control	20	1.31963e6	8.922	24.70624

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	649377 CCV@25	Vial 71	1	Control	1	4.18181e5	8.869	24.80861
*	649381 QC@4.0	Vial 72	1	Control	2	8.36399e4	9.058	4.29372
*	649379 ICS@4.0	Vial 73	1	Control	3	6.48502e4	8.654	3.82172
*	649380 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1910478001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	1910480001 1K	Vial 76	1	Sample	6	1.09251e5	9.041	5913.57786
*	1910483001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1911288001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1910837001	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1910837002 MS	Vial 80	1	Sample	10	7.41215e4	9.057	4.12337
*	1910837003 MSD	Vial 81	1	Sample	11	7.23834e4	9.061	4.20632
*	1910837004	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1910837005	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1910837006	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	649382 CCV@25	Vial 71	1	Control	15	4.00971e5	8.953	24.95975
*	1910837007	Vial 85	1	Sample	16	2.34854e4	9.061	1.36511
*	1910837008	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1910837009	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1909952003 10K	Vial 88	1	Sample	19	1.70464e5	9.151	9.83177e4
*	649383 CCV@25	Vial 71	1	Control	20	4.01823e5	8.937	25.30992

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	649377 CCV@25	Vial 71	1	Control	1	1.72840e5	8.867	5.00000
*	649381 QC@4.0	Vial 72	1	Control	2	2.08542e5	9.066	5.00000
*	649379 ICS@4.0	Vial 73	1	Control	3	1.81824e5	8.654	5.00000
*	649380 LMB	Vial 74	1	Control	4	2.16871e5	9.008	5.00000
*	1910478001	Vial 75	1	Sample	5	1.72857e5	8.404	5.00000
*	1910480001 1K	Vial 76	1	Sample	6	1.97149e5	9.050	5000.00000
*	1910483001	Vial 77	1	Sample	7	1.65412e5	8.420	5.00000
*	1911288001	Vial 78	1	Sample	8	1.81749e5	8.489	5.00000

Batch Report: C:\HPCHEM\1\DATA\23APR19D\23APR19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	1910837001	Vial 79	1	Sample	9	1.87599e5	9.028	5.00000
*	1910837002 MS	Vial 80	1	Sample	10	1.92507e5	9.073	5.00000
*	1910837003 MSD	Vial 81	1	Sample	11	1.84256e5	9.062	5.00000
*	1910837004	Vial 82	1	Sample	12	1.80138e5	8.810	5.00000
*	1910837005	Vial 83	1	Sample	13	1.97954e5	9.090	5.00000
*	1910837006	Vial 84	1	Sample	14	1.83017e5	9.051	5.00000
*	649382 CCV@25	Vial 71	1	Control	15	1.64671e5	8.965	5.00000
*	1910837007	Vial 85	1	Sample	16	1.84879e5	9.067	5.00000
*	1910837008	Vial 86	1	Sample	17	1.96777e5	8.752	5.00000
*	1910837009	Vial 87	1	Sample	18	1.91613e5	9.161	5.00000
*	1909952003 10K	Vial 88	1	Sample	19	1.83509e5	9.157	5.00000e4
*	649383 CCV@25	Vial 71	1	Control	20	1.62618e5	8.942	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\APR\23APR19D.S

Sequence Table:

Method and Injection Info Part:

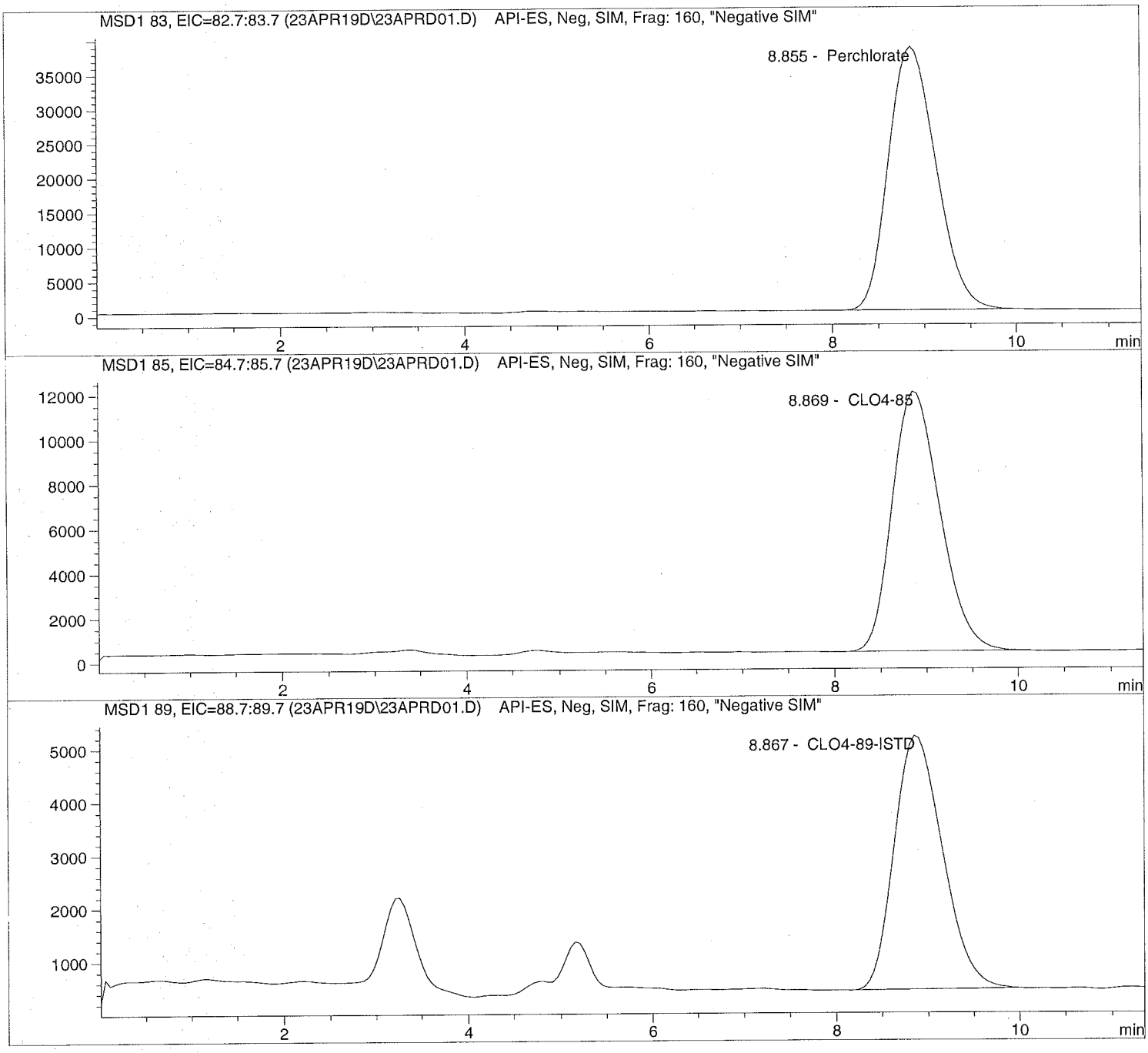
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	649377	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	649381	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	649379	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	649380	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1910478001		CLO4-AQN	1	Sample		
6	Vial 76	1910480001	1K	CLO4-AQN	1	Sample		
7	Vial 77	1910483001		CLO4-AQN	1	Sample		
8	Vial 78	1911288001		CLO4-AQN	1	Sample		
9	Vial 79	1910837001		CLO4-AQN	1	Sample		
10	Vial 80	1910837002	MS	CLO4-AQN	1	Sample		
11	Vial 81	1910837003	MSD	CLO4-AQN	1	Sample		
12	Vial 82	1910837004		CLO4-AQN	1	Sample		
13	Vial 83	1910837005		CLO4-AQN	1	Sample		
14	Vial 84	1910837006		CLO4-AQN	1	Sample		
15	Vial 71	649382	CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1910837007		CLO4-AQN	1	Sample		
17	Vial 86	1910837008		CLO4-AQN	1	Sample		
18	Vial 87	1910837009		CLO4-AQN	1	Sample		
19	Vial 71	649383	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD01.D Sample Name: 649377 CCV@25

Injection Date:	4/23/2019 08:37:56	Seq Line:	1
Sample Name:	649377 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD01.D Sample Name: 649377 CCV@25

Injection Date:	4/23/2019 08:37:56	Seq Line:	1
Sample Name:	649377 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.855	PBA	1360543.6	24.0062	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.869	PBA	418181.2	24.8086	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.867	PBA	172839.5	5.0000	CLO4-89-ISTD

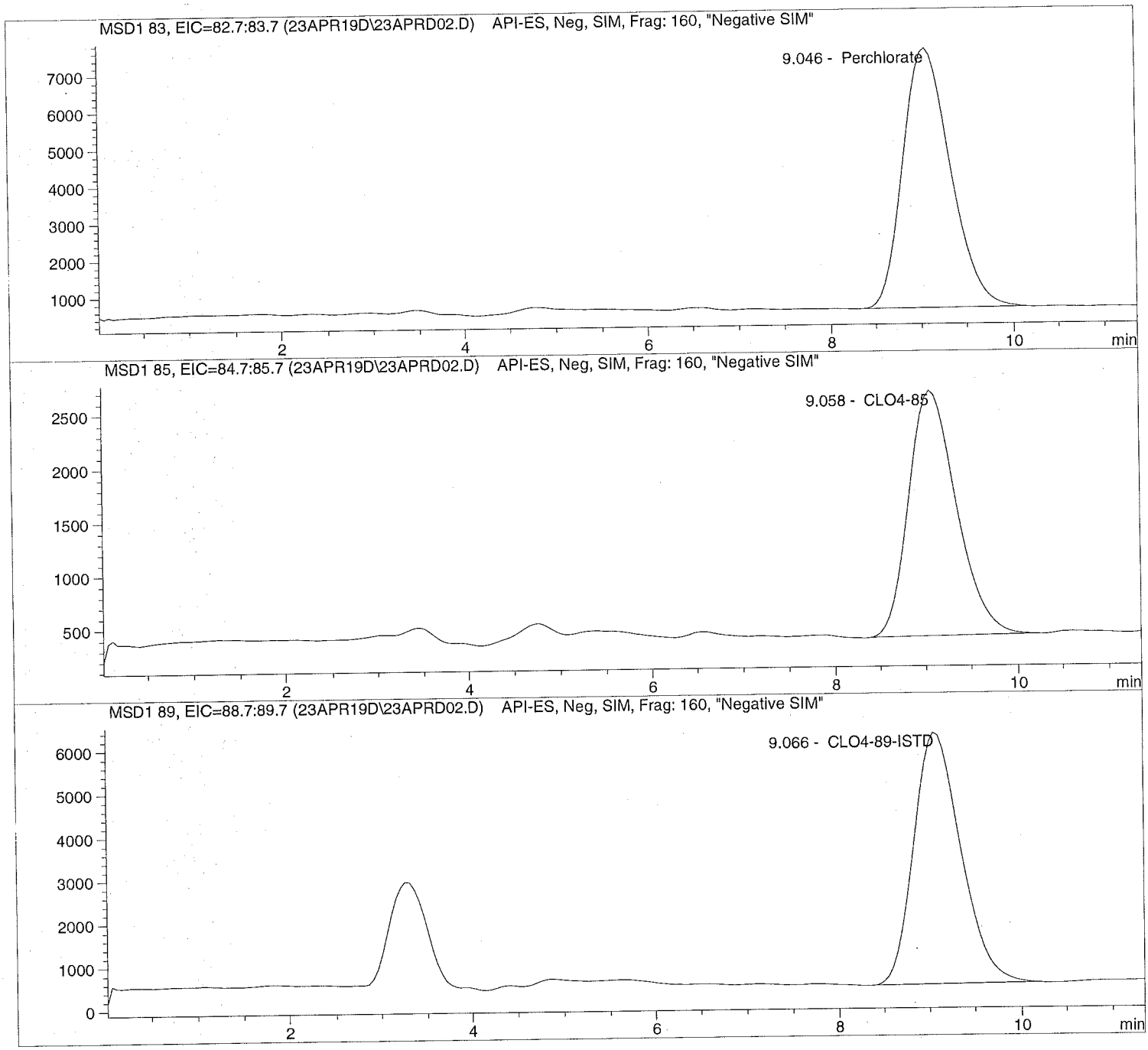
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD02.D Sample Name: 649381 QC@4.0

Injection Date:	4/23/2019 08:53:38	Seq Line:	2
Sample Name:	649381 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD02.D Sample Name: 649381 QC@4.0

Injection Date:	4/23/2019 08:53:38	Seq Line:	2
Sample Name:	649381 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.046	PBA	253897.8	4.0112	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.058	PBA	83639.9	4.2937	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.066	PBA	208541.6	5.0000	CLO4-89-ISTD

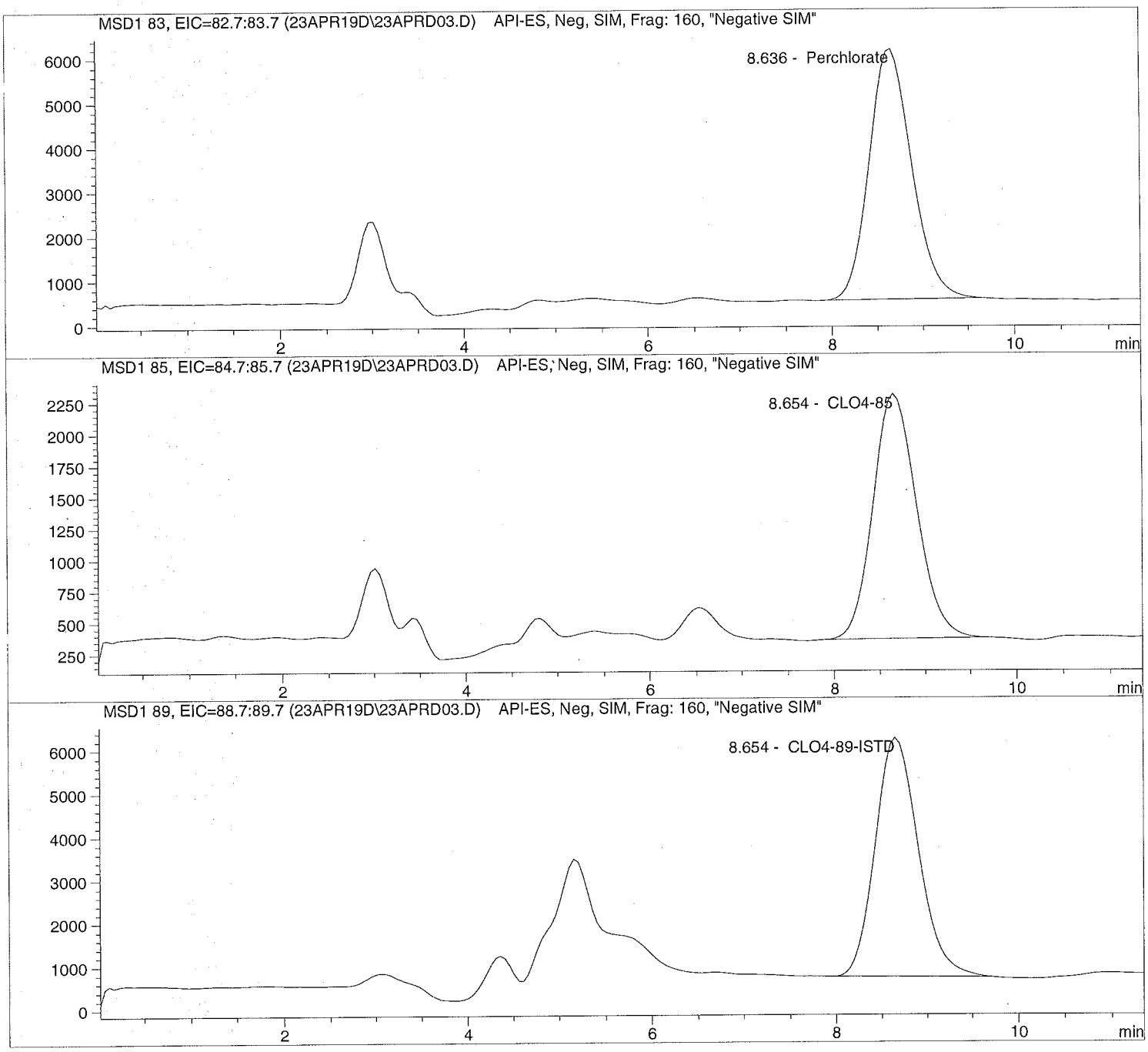
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD03.D Sample Name: 649379 ICS@4.0

Injection Date:	4/23/2019 09:07:01	Seq Line:	3
Sample Name:	649379 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD03.D Sample Name: 649379 ICS@4.0

Injection Date:	4/23/2019 09:07:01	Seq Line:	3
Sample Name:	649379 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.636	PBA	182630.9	3.3416	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.654	PBA	64850.2	3.8217	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.654	PBA	181823.6	5.0000	CLO4-89-ISTD

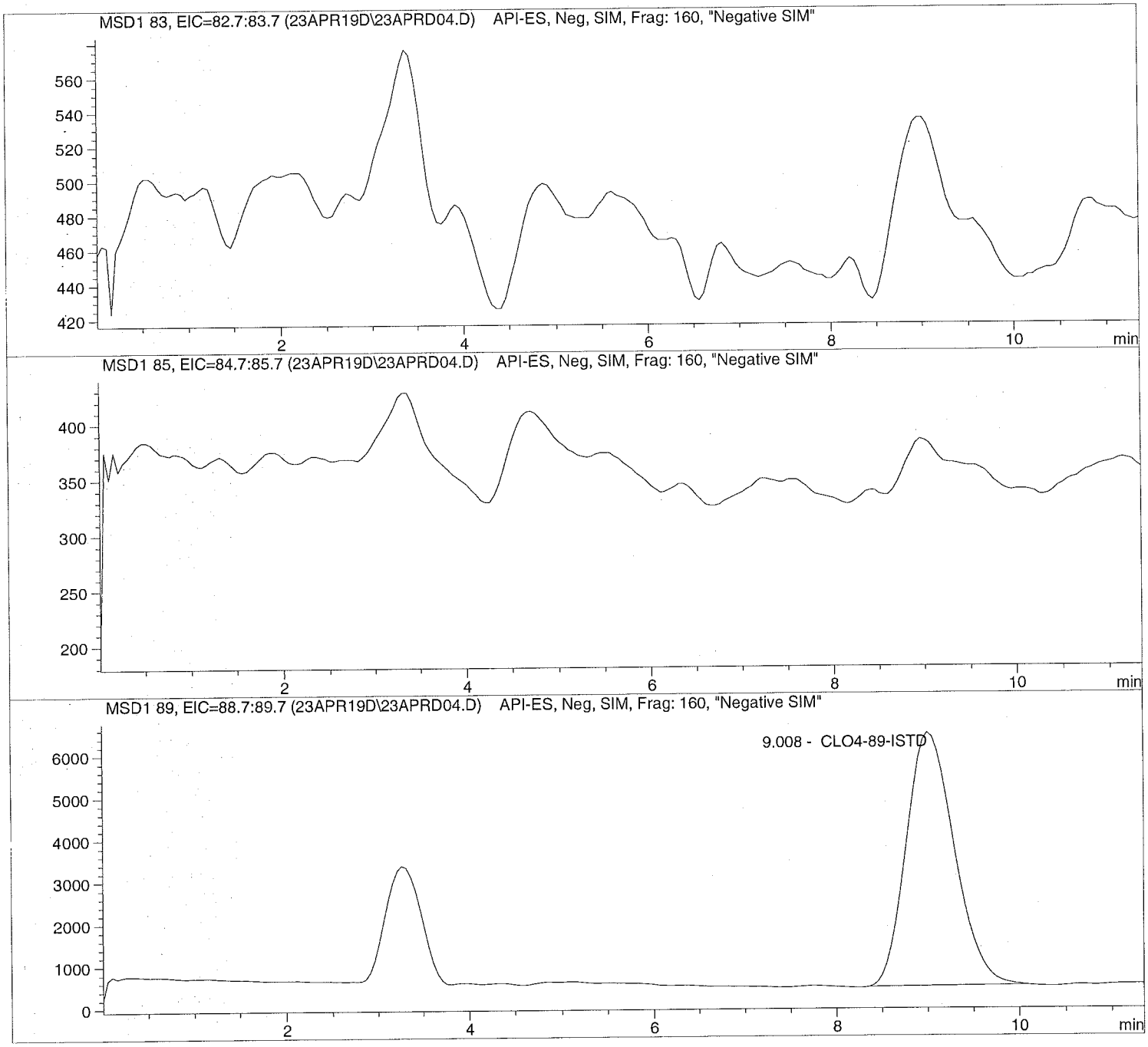
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD04.D Sample Name: 649380 LMB

Injection Date:	4/23/2019 09:20:26	Seq Line:	4
Sample Name:	649380 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD04.D Sample Name: 649380 LMB

Injection Date:	4/23/2019 09:20:26	Seq Line:	4
Sample Name:	649380 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.008	PBA	216871.1	5.0000	CLO4-89-ISTD

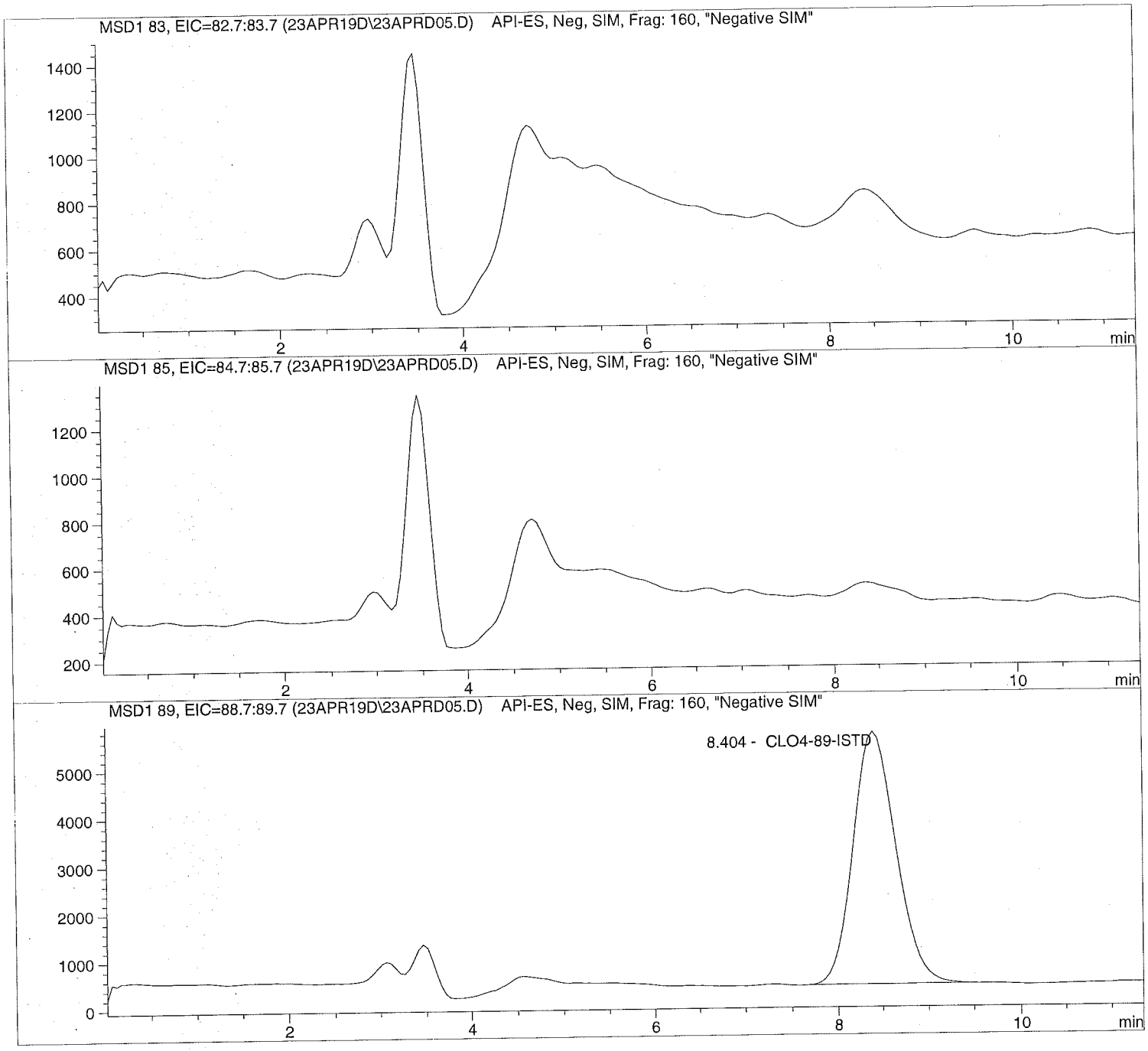
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD05.D Sample Name: 1910478001

Injection Date:	4/23/2019 09:36:37	Seq Line:	5
Sample Name:	1910478001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD05.D Sample Name: 1910478001

Injection Date:	4/23/2019 09:36:37	Seq Line:	5
Sample Name:	1910478001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.404	PBA	172857.1	5.0000	CLO4-89-ISTD

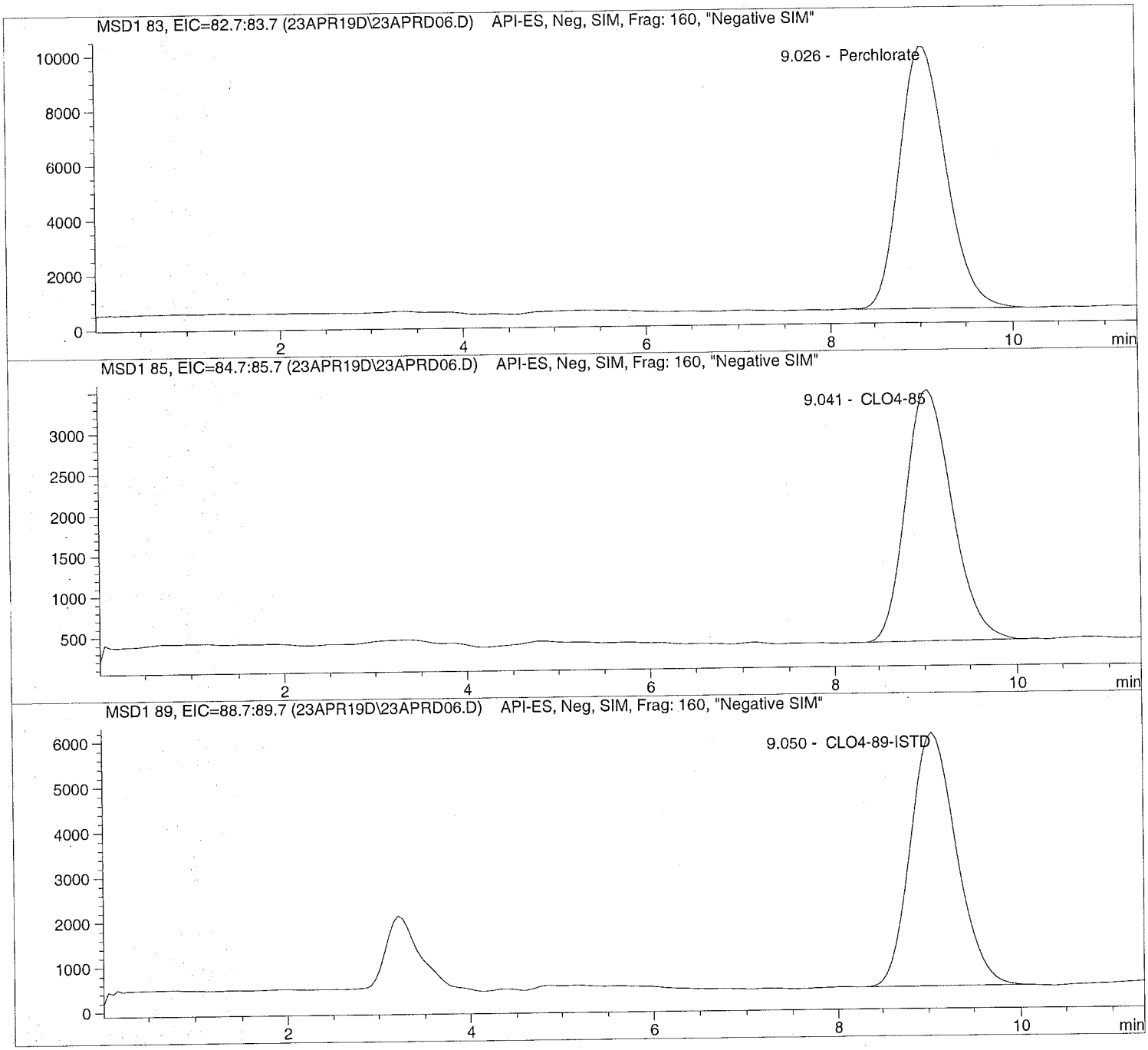
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD06.D Sample Name: 1910480001 1K

Injection Date:	4/23/2019 09:49:59	Seq Line:	6
Sample Name:	1910480001 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD06.D Sample Name: 1910480001 1K

Injection Date:	4/23/2019 09:49:59	Seq Line:	6
Sample Name:	1910480001 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.026	BBA	337160.7	5552.1819	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.041	PBA	109251.5	5913.5779	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.050	PBA	197148.5	5000.0000	CLO4-89-ISTD

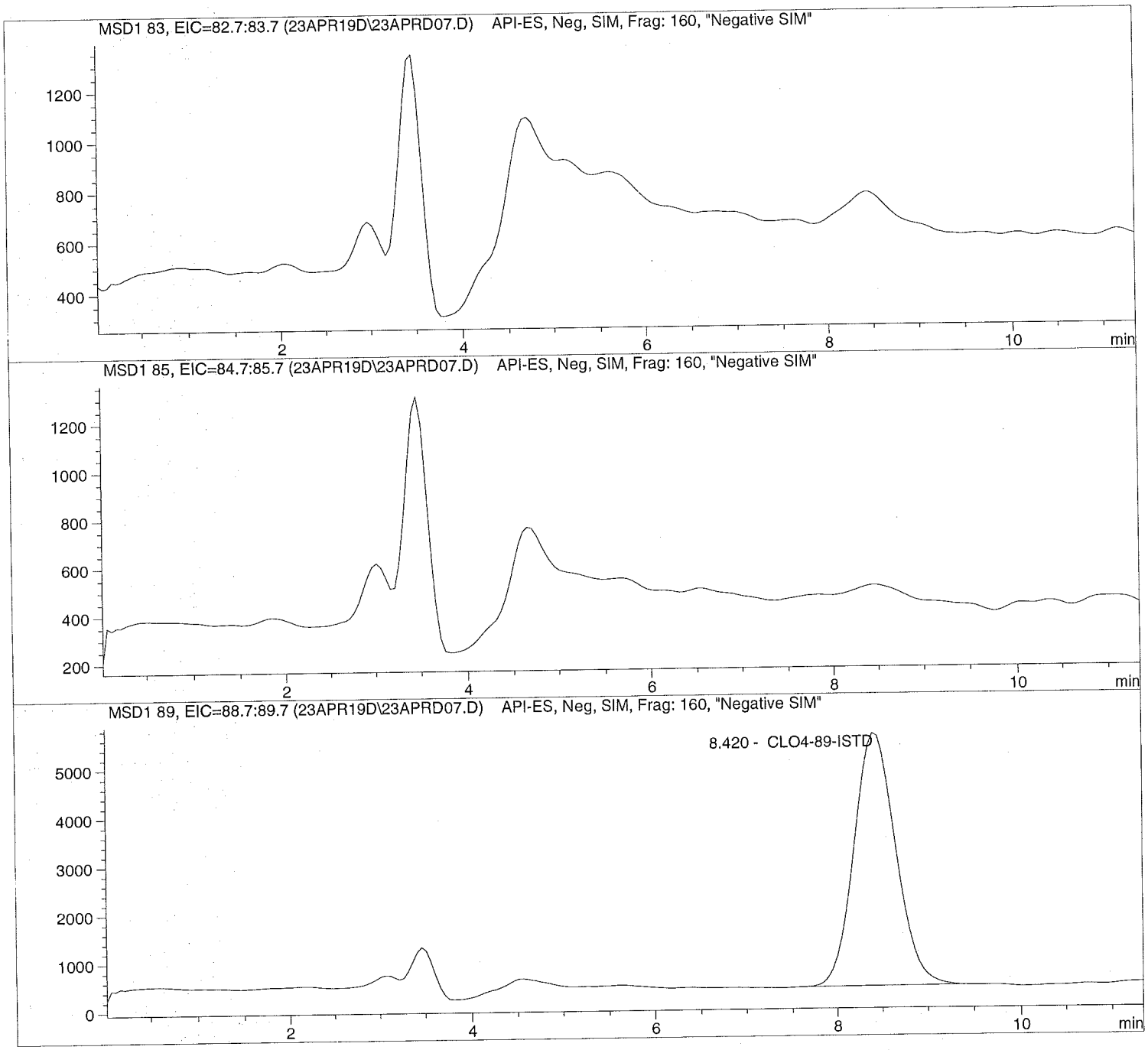
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD07.D Sample Name: 1910483001

Injection Date:	4/23/2019 10:03:26	Seq Line:	7
Sample Name:	1910483001	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD07.D Sample Name: 1910483001

Injection Date:	4/23/2019 10:03:26	Seq Line:	7
Sample Name:	1910483001	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.420	PBA	165412.1	5.0000	CLO4-89-ISTD

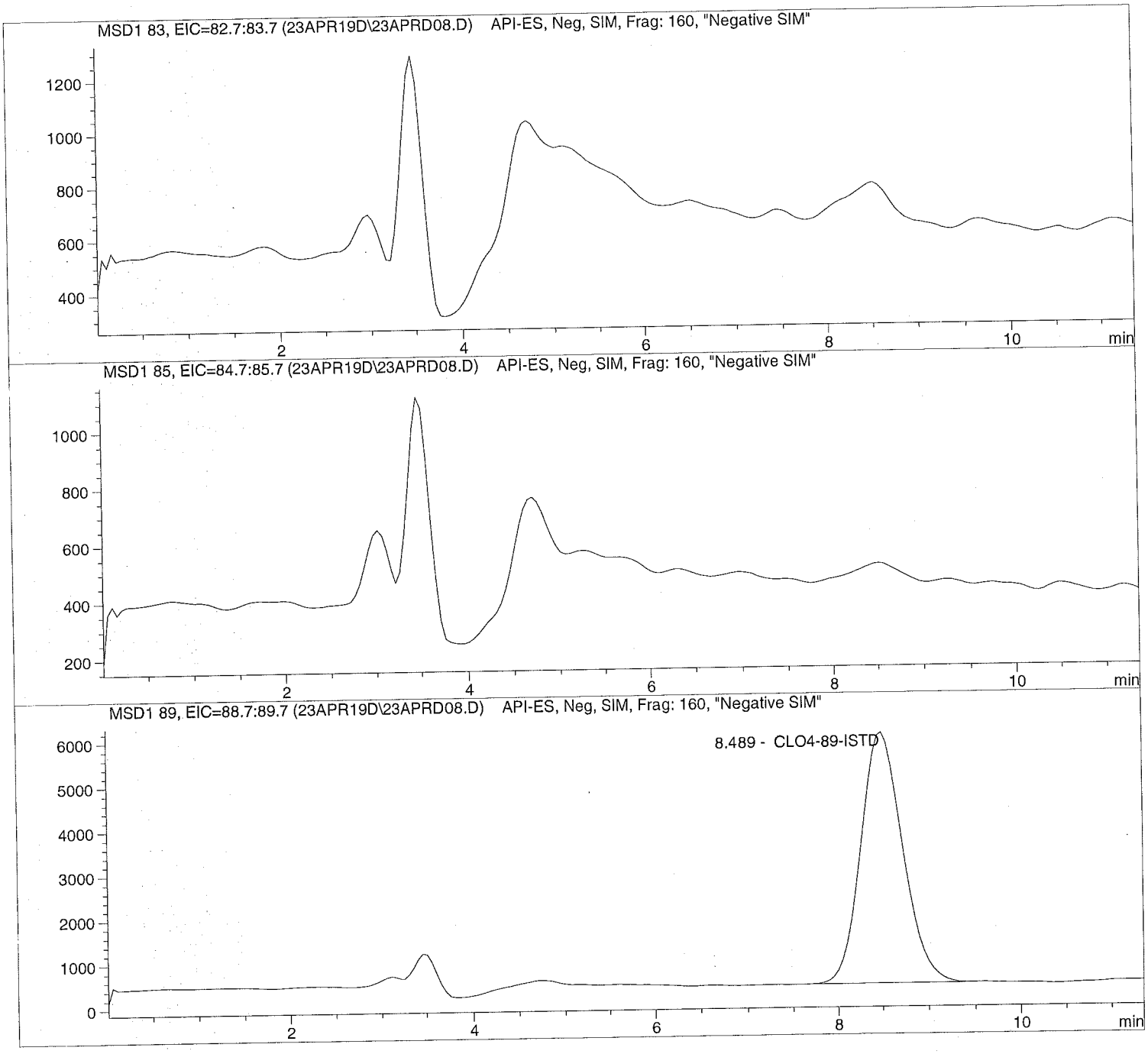
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD08.D Sample Name: 1911288001

Injection Date:	4/23/2019 10:16:48	Seq Line:	8
Sample Name:	1911288001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD08.D Sample Name: 1911288001

Injection Date:	4/23/2019 10:16:48	Seq Line:	8
Sample Name:	1911288001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.489	BBA	181749.4	5.0000	CLO4-89-ISTD

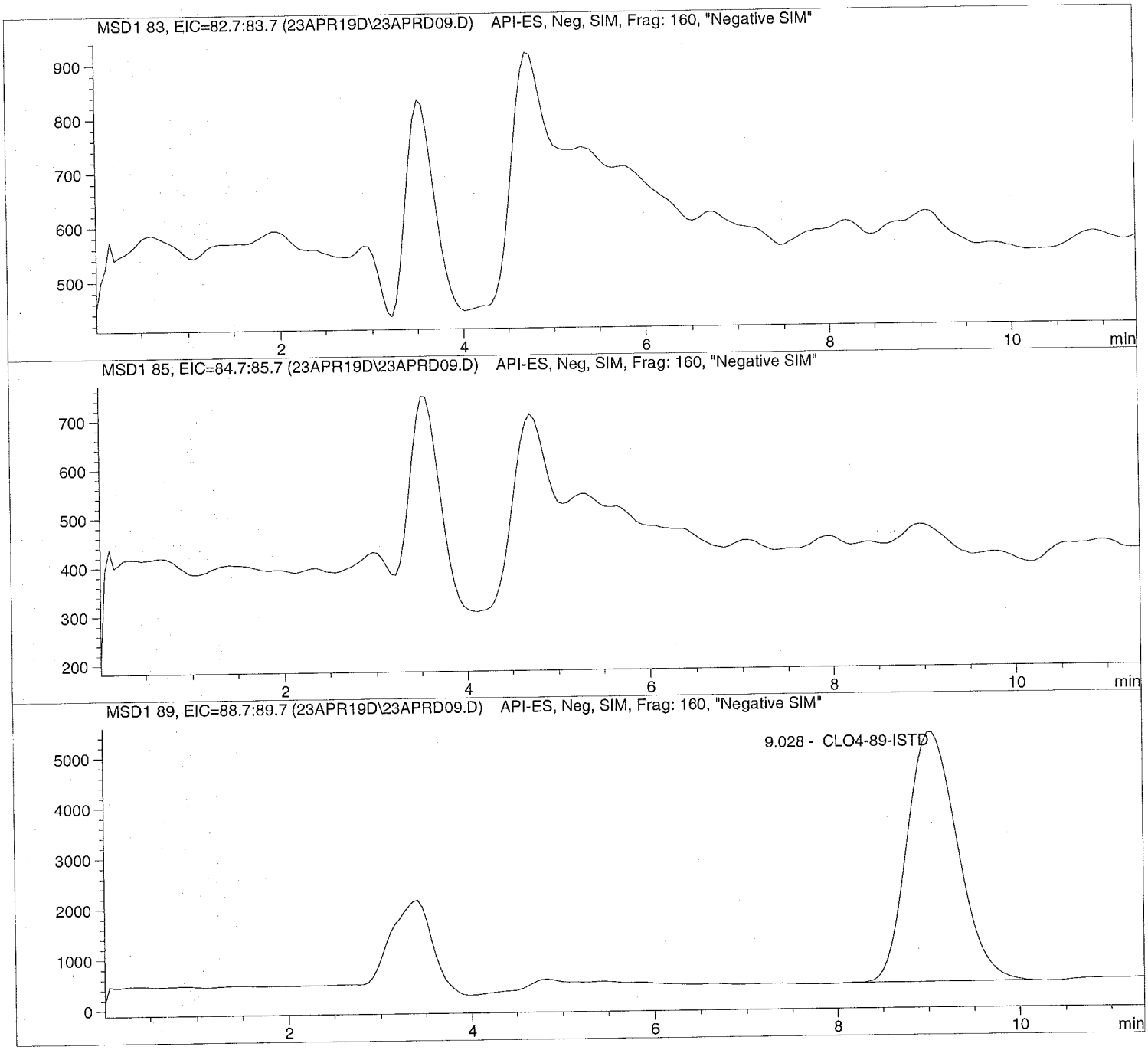
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD09.D Sample Name: 1910837001

Injection Date:	4/23/2019 10:30:16	Seq Line:	9
Sample Name:	1910837001	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD09.D Sample Name: 1910837001

Injection Date:	4/23/2019 10:30:16	Seq Line:	9
Sample Name:	1910837001	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.028	BBA	187599.0	5.0000	CLO4-89-ISTD

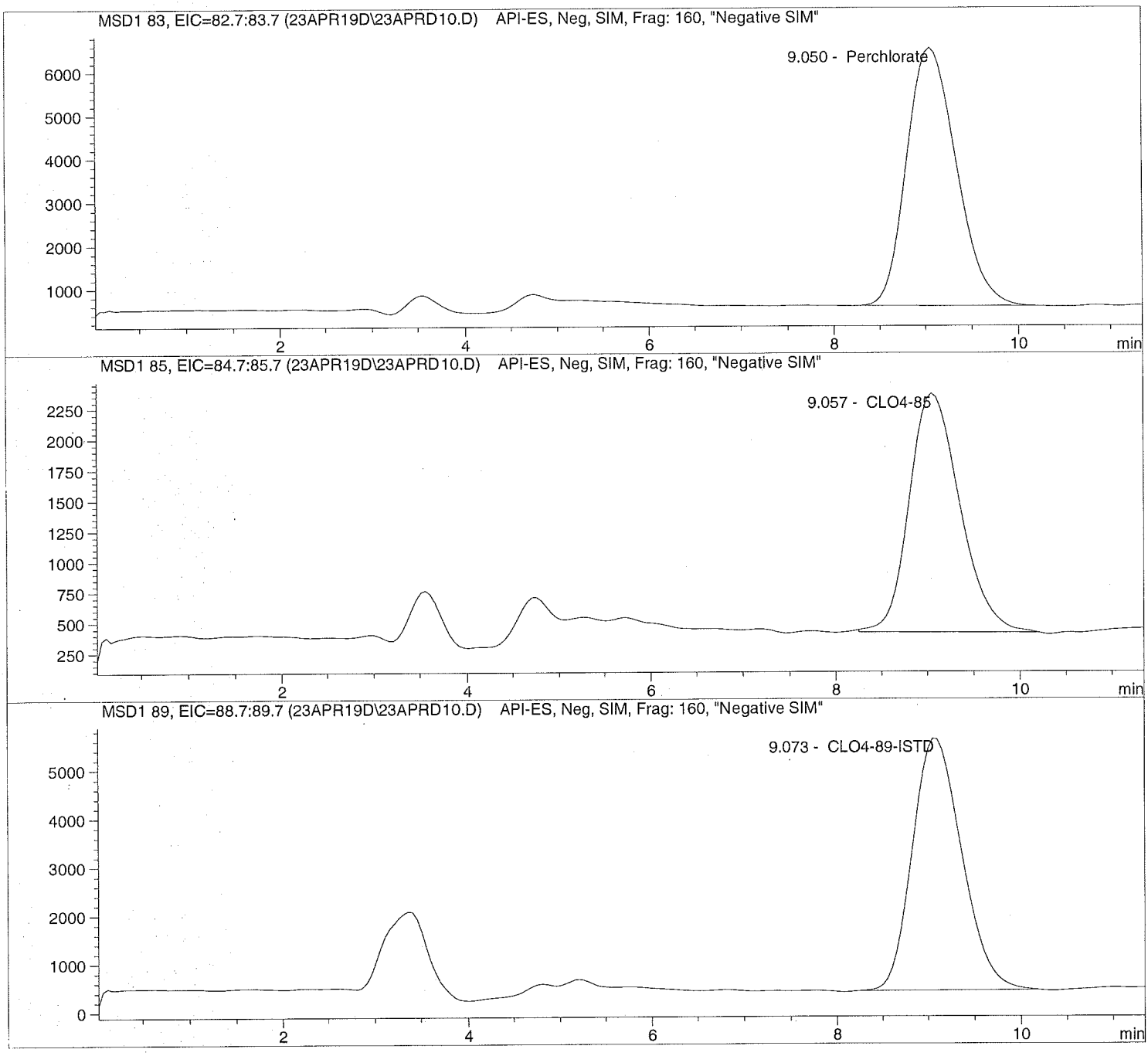
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD10.D Sample Name: 1910837002 MS

Injection Date:	4/23/2019 10:43:43	Seq Line:	10
Sample Name:	1910837002 MS	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD10.D Sample Name: 1910837002 MS

Injection Date:	4/23/2019 10:43:43	Seq Line:	10
Sample Name:	1910837002 MS	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.050	PBA	221785.2	3.8059	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.057	BBA	74121.5	4.1234	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.073	PBA	192506.7	5.0000	CLO4-89-ISTD

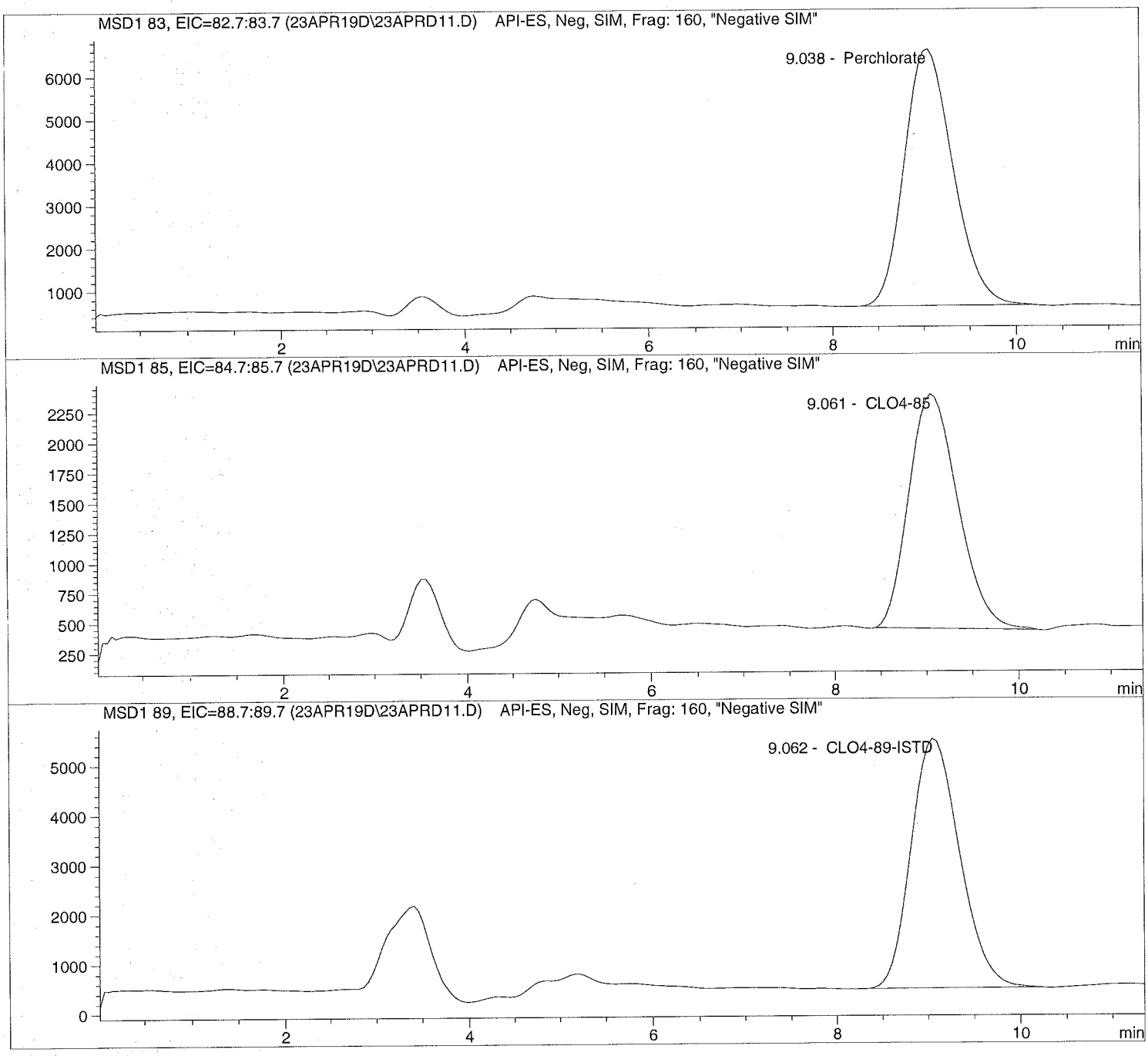
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD11.D Sample Name: 1910837003 MSD

Injection Date:	4/23/2019 10:57:05	Seq Line:	11
Sample Name:	1910837003 MSD	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD11.D Sample Name: 1910837003 MSD

Injection Date:	4/23/2019 10:57:05	Seq Line:	11
Sample Name:	1910837003 MSD	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.038	PBA	220802.4	3.9511	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.061	BBA	72383.4	4.2063	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.062	PBA	184256.2	5.0000	CLO4-89-ISTD

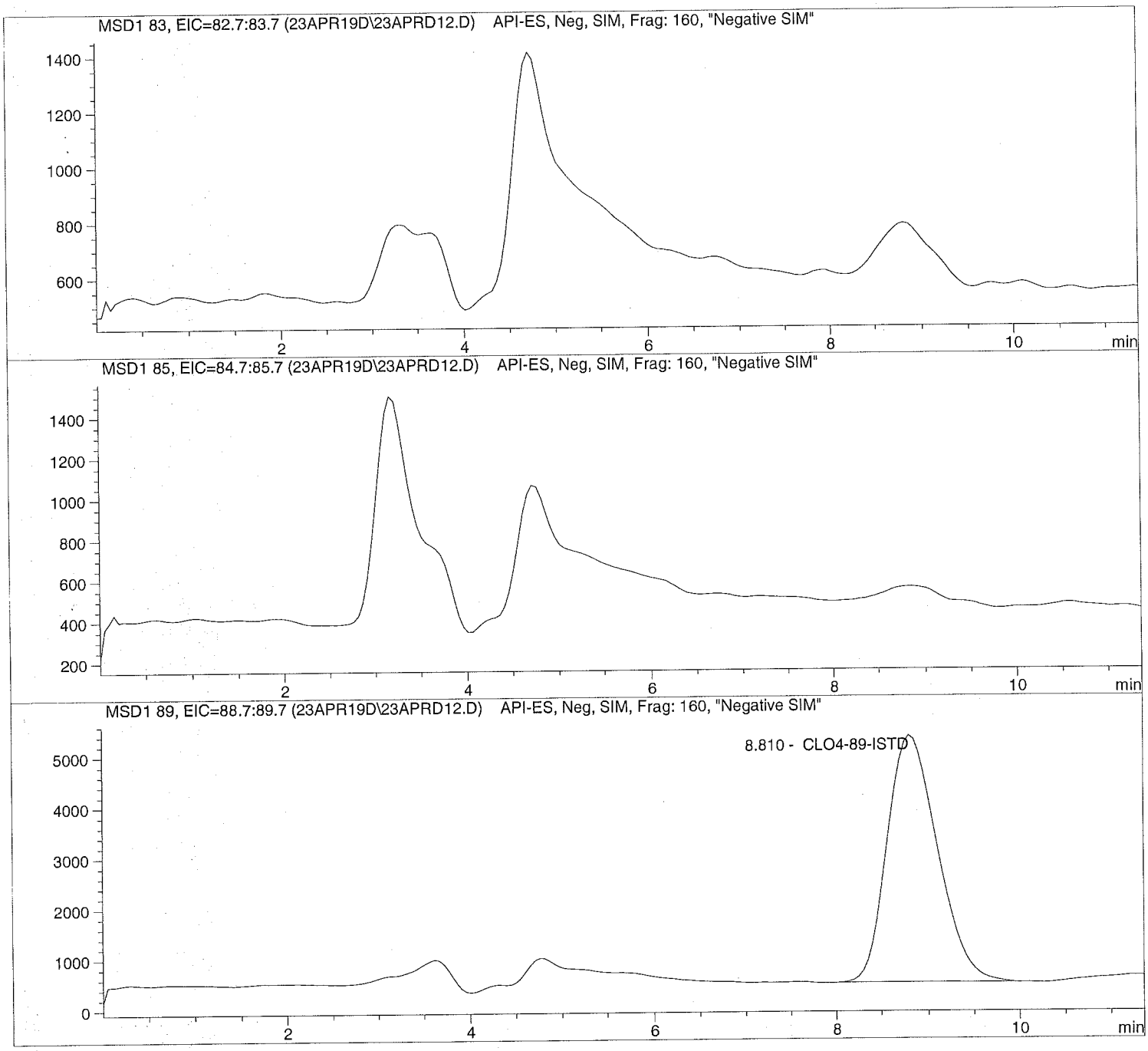
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD12.D Sample Name: 1910837004

Injection Date:	4/23/2019 11:10:26	Seq Line:	12
Sample Name:	1910837004	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD12.D Sample Name: 1910837004

Injection Date:	4/23/2019 11:10:26	Seq Line:	12
Sample Name:	1910837004	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	180138.5	5.0000	CLO4-89-ISTD

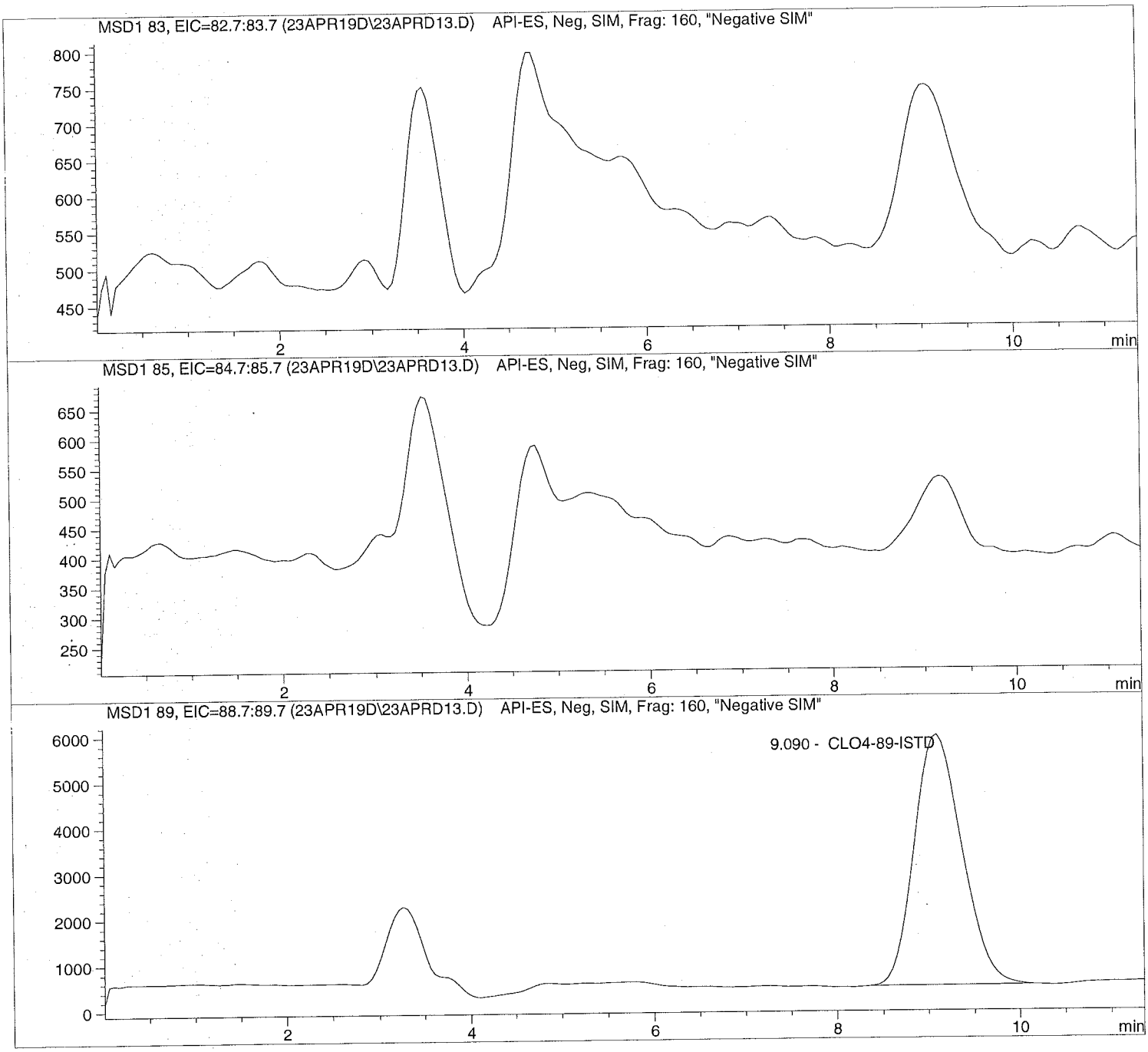
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD13.D Sample Name: 1910837005

Injection Date:	4/23/2019 11:23:52	Seq Line:	13
Sample Name:	1910837005	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD13.D Sample Name: 1910837005

Injection Date:	4/23/2019 11:23:52	Seq Line:	13
Sample Name:	1910837005	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.090	BBA	197954.5	5.0000	CLO4-89-ISTD

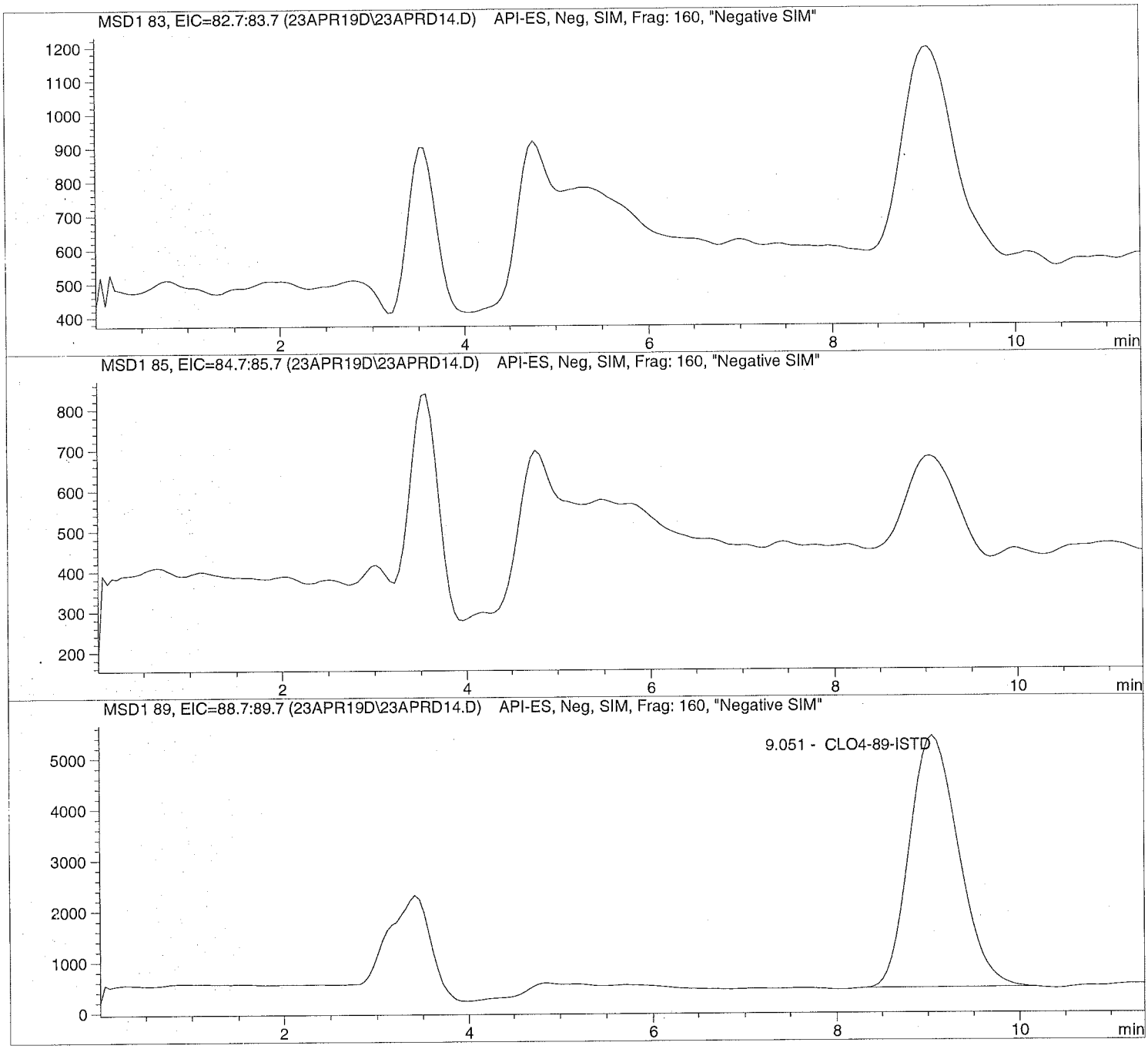
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD14.D Sample Name: 1910837006

Injection Date:	4/23/2019 11:37:15	Seq Line:	14
Sample Name:	1910837006	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD14.D Sample Name: 1910837006

Injection Date:	4/23/2019 11:37:15	Seq Line:	14
Sample Name:	1910837006	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.051	BBA	183017.4	5.0000	CLO4-89-ISTD

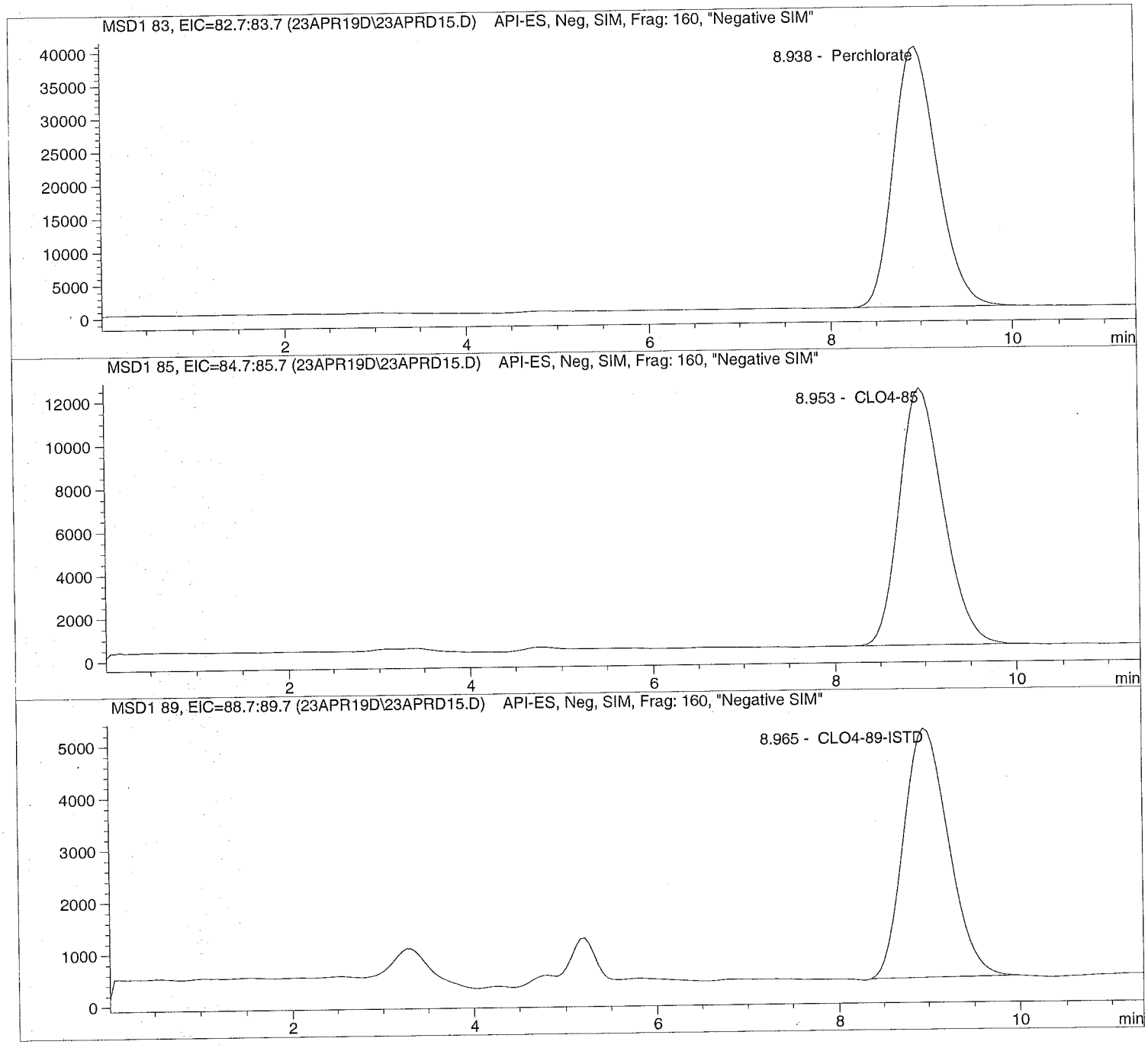
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD15.D Sample Name: 649382 CCV@25

Injection Date:	4/23/2019 11:50:37	Seq Line:	15
Sample Name:	649382 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD15.D Sample Name: 649382 CCV@25

Injection Date:	4/23/2019 11:50:37	Seq Line:	15
Sample Name:	649382 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.938	PBA	1311276.0	24.2693	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.953	BBA	400971.3	24.9597	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.965	PBA	164670.7	5.0000	CLO4-89-ISTD

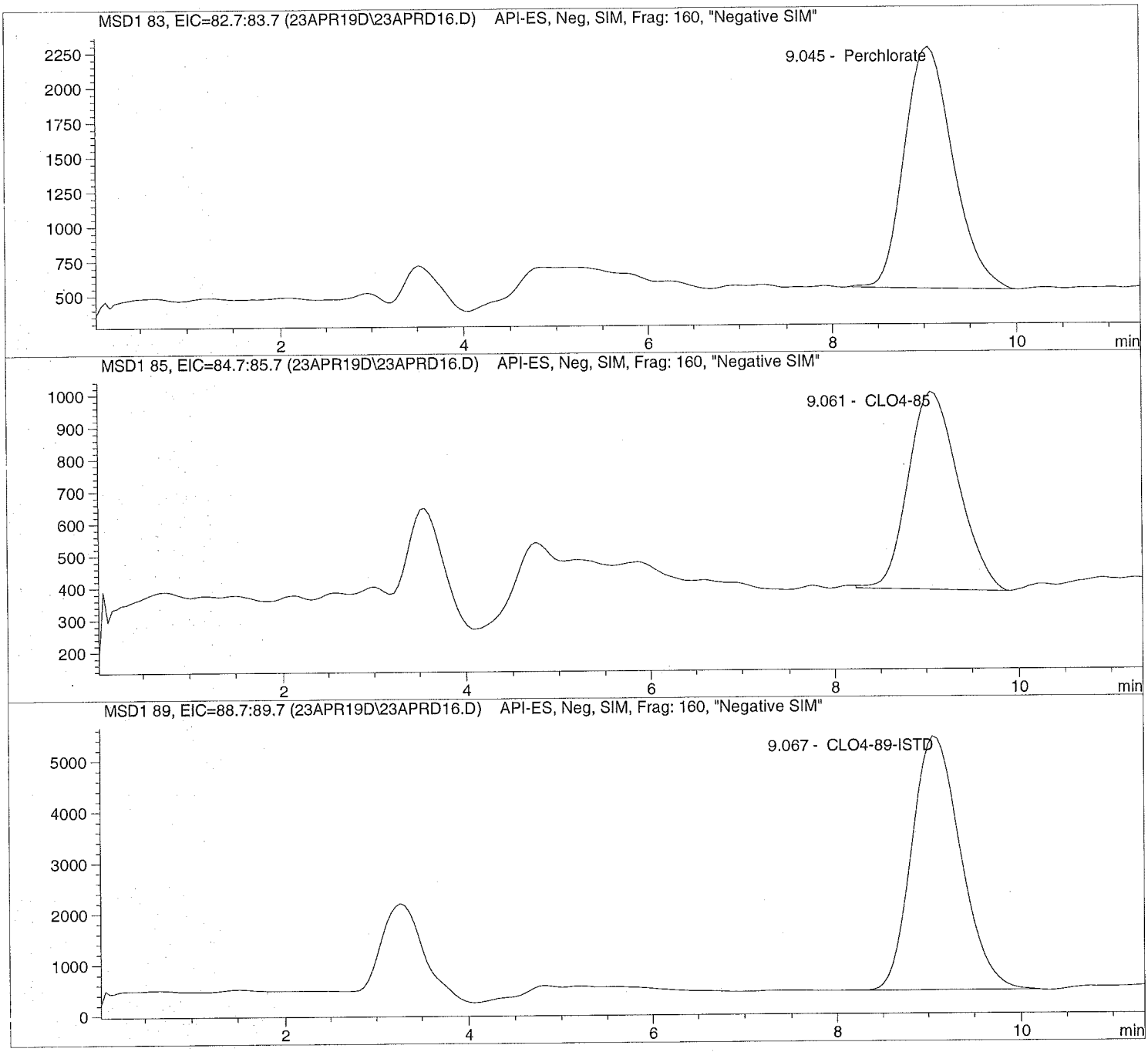
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD16.D Sample Name: 1910837007

Injection Date:	4/23/2019 12:03:59	Seq Line:	16
Sample Name:	1910837007	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD16.D Sample Name: 1910837007

Injection Date:	4/23/2019 12:03:59	Seq Line:	16
Sample Name:	1910837007	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.045	BBA	64240.0	1.2640	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.061	BBA	23485.4	1.3651	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.067	PBA	184879.5	5.0000	CLO4-89-ISTD

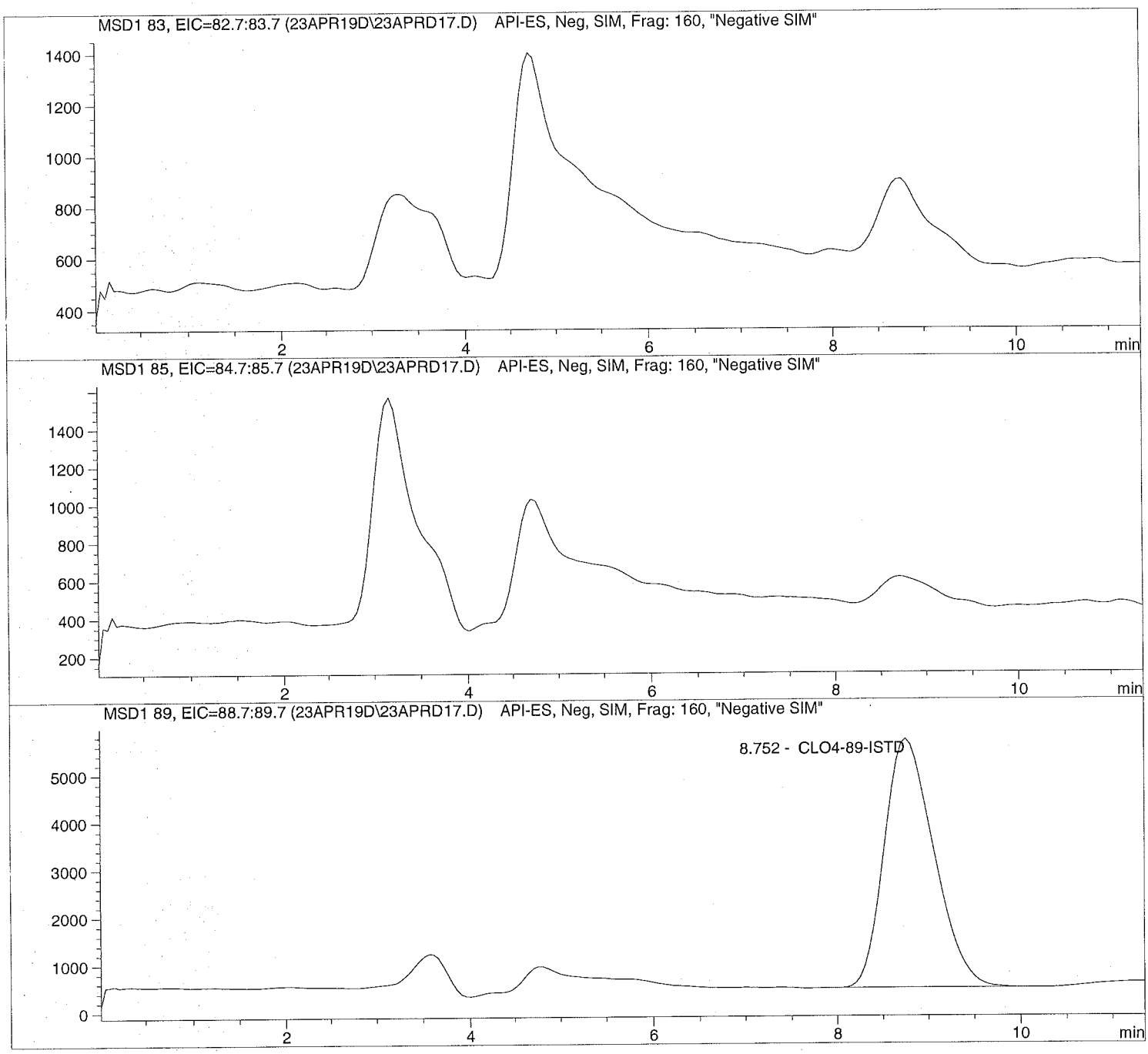
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD17.D Sample Name: 1910837008

Injection Date:	4/23/2019 12:17:22	Seq Line:	17
Sample Name:	1910837008	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD17.D Sample Name: 1910837008

Injection Date:	4/23/2019 12:17:22	Seq Line:	17
Sample Name:	1910837008	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.752	PBA	196776.6	5.0000	CLO4-89-ISTD

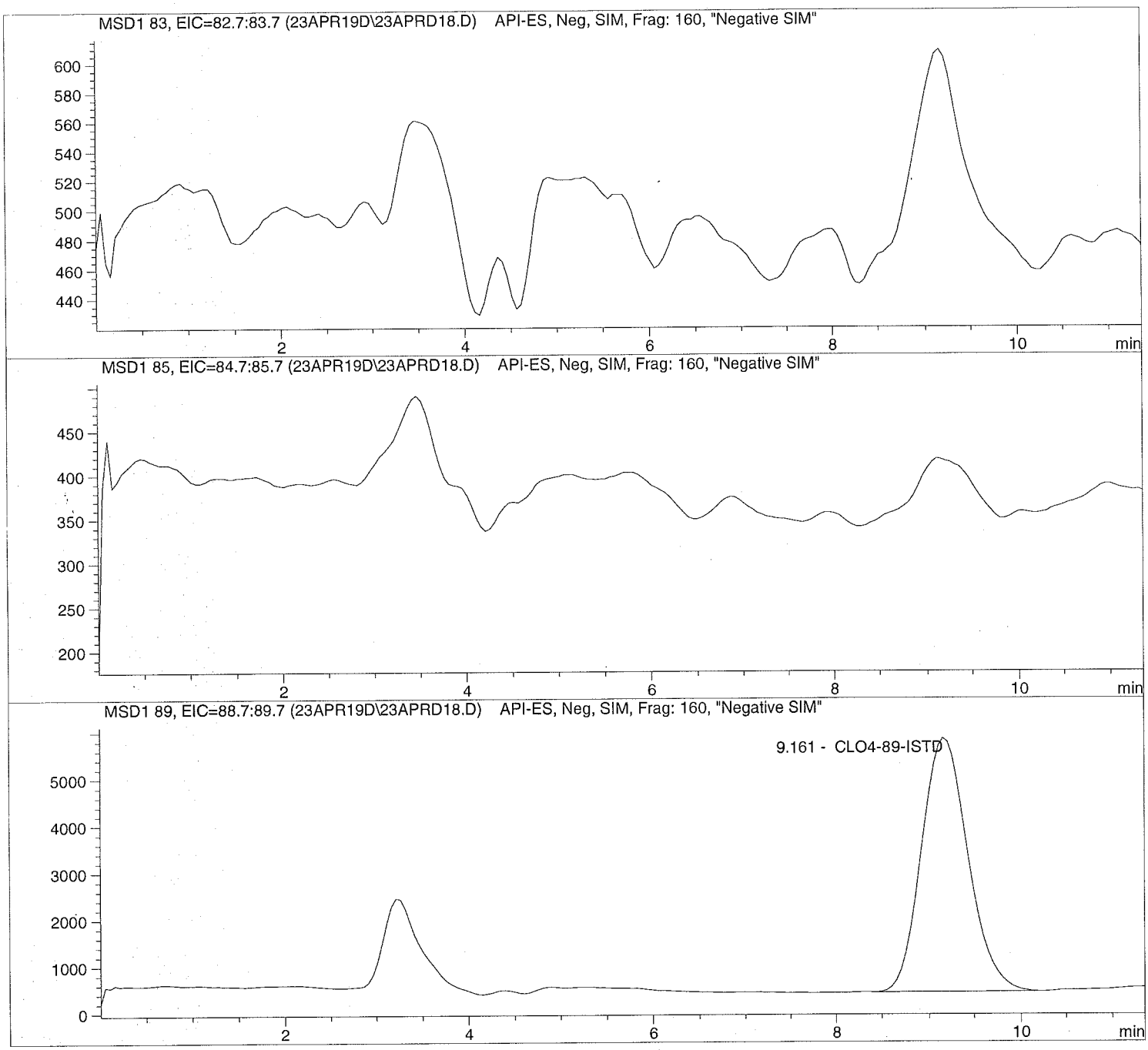
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD18.D Sample Name: 1910837009

Injection Date:	4/23/2019 12:30:43	Seq Line:	18
Sample Name:	1910837009	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD18.D Sample Name: 1910837009

Injection Date:	4/23/2019 12:30:43	Seq Line:	18
Sample Name:	1910837009	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.161	BBA	191613.1	5.0000	CLO4-89-ISTD

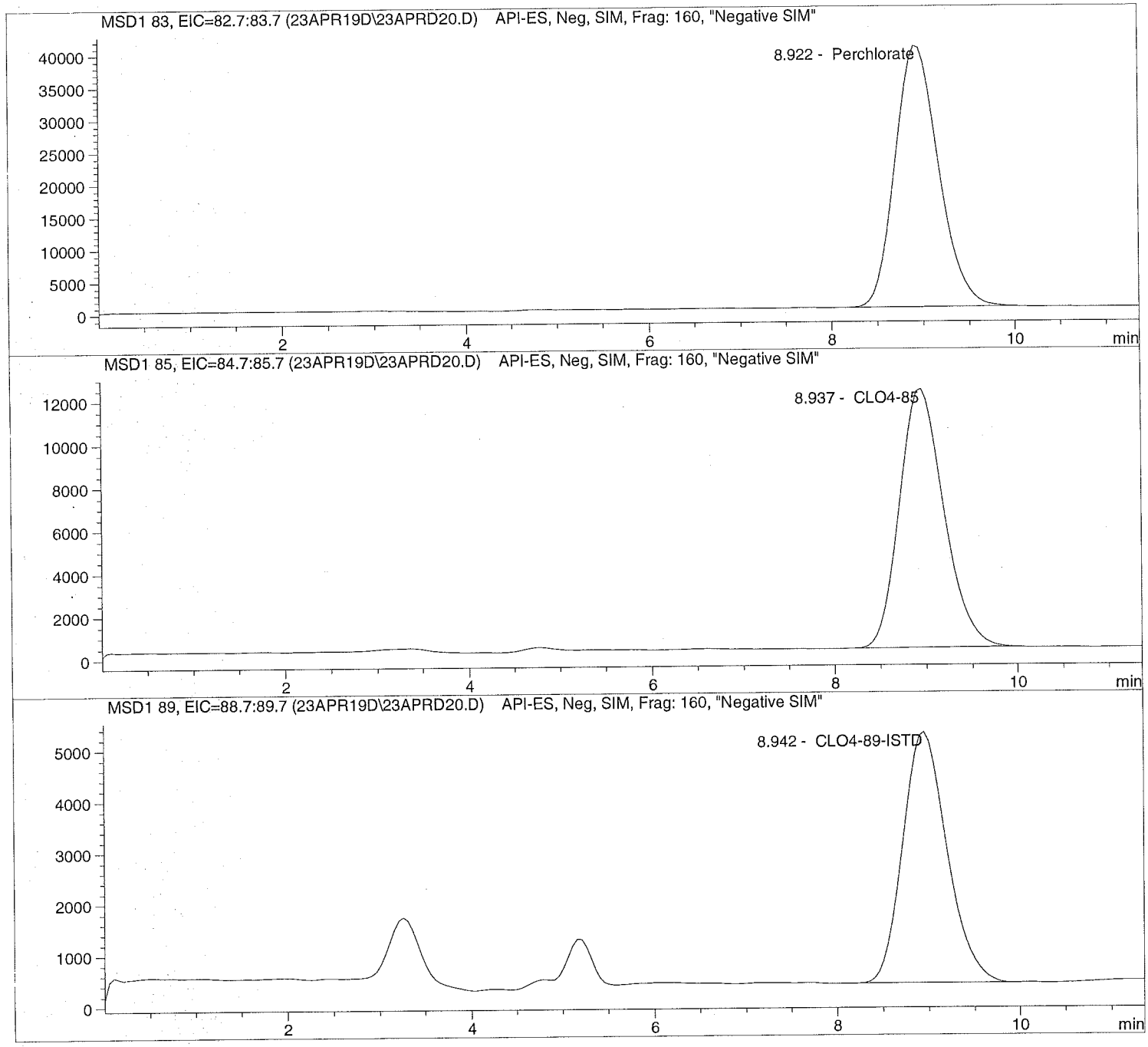
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD20.D Sample Name: 649383 CCV@25

Injection Date:	4/23/2019 13:01:17	Seq Line:	20
Sample Name:	649383 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD20.D Sample Name: 649383 CCV@25

Injection Date:	4/23/2019 13:01:17	Seq Line:	20
Sample Name:	649383 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.922	PBA	1319634.0	24.7062	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.937	PBA	401823.2	25.3099	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.942	PBA	162618.0	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

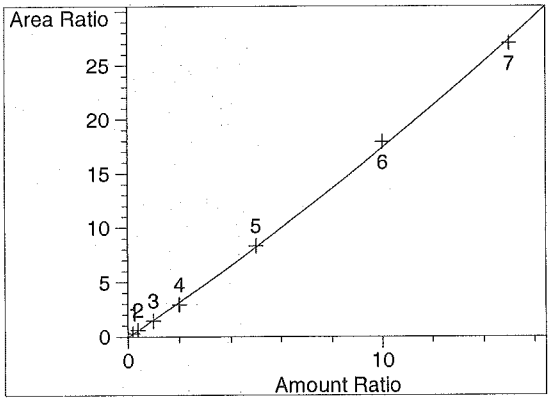
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

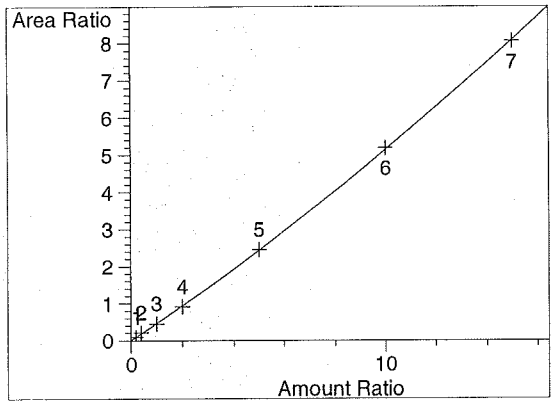
Peak Sum Table

No Entries in table

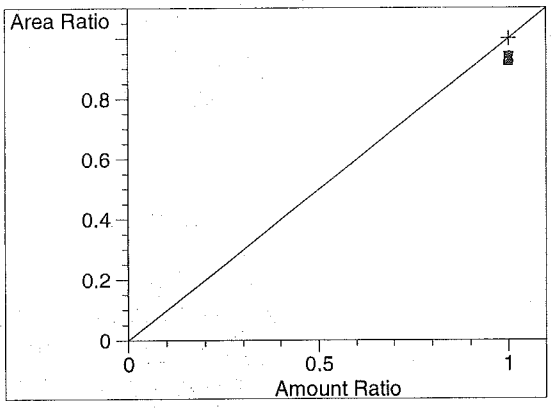
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Report: C:\HPCHEM\1\DATA\19MAR19I\19MAR19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

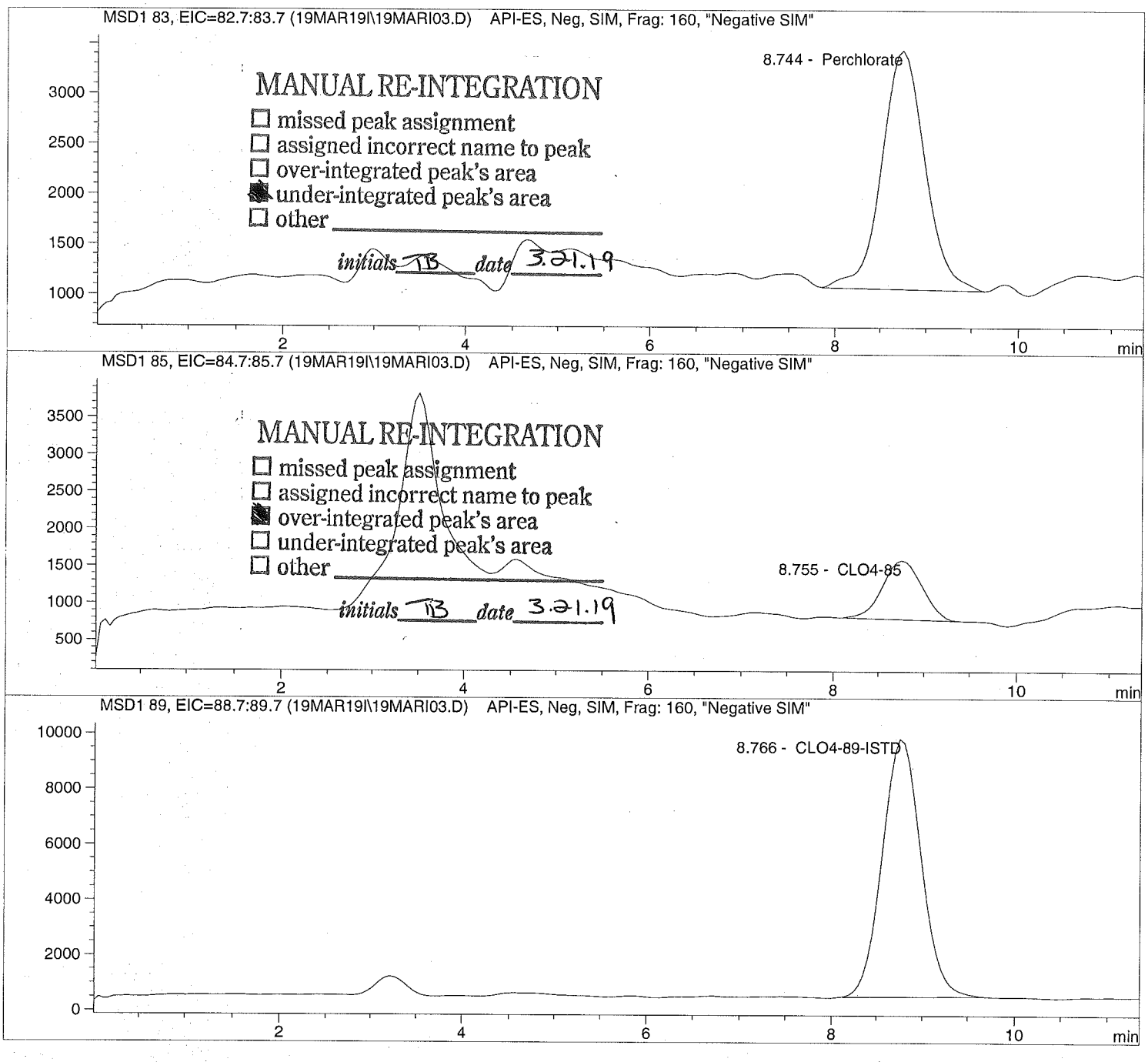
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L 00938034

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

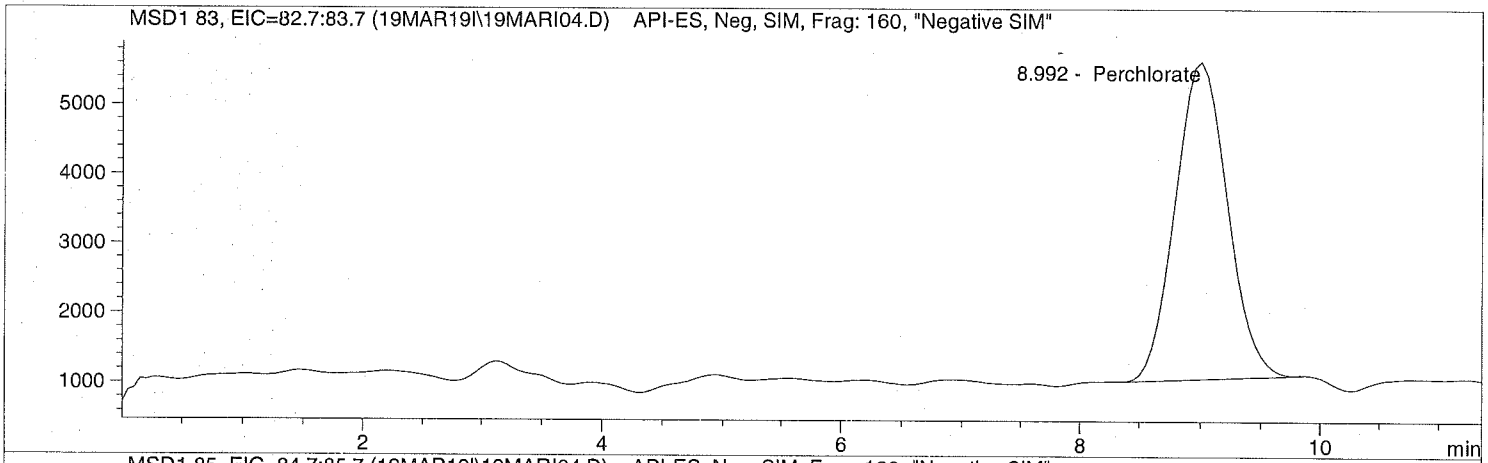
*** End of Report ***

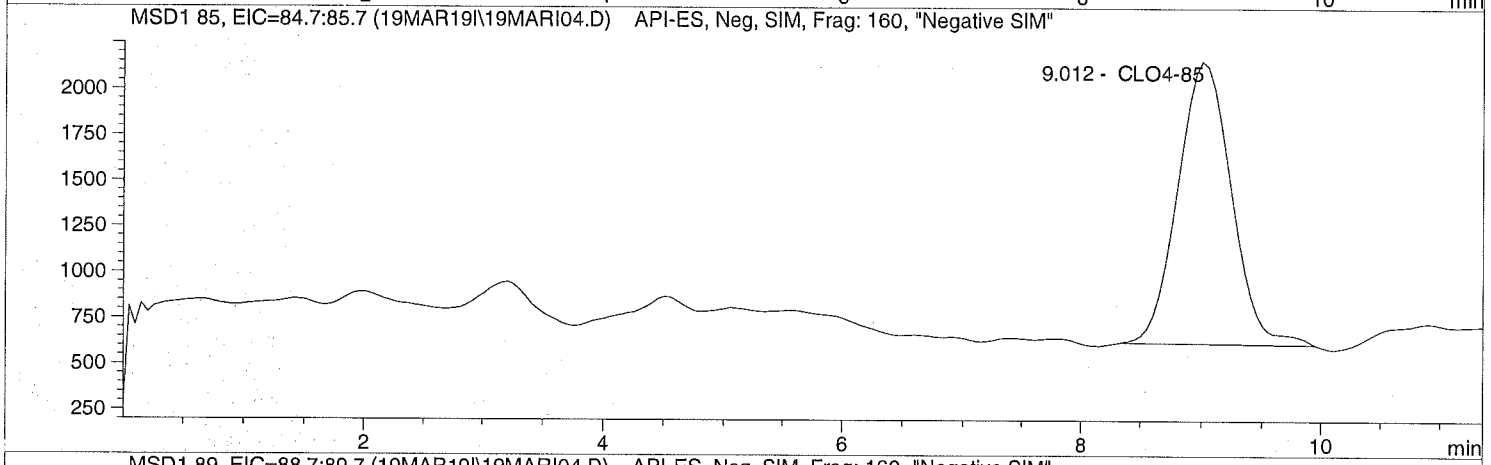
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L 00938036

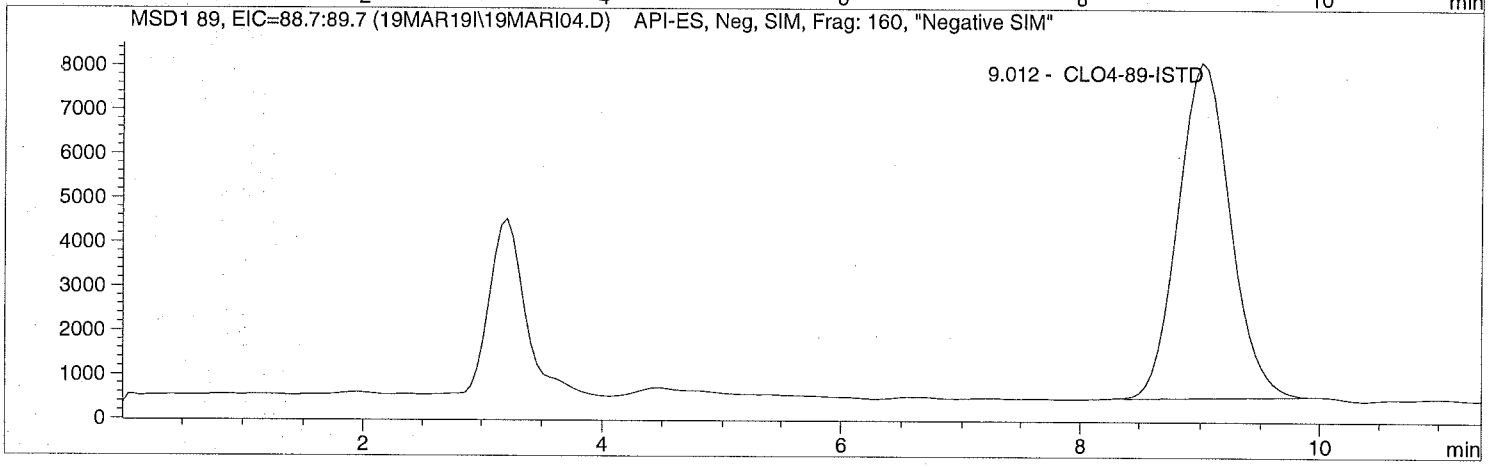
Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

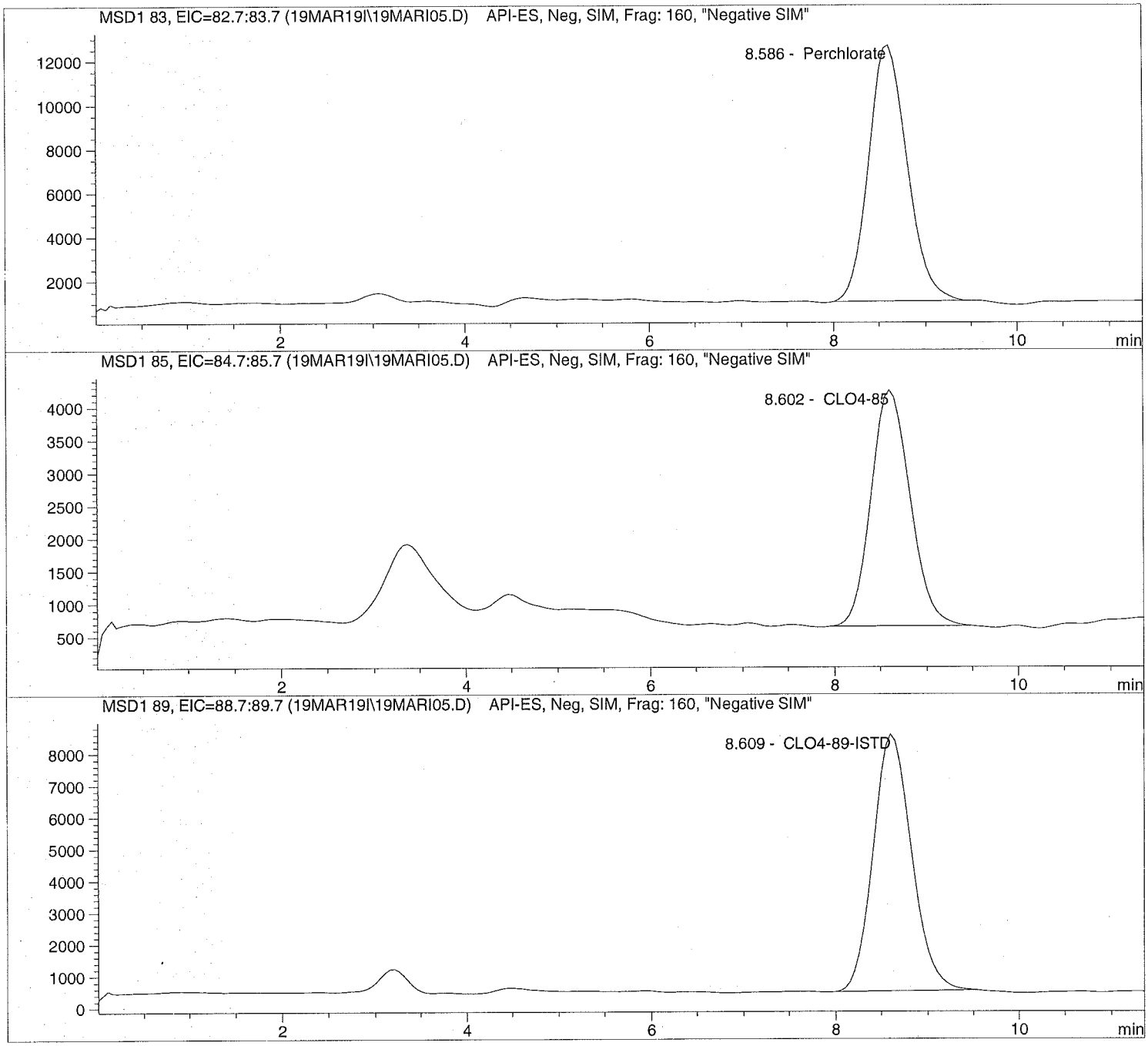
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

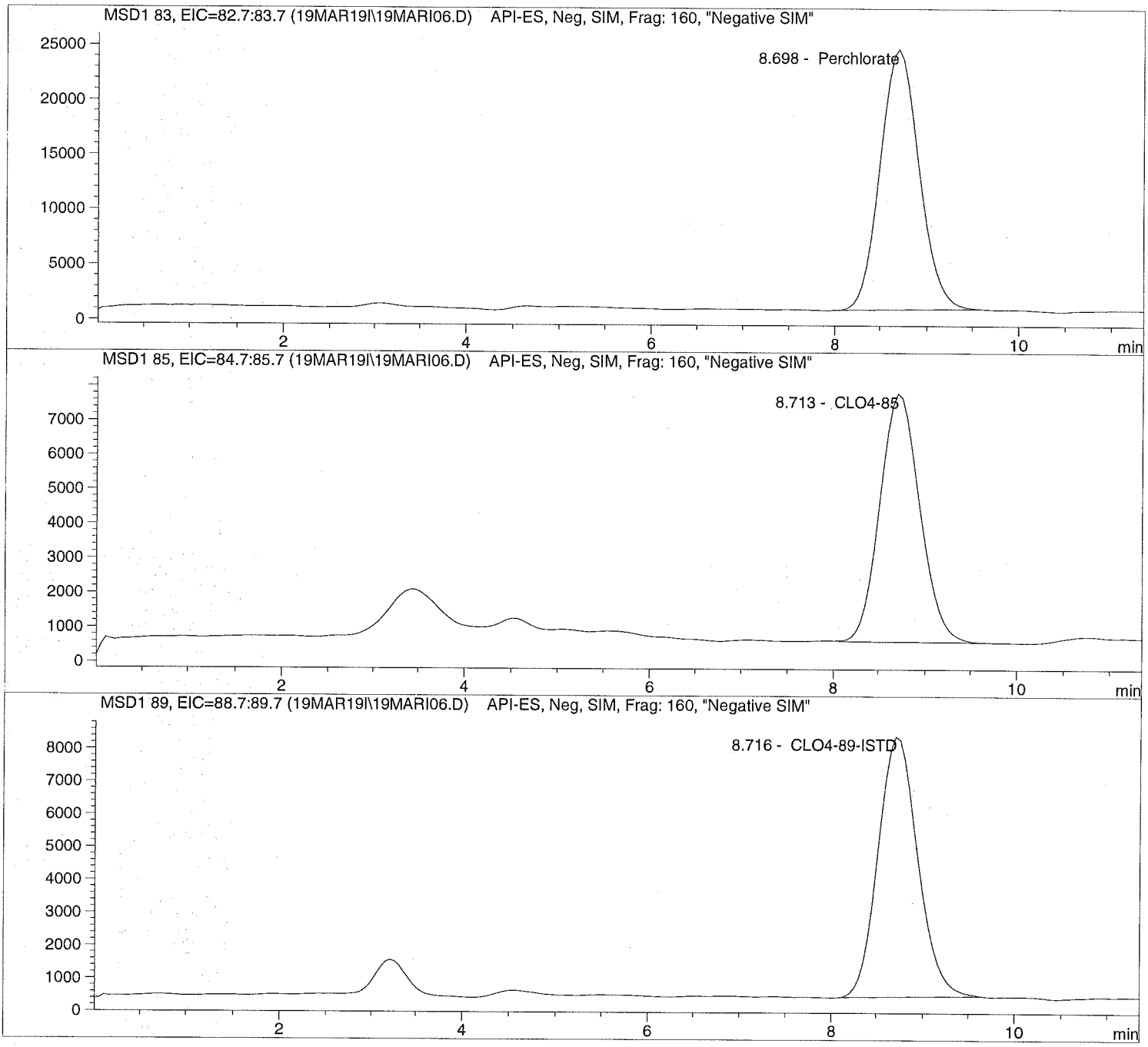
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L 00938040

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

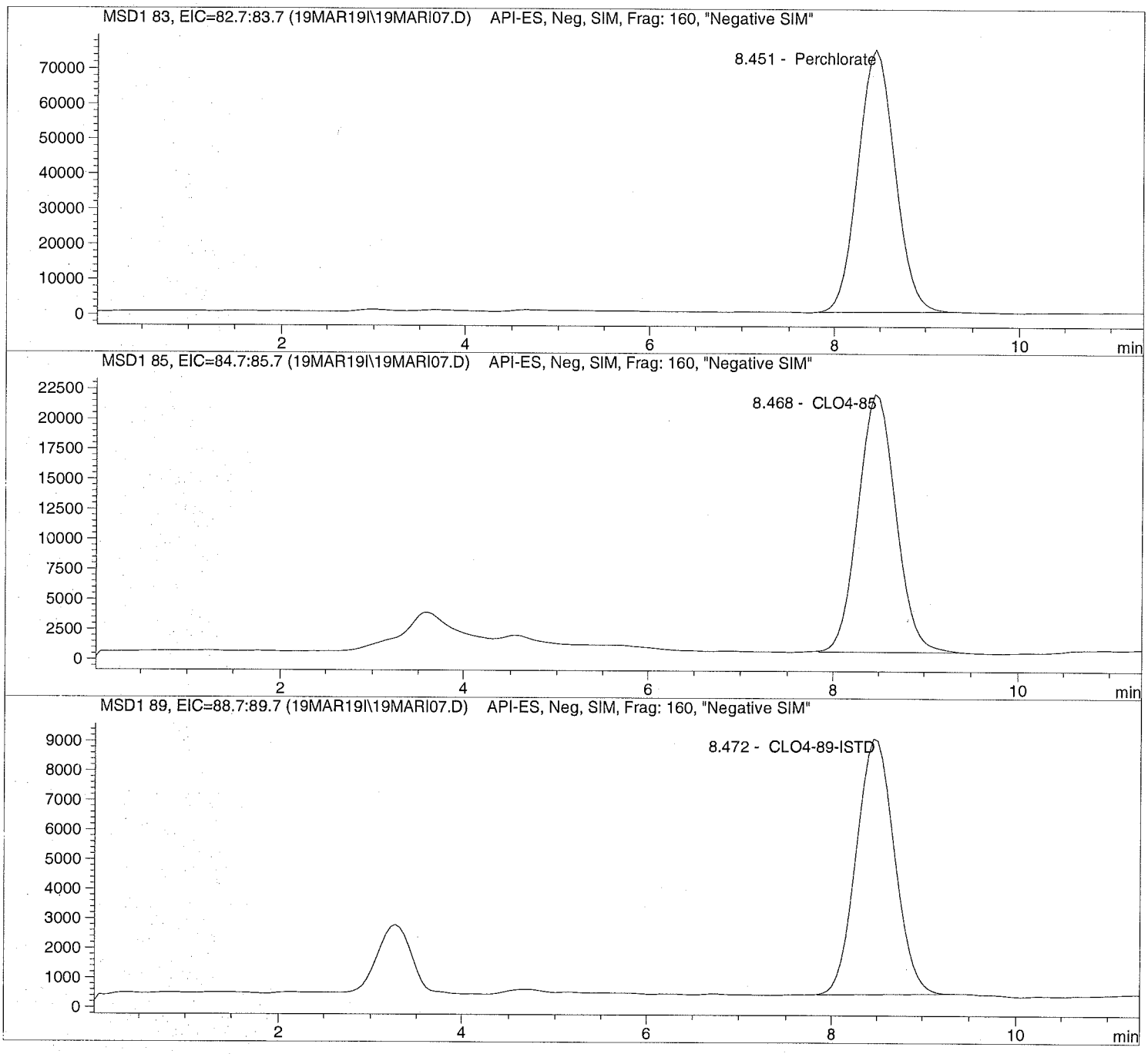
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L 00938042

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

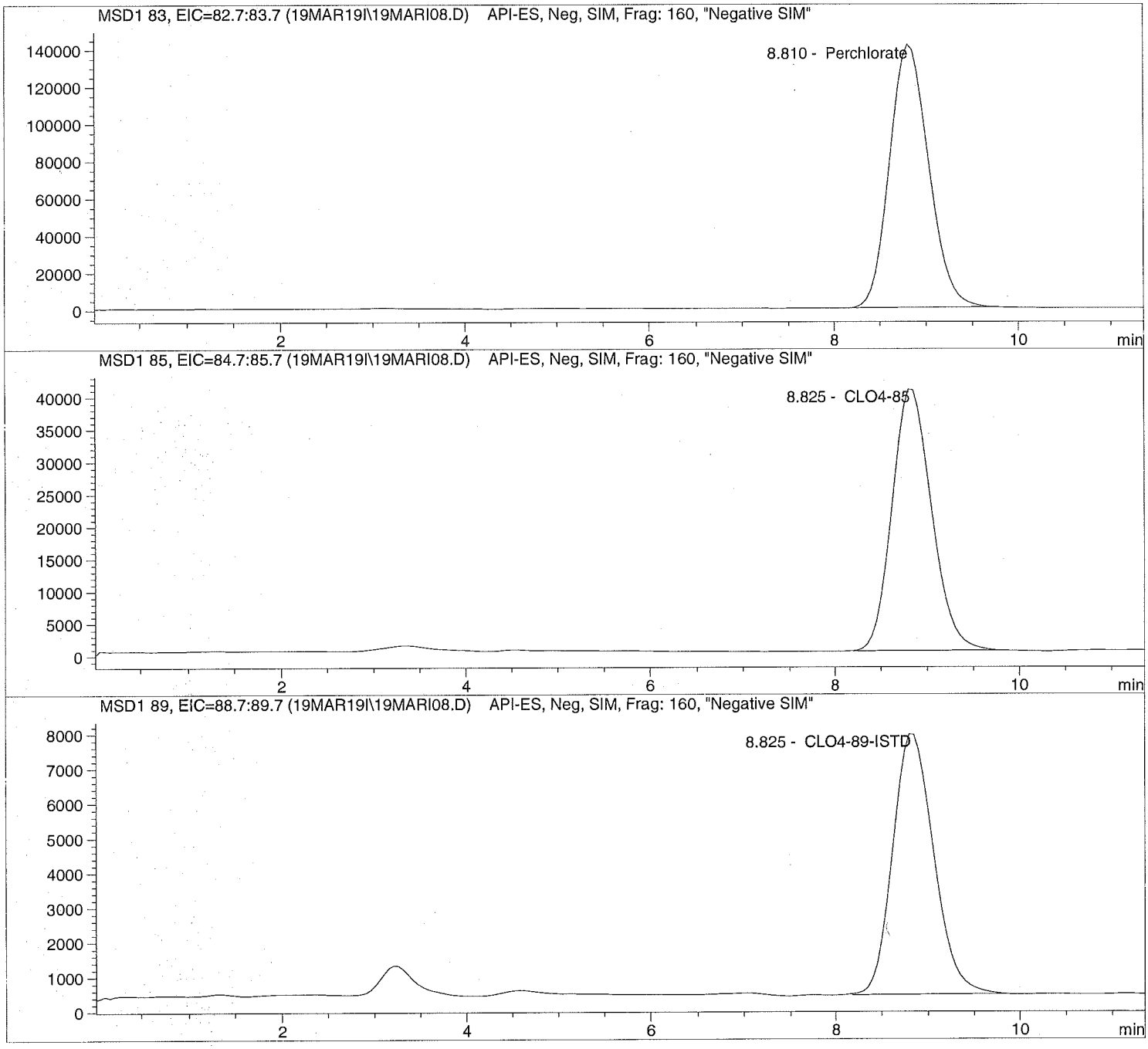
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

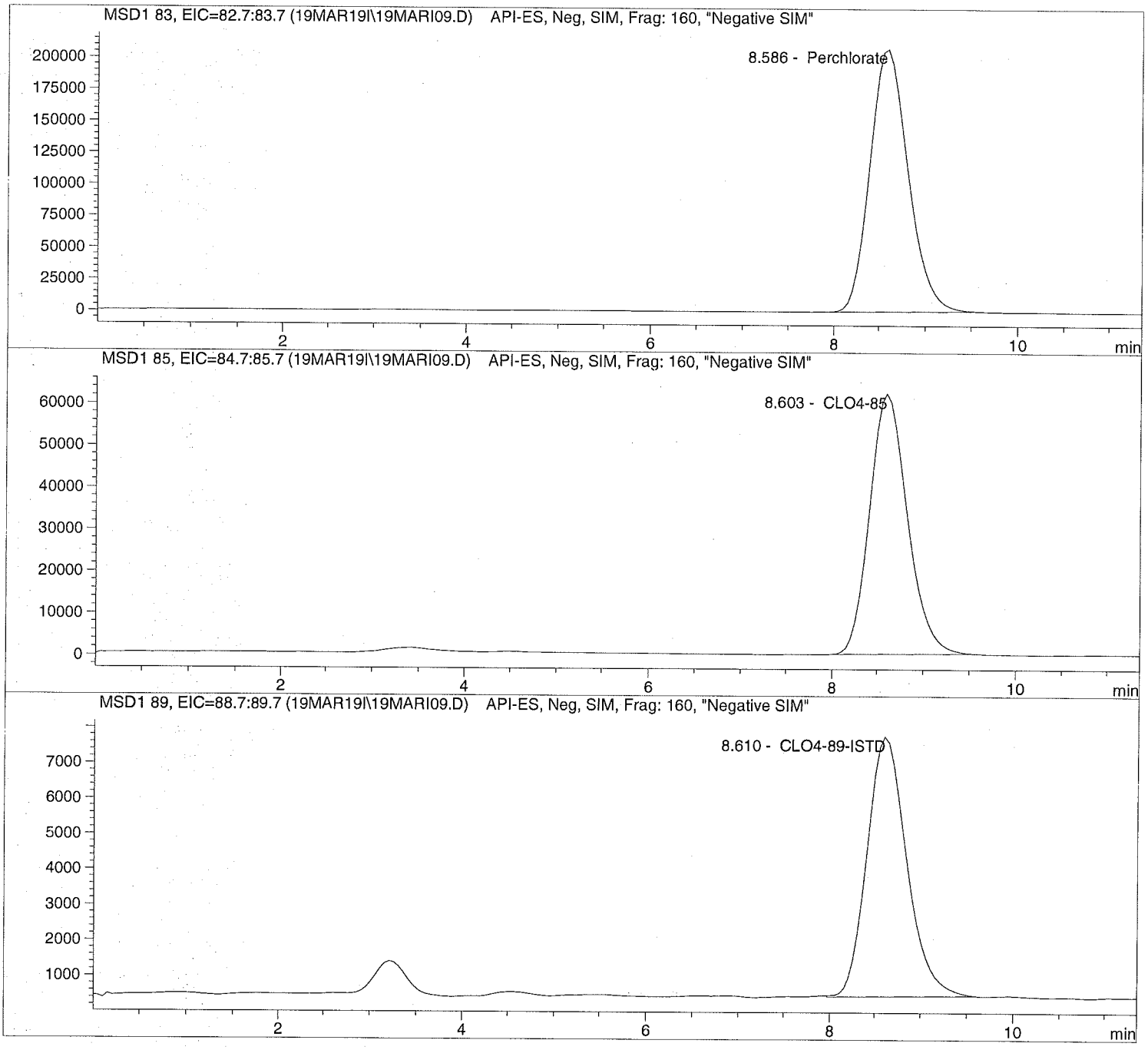
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

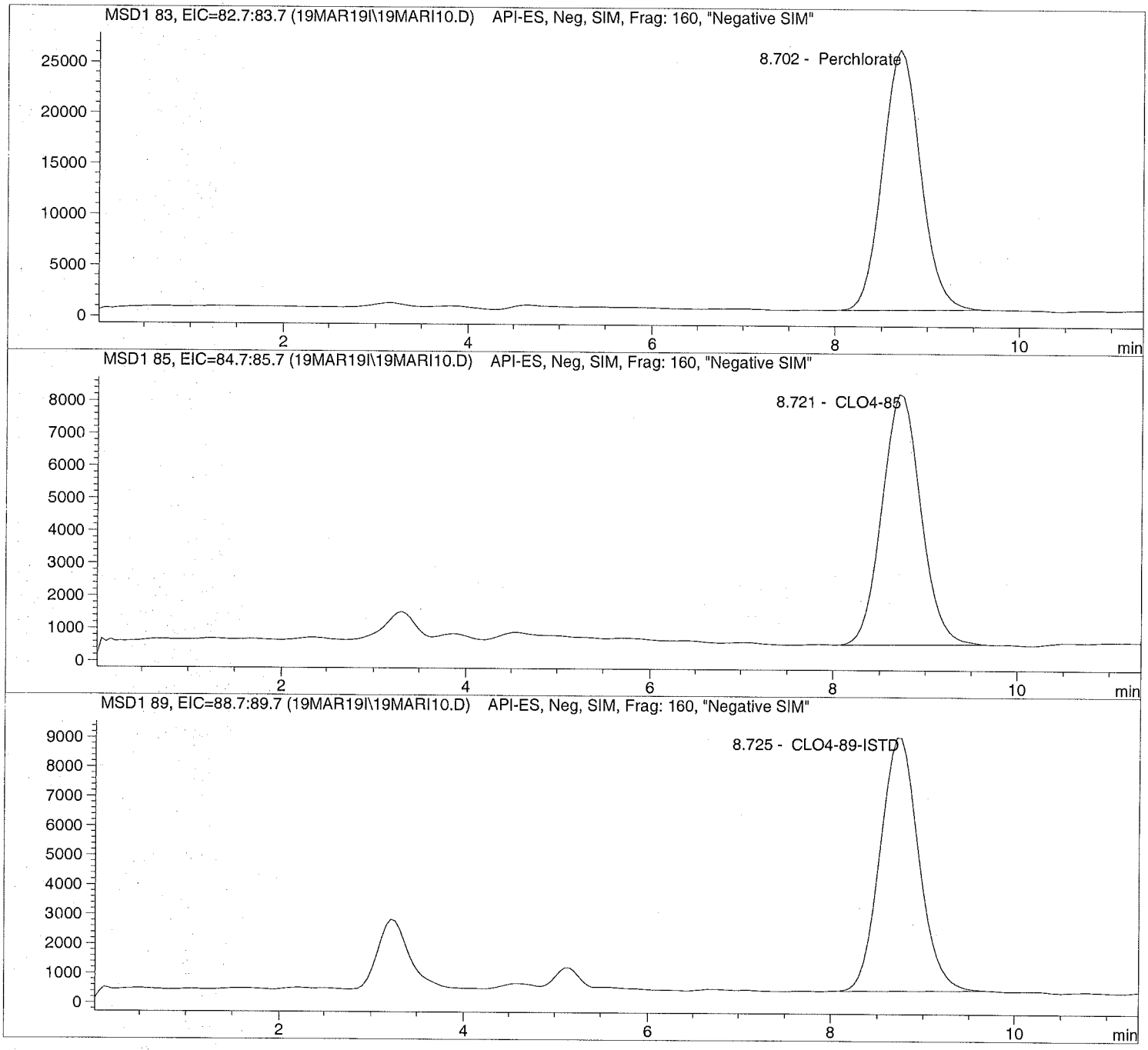
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L 00938048

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

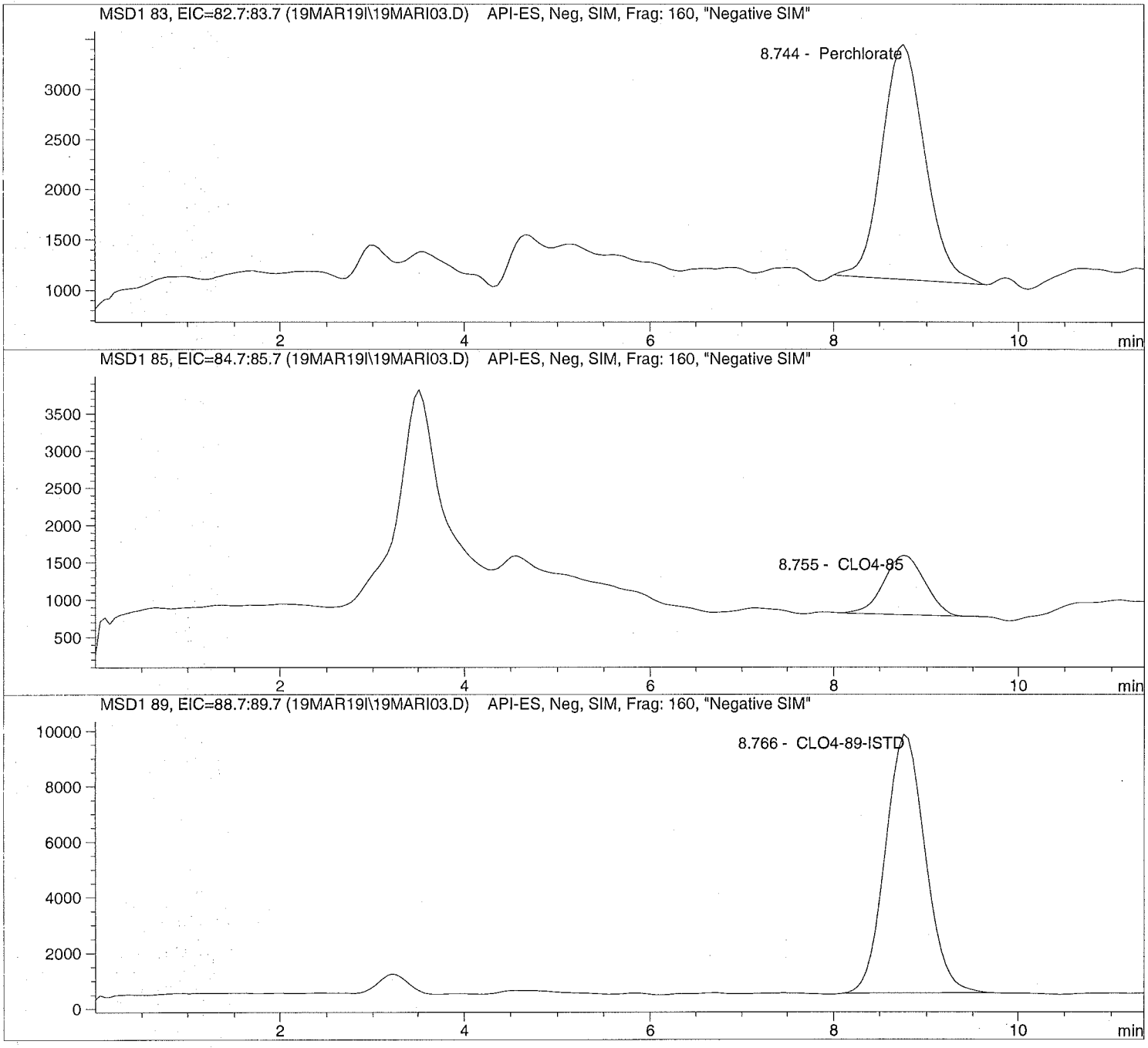
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
Work Order: HS19040654

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19040654-01	LH18/24-SP140_041019	Water		10-Apr-2019 14:00	11-Apr-2019 09:00	☐

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
Work Order:

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Metals by Method SW6020

Batch ID: 139800

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Wet Chemistry by Method SW7196

Batch ID: R336864

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 GW Treatment Plant Monthly Influent Samples WorkOrder:HS19040654

Sample ID: LH18/24-SP140_041019 Lab ID:HS19040654-01

Collection Date: 10-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 15-Apr-2019		Analyst: JHD
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	16-Apr-2019 23:35
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	16-Apr-2019 23:35
HEXAVALENT CHROMIUM BY SW7196A		**Method:SW7196**						Analyst: MZD
Chromium, Hexavalent	0.0100	U	0.00600	0.0100	0.0100	mg/L	1	11-Apr-2019 12:10
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	25-Apr-2019 17:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19040654

Batch ID: 139800 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19040654-01	1	10	10 (mL)	1

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19040654

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 139800	**Test Name :** METALS BY ICPMS BY SW6020A			**Matrix:** Water		
HS19040654-01	LH18/24-SP140_041019	10 Apr 2019 14:00		15 Apr 2019 08:30	16 Apr 2019 23:35	1
Batch ID R336864	**Test Name :** HEXAVALENT CHROMIUM BY SW7196A			**Matrix:** Water		
HS19040654-01	LH18/24-SP140_041019	10 Apr 2019 14:00			11 Apr 2019 12:10	1
Batch ID R337297	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19040654-01	LH18/24-SP140_041019	10 Apr 2019 14:00			25 Apr 2019 17:26	1

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19040654

QC BATCH REPORT

Batch ID: 139800 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-139800** Units: **mg/L** Analysis Date: **16-Apr-2019 22:45**
Client ID: Run ID: **ICPMS05_336650** SeqNo: **5038034** PrepDate: **15-Apr-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U

LCS Sample ID: **LCS-139800** Units: **mg/L** Analysis Date: **16-Apr-2019 22:48**
Client ID: Run ID: **ICPMS05_336650** SeqNo: **5038035** PrepDate: **15-Apr-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.05057	0.00200	0.05	0	101	80 - 120				
Silver	0.05065	0.00200	0.05	0	101	80 - 120				

MS Sample ID: **HS19040658-01MS** Units: **mg/L** Analysis Date: **16-Apr-2019 22:58**
Client ID: Run ID: **ICPMS05_336650** SeqNo: **5038040** PrepDate: **15-Apr-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.05136	0.00200	0.05	0.000747	101	80 - 120				
Silver	0.04992	0.00200	0.05	0.000017	99.8	80 - 120				

MSD Sample ID: **HS19040658-01MSD** Units: **mg/L** Analysis Date: **16-Apr-2019 23:01**
Client ID: Run ID: **ICPMS05_336650** SeqNo: **5038041** PrepDate: **15-Apr-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.05176	0.00200	0.05	0.000747	102	80 - 120	0.05136	0.78	20	
Silver	0.04999	0.00200	0.05	0.000017	99.9	80 - 120	0.04992	0.14	20	

PDS Sample ID: **HS19040658-01PDS** Units: **mg/L** Analysis Date: **16-Apr-2019 23:03**
Client ID: Run ID: **ICPMS05_336650** SeqNo: **5038042** PrepDate: **15-Apr-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.101	0.00200	0.1	0.000747	100	75 - 125				
Silver	0.0996	0.00200	0.1	0.000017	99.6	75 - 125				

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19040654

QC BATCH REPORT

Batch ID: 139800 (0) **Instrument: ICPMS05** **Method: ICP-MS METALS BY SW6020A**

SD Sample ID: **HS19040658-01SD** Units: **mg/L** Analysis Date: **16-Apr-2019 22:56**
Client ID: Run ID: **ICPMS05_336650** SeqNo: **5038039** PrepDate: **15-Apr-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Selenium	0.0125	0.0100					0.000747	0	10	U
Silver	0.00250	0.0100					0.000017	0	10	U

The following samples were analyzed in this batch: HS19040654-01

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19040654

QC BATCH REPORT

Batch ID: R336864 (0) **Instrument: UV-2450** **Method: HEXAVALENT CHROMIUM BY SW7196A**

MBLK Sample ID: **MBLK-336864** Units: **mg/L** Analysis Date: **11-Apr-2019 12:10**
Client ID: Run ID: **UV-2450_336864** SeqNo: **5041191** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.0100	0.0100								U

LCS Sample ID: **LCS-336864** Units: **mg/L** Analysis Date: **11-Apr-2019 12:10**
Client ID: Run ID: **UV-2450_336864** SeqNo: **5041192** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.243	0.0100	0.25	0	97.2	90 - 111				

MS Sample ID: **HS19040652-01MS** Units: **mg/L** Analysis Date: **11-Apr-2019 12:10**
Client ID: Run ID: **UV-2450_336864** SeqNo: **5041195** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.242	0.0100	0.25	-0.003	98.0	90 - 111				

MSD Sample ID: **HS19040652-01MSD** Units: **mg/L** Analysis Date: **11-Apr-2019 12:10**
Client ID: Run ID: **UV-2450_336864** SeqNo: **5041196** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.251	0.0100	0.25	-0.003	102	90 - 111	0.242	3.65	20	

The following samples were analyzed in this batch: HS19040654-01

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: **HS19040654**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020

ALS Houston, US Date: 29-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
Work Order: HS19040654

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19040654-01	LH18/24-SP140_041019	Login	4/11/2019 11:03:58 AM	RPG	WET070
HS19040654-01	LH18/24-SP140_041019	Login	4/11/2019 11:03:58 AM	RPG	WET070
HS19040654-01	LH18/24-SP140_041019	Login	4/11/2019 11:03:58 AM	RPG	MET033

ALS Houston, US Date: 29-Apr-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19040654
Date/Time Received: **11-Apr-2019 09:00**
Received by: **PMG**

Checklist completed by: *Raegen Giga* eSignature 11-Apr-2019 Date
Reviewed by: *RJ Modashia* eSignature 11-Apr-2019 Date

Matrices: **water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	4.7c uc/c	IR 25
Cooler(s)/Kit(s):	25587	
Date/Time sample(s) sent to storage:	04/11/2019 11:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

HS19040654

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: RJ Modshia

Bhate Environmental Associates, Inc.

LH18/24 GW Treatment Plant Monthly Influent Samples

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No.
NWO1312.0150.0
16.0001

Job:
GROUNDWATER TREATMENT PLANT MONTHLY INFLUENT SAMPLES

Prepared By:
Scott Beesinger

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: SILVER & SELENIUM	HEXAVALENT CHROMIUM	PERCHLORATE							Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP140_041019	Water	04/10/19 / 14:00		1	X									HNO3	
LH18/24-SP140_041019	Water	04/10/19 / 14:00		2		X	X							NONE	

Additional Remarks: **STANDARD TURN AROUND TIME**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	04/10/19	14:30		4/11/19	09:00						

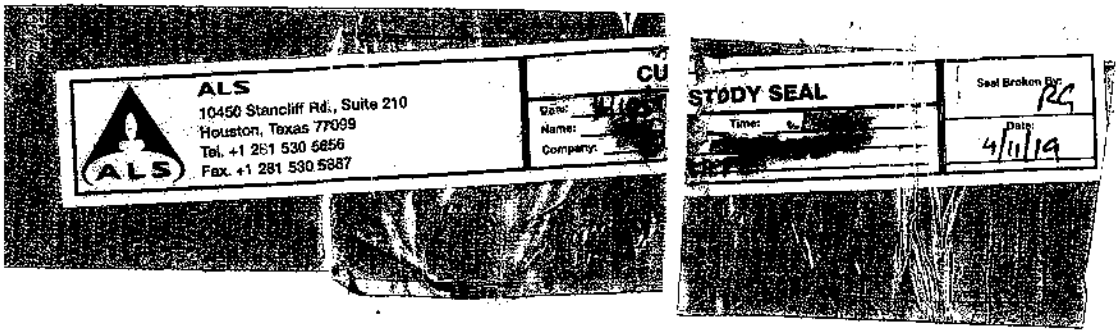
For Lab Use Only

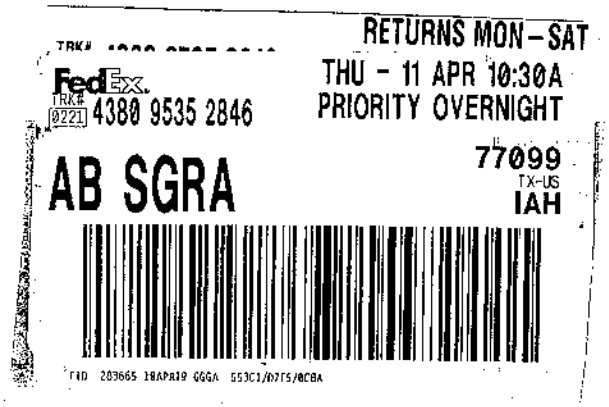
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

25587 VOC- 4.76 -825 CIF 0.04

(Word) S:\Forms\Chain of Custody - BiWeekly


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CU
Date:
Name:
Company:
STODY SEAL
Time:
Seal Broken By:
RC
Date:
4/11/19


RETURNS MON-SAT
THU - 11 APR 10:30A
PRIORITY OVERNIGHT
FedEx
TRK# 9221 4380 9535 2846
AB SGRA
77099
TX-US
IAH

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1910478; 1910480; 1910483; 1911288

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2241 (237388)

General Set Information: There were four field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1910480001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 649380) was less than 1/2 the CRDL. The recovery for the LCS (649381) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 1910837002/03 of Work Order 1910837. 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 649378) is reported from the analysis of the Laboratory Control Sample (LCS – 649381) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Thomas Bosch April 24, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: April 25, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1910480**
Project ID: HS19040654
Purchase Order: HS19040654
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP140_041019	1910480001	04/10/19	04/12/19	

ANALYTICAL REPORT

Workorder: 34-1910480
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP140_041019** | Sampling Site: NA | Collected: 04/10/2019
Lab ID: 1910480001 | Media: 125 mL Nalgene | Received: 04/12/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2241 (HBN: 237388) | **Percent Solid:** NA
Analyzed: 04/23/2019 09:49 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**5600**	1000	2000	4000	1000	

Comments

Workorder: 1910480

Field sample 1910480001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 04/24/2019 07:51	/S/ Stephen Brose 04/25/2019 07:42

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1910480
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1910480

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2241 (HBN: 237388)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 649380
Analyzed: 04/23/2019 09:20
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 649381
Analyzed: 04/23/2019 08:53
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.01	4.00	100	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1910837001	**MS:**	1910837002				**MSD:**	1910837003			
Analyzed:	04/23/2019 10:30	**Analyzed:**	04/23/2019 10:43				**Analyzed:**	04/23/2019 10:57			
Dilution:	1	**Dilution:**	1				**Dilution:**	1			
Units:	ug/L	**Units:**	ug/L				**Units:**	ug/L			

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.81	4	95.1	78.8	123.8	3.95	98.8	3.74	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
04/24/2019 07:52	04/25/2019 07:42

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

COC ID: 11113

1910480

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19040654
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19040654-01**	**LH18/24-SP140_041019**	**Water**	**10 Apr 2019 14:00**
	SUB_Perch-6850			25 Apr 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: R Cuff Date/Time: 4/11/19 1800

Received By: Tanvir Jussell Date/Time: 04-12-19 9:55

Cooler ID(s): Temperature(s):

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19040654	***Split:***	**Workorder ID:** 1910480	**Level:** ENV_LVL4	**Requested Analysis**
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly	
Comments:			**Preservatives**	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	COOL	EPA 6850, DoD QSM
1	04/10/2019 14:00	LH18/24-SP140_041019	1910480001		Water	A	1		A
2									
3									
4									
5									
6									
7									
8									
9									
10									

23 of 110

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Wrath, Julie	04/12/2019 09:55	ALS Sample Receiving	Sample Login
Julie Wrath 4/13/19 1300		SB	Storage
R.33.1 4-22-19/13:05		T. Bush	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00938074

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 910480

Date/Time of Receipt: 04-17-19 9:55

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA		
	Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9309	3 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Tam Van Tassell (Signature) Tam Van Tassell (Printed Name) 04-17-19 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ No ☐

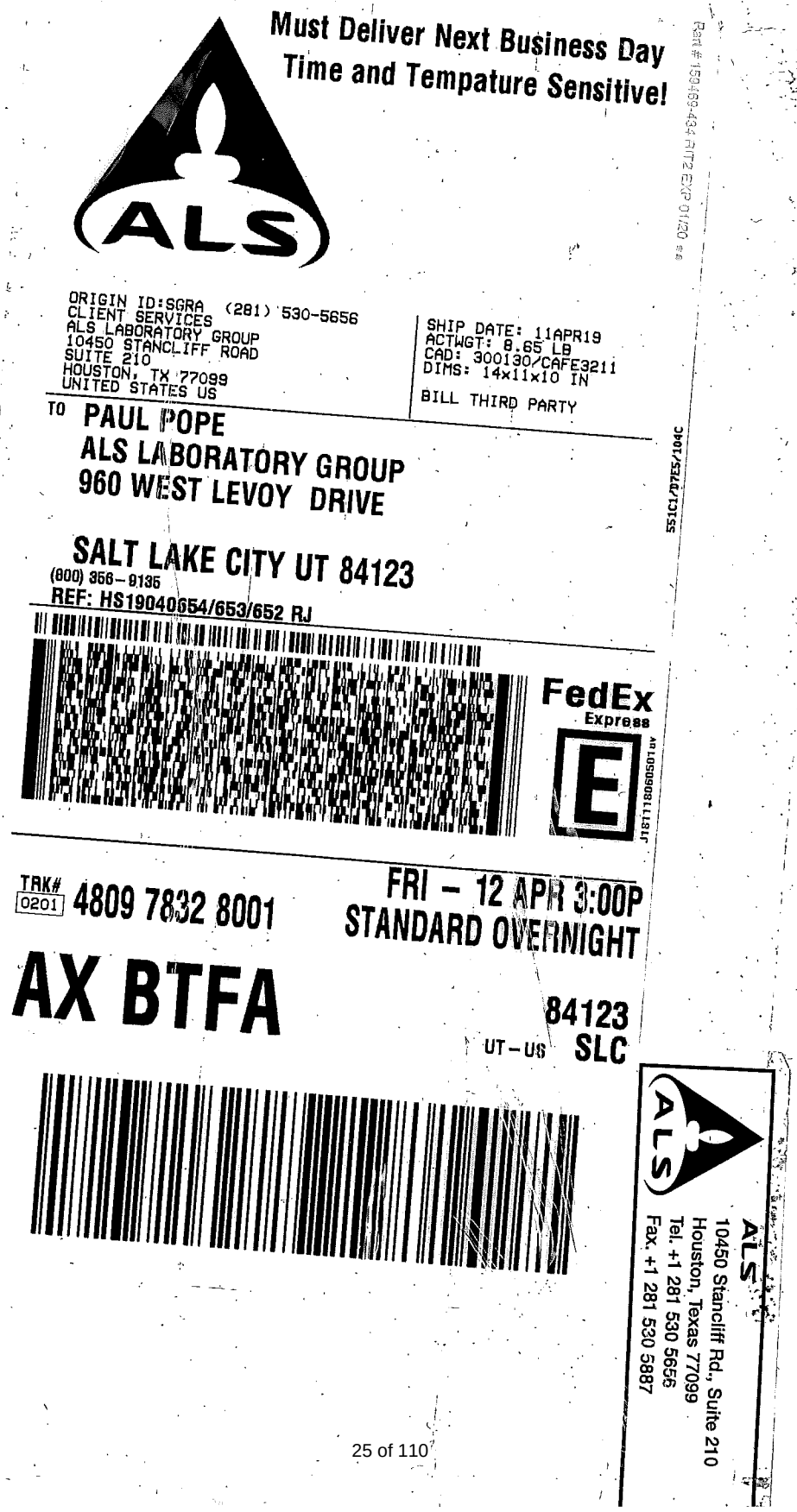
Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc Revised 01/01/2018



Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 150469-434 RIT2 EXP 01/20

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 11APR19
ACTWGT: 8.65 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO PAUL POPE
ALS LABORATORY GROUP
960 WEST LEVOY DRIVE

SALT LAKE CITY UT 84123
(800) 356-9135
REF: HS19040654/653/652 RJ

FedEx Express

TRK# 0201 4809 7832 8001

FRI - 12 APR 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

Batch Worklist

Batch: ELMS/ 2241 **Created:** 4/23/2019 07:43 **Instrument:** **HBN:** 237388

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1910478 [ENV_LVL4]
Workorder: 1910480 [ENV_LVL4]
Workorder: 1910483 [ENV_LVL4]
Workorder: 1910837 [ENV_LVL4]
Workorder: 1911288 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	649377	CCV for HBN 237388 [ELMS/2241]				CCV	3		E685041C3Q	5311		4/25/2019	
2	649378	RLVS for HBN 237388 [ELMS/2241				RLVS	3		E685041C3Q	5311		4/25/2019	
3	649379	ICS for HBN 237388 [ELMS/2241]				ICS	3		E6850..D3Q	5311		4/25/2019	
4	649380	LMB for HBN 237388 [ELMS/2241]				LMB	3		E6850Q413Q	5311		4/25/2019	
5	649381	LCS for HBN 237388 [ELMS/2241]				LCS	3		E6850Q413Q	5311		4/25/2019	
6	1910478001	LH18/24-SP650_041019_BIX				SAMPLE	3	1910478001-A	E6850Q41.3	5480	5/8/2019	4/25/2019	
7	1910480001	LH18/24-SP140_041019				SAMPLE	3	1910480001-A	E6850Q41.3	5480	5/8/2019	4/25/2019	
8	1910483001	LH18/24-SP650_041019_BIX				SAMPLE	3	1910483001-A	E6850Q41.3	5480	5/8/2019	4/25/2019	
9	1910837001	43MW01				SAMPLE	3	1910837001-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
10	1910837002	43MW01MS				MS	3	1910837002-A	E6850Q413Q	5480		4/25/2019	
11	1910837003	43MW01MSD				MSD	3	1910837003-A	E6850Q413Q	5480		4/25/2019	
12	1910837004	43MW03				SAMPLE	3	1910837004-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
13	1910837005	43MW04				SAMPLE	3	1910837005-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
14	1910837006	43MW05				SAMPLE	3	1910837006-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
15	1910837007	43MW06				SAMPLE	3	1910837007-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
16	649382	CCV for HBN 237388 [ELMS/2241]				CCV	3		E685041C3Q	5311		4/25/2019	
17	1910837008	DUP040919				FLDDUP	3	1910837008-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
18	1910837009	EB041019				EQBK	3	1910837009-A	E6850Q41.3	5480	5/8/2019	4/29/2019	
19	1911288001	LH18/24-SP650_041719_BIX				SAMPLE	3	1911288001-A	E6850Q41.3	5480	5/15/2019	5/2/2019	
20	649383	CCV for HBN 237388 [ELMS/2241]				CCV	3		E685041C3Q	5311		4/25/2019	

00938077

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1910478 (001); 1910480 (001); 1910483 (001); 1911288 (001); 1910837 (001-09) ELMS Batch/HBN ID: 2241 (237388)
Prep Date: 04/22/2019 Analysis Date: 04/23/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\APR\23APR19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by TNB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 41830 was used for LCS 649381; Target = 4.0µg/L. ASTM type II water was used for LMB 649380.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1910837002/03 (Client ID: 43MW01). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field sample 1910480001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\APR\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\237388-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 649378) is reported from the analysis of the Laboratory Control Sample (LCS – 649381) at a level 4.0µg/L.
6) Due to limitations of the Chemstation Software, many of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2241 HBN: 237388 Sample Set IDs if Applicable: 1910478 / 1910480 / 1910483 / 1910837 / 1911288	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SM
Standards traceability checked and meets criteria	TB	SM
Standard curve coefficients evaluated and meet criteria	TB	SM
ICVs analyzed and meet acceptance criteria	TB	SM
CCVs analyzed and meet acceptance criteria	TB	SM
Method Blanks analyzed and meet acceptance criteria	TB	SM
Retention Time Windows checked	TB	SM
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SM
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SM
RLVS analyzed	TB	SM
Preparation and analysis hold times met	TB	SM
Preparation deviations and re-preparations noted when performed	TB	SM
Analysis deviations and re-analyses noted when performed	TB	SM
Sample dilution factors noted on reports	TB	SM
Electronic records in HBN transcription accuracy and completeness checked	TB	SM
Preparation and analysis calculations checked	TB	SM
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SM
Manual integrations checked	TB	SM

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/18/2018 02:09PM	**Expires:** 09/18/2019
MFG Lot: TNB: 09/18/2018		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK	Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659	Created By: Thomas Bosch	Amount: 100 mL
MFG: AccuStandard	Create Date: 09/17/2018 09:09AM	Expires: 07/25/2020
MFG Lot: 218065075		Usable: No
Part ID: IC-PER-10X-1		Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109		Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House		Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided			Usable: Yes
Part ID: Not Provided			Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/18/2018 02:09PM	**Expires:** 09/18/2019
MFG Lot: TNB: 09/18/2018		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description: 6850 QC WKG STD 100ug/L

Standard: 41831
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
41830	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/09/2019

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description** - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 41830
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description: ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK Description: 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED TESTING LABORATORY

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

GHS

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)

Included on ISO/IEC 17025 Scope of Accreditation: Yes

Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.

The final solution was checked against an independent standard to verify its concentration.

We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.

All solutions are filtered through a 0.2 µm filter prior to being bottled.

All glassware used in preparation is Class A and calibrated regularly.

All weights are traceable through NIST, Test No. 822-275872-11

All bottles are triple rinsed with deionized water prior to use.

Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.

We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
	*	649377 CCV@25	Vial 71	1	Control	1	1.36054e6	8.855	24.00623
	*	649381 QC@4.0	Vial 72	1	Control	2	2.53898e5	9.046	4.01121
	*	649379 ICS@4.0	Vial 73	1	Control	3	1.82631e5	8.636	3.34158
	*	649380 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
	*	1910478001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
	*	1910480001 1K	Vial 76	1	Sample	6	3.37161e5	9.026	5552.18188
	*	1910483001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
	*	1911288001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
	*	1910837001	Vial 79	1	Sample	9	0.00000	0.000	0.00000
	*	1910837002 MS	Vial 80	1	Sample	10	2.21785e5	9.050	3.80586
	*	1910837003 MSD	Vial 81	1	Sample	11	2.20802e5	9.038	3.95111
	*	1910837004	Vial 82	1	Sample	12	0.00000	0.000	0.00000
	*	1910837005	Vial 83	1	Sample	13	0.00000	0.000	0.00000
	*	1910837006	Vial 84	1	Sample	14	0.00000	0.000	0.00000
	*	649382 CCV@25	Vial 71	1	Control	15	1.31128e6	8.938	24.26925
	*	1910837007	Vial 85	1	Sample	16	6.42400e4	9.045	1.26400
	*	1910837008	Vial 86	1	Sample	17	0.00000	0.000	0.00000
	*	1910837009	Vial 87	1	Sample	18	0.00000	0.000	0.00000
	*	1909952003 10K	Vial 88	1	Sample	19	5.40192e5	9.131	9.36492e4
	*	649383 CCV@25	Vial 71	1	Control	20	1.31963e6	8.922	24.70624

#	*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
	*	649377 CCV@25	Vial 71	1	Control	1	4.18181e5	8.869	24.80861
	*	649381 QC@4.0	Vial 72	1	Control	2	8.36399e4	9.058	4.29372
	*	649379 ICS@4.0	Vial 73	1	Control	3	6.48502e4	8.654	3.82172
	*	649380 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
	*	1910478001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
	*	1910480001 1K	Vial 76	1	Sample	6	1.09251e5	9.041	5913.57786
	*	1910483001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
	*	1911288001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
	*	1910837001	Vial 79	1	Sample	9	0.00000	0.000	0.00000
	*	1910837002 MS	Vial 80	1	Sample	10	7.41215e4	9.057	4.12337
	*	1910837003 MSD	Vial 81	1	Sample	11	7.23834e4	9.061	4.20632
	*	1910837004	Vial 82	1	Sample	12	0.00000	0.000	0.00000
	*	1910837005	Vial 83	1	Sample	13	0.00000	0.000	0.00000
	*	1910837006	Vial 84	1	Sample	14	0.00000	0.000	0.00000
	*	649382 CCV@25	Vial 71	1	Control	15	4.00971e5	8.953	24.95975
	*	1910837007	Vial 85	1	Sample	16	2.34854e4	9.061	1.36511
	*	1910837008	Vial 86	1	Sample	17	0.00000	0.000	0.00000
	*	1910837009	Vial 87	1	Sample	18	0.00000	0.000	0.00000
	*	1909952003 10K	Vial 88	1	Sample	19	1.70464e5	9.151	9.83177e4
	*	649383 CCV@25	Vial 71	1	Control	20	4.01823e5	8.937	25.30992

#	*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
	*	649377 CCV@25	Vial 71	1	Control	1	1.72840e5	8.867	5.00000
	*	649381 QC@4.0	Vial 72	1	Control	2	2.08542e5	9.066	5.00000
	*	649379 ICS@4.0	Vial 73	1	Control	3	1.81824e5	8.654	5.00000
	*	649380 LMB	Vial 74	1	Control	4	2.16871e5	9.008	5.00000
	*	1910478001	Vial 75	1	Sample	5	1.72857e5	8.404	5.00000
	*	1910480001 1K	Vial 76	1	Sample	6	1.97149e5	9.050	5000.00000
	*	1910483001	Vial 77	1	Sample	7	1.65412e5	8.420	5.00000
	*	1911288001	Vial 78	1	Sample	8	1.81749e5	8.489	5.00000

Batch Report: C:\HPCHEM\1\DATA\23APR19D\23APR19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	1910837001	Vial 79	1	Sample	9	1.87599e5	9.028	5.00000
*	1910837002 MS	Vial 80	1	Sample	10	1.92507e5	9.073	5.00000
*	1910837003 MSD	Vial 81	1	Sample	11	1.84256e5	9.062	5.00000
*	1910837004	Vial 82	1	Sample	12	1.80138e5	8.810	5.00000
*	1910837005	Vial 83	1	Sample	13	1.97954e5	9.090	5.00000
*	1910837006	Vial 84	1	Sample	14	1.83017e5	9.051	5.00000
*	649382 CCV@25	Vial 71	1	Control	15	1.64671e5	8.965	5.00000
*	1910837007	Vial 85	1	Sample	16	1.84879e5	9.067	5.00000
*	1910837008	Vial 86	1	Sample	17	1.96777e5	8.752	5.00000
*	1910837009	Vial 87	1	Sample	18	1.91613e5	9.161	5.00000
*	1909952003 10K	Vial 88	1	Sample	19	1.83509e5	9.157	5.00000e4
*	649383 CCV@25	Vial 71	1	Control	20	1.62618e5	8.942	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\APR\23APR19D.S

Sequence Table:

Method and Injection Info Part:

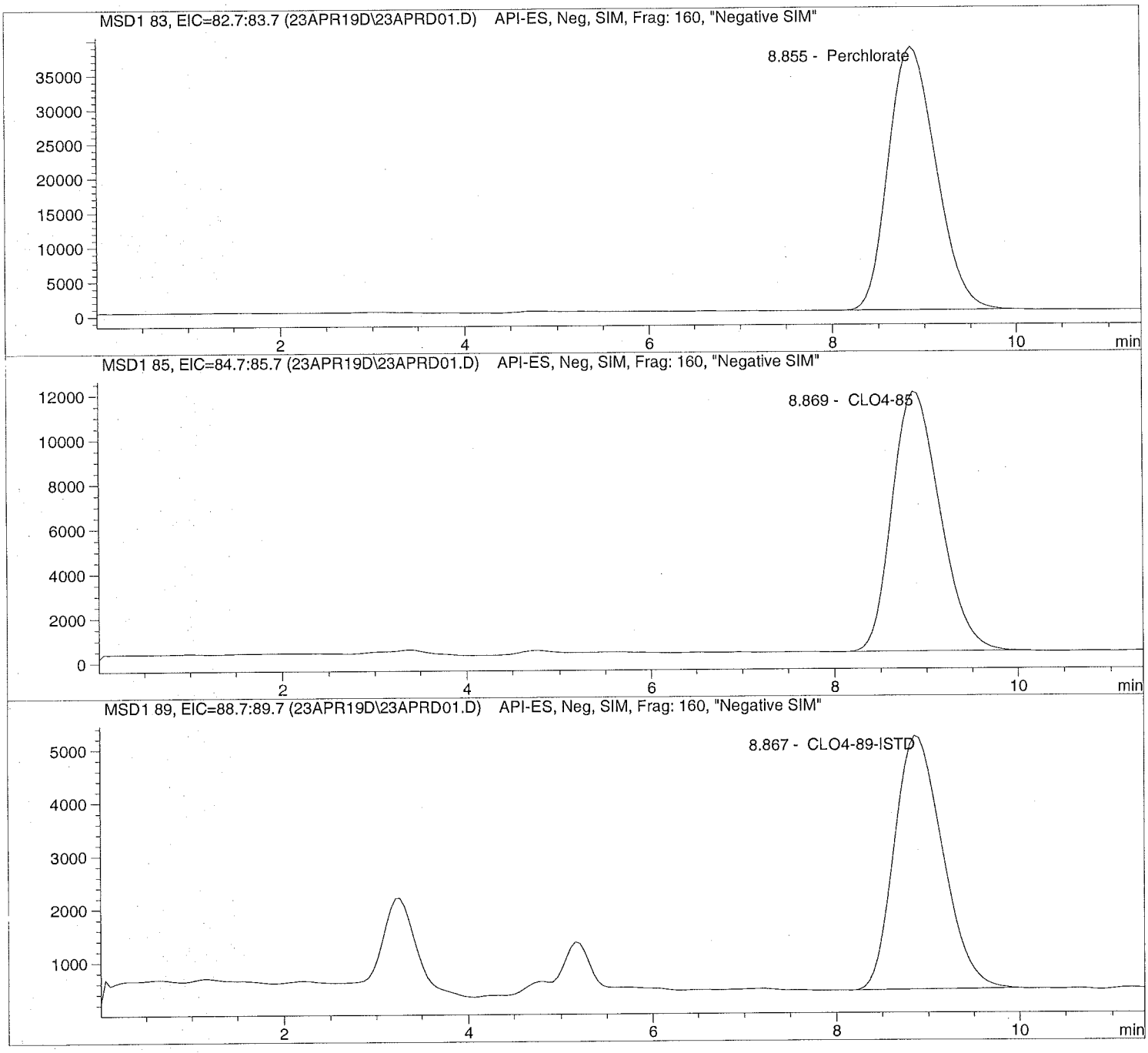
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	649377	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	649381	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	649379	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	649380	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1910478001		CLO4-AQN	1	Sample		
6	Vial 76	1910480001	1K	CLO4-AQN	1	Sample		
7	Vial 77	1910483001		CLO4-AQN	1	Sample		
8	Vial 78	1911288001		CLO4-AQN	1	Sample		
9	Vial 79	1910837001		CLO4-AQN	1	Sample		
10	Vial 80	1910837002	MS	CLO4-AQN	1	Sample		
11	Vial 81	1910837003	MSD	CLO4-AQN	1	Sample		
12	Vial 82	1910837004		CLO4-AQN	1	Sample		
13	Vial 83	1910837005		CLO4-AQN	1	Sample		
14	Vial 84	1910837006		CLO4-AQN	1	Sample		
15	Vial 71	649382	CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1910837007		CLO4-AQN	1	Sample		
17	Vial 86	1910837008		CLO4-AQN	1	Sample		
18	Vial 87	1910837009		CLO4-AQN	1	Sample		
19	Vial 71	649383	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD01.D Sample Name: 649377 CCV@25

Injection Date:	4/23/2019 08:37:56	Seq Line:	1
Sample Name:	649377 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD01.D Sample Name: 649377 CCV@25

Injection Date:	4/23/2019 08:37:56	Seq Line:	1
Sample Name:	649377 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.855	PBA	1360543.6	24.0062	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.869	PBA	418181.2	24.8086	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.867	PBA	172839.5	5.0000	CLO4-89-ISTD

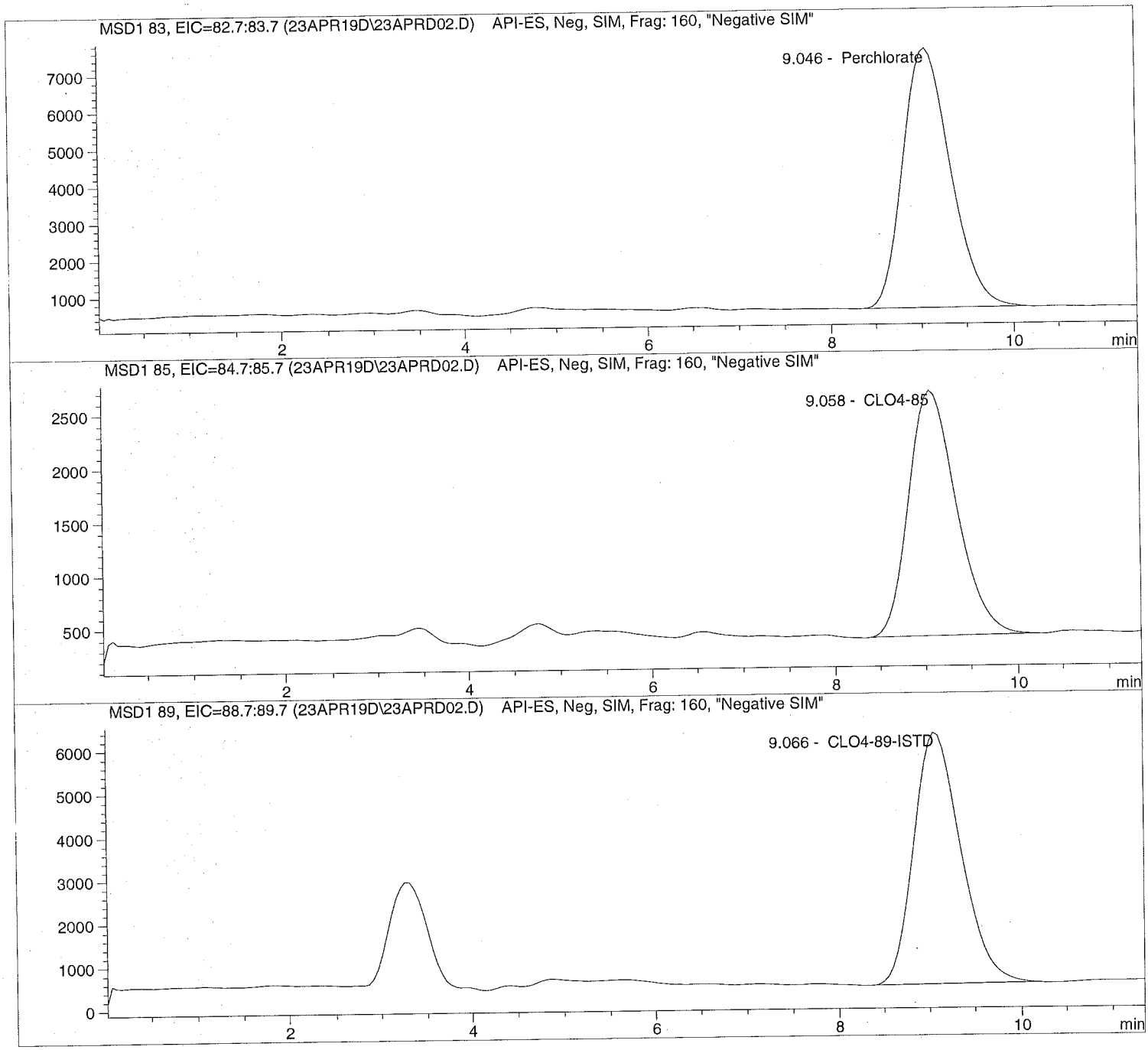
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD02.D Sample Name: 649381 QC@4.0

Injection Date:	4/23/2019 08:53:38	Seq Line:	2
Sample Name:	649381 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD02.D Sample Name: 649381 QC@4.0

Injection Date:	4/23/2019 08:53:38	Seq Line:	2
Sample Name:	649381 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.046	PBA	253897.8	4.0112	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.058	PBA	83639.9	4.2937	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.066	PBA	208541.6	5.0000	CLO4-89-ISTD

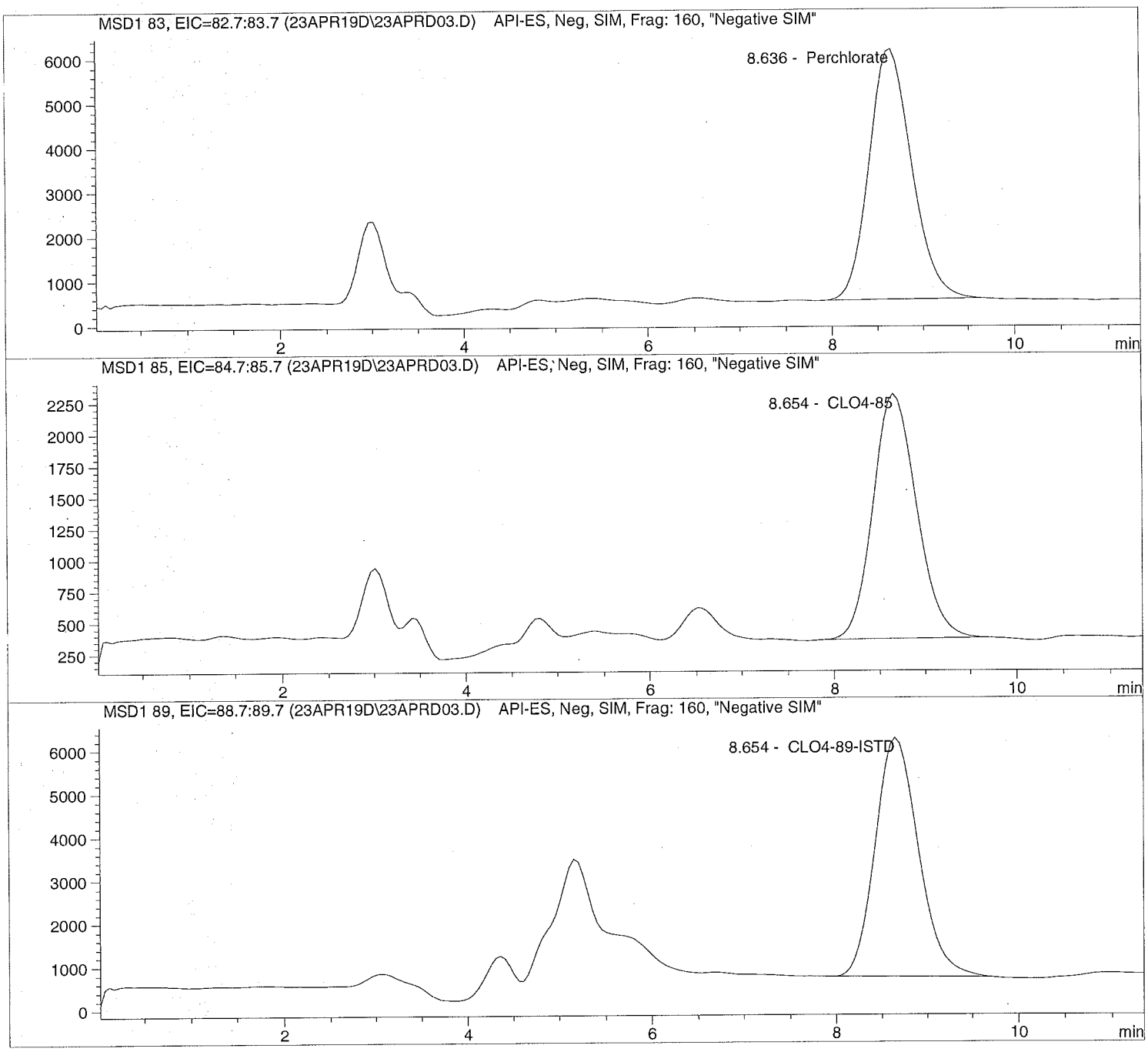
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD03.D Sample Name: 649379 ICS@4.0

Injection Date:	4/23/2019 09:07:01	Seq Line:	3
Sample Name:	649379 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD03.D Sample Name: 649379 ICS@4.0

Injection Date:	4/23/2019 09:07:01	Seq Line:	3
Sample Name:	649379 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.636	PBA	182630.9	3.3416	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.654	PBA	64850.2	3.8217	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.654	PBA	181823.6	5.0000	CLO4-89-ISTD

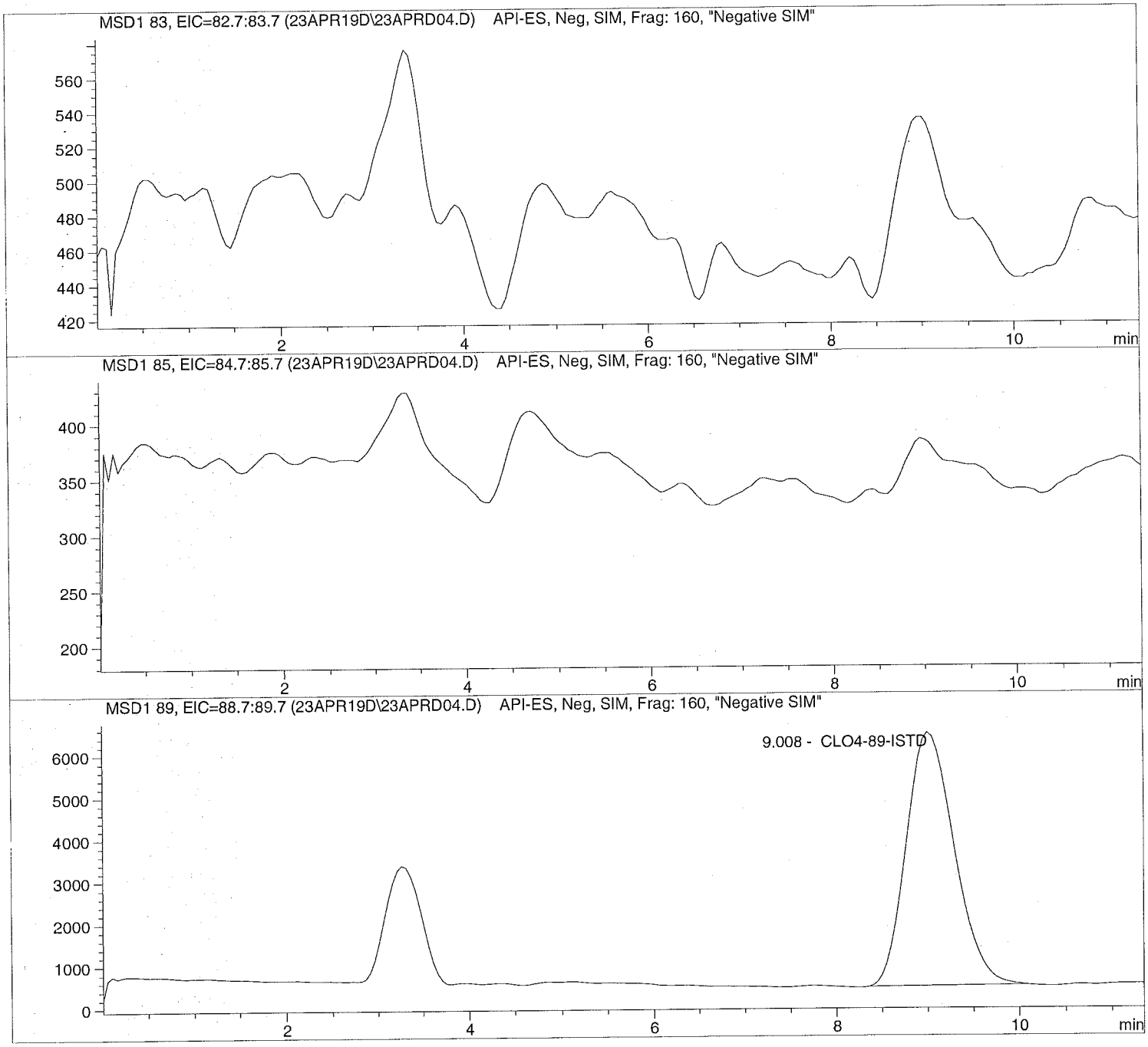
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD04.D Sample Name: 649380 LMB

Injection Date:	4/23/2019 09:20:26	Seq Line:	4
Sample Name:	649380 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD04.D Sample Name: 649380 LMB

Injection Date:	4/23/2019 09:20:26	Seq Line:	4
Sample Name:	649380 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.008	PBA	216871.1	5.0000	CLO4-89-ISTD

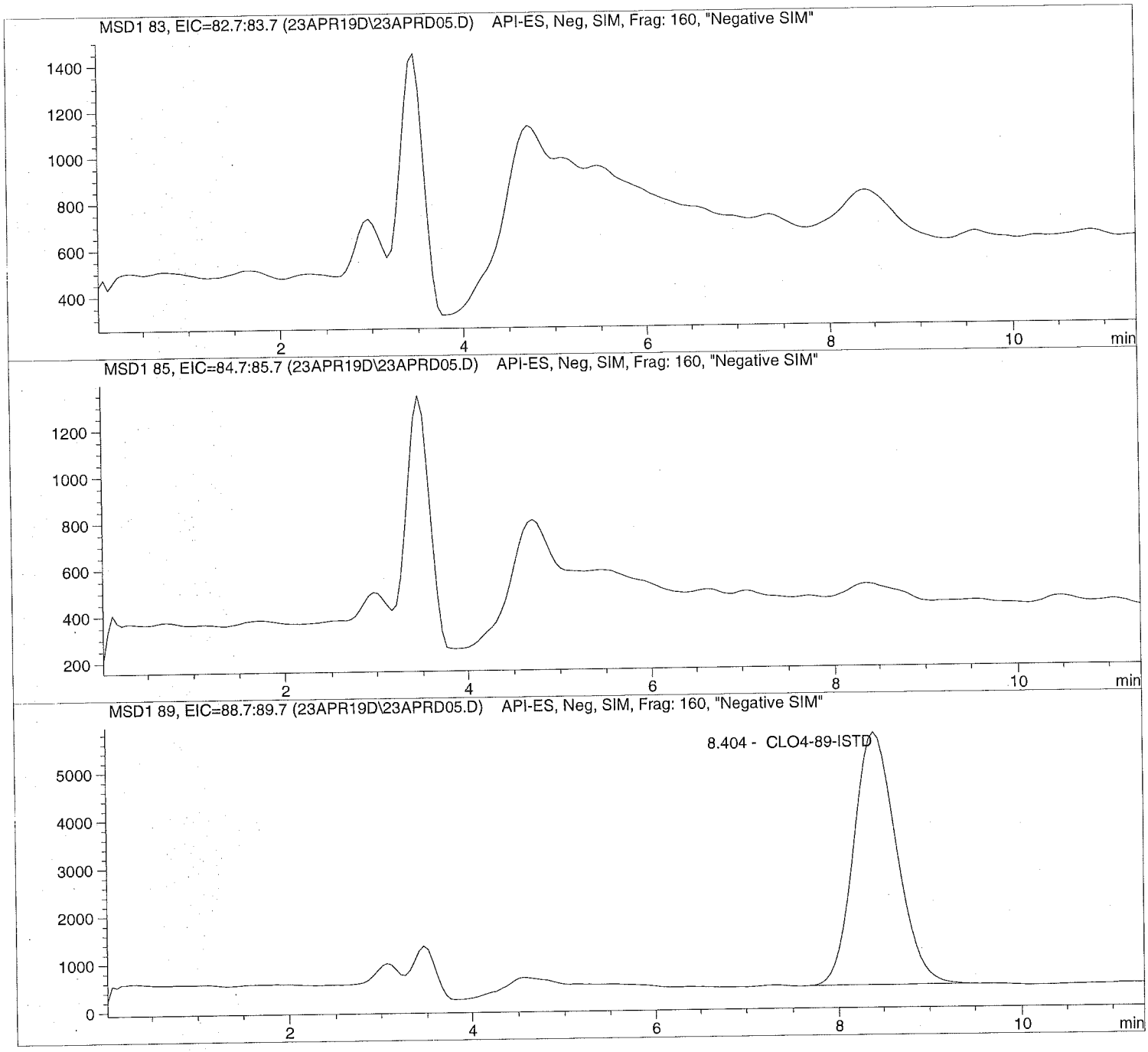
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD05.D Sample Name: 1910478001

Injection Date:	4/23/2019 09:36:37	Seq Line:	5
Sample Name:	1910478001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD05.D Sample Name: 1910478001

Injection Date:	4/23/2019 09:36:37	Seq Line:	5
Sample Name:	1910478001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.404	PBA	172857.1	5.0000	CLO4-89-ISTD

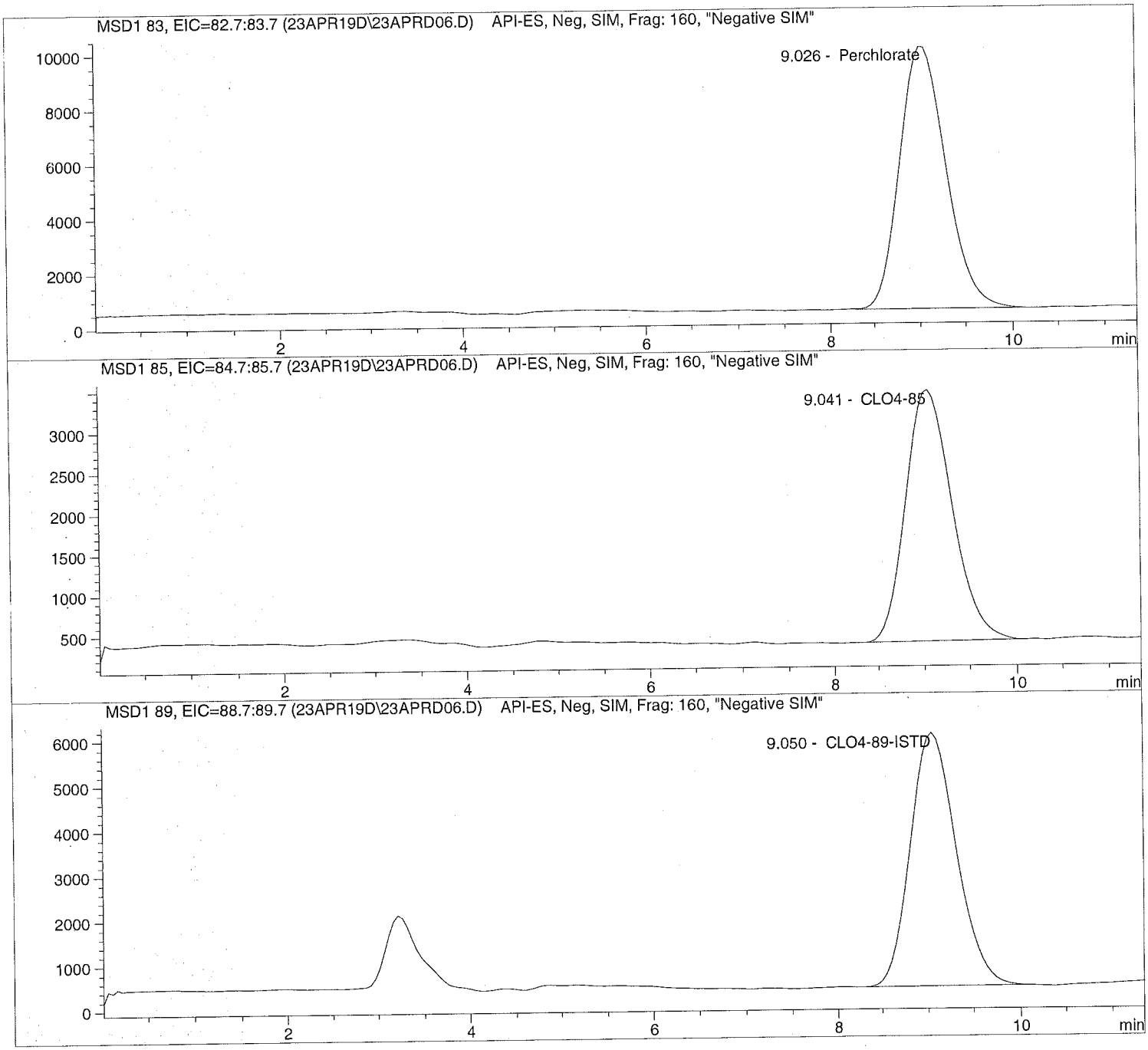
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD06.D Sample Name: 1910480001 1K

Injection Date:	4/23/2019 09:49:59	Seq Line:	6
Sample Name:	1910480001 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD06.D Sample Name: 1910480001 1K

Injection Date:	4/23/2019 09:49:59	Seq Line:	6
Sample Name:	1910480001 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.026	BBA	337160.7	5552.1819	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.041	PBA	109251.5	5913.5779	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.050	PBA	197148.5	5000.0000	CLO4-89-ISTD

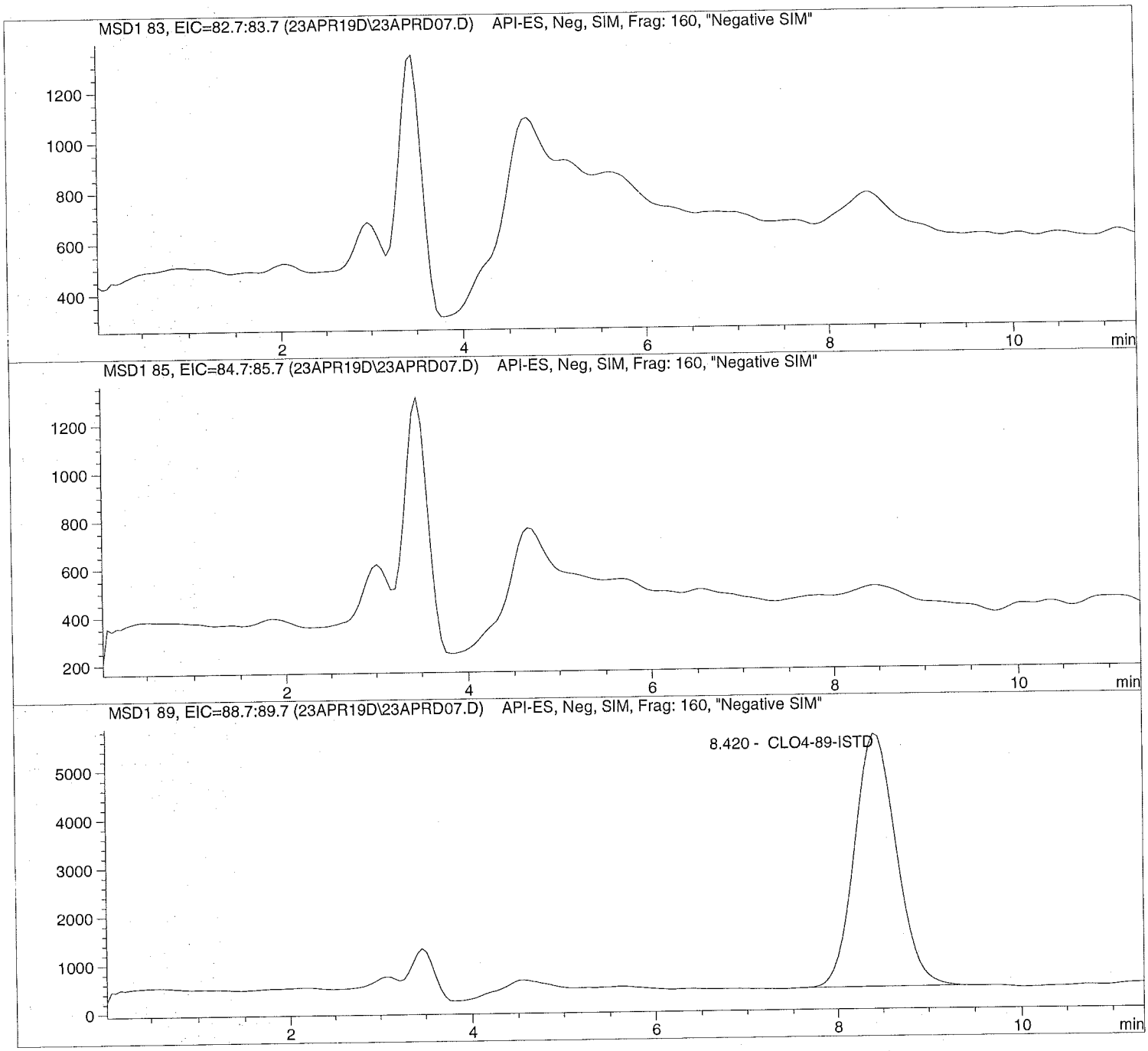
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD07.D Sample Name: 1910483001

Injection Date:	4/23/2019 10:03:26	Seq Line:	7
Sample Name:	1910483001	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD07.D Sample Name: 1910483001

Injection Date:	4/23/2019 10:03:26	Seq Line:	7
Sample Name:	1910483001	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.420	PBA	165412.1	5.0000	CLO4-89-ISTD

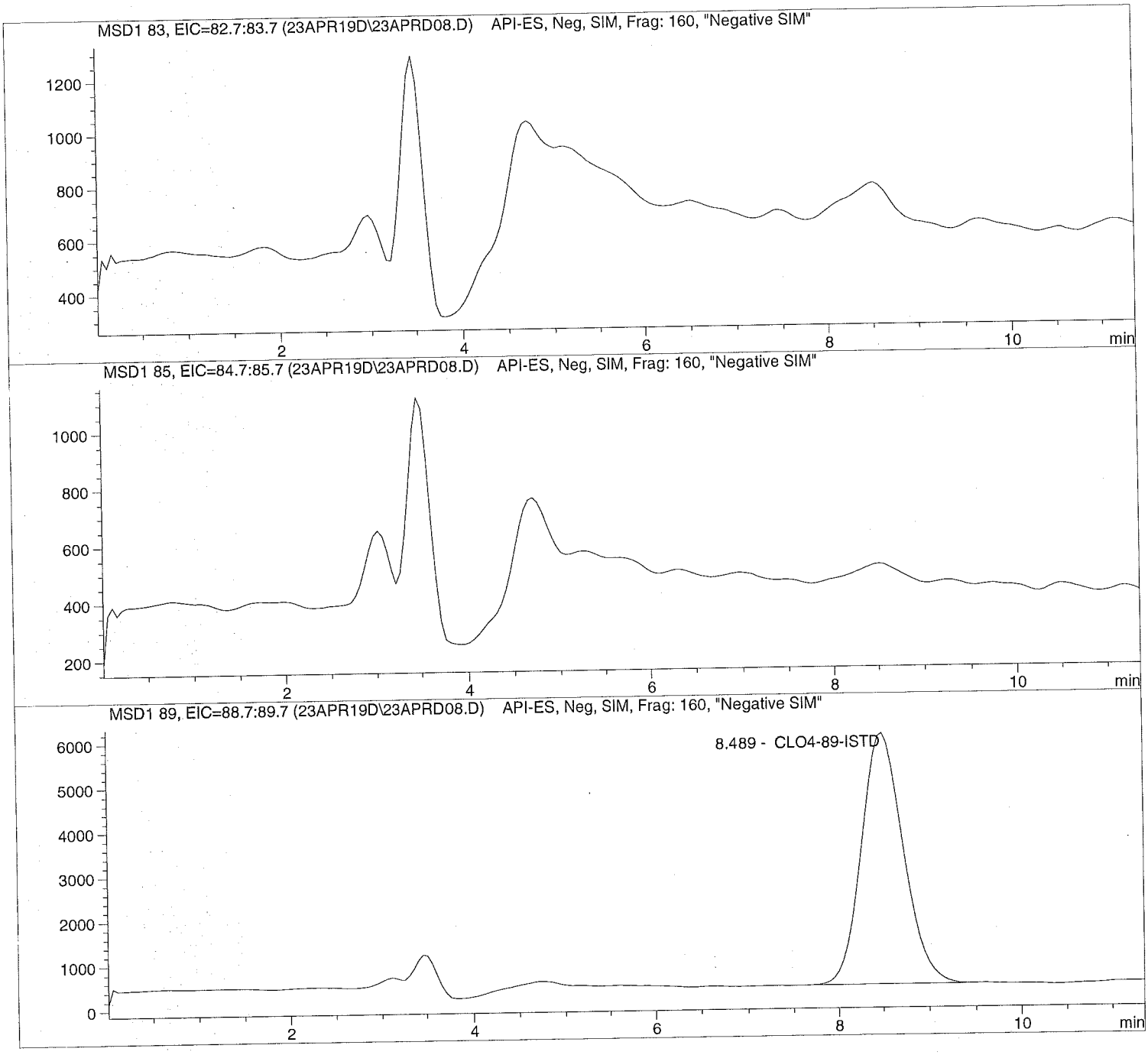
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD08.D Sample Name: 1911288001

Injection Date:	4/23/2019 10:16:48	Seq Line:	8
Sample Name:	1911288001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD08.D Sample Name: 1911288001

Injection Date:	4/23/2019 10:16:48	Seq Line:	8
Sample Name:	1911288001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.489	BBA	181749.4	5.0000	CLO4-89-ISTD

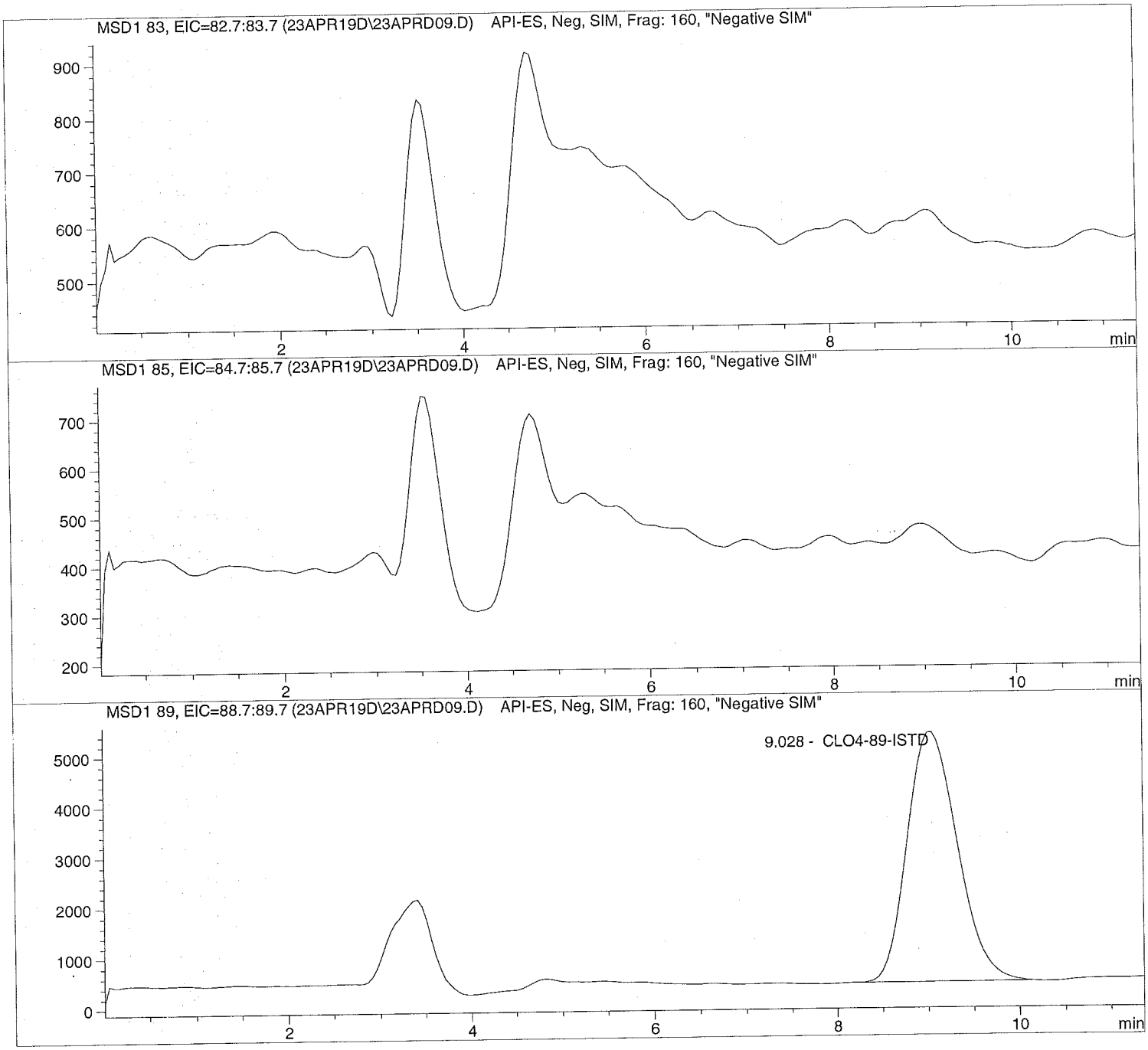
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD09.D Sample Name: 1910837001

Injection Date:	4/23/2019 10:30:16	Seq Line:	9
Sample Name:	1910837001	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD09.D Sample Name: 1910837001

Injection Date:	4/23/2019 10:30:16	Seq Line:	9
Sample Name:	1910837001	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.028	BBA	187599.0	5.0000	CLO4-89-ISTD

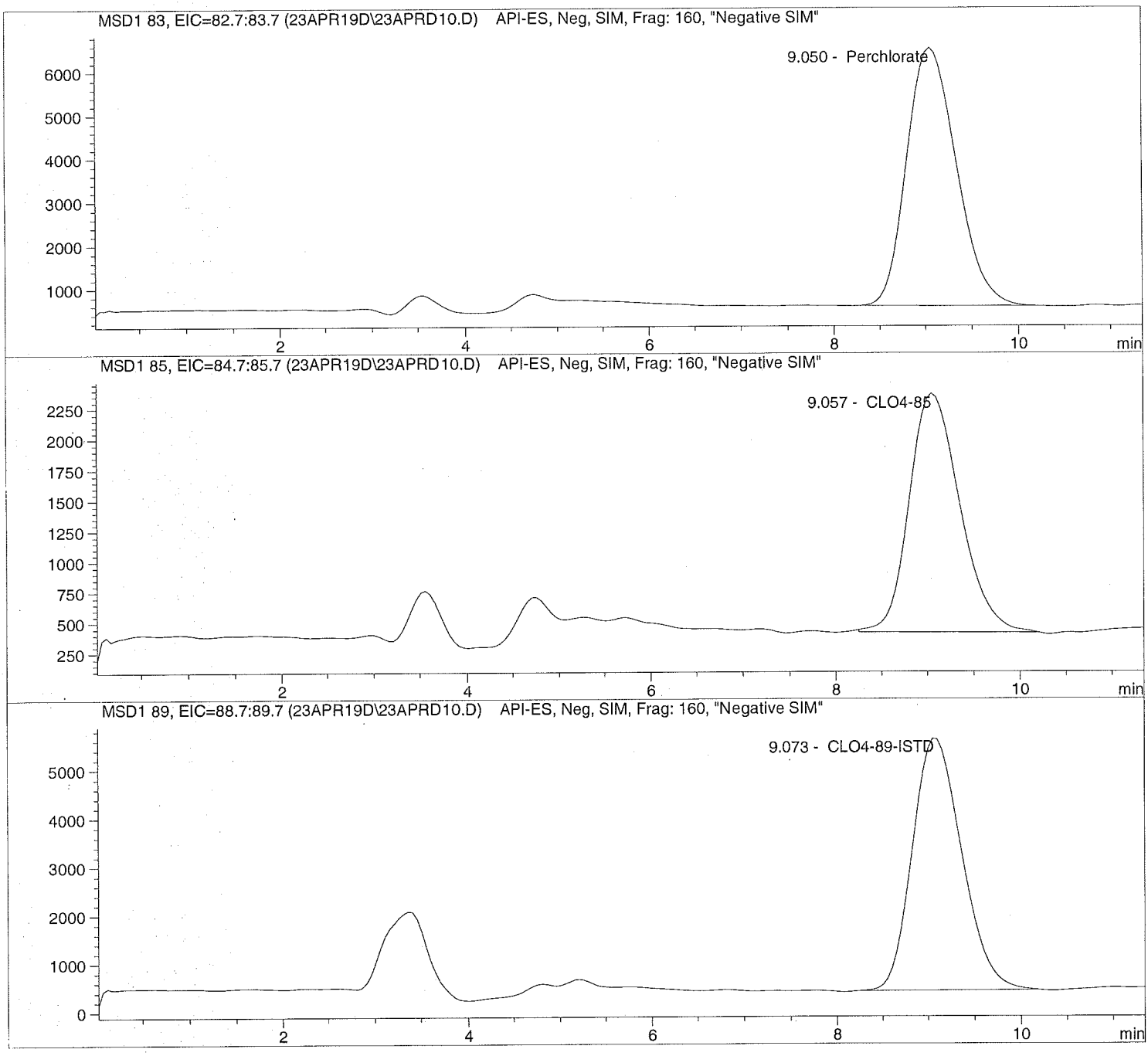
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD10.D Sample Name: 1910837002 MS

Injection Date:	4/23/2019 10:43:43	Seq Line:	10
Sample Name:	1910837002 MS	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD10.D Sample Name: 1910837002 MS

Injection Date:	4/23/2019 10:43:43	Seq Line:	10
Sample Name:	1910837002 MS	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.050	PBA	221785.2	3.8059	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.057	BBA	74121.5	4.1234	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.073	PBA	192506.7	5.0000	CLO4-89-ISTD

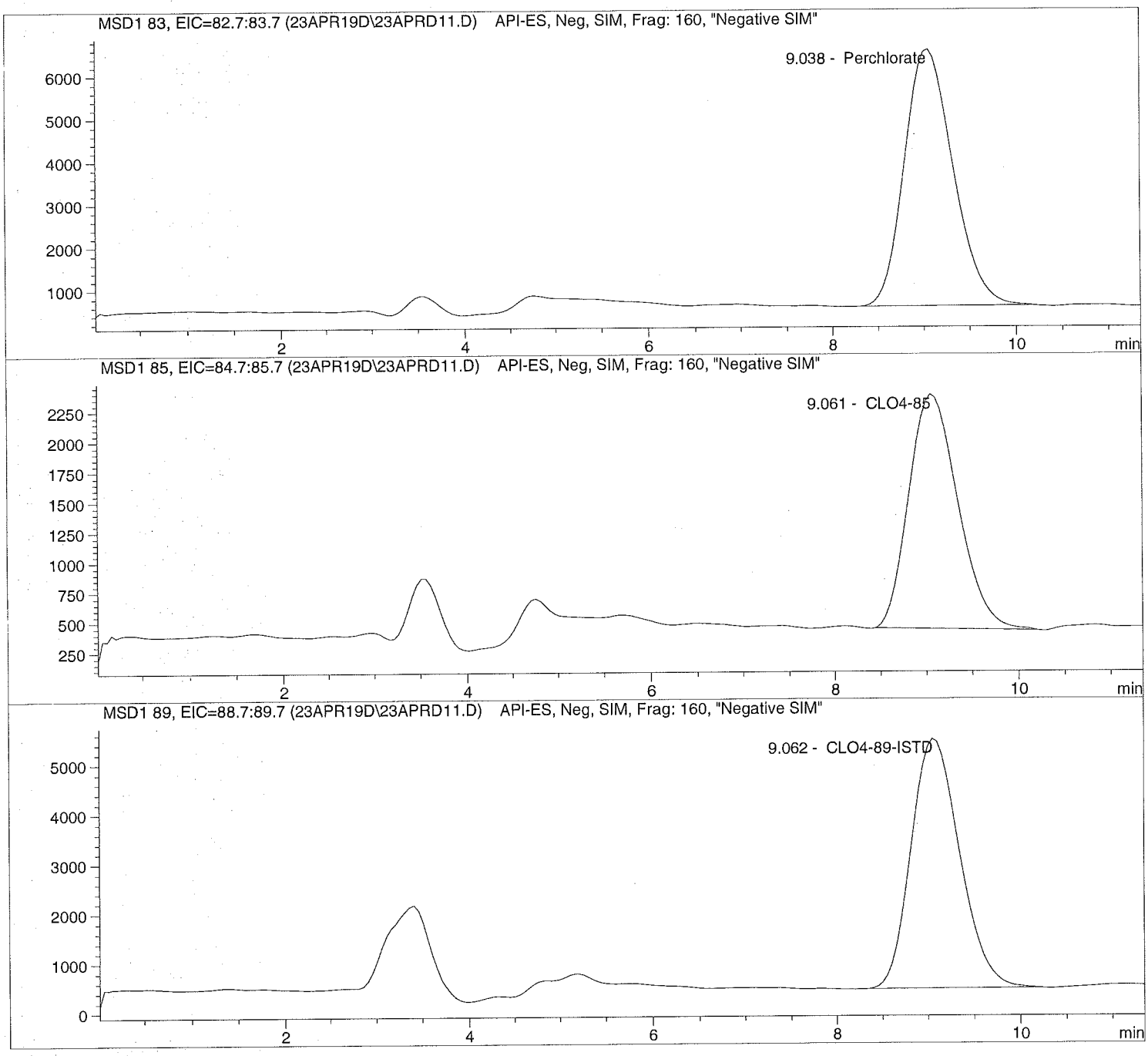
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD11.D Sample Name: 1910837003 MSD

Injection Date:	4/23/2019 10:57:05	Seq Line:	11
Sample Name:	1910837003 MSD	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD11.D Sample Name: 1910837003 MSD

Injection Date:	4/23/2019 10:57:05	Seq Line:	11
Sample Name:	1910837003 MSD	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.038	PBA	220802.4	3.9511	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.061	BBA	72383.4	4.2063	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.062	PBA	184256.2	5.0000	CLO4-89-ISTD

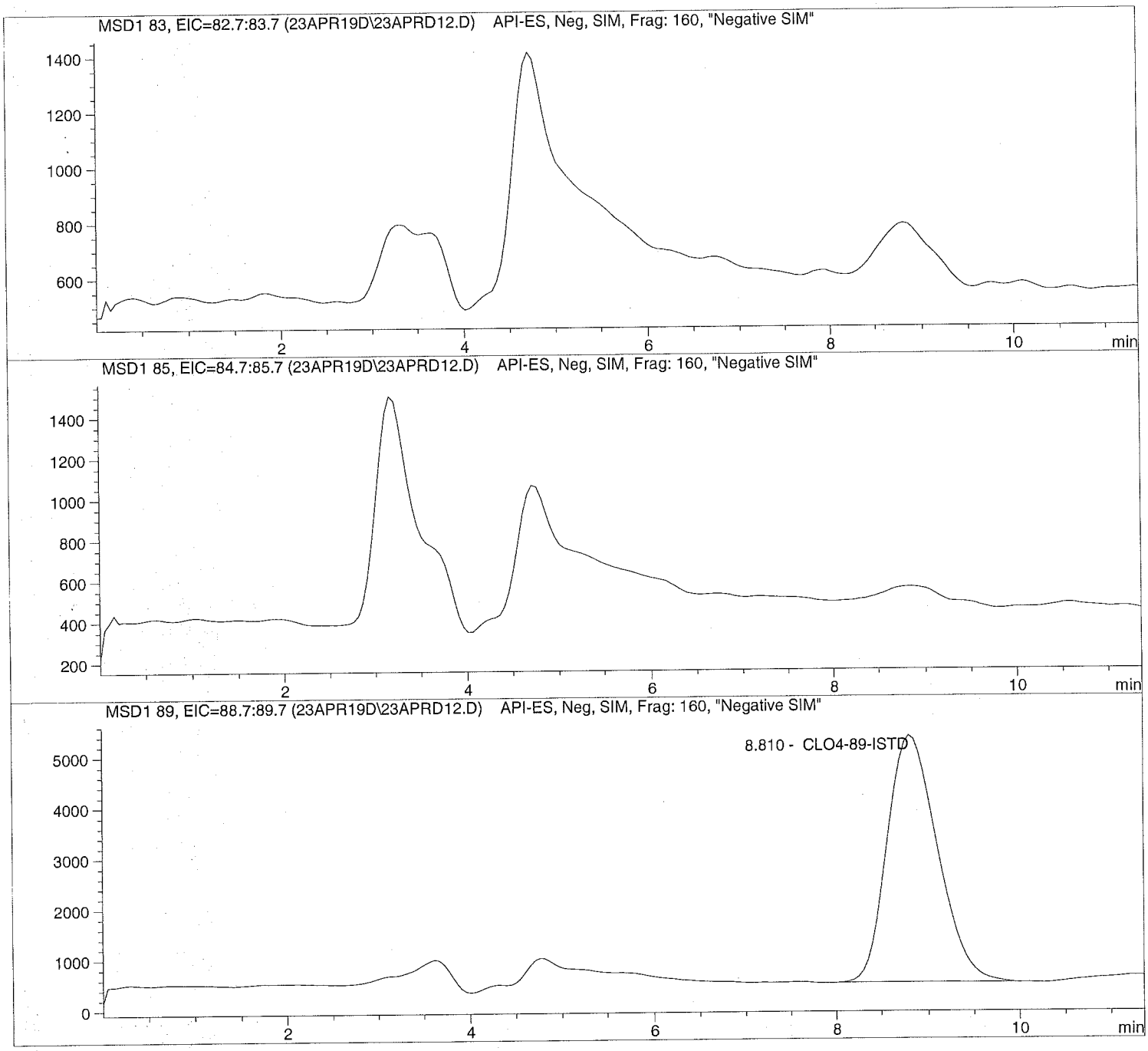
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD12.D Sample Name: 1910837004

Injection Date:	4/23/2019 11:10:26	Seq Line:	12
Sample Name:	1910837004	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD12.D Sample Name: 1910837004

Injection Date:	4/23/2019 11:10:26	Seq Line:	12
Sample Name:	1910837004	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	180138.5	5.0000	CLO4-89-ISTD

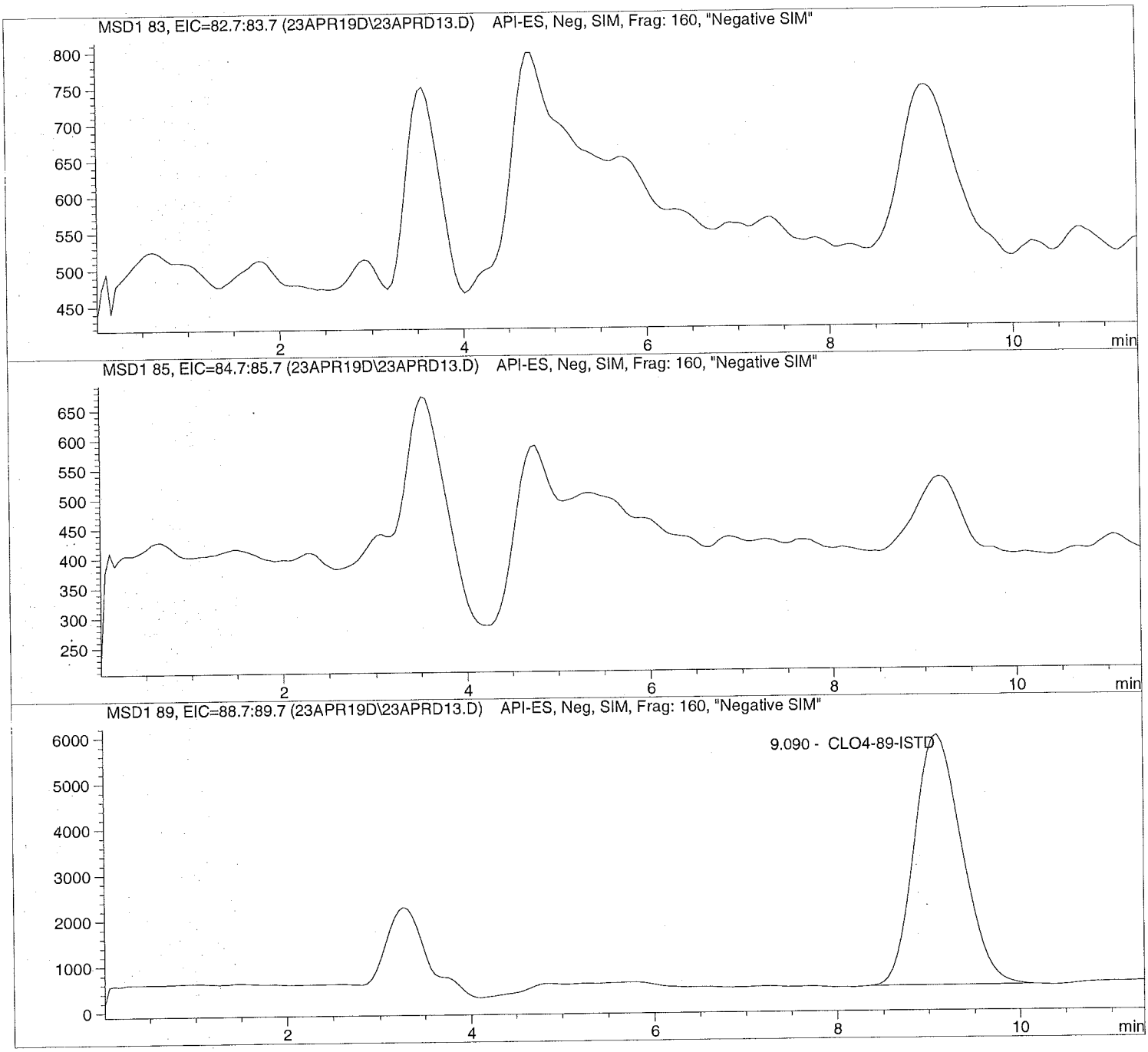
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD13.D Sample Name: 1910837005

Injection Date:	4/23/2019 11:23:52	Seq Line:	13
Sample Name:	1910837005	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD13.D Sample Name: 1910837005

Injection Date:	4/23/2019 11:23:52	Seq Line:	13
Sample Name:	1910837005	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.090	BBA	197954.5	5.0000	CLO4-89-ISTD

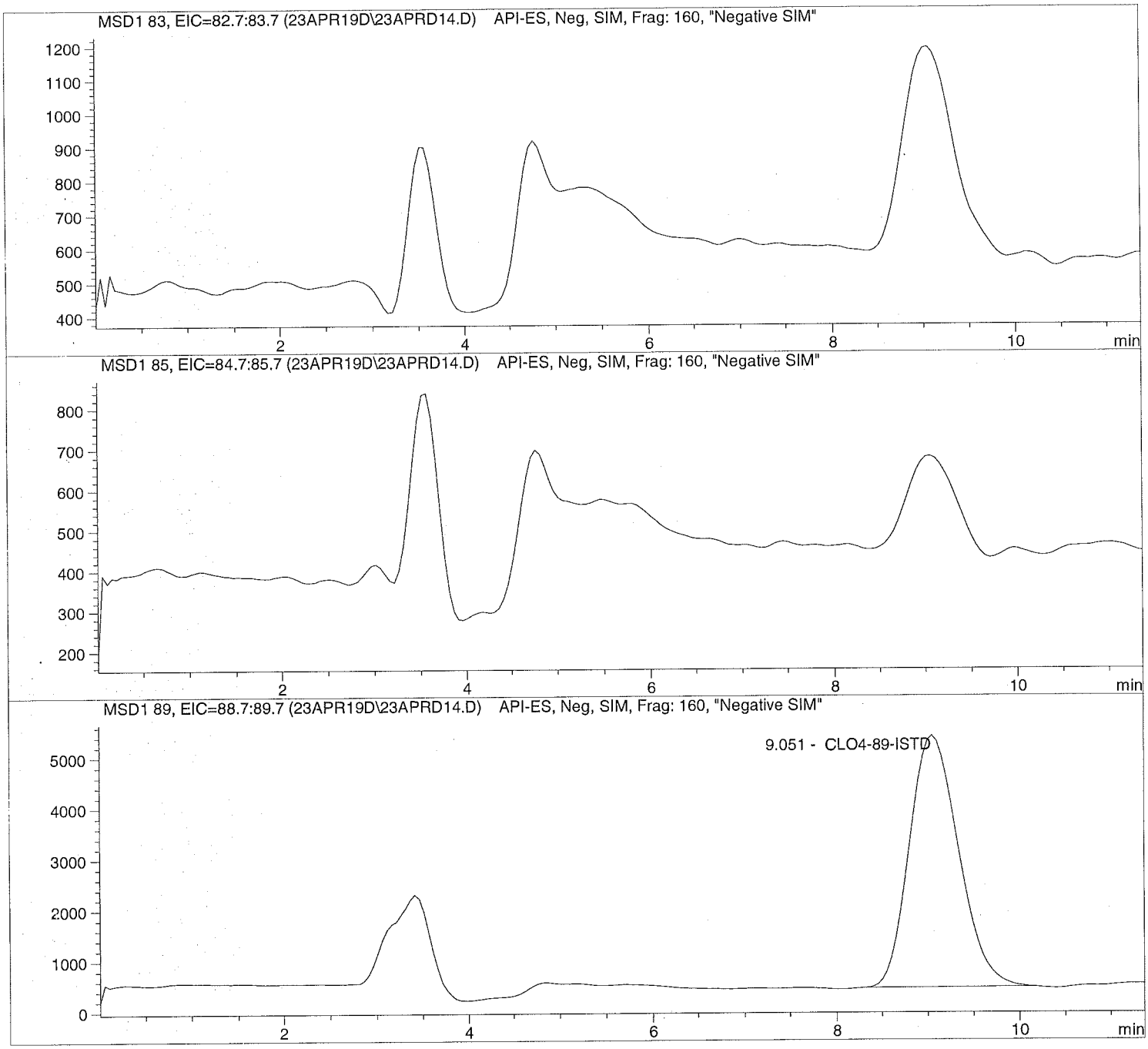
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD14.D Sample Name: 1910837006

Injection Date:	4/23/2019 11:37:15	Seq Line:	14
Sample Name:	1910837006	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD14.D Sample Name: 1910837006

Injection Date:	4/23/2019 11:37:15	Seq Line:	14
Sample Name:	1910837006	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.051	BBA	183017.4	5.0000	CLO4-89-ISTD

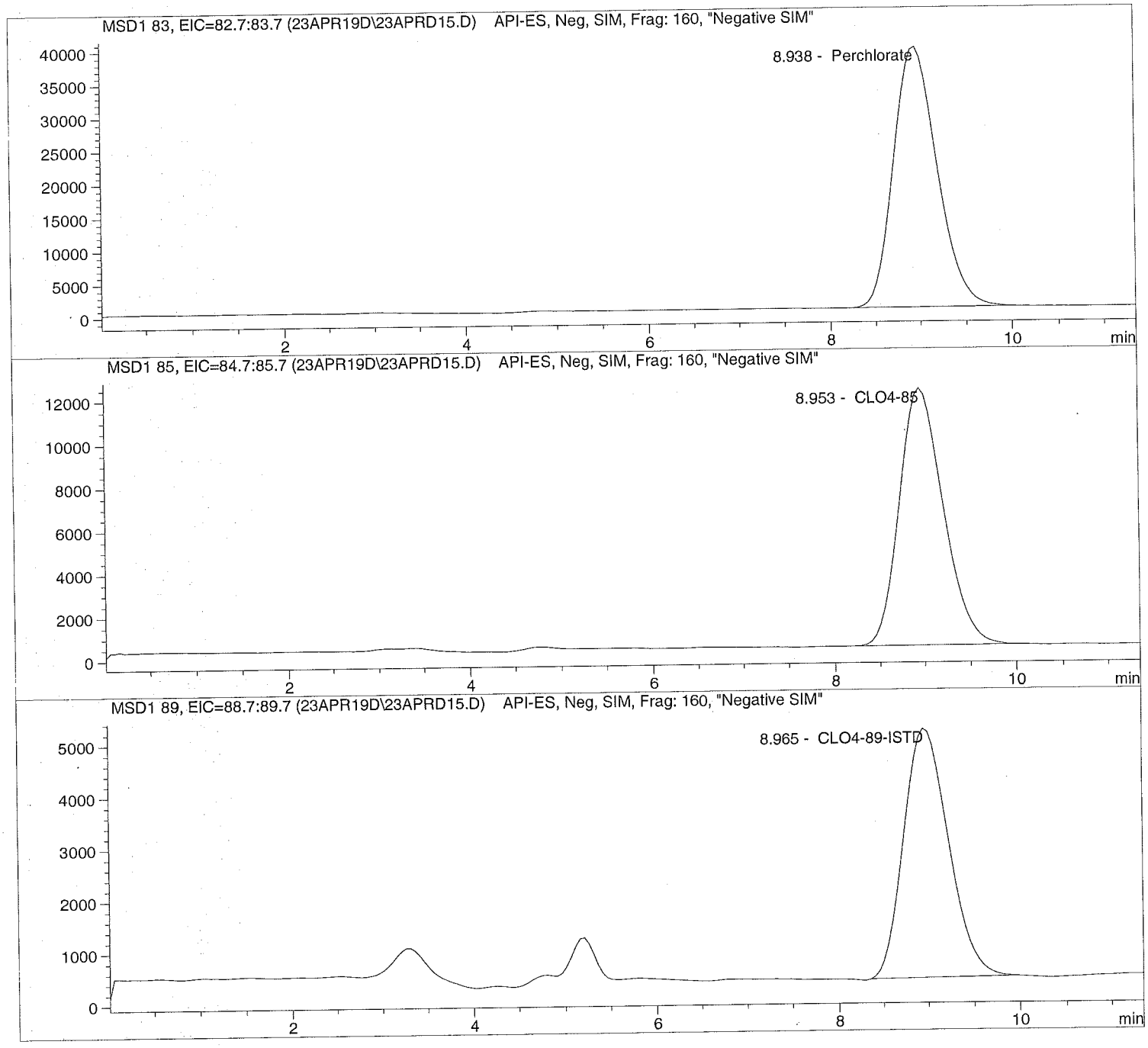
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD15.D Sample Name: 649382 CCV@25

Injection Date:	4/23/2019 11:50:37	Seq Line:	15
Sample Name:	649382 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD15.D Sample Name: 649382 CCV@25

Injection Date:	4/23/2019 11:50:37	Seq Line:	15
Sample Name:	649382 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.938	PBA	1311276.0	24.2693	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.953	BBA	400971.3	24.9597	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.965	PBA	164670.7	5.0000	CLO4-89-ISTD

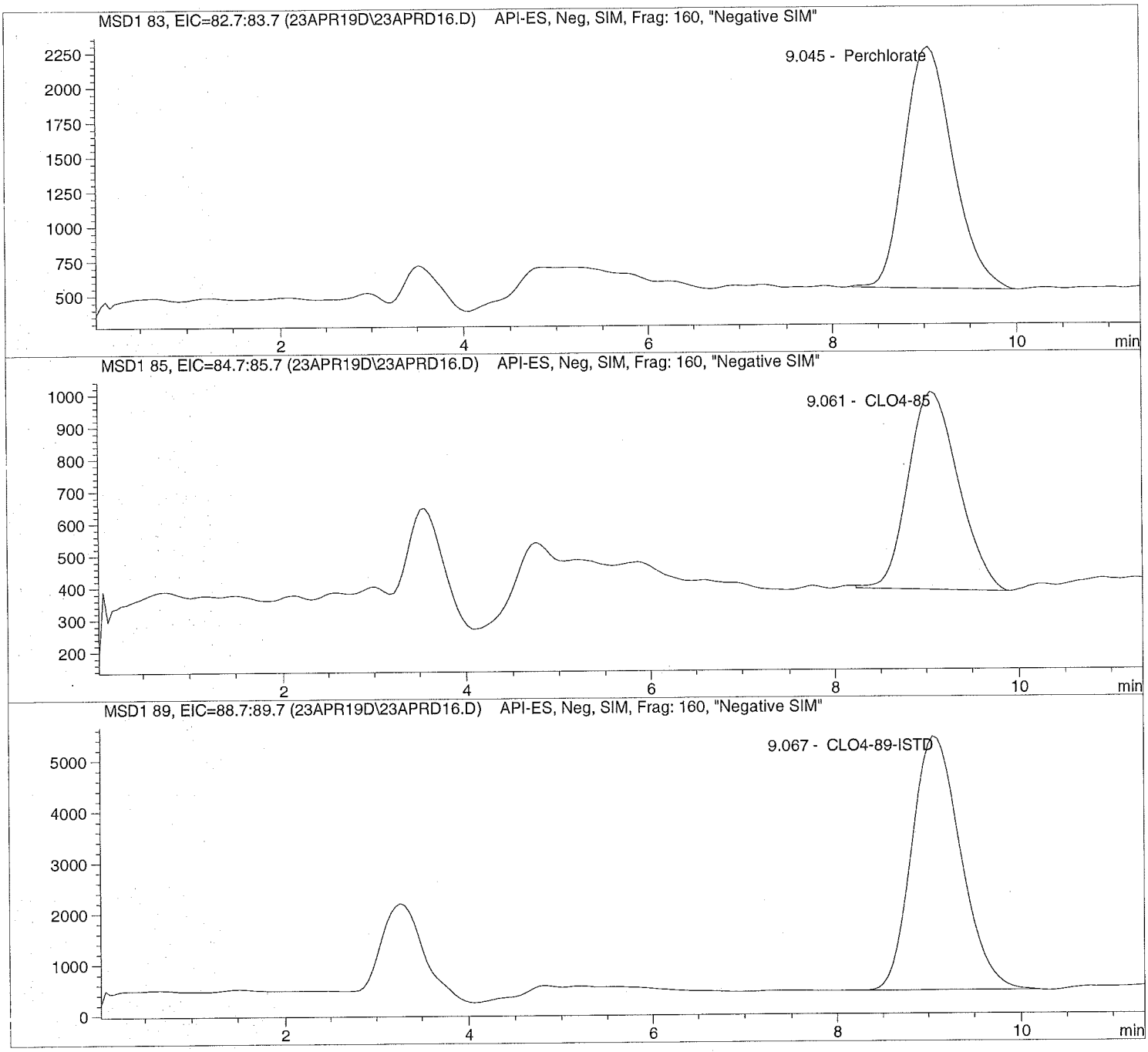
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD16.D Sample Name: 1910837007

Injection Date:	4/23/2019 12:03:59	Seq Line:	16
Sample Name:	1910837007	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD16.D Sample Name: 1910837007

Injection Date:	4/23/2019 12:03:59	Seq Line:	16
Sample Name:	1910837007	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.045	BBA	64240.0	1.2640	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.061	BBA	23485.4	1.3651	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.067	PBA	184879.5	5.0000	CLO4-89-ISTD

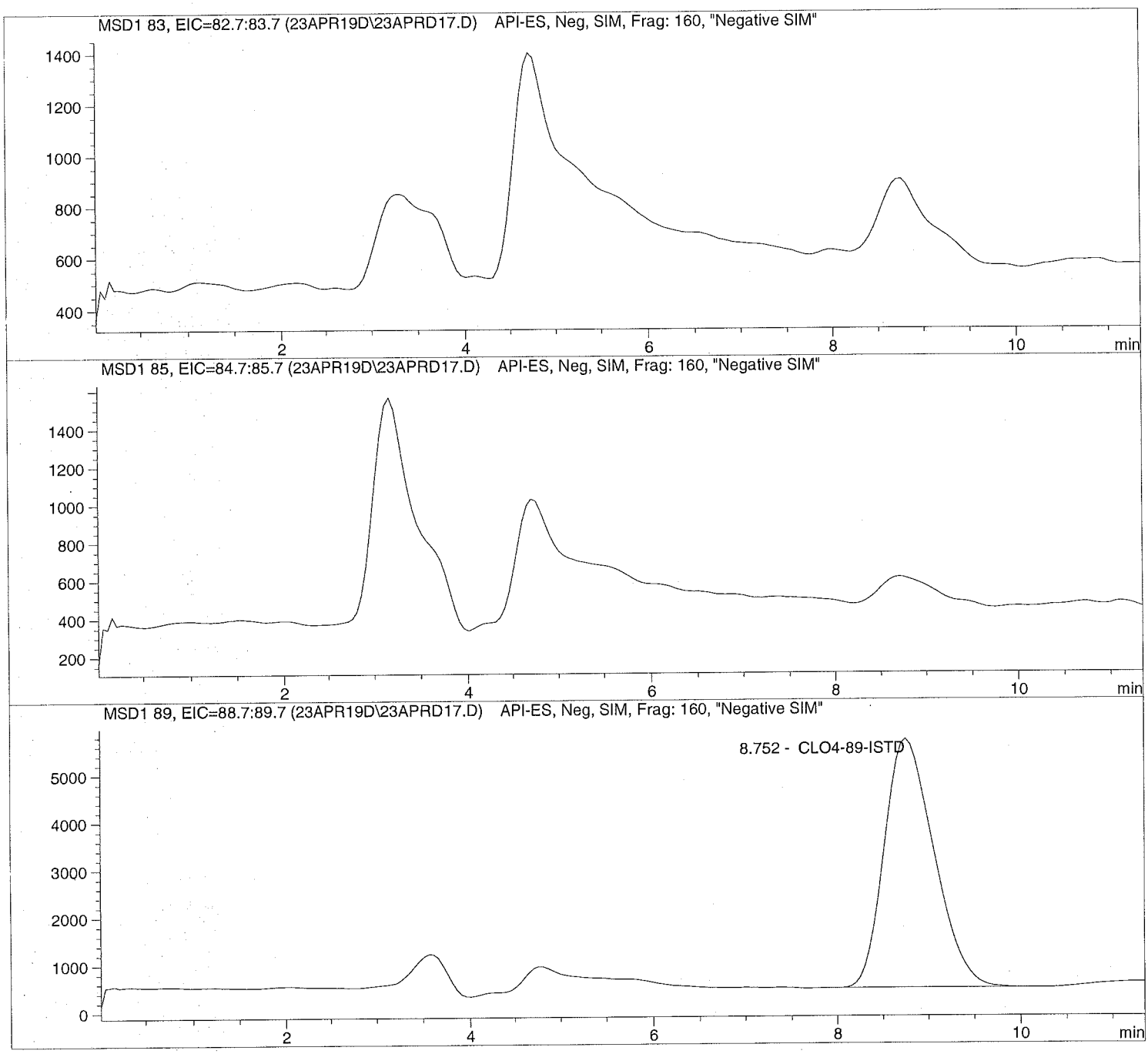
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD17.D Sample Name: 1910837008

Injection Date:	4/23/2019 12:17:22	Seq Line:	17
Sample Name:	1910837008	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD17.D Sample Name: 1910837008

Injection Date:	4/23/2019 12:17:22	Seq Line:	17
Sample Name:	1910837008	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.752	PBA	196776.6	5.0000	CLO4-89-ISTD

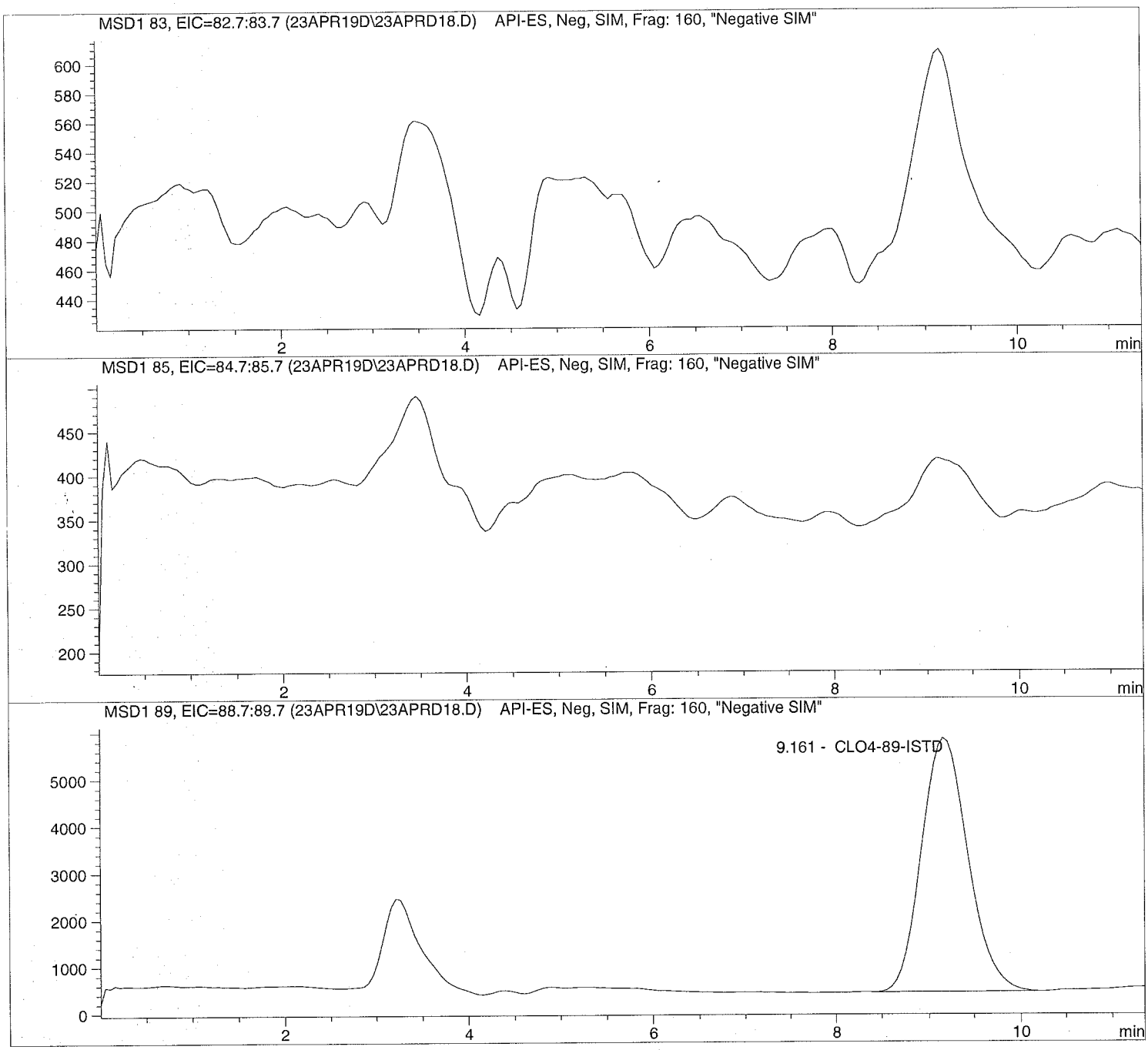
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD18.D Sample Name: 1910837009

Injection Date:	4/23/2019 12:30:43	Seq Line:	18
Sample Name:	1910837009	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD18.D Sample Name: 1910837009

Injection Date:	4/23/2019 12:30:43	Seq Line:	18
Sample Name:	1910837009	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.161	BBA	191613.1	5.0000	CLO4-89-ISTD

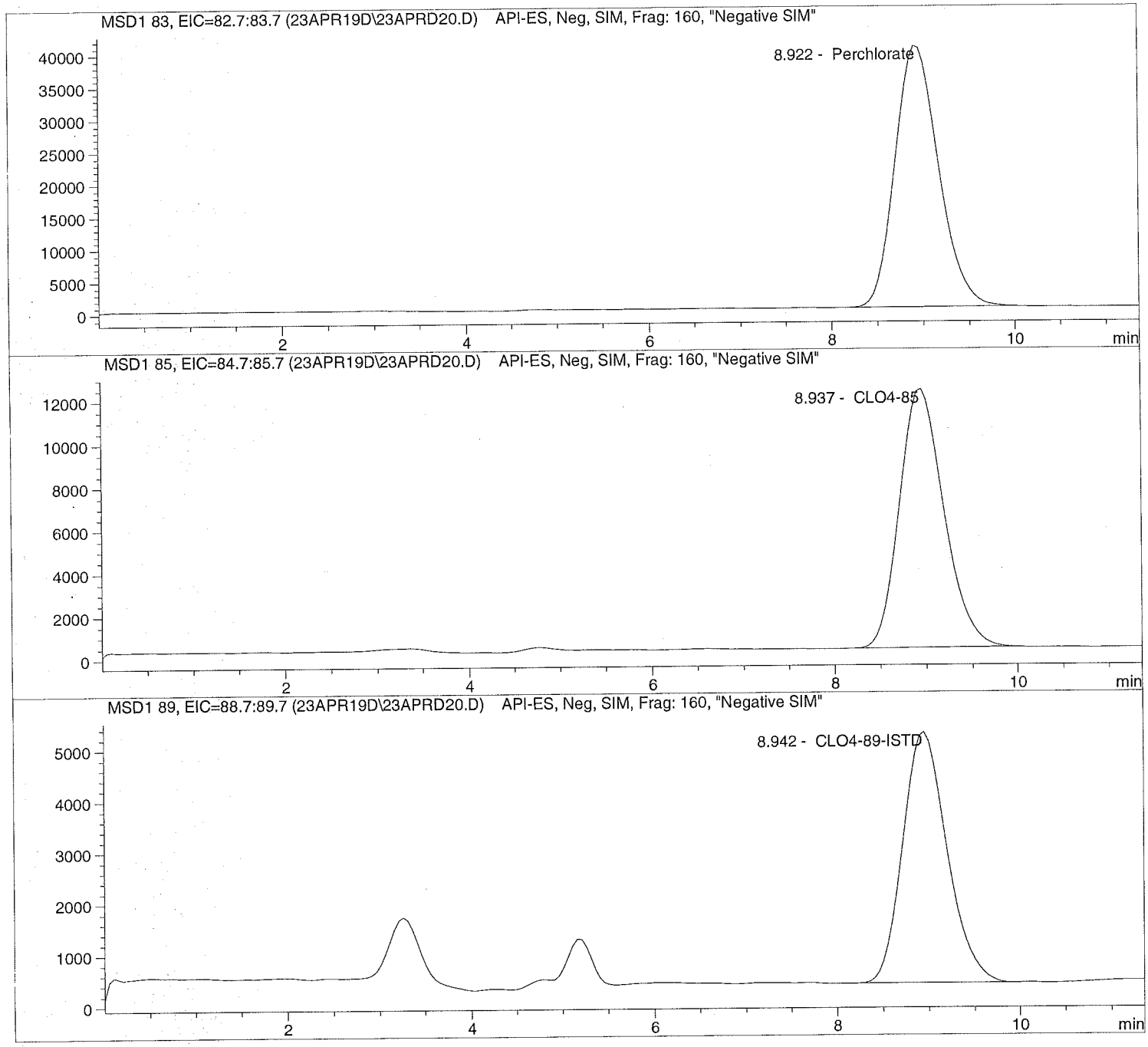
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD20.D Sample Name: 649383 CCV@25

Injection Date:	4/23/2019 13:01:17	Seq Line:	20
Sample Name:	649383 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD20.D Sample Name: 649383 CCV@25

Injection Date:	4/23/2019 13:01:17	Seq Line:	20
Sample Name:	649383 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.922	PBA	1319634.0	24.7062	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.937	PBA	401823.2	25.3099	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.942	PBA	162618.0	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

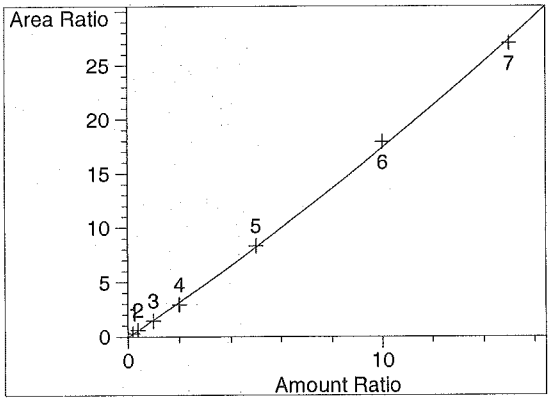
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

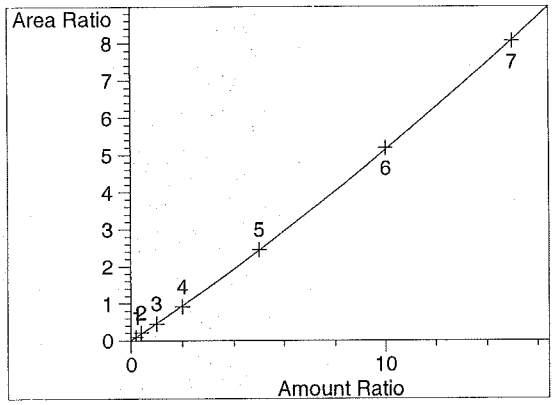
Peak Sum Table

No Entries in table

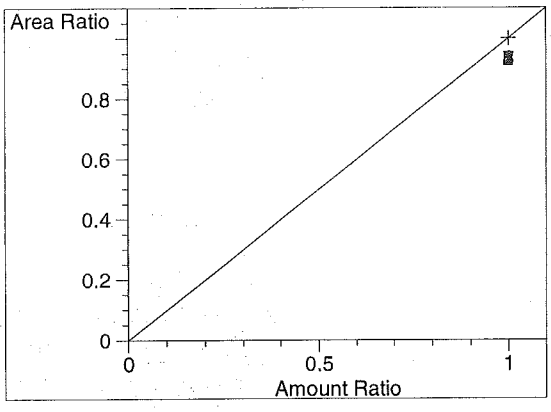
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Report: C:\HPCHEM\1\DATA\19MAR19I\19MAR19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

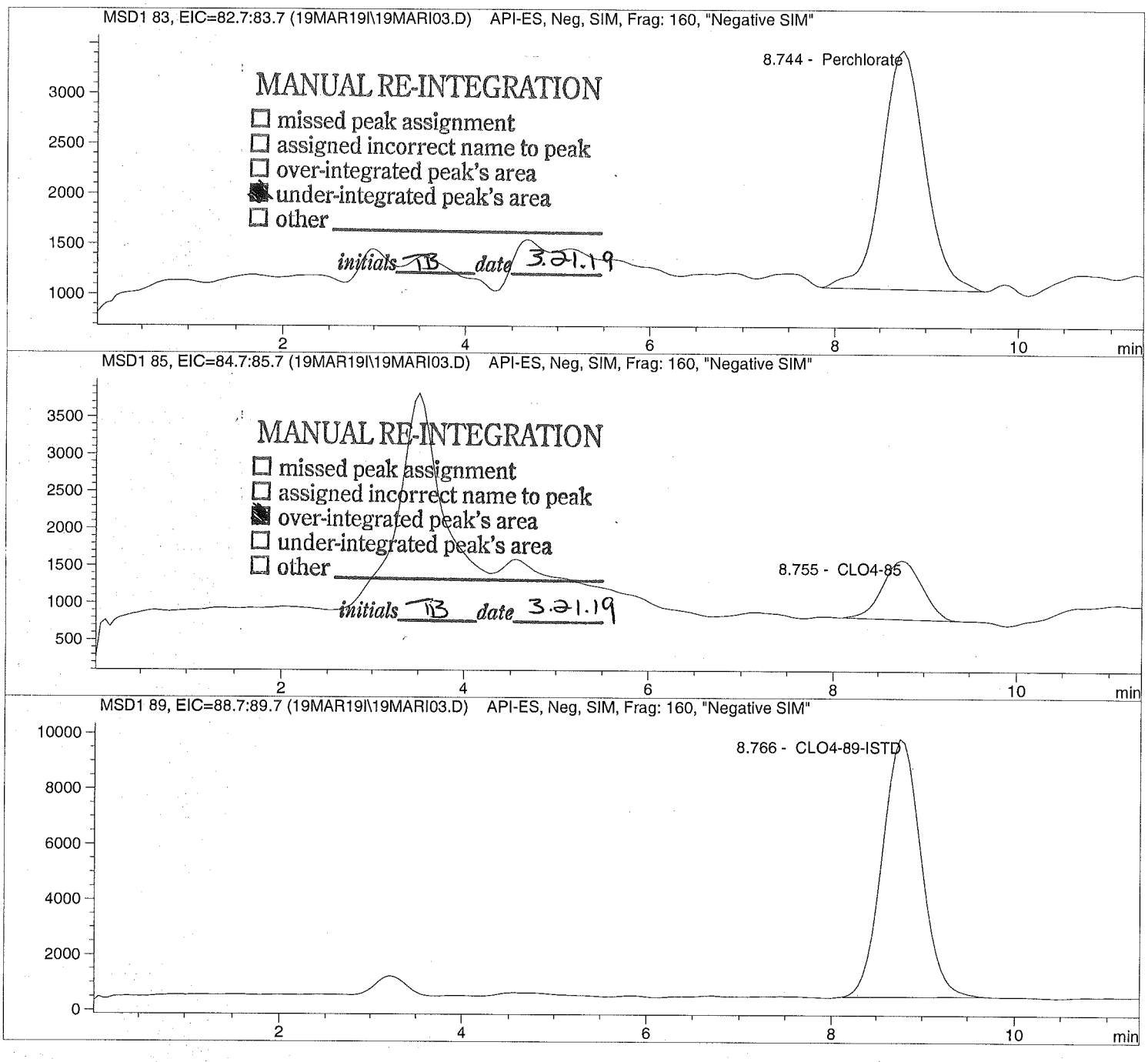
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

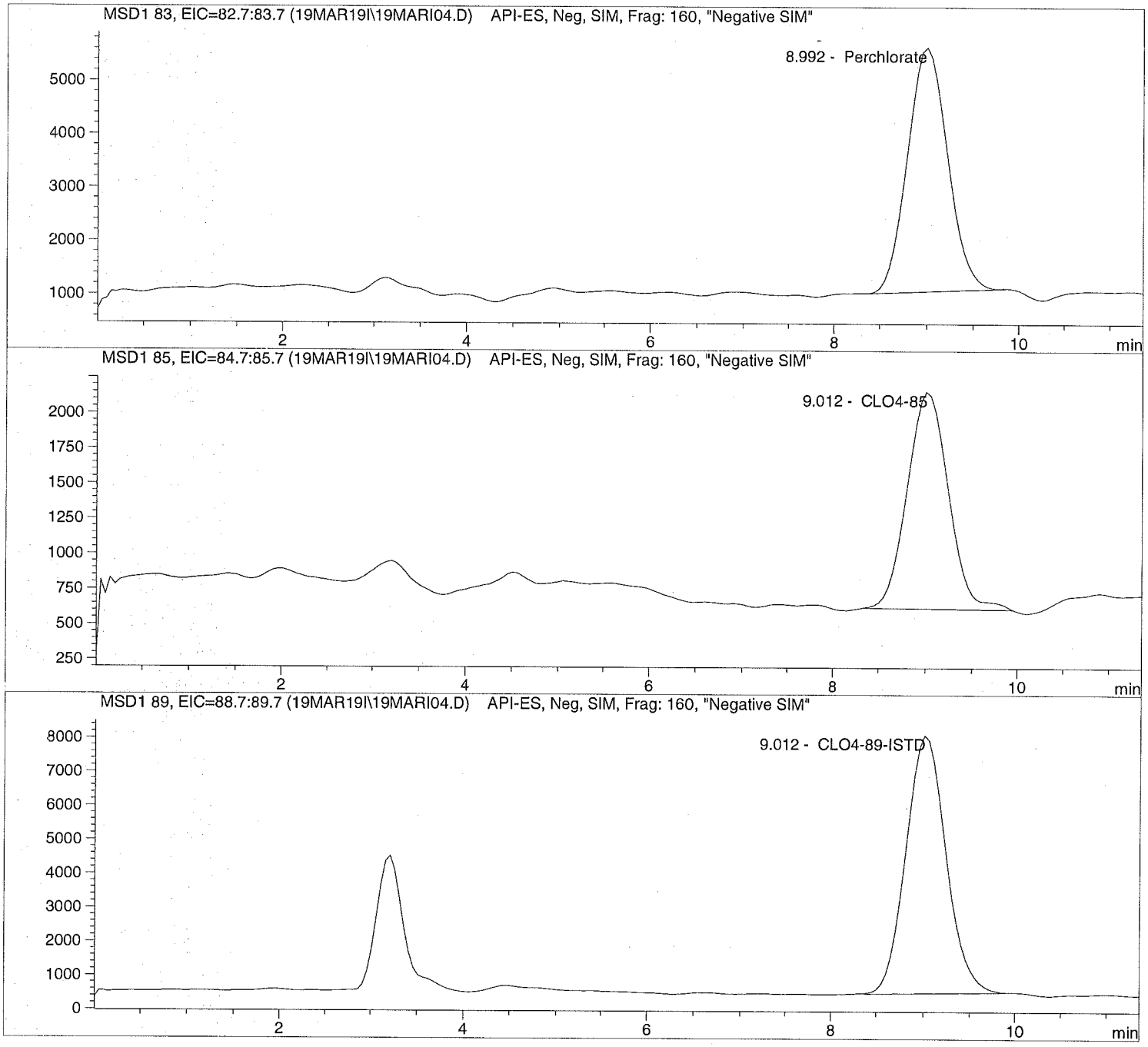
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L 00938145

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

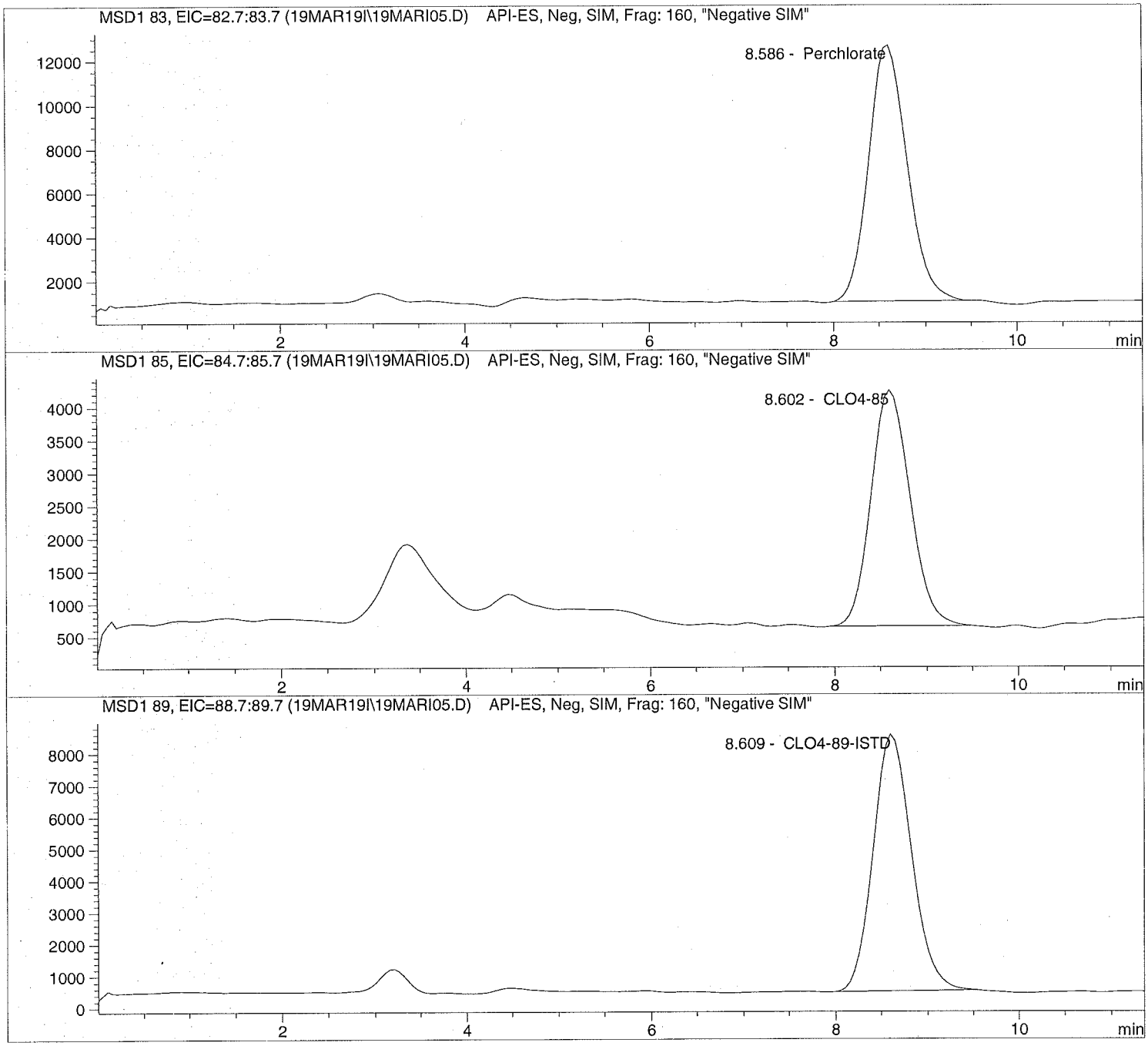
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

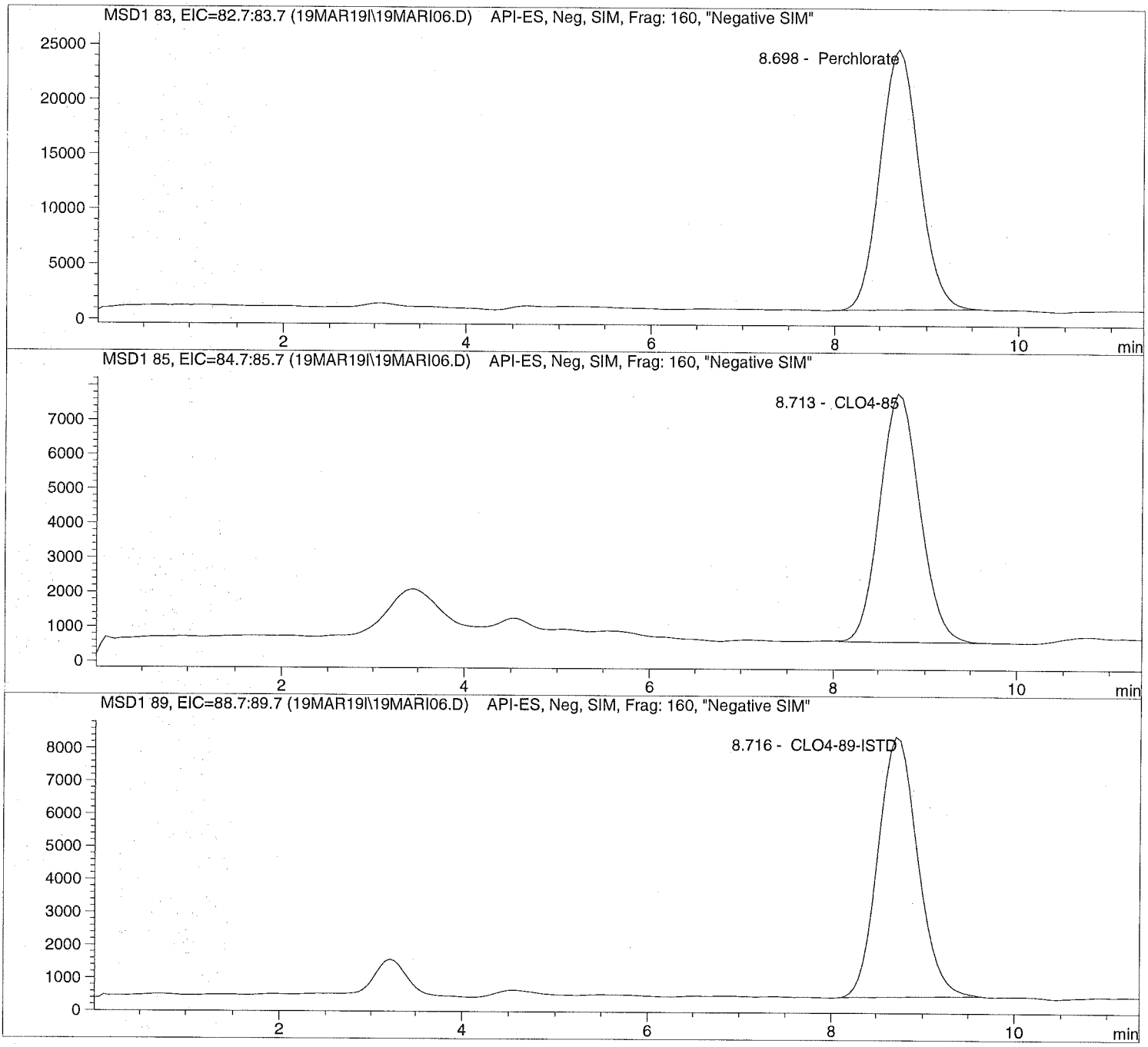
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

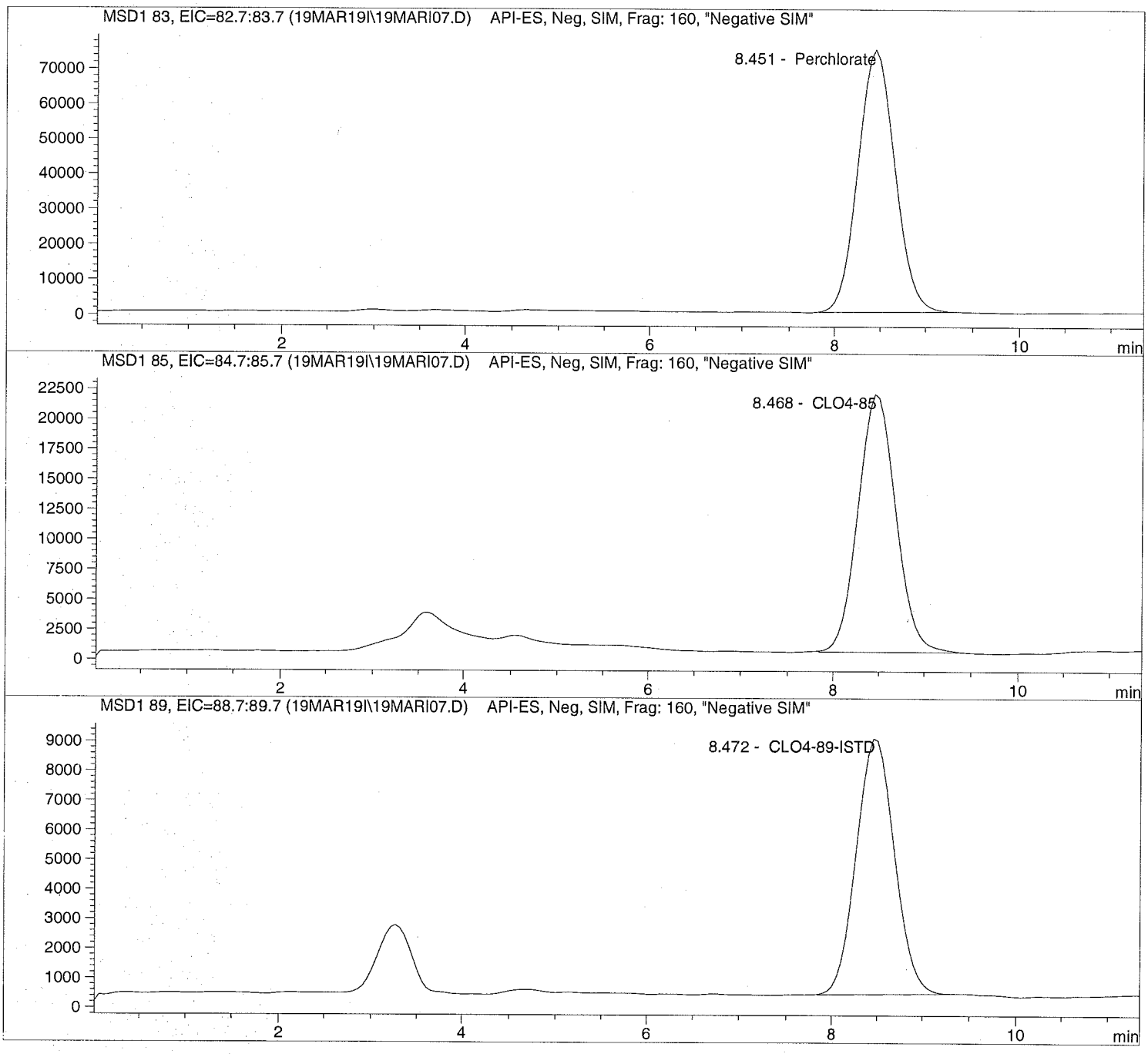
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

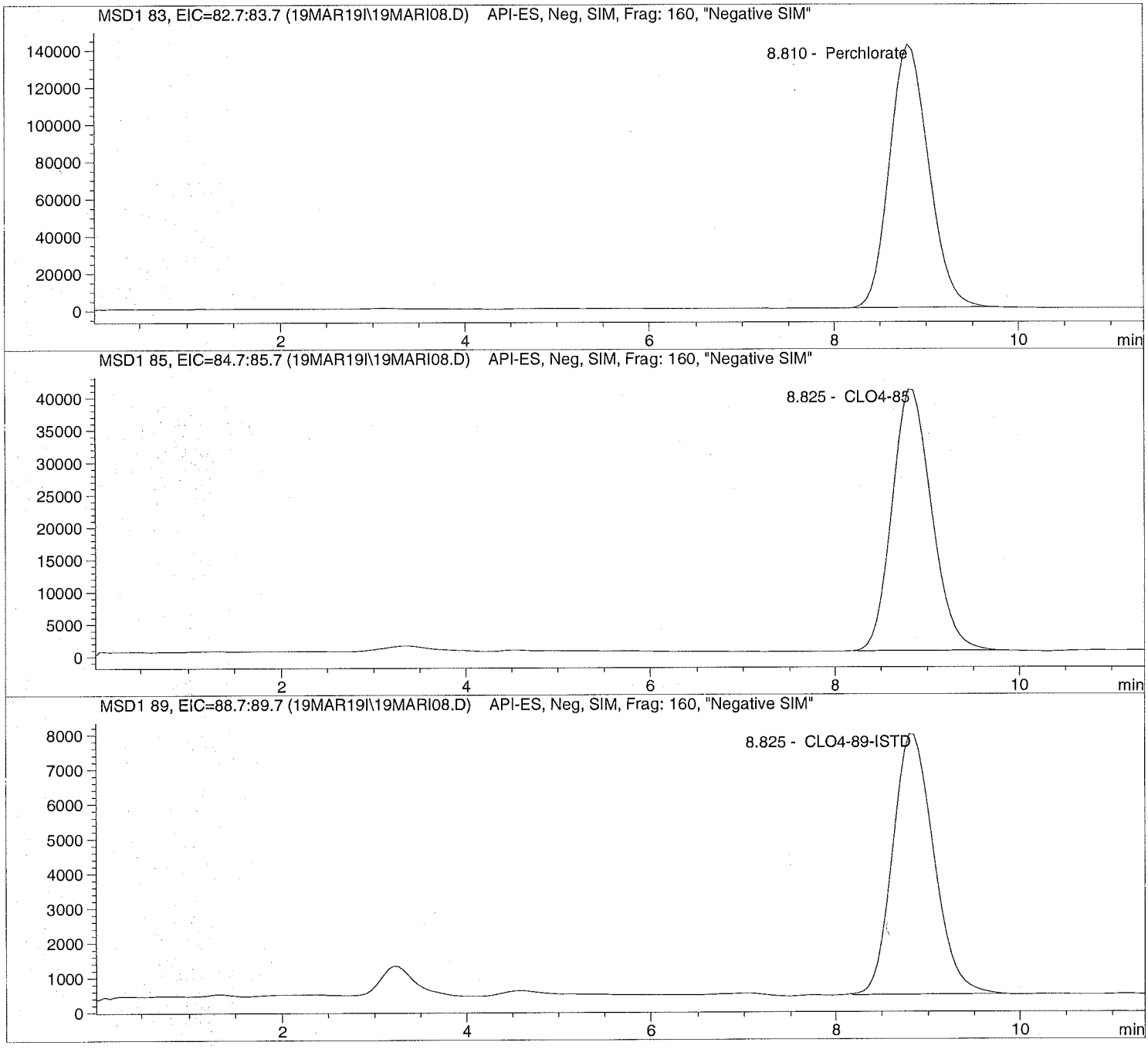
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

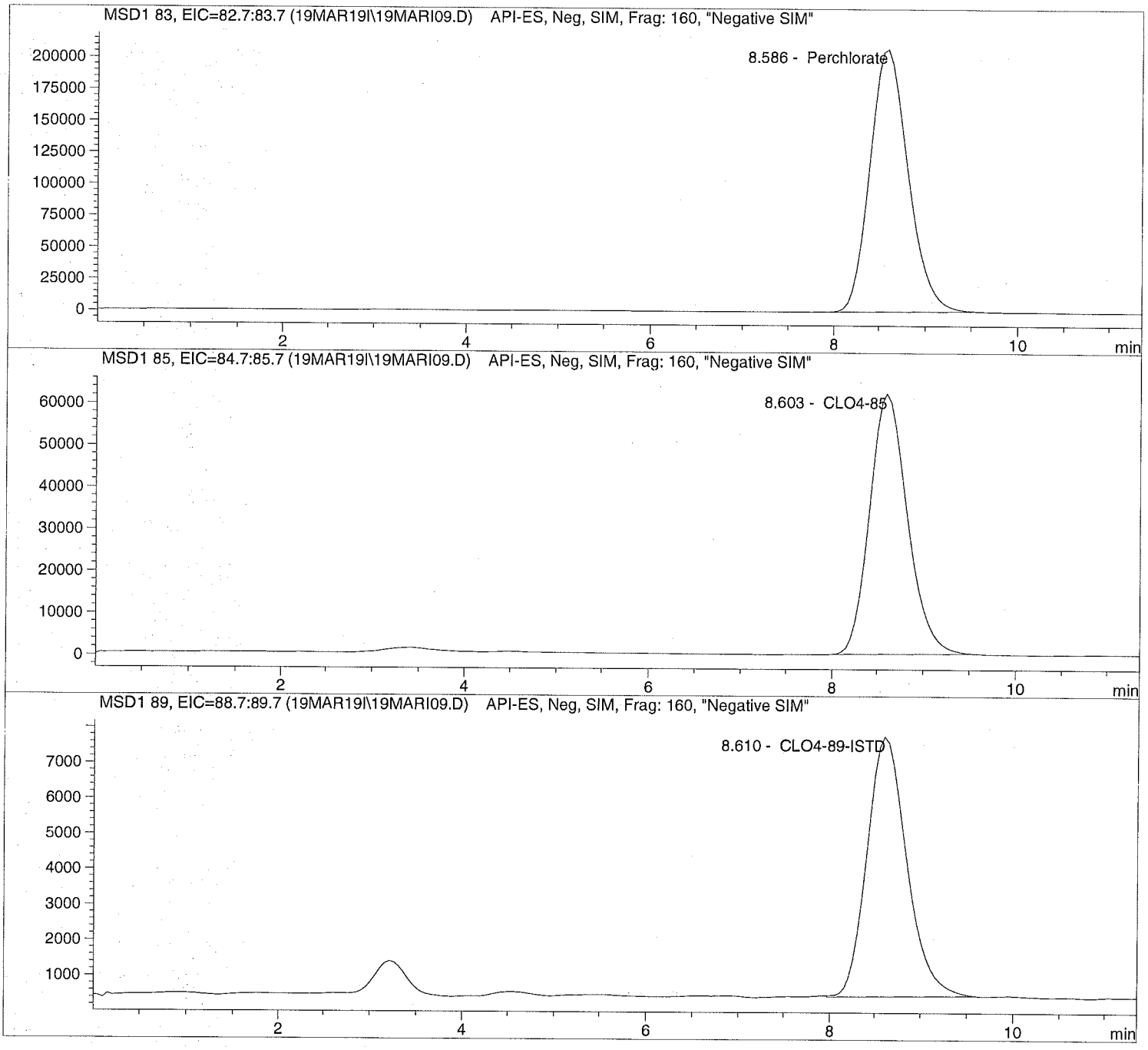
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

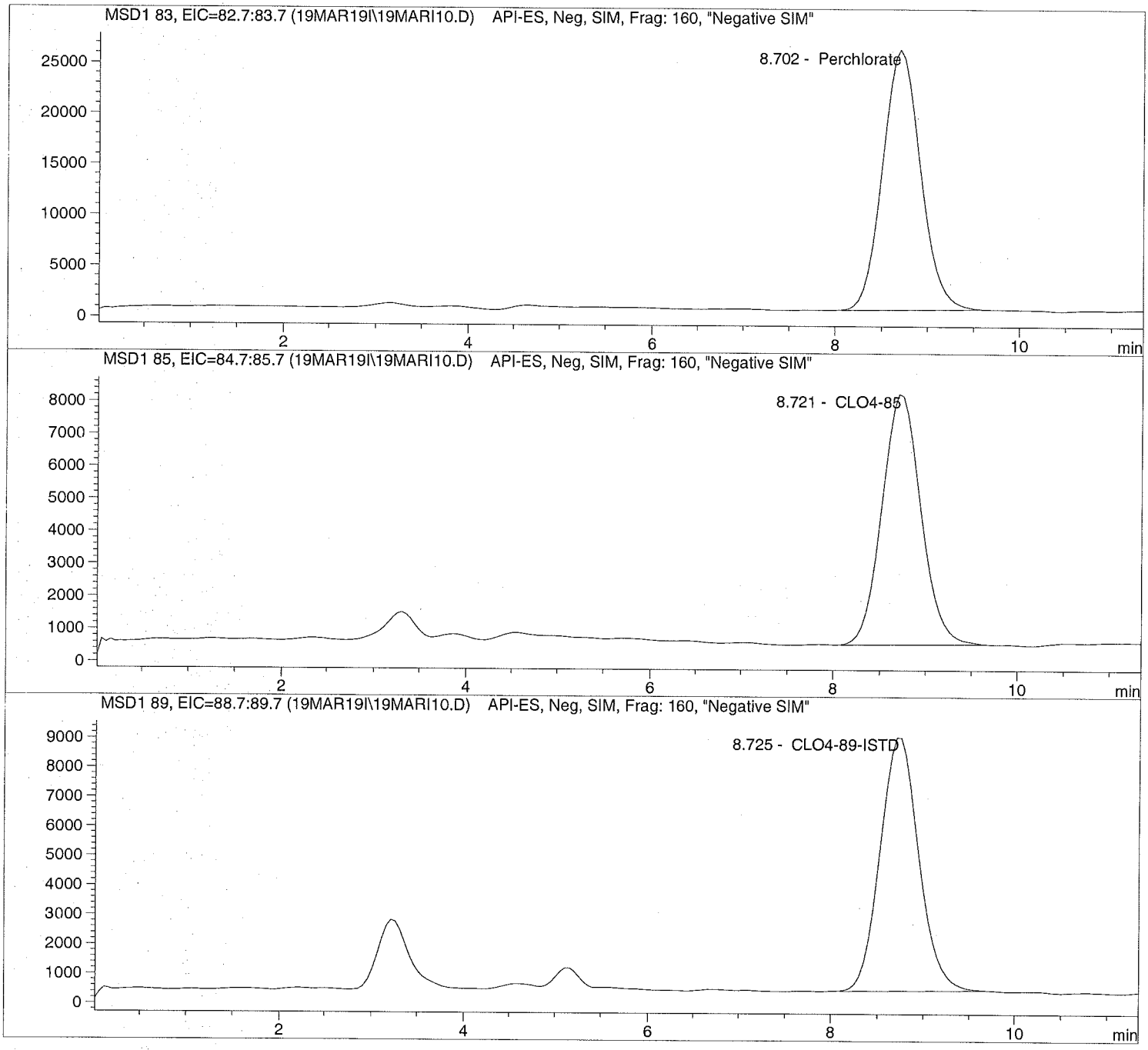
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

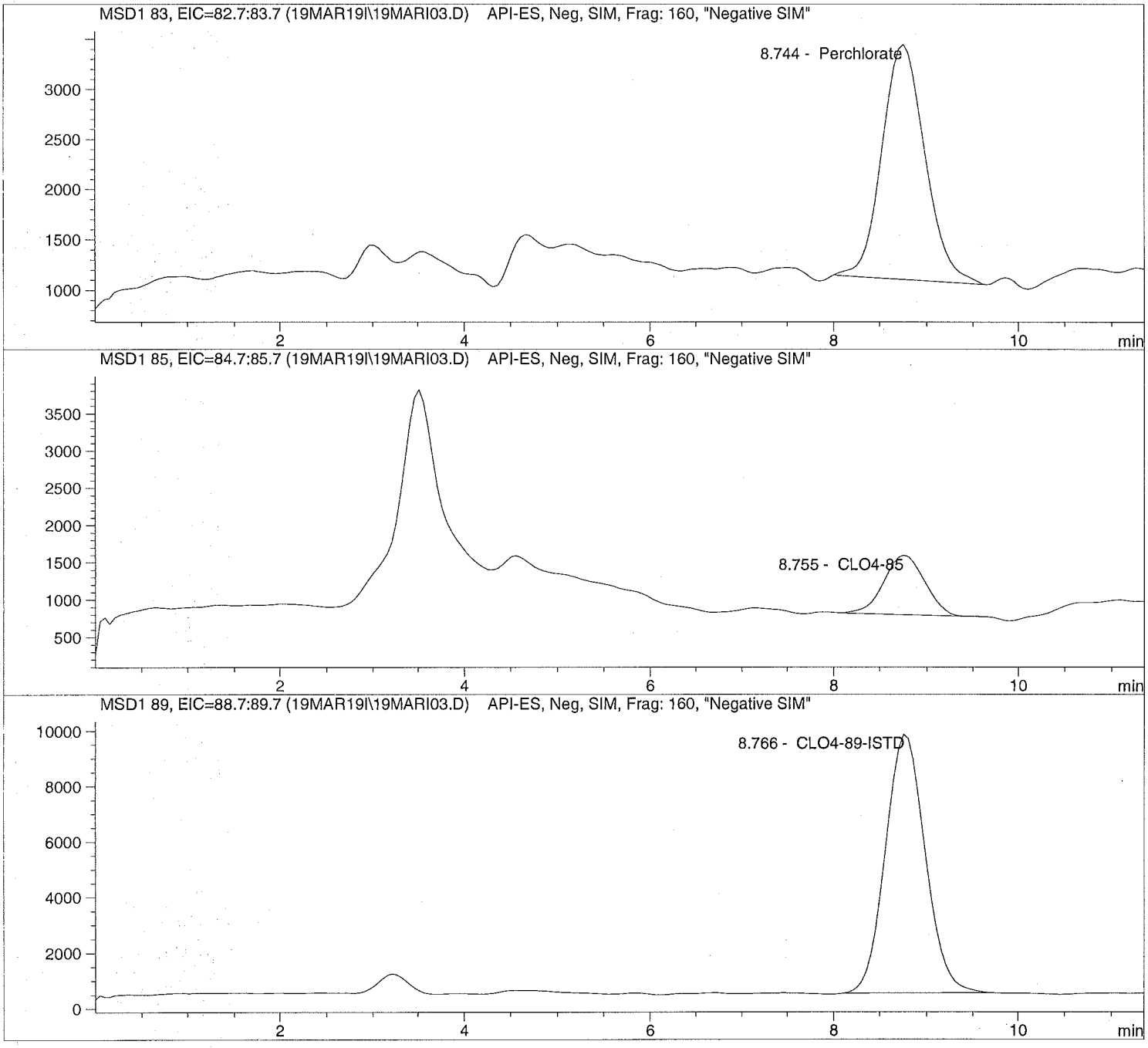
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Houston, US Date: 25-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19040653

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19040653-01	LH18/24-SP650_041019	Water		10-Apr-2019 14:00	11-Apr-2019 09:00	☐
HS19040653-02	LH18/24-SP650_041019_BIX	Water		10-Apr-2019 14:00	11-Apr-2019 09:00	☐

ALS Houston, US Date: 25-Apr-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order:

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

  The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA. Final report attached.

WetChemistry by Method E350.3

Batch ID: R336526

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E365.3

Batch ID: R336521

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 25-Apr-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19040653

Sample ID: LH18/24-SP650_041019 Lab ID:HS19040653-01

Collection Date: 10-Apr-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: KVL
Nitrogen, Ammonia (As N)	**15**		**0.20**	**0.10**	**0.20**	**mg/L**	1	12-Apr-2019 14:20
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: MZD
Phosphorus, Total Orthophosphate (As P)	**3.92**		**0.100**	**0.200**	**0.250**	**mg/L**	10	11-Apr-2019 11:44
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	19-Apr-2019 09:11

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US

Date: 25-Apr-19

Client: Bhate Environmental Associates, Inc.

ANALYTICAL REPORT

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples

WorkOrder:HS19040653

Sample ID: LH18/24-SP650_041019_BIX

Lab ID:HS19040653-02

Collection Date: 10-Apr-2019 14:00

Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	25-Apr-2019 17:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 25-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19040653

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R336521	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3				**Matrix:** Water	
HS19040653-01	LH18/24-SP650_041019	10 Apr 2019 14:00			11 Apr 2019 11:44	10
Batch ID R336526	**Test Name :** AMMONIA AS N BY E350.3(ISE)				**Matrix:** Water	
HS19040653-01	LH18/24-SP650_041019	10 Apr 2019 14:00			12 Apr 2019 14:20	1
Batch ID R336898	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS				**Matrix:** Water	
HS19040653-01	LH18/24-SP650_041019	10 Apr 2019 14:00			19 Apr 2019 09:11	1
Batch ID R337297	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS19040653-02	LH18/24-SP650_041019_BIX	10 Apr 2019 14:00			25 Apr 2019 17:26	1

ALS Houston, US Date: 25-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19040653

QC BATCH REPORT NEW

Batch ID: R336521 (0) **Instrument: UV-2450** **Method: ORTHO PHOSPHATE (PO4) AS P BY E365.3**

MBLK Sample ID: **MBLK-336521** Units: **mg/L** Analysis Date: **11-Apr-2019 11:44**
Client ID: Run ID: **UV-2450_336521** SeqNo: **5033937** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0200	0.0250								U

LCS Sample ID: **LCS-336521** Units: **mg/L** Analysis Date: **11-Apr-2019 11:44**
Client ID: Run ID: **UV-2450_336521** SeqNo: **5033938** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.246	0.0250	0.25	0	98.4	85 - 115				

MS Sample ID: **HS19040553-02MS** Units: **mg/L** Analysis Date: **11-Apr-2019 11:44**
Client ID: Run ID: **UV-2450_336521** SeqNo: **5033940** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.286	0.0250	0.25	0.042	97.6	80 - 120				

MSD Sample ID: **HS19040553-02MSD** Units: **mg/L** Analysis Date: **11-Apr-2019 11:44**
Client ID: Run ID: **UV-2450_336521** SeqNo: **5033941** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.294	0.0250	0.25	0.042	101	80 - 120	0.286	2.76	20	

The following samples were analyzed in this batch: HS19040653-01

ALS Houston, US Date: 25-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19040653

QC BATCH REPORT NEW

Batch ID: R336526 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R336526** Units: **mg/L** Analysis Date: **12-Apr-2019 14:20**
Client ID: Run ID: **WetChem_HS_336526** SeqNo: **5034013** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R336526** Units: **mg/L** Analysis Date: **12-Apr-2019 14:20**
Client ID: Run ID: **WetChem_HS_336526** SeqNo: **5034012** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.75	0.20	10	0	108	85 - 115				

MS Sample ID: **HS19040604-01MS** Units: **mg/L** Analysis Date: **12-Apr-2019 14:20**
Client ID: Run ID: **WetChem_HS_336526** SeqNo: **5034026** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.88	0.20	10	0.06212	108	80 - 120				

MSD Sample ID: **HS19040604-01MSD** Units: **mg/L** Analysis Date: **12-Apr-2019 14:20**
Client ID: Run ID: **WetChem_HS_336526** SeqNo: **5034025** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	11.13	0.20	10	0.06212	111	80 - 120	10.88	2.27	20	

The following samples were analyzed in this batch: HS19040653-01

ALS Houston, US Date: 25-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS19040653**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

ALS Houston, US Date: 25-Apr-19

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Texas	T10470231-18-21	30-Apr-2019
North Dakota	R193 2018-2019	30-Apr-2019
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kentucky	123043 - 2018	30-Apr-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
California	2919, 2018-2019	30-Apr-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020

ALS Houston, US Date: 25-Apr-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19040653

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19040653-01	LH18/24-SP650_041019	Login	4/11/2019 10:42:26 AM	RPG	WET309
HS19040653-01	LH18/24-SP650_041019	Login	4/11/2019 10:42:26 AM	RPG	WET309
HS19040653-01	LH18/24-SP650_041019	Login	4/11/2019 10:42:26 AM	RPG	Sub
HS19040653-02	LH18/24-SP650_041019_BIX	Login	4/11/2019 10:42:26 AM	RPG	Sub

00938172

ALS Houston, US Date: 25-Apr-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19040653
Date/Time Received: **11-Apr-2019 09:00**
Received by: **PMG**

Checklist completed by: *Raegen Giga* eSignature 11-Apr-2019 Date
Reviewed by: *RJ Modashia* eSignature 11-Apr-2019 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	4.7c uc/c	IR 25
Cooler(s)/Kit(s):	25587	
Date/Time sample(s) sent to storage:	04/11/2019 10:55	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

00938173

HS19040653

CHAIN OF CUSTODY

Bhate Environmental Associates, Inc.

LH18/24 Longhorn GW Treatment Plant Weekly Sampl

Name Of Lab Shipping To: ALS 10450 Stancliff Rd, Suite 210 Houston, TX, 77099 (281) 530-5656 ATTN: R.J Modshia

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. NWO1312.0150.0 16.0001
Job: **GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES**	
Prepared By: Scott Beesinger	P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyse: AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE							Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_041019	Water	04/10/19 / 14:00		2	X	X									H2SO4	
LH18/24-SP650_041019	Water	04/10/19 / 14:00		1			X								NONE	
LH18/24-SP650_041019_BIX	Water	04/10/19 / 14:00		1				X							NONE	

Additional Remarks: **Standard TAT on all parameters**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	04/10/19	14:30		4/11/19	09:00						

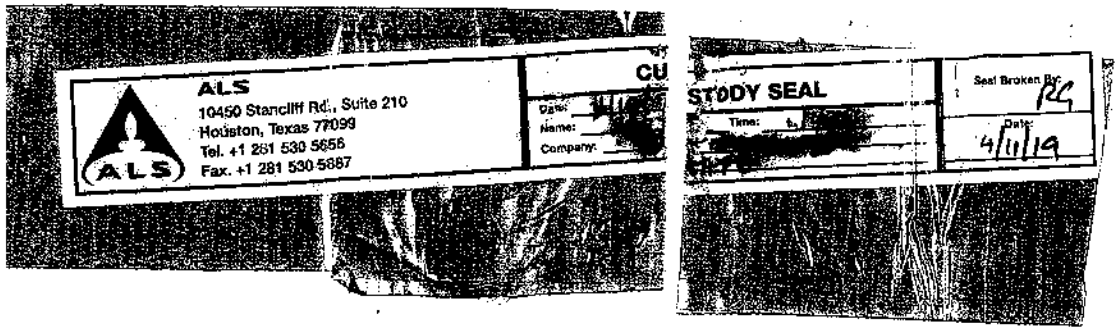
For Lab Use Only

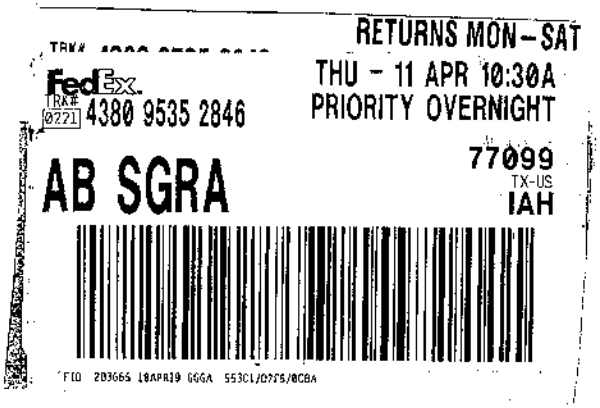
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

25587 wic. 4.7° 421° 21-0.0°

(Word) S:\1-ees\Forms\Chain of Custody - BiWeekly


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5687
CU
Date:
Name:
Company:
STODY SEAL
Time:
Seal Broken By:
RC
Date:
4/11/19


RETURNS MON-SAT
FedEx.
TRK# 4380 9535 2846
0221
THU - 11 APR 10:30A
PRIORITY OVERNIGHT
77099
TX-US
IAH
AB SGRA
FIO 2B366S 18APR19 GGGA 553C1/D7F5/0CBA

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April 18, 2019

Analytical Report for Service Request No: K1903297

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS19040653

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory April 12, 2019
For your reference, these analyses have been assigned our service request number **K1903297.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy
Project Manager

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Chain of Custody

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KH903997

Subcontract Chain of Custody

COC ID: 11112

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19040653
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19040653-01**	**LH18/24-SP650_041019**	**Water**	**10 Apr 2019 14:00**
	TOC Analysis for DOD Level IV			19 Apr 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: R Cuse Date/Time: 4/11/19 1800

Received By: R Morrow ALS-Kelso Date/Time: 4/12/19 0920

Cooler ID(s): _____ Temperature(s): _____

00938182

PC KL

Cooler Receipt and Preservation Form

Client ALS - Houston Service Request *K19* 03297

Received: 4/12/19 Opened: 4/12/19 By: [illegible] Unloaded: 4/12/19 By: [illegible]

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 1 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.0	0.1	1.2	1.3	+0.1	392	11112	4809 7832 8012	

4. Packing material: *Inserts* (*Baggies*) (*Bubble Wrap*) *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: ***Frozen*** ***Partially Thawed*** ***Thawed***
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: RUSH

General Chemistry

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1903297
Project:	HS19040653	**Date Collected:**	04/10/19
Sample Matrix:	Water	**Date Received:**	04/12/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_041019	K1903297-001	**2.37**	0.50	0.20	0.07	1	04/16/19 15:00	
Method Blank	K1903297-MB	ND U	0.50	0.20	0.07	1	04/16/19 13:06	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1903297
Project	HS19040653	**Date Collected:**	04/10/19
Sample Matrix:	Water	**Date Received:**	04/12/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Replicate Sample Summary
Carbon, Total Organic

Sample Name:	Lab Code:	MRL	LOQ	MDL	Sample Result	Duplicate Result	Average	RPD	RPD Limit	Date Analyzed
Batch QC	K1903133-002DUP	50	20	7	912	908	910	<1	10	04/16/19
Batch QC	K1903133-003DUP	50	20	7	944	934	939	1	10	04/16/19
Batch QC	K1903192-002DUP	0.50	0.20	0.07	1.05	1.05	1.05	<1	10	04/16/19
Batch QC	K1903227-001DUP	0.50	0.20	0.07	3.38	3.30	3.34	3	10	04/16/19
Batch QC	K1903227-002DUP	0.50	0.20	0.07	3.35	3.29	3.32	2	10	04/16/19
Batch QC	K1903227-003DUP	0.50	0.20	0.07	ND U	0.14 J	NC	NC	10	04/16/19
Batch QC	K1903227-004DUP	0.50	0.20	0.07	ND U	0.42 J	NC	NC	10	04/16/19
LH18/24-SP650_041019	K1903297-001DUP	0.50	0.20	0.07	2.37	2.39	2.38	<1	10	04/16/19
Batch QC	K1903367-001DUP	0.50	0.20	0.07	ND U	ND U	NC	NC	10	04/16/19
Batch QC	K1903367-002DUP	0.50	0.20	0.07	ND U	ND U	NC	NC	10	04/16/19

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1903297
Project:	HS19040653	**Date Collected:**	04/10/19
Sample Matrix:	Water	**Date Received:**	04/12/19
		Date Analyzed:	04/16/19
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	LH18/24-SP650_041019	**Units:**	mg/L
Lab Code:	K1903297-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1903297-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	2.37	29.3	25.0	108	83-117

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1903297
Project:	HS19040653	**Date Analyzed:**	04/16/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	632160

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1903297-LCS	26.9	25.0	107	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1903297
Project: HS19040653

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	632160	KQ1904985-02	04/16/19 12:36	25.0	25.7	103	90-110
CCV2	632160	KQ1904985-06	04/16/19 16:26	25.0	25.4	102	90-110
CCV3	632160	KQ1904985-07	04/16/19 21:36	25.0	25.1	100	90-110
CCV4	632160	KQ1904985-08	04/17/19 03:15	25.0	25.2	101	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1903297
Project: HS19040653

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	632160	KQ1904985-01	04/16/19 12:51	0.50	0.20	0.07	ND	U
CCB2	632160	KQ1904985-03	04/16/19 16:40	0.50	0.20	0.07	ND	U
CCB3	632160	KQ1904985-04	04/16/19 21:51	0.50	0.20	0.07	ND	U
CCB4	632160	KQ1904985-05	04/17/19 03:30	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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www.alsglobal.com

Work Request # Original ( ) KH03076, 3133, 3192, 3221, 3227, 3297, 3367

Tier: II II I I II IV I

Date Analyzed: 4/16/19

Analyst: RCD

Analysis: TOC/DOC

Run # TOC: 632160 DOC: 630162

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	(yes)/no/NA
2.	Holding times met for all analyses and for all samples?	yes/(no)/NA
3.	Are calculations correct?	(yes)/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/(NA)
5.	All quality control criteria met?	(yes)/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	(yes)/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	(yes)/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	(yes)/no/NA
9.	Are results for methods blanks all ND?	(yes)/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/(no)/NA
11.	Are all exceptions explained?	(yes)/no/NA
12.	Have all applicable service requests been reviewed?	(yes)/no/NA
13.	Are all samples labeled correctly?	(yes)/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	(yes)/no/NA
15.	Are detection limits and units reported correctly?	(yes)/no/NA
16.	Is the unused space on the benchsheet crossed out?	(yes)/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	(yes)/no/NA

COMMENTS: KH03076-1 reports being overdiluted, but this sample requires a minimum dilution due to being dirty.
KH03076 samples reanalyzed past hold.

Final Approved by: [signature] Date: 04/18/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 632160 **Method/Testcode:** 415.1/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1903076-001	Carbon, Total Organic	N/A		Water	0.44 mg/L	10 ml	10 mg/L U	20	2	10			4/16/19 20:40	N	II
K1903076-002	Carbon, Total Organic	N/A		Water	0.95 mg/L	10 ml	19 mg/L	20	2	10			4/16/19 22:34	N	II
K1903076-003	Carbon, Total Organic	N/A		Water	2.02 mg/L	10 ml	40 mg/L	20	2	10			4/16/19 23:03	N	II
K1903076-004	Carbon, Total Organic	N/A		Water	1.25 mg/L	10 ml	25 mg/L	20	2	10			4/16/19 23:31	N	II
K1903076-005	Carbon, Total Organic	N/A		Water	2.29 mg/L	10 ml	46 mg/L	20	2	10			4/16/19 23:59	N	II
K1903076-006	Carbon, Total Organic	N/A		Water	2.68 mg/L	10 ml	54 mg/L	20	2	10			4/17/19 00:27	N	II
K1903076-007	Carbon, Total Organic	N/A		Water	32.80 mg/L	10 ml	328000 mg/L	10000	700	5000			4/17/19 00:55	N	II
K1903133-002	Carbon, Total Organic	N/A		Water	9.12 mg/L	10 ml	912 mg/L	100	7	50			4/16/19 18:48	N	II
K1903133-003	Carbon, Total Organic	N/A		Water	9.44 mg/L	10 ml	944 mg/L	100	7	50			4/16/19 19:16	N	II
K1903192-002	Carbon, Total Organic	N/A		Drinking Water	1.06 mg/L	10 ml	1.05 mg/L	1	0.07	0.50			4/16/19 15:57	N	I
K1903221-001	Carbon, Total Organic	N/A		Water	2.11 mg/L	10 ml	21.1 mg/L	10	0.7	5.0			4/16/19 20:12	N	I
K1903227-001	Carbon, Total Organic	N/A		Water	3.38 mg/L	10 ml	3.38 mg/L	1	0.07	0.50			4/16/19 16:55	N	II
K1903227-002	Carbon, Total Organic	N/A		Water	3.35 mg/L	10 ml	3.35 mg/L	1	0.07	0.50			4/16/19 17:23	N	II
K1903227-003	Carbon, Total Organic	N/A		Water	0.18 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/16/19 17:51	N	II
K1903227-004	Carbon, Total Organic	N/A		Water	0.45 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/16/19 18:19	N	II
K1903297-001	Carbon, Total Organic	N/A		Water	2.37 mg/L	10 ml	2.37 mg/L	1	0.07	0.50			4/16/19 15:00	N	IV
K1903367-001	Carbon, Total Organic	N/A		Reagent Water	0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/16/19 13:50	N	I
K1903367-002	Carbon, Total Organic	N/A		Reagent Water	0.02 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/16/19 14:18	N	I
KQ1904985-01	Carbon, Total Organic	CCB		Reagent Water	0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/16/19 12:51	N	I
KQ1904985-01	Carbon, Total Organic	CCB		Reagent Water	0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/16/19 12:51	N	I
KQ1904985-02	Carbon, Total Organic	CCV		Reagent Water	25.66 mg/L	10 ml	25.7 mg/L	1					4/16/19 12:36	N	I
KQ1904985-02	Carbon, Total Organic	CCV		Reagent Water	25.66 mg/L	10 ml	25.7 mg/L	1					4/16/19 12:36	N	I
KQ1904985-03	Carbon, Total Organic	CCB		Reagent Water	0.02 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/16/19 16:40	N	I
KQ1904985-03	Carbon, Total Organic	CCB		Reagent Water	0.02 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/16/19 16:40	N	I
KQ1904985-04	Carbon, Total Organic	CCB		Reagent Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/16/19 21:51	N	I
KQ1904985-04	Carbon, Total Organic	CCB		Reagent Water	0.00 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/16/19 21:51	N	I
KQ1904985-05	Carbon, Total Organic	CCB		Reagent Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/17/19 03:30	N	I
KQ1904985-05	Carbon, Total Organic	CCB		Reagent Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/17/19 03:30	N	I
KQ1904985-06	Carbon, Total Organic	CCV		Reagent Water	25.41 mg/L	10 ml	25.4 mg/L	1					4/16/19 16:26	N	I

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Printed 4/17/19 15:20

Results Summary

04/18/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 632160 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1904985-06	Carbon, Total Organic	CCV		Reagent Water	25.41 mg/L	10 ml	25.4 mg/L	1					4/16/19 16:26	N	I
KQ1904985-07	Carbon, Total Organic	CCV		Reagent Water	25.12 mg/L	10 ml	25.1 mg/L	1					4/16/19 21:36	N	I
KQ1904985-07	Carbon, Total Organic	CCV		Reagent Water	25.12 mg/L	10 ml	25.1 mg/L	1					4/16/19 21:36	N	I
KQ1904985-08	Carbon, Total Organic	CCV		Reagent Water	25.23 mg/L	10 ml	25.2 mg/L	1					4/17/19 03:15	N	I
KQ1904985-08	Carbon, Total Organic	CCV		Reagent Water	25.23 mg/L	10 ml	25.2 mg/L	1					4/17/19 03:15	N	I
KQ1904985-09	Carbon, Total Organic	MDL		Reagent Water	0.25 mg/L	10 ml	0.25 mg/L J	1	0.07	0.50			4/16/19 14:46	N	I
KQ1904985-10	Carbon, Total Organic	N/A		Water	2.37 mg/L	10 mL	2.37 mg/L	1	0.07	0.50			4/16/19 15:00:00	N	II
KQ1904985-11	Carbon, Total Organic	MS	KQ1904985-10	Water	29.27 mg/L	10 mL	29.3 mg/L	1	0.07	0.50	108		4/16/19 15:28:00	N	II
KQ1904985-13	Carbon, Total Organic	DUP	KQ1904985-10	Water	2.39 mg/L	10 mL	2.39 mg/L	1	0.07	0.50		<1	4/16/19 15:00:00	N	II
KQ1904985-14	Carbon, Total Organic	MB		Reagent Water	0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/16/19 13:06	N	I
KQ1904985-14	Carbon, Total Organic	MB		Reagent Water	0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/16/19 13:06	N	I
KQ1904985-15	Carbon, Total Organic	LCS		Reagent Water	26.86 mg/L	10 ml	26.9 mg/L	1	0.07	0.50	107		4/16/19 13:20	N	I
KQ1904985-15	Carbon, Total Organic	LCS		Reagent Water	26.86 mg/L	10 ml	26.9 mg/L	1	0.07	0.50	107		4/16/19 13:20	N	I
KQ1904985-16	Carbon, Total Organic	MS	K1903297-001	Water	29.27 mg/L	10 ml	29.3 mg/L	1	0.07	0.50	108		4/16/19 15:28	N	IV
KQ1904985-17	Carbon, Total Organic	DUP	K1903367-001	Reagent Water	0.03 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	4/16/19 13:50	N	I
KQ1904985-18	Carbon, Total Organic	DUP	K1903367-002	Reagent Water	0.05 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50		NC	4/16/19 14:18	N	I
KQ1904985-19	Carbon, Total Organic	DUP	K1903297-001	Water	2.39 mg/L	10 ml	2.39 mg/L	1	0.07	0.50		<1	4/16/19 15:00	N	IV
KQ1904985-20	Carbon, Total Organic	DUP	K1903192-002	Drinking Water	1.05 mg/L	10 ml	1.05 mg/L	1	0.07	0.50		<1	4/16/19 15:57	N	I
KQ1904985-21	Carbon, Total Organic	DUP	K1903227-001	Water	3.30 mg/L	10 ml	3.30 mg/L	1	0.07	0.50		3	4/16/19 16:55	N	II
KQ1904985-22	Carbon, Total Organic	DUP	K1903227-002	Water	3.29 mg/L	10 ml	3.29 mg/L	1	0.07	0.50		2	4/16/19 17:23	N	II
KQ1904985-23	Carbon, Total Organic	DUP	K1903227-003	Water	0.14 mg/L	10 ml	0.14 mg/L J	1	0.07	0.50		NC	4/16/19 17:51	N	II
KQ1904985-24	Carbon, Total Organic	DUP	K1903227-004	Water	0.42 mg/L	10 ml	0.42 mg/L J	1	0.07	0.50		NC	4/16/19 18:19	N	II
KQ1904985-25	Carbon, Total Organic	DUP	K1903133-002	Water	9.08 mg/L	10 ml	908 mg/L	100	7	50		<1	4/16/19 18:48	N	II
KQ1904985-26	Carbon, Total Organic	DUP	K1903133-003	Water	9.34 mg/L	10 ml	934 mg/L	100	7	50		1	4/16/19 19:16	N	II
KQ1904985-27	Carbon, Total Organic	DUP	K1903221-001	Water	2.19 mg/L	10 ml	21.9 mg/L	10	0.7	5.0		4	4/16/19 20:12	N	I
KQ1904985-28	Carbon, Total Organic	DUP	K1903076-001	Water	0.33 mg/L	10 ml	7 mg/L J	20	2	10		NC	4/16/19 20:40	N	II
KQ1904985-29	Carbon, Total Organic	DUP	K1903076-002	Water	0.76 mg/L	10 ml	15 mg/L	20	2	10		22*	4/16/19 22:34	N	II
KQ1904985-30	Carbon, Total Organic	DUP	K1903076-003	Water	1.91 mg/L	10 ml	38 mg/L	20	2	10		5	4/16/19 23:03	N	II
KQ1904985-31	Carbon, Total Organic	DUP	K1903076-004	Water	1.10 mg/L	10 ml	22 mg/L	20	2	10		12	4/16/19 23:31	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 632160 **Method/Testcode:** 415.1/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1904985-32	Carbon, Total Organic	DUP	K1903076-005	Water	2.04 mg/L	10 ml	41 mg/L	20	2	10		12	4/16/19 23:59	N	II
KQ1904985-33	Carbon, Total Organic	DUP	K1903076-006	Water	2.97 mg/L	10 ml	59 mg/L	20	2	10		10	4/17/19 00:27	N	II
KQ1904985-34	Carbon, Total Organic	DUP	K1903076-007	Water	33.40 mg/L	10 ml	334000 mg/L	10000	700	5000		2	4/17/19 00:55	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 632162 **Method/Testcode:** 415.1/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1903076-003	Carbon, Dissolved Organic	N/A		Water	0.78 mg/L	10 ml	16 mg/L	20	2	10			4/17/19 03:59	N	II
KQ1904986-01	Carbon, Dissolved Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/17/19 03:30	N	II
KQ1904986-02	Carbon, Dissolved Organic	CCB		Water	-0.04 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/17/19 06:17	N	II
KQ1904986-03	Carbon, Dissolved Organic	CCV		Water	25.23 mg/L	10 ml	25.2 mg/L	1					4/17/19 03:15	N	II
KQ1904986-04	Carbon, Dissolved Organic	CCV		Water	24.72 mg/L	10 ml	24.7 mg/L	1					4/17/19 06:02	N	II
KQ1904986-05	Carbon, Dissolved Organic	DUP	K1903076-003	Water	0.70 mg/L	10 ml	14 mg/L	20	2	10		10	4/17/19 03:59	N	II
KQ1904986-06	Carbon, Dissolved Organic	MS	K1903076-003	Water	27.36 mg/L	10 ml	547 mg/L	20	2	10	106		4/17/19 04:27	N	II
KQ1904986-07	Carbon, Dissolved Organic	MB		Water	-0.01 mg/L	10 ml	0.50 mg/L U	1	0.07	0.50			4/16/19 22:05	N	II
KQ1904986-08	Carbon, Dissolved Organic	LCS		Water	26.24 mg/L	10 ml	26.2 mg/L	1	0.07	0.50	105		4/16/19 22:20	N	II

04/18/19

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

0.052	0.052	0.052	0.052	OBSERVATIONS	7	0.0521
0.050	0.050	0.050	0.050	STD Deviation	0.02630	0.0501
0.068				AVERAGE	0.03489	ABOVE
0.043	0.043	0.043	0.043	UCL	0.06118	0.0434
0.031	0.031	0.031	0.031	LCL	0.00859	0.0306
0.000						BELOW
0.000						BELOW
				OBSERVATIONS	4	BELOW
				STD Deviation	0.01407	BELOW
				AVERAGE	0.04405	BELOW
				UCL	0.05812	BELOW
				LCL	0.02998	BELOW
						BELOW
						BELOW
				OBSERVATIONS	4	BELOW
				STD Deviation	0.01407	BELOW
				AVERAGE	0.04405	BELOW
				UCL	0.05812	BELOW
				LCL	0.02998	BELOW
						BELOW
						BELOW
				OBSERVATIONS	4	BELOW
				STD Deviation	0.01121	BELOW
				AVERAGE	0.04405	BELOW
						BELOW
						BELOW
						BELOW
						BELOW
						BELOW
						BELOW

04/18/19

TOC: 632160
DOC: 632162

Schedule: 04162019

Version: 5
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/04/16 16:59 - Tuesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1903367-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1903367-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	MDL	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1903297-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1903297-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
8	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
9	Sample	K1903192-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1903227-001.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1903227-002.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1903227-003.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1903227-004.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1903133-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1903133-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1903221-001.10 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1903076-001.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1903076-002.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1903076-003.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1903076-004.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1903076-005.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1903076-006.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1903076-007.01 10000x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	8	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
28	Sample	FB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1903076-003.01 doc 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1903076-003.01 ms doc 20x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
31	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	6	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

04/18/19

Printed on: April 17, 2019 09:21:33

00938199

Fusion Report - 04162019
Tuesday, April 16, 2019 09:54 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/04/17 09:21 - Wednesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	04162019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5)		
Comment:			

Report Results

04/18/19

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/04/16 09:54

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.41	19.02	7.61	49.72	05:24
2	TC Clean	32.48	35.69	3.20	49.80	07:18
3	TC Clean	3.50	6.75	3.25	49.86	07:02
4	TC Clean	2.05	5.38	3.33	49.84	07:03

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/04/16 10:26

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.32	16.30	2.98	49.68	05:23
2	TC Clean	5.10	8.16	3.06	49.84	07:19
3	TC Clean	2.21	5.26	3.06	49.87	07:00

4	TC Clean	1.42	4.62	3.19	49.86	07:03

Sample Type: Clean — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/04/16 11:03

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.28	16.26	2.98	49.80	05:23
2	TC Clean	4.38	7.60	3.22	49.81	07:17
3	TC Clean	1.78	4.80	3.03	49.85	07:02
4	TC Clean	1.25	4.32	3.08	49.88	07:03

Sample Type: Blank (Creating v1245) — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2019/04/16 11:35

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.84	3.76	2.92	49.77	05:25
2	TC Clean	3.67	6.67	2.99	49.87	07:18
3	TC Clean	1.61	4.52	2.91	49.88	07:03
4	TC Clean	1.71	4.57	2.86	49.86	06:59
5	Reagent Blank	5.02	8.04	3.02	49.83	08:11
6	Acid Blank	1.42	4.25	2.83	49.71	05:31

Sample Type: Sample — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.4757 ppm	0.0000 ppm	0.0000%	2019/04/16 12:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4757	4.7568	12.08	15.02	2.94	50.01	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 4

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.7036 ppm (PASS)	0.0000 ppm	0%	2019/04/16 12:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.7036	257.0360	183.94	186.76	2.82	50.02	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 4

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0521 ppm (PASS)	0.0000 ppm	0%	2019/04/16 12:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0521	0.5208	9.82	12.84	3.03	50.01	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0501 ppm	0.0000 ppm	0.0000%	2019/04/16 13:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0501	0.5007	9.19	12.26	3.07	50.02	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 4

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	26.9079 ppm (PASS)	0.0000 ppm	0%	2019/04/16 13:20

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Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.9079	269.0794	192.11	195.03	2.91	50.01	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample From Schedule Version 4

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC	ICS	0.5029 ppm	0.0000 ppm	0.0000%	2019/04/16 13:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5029	5.0293	12.26	15.29	3.02	50.01	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K1903367-001.01	0.0656 ppm	0.0166 ppm	25.2400%	2019/04/16 13:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0539	0.5390	9.22	12.31	3.09	50.00	10:28
2	TOC	0.0773	0.7733	9.38	12.42	3.05	50.00	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	4	TOC	K1903367-002.01	0.0834 ppm	0.0216 ppm	25.8400%	2019/04/16 14:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0682	0.6819	9.31	12.40	3.09	50.00	10:26
2	TOC	0.0987	0.9869	9.52	12.65	3.13	49.99	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	5	TOC	MDL	0.2937 ppm	0.0000 ppm	0.0000%	2019/04/16 14:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2937	2.9374	10.84	13.94	3.09	49.99	10:34

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1903297-001.01	2.4196 ppm	0.0145 ppm	0.6000%	2019/04/16 15:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4094	24.0940	25.21	28.18	2.97	49.97	10:27
2	TOC	2.4299	24.2988	25.35	28.42	3.08	49.94	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1903297-001.01 ms	29.3103 ppm	0.0000 ppm	0.0000%	2019/04/16 15:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.3103	293.1035	207.81	210.86	3.06	49.95	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	RB	0.3011 ppm	0.0000 ppm	0.0000%	2019/04/16 15:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3011	3.0111	10.90	13.99	3.10	49.97	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1903192-002.01	1.0976 ppm	0.0020 ppm	0.1800%	2019/04/16 15:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0990	10.9899	16.31	19.40	3.09	49.95	10:29
2	TOC	1.0962	10.9619	16.29	19.44	3.15	49.96	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 4

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25	0 / infinity	25.4568	0.0000	0%	2019/04/16 16:26

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					ppm [25 ppm]	(NA / NA)	ppm (PASS)	ppm		

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.4568	254.5684	182.26	185.33	3.07	49.95	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 4

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0680 ppm (PASS)	0.0000 ppm	0%	2019/04/16 16:40

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0680	0.6799	9.92	12.93	3.00	49.98	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K1903227-001.04	3.3836 ppm	0.0623 ppm	1.8400%	2019/04/16 16:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.4277	34.2768	32.12	35.20	3.08	49.95	10:28
2	TOC	3.3396	33.3958	31.52	34.54	3.02	49.96	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K1903227-002.04	3.3609 ppm	0.0402 ppm	1.2000%	2019/04/16 17:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3894	33.8938	31.86	34.93	3.07	49.97	10:27
2	TOC	3.3325	33.3251	31.47	34.46	2.99	49.99	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1903227-003.04	0.2079 ppm	0.0296 ppm	14.2300%	2019/04/16 17:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2288	2.2877	10.40	13.45	3.05	49.99	10:31
2	TOC	0.1869	1.8693	10.12	12.98	2.86	49.99	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1903227-004.04	0.4756 ppm	0.0230 ppm	4.8400%	2019/04/16 18:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4919	4.9189	12.19	15.03	2.84	50.01	10:28
2	TOC	0.4593	4.5933	11.97	14.97	3.01	50.01	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1903133-002.01 100x	9.1446 ppm	0.0317 ppm	0.3500%	2019/04/16 18:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.1670	91.6698	71.08	74.03	2.96	50.02	10:26
2	TOC	9.1222	91.2219	70.77	73.84	3.07	50.02	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1903133-003.01 100x	9.4324 ppm	0.0697 ppm	0.7400%	2019/04/16 19:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.4817	94.8165	73.21	76.28	3.07	50.03	10:28
2	TOC	9.3831	93.8310	72.54	75.52	2.98	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	RB	0.1250 ppm	0.0395 ppm	31.5900%	2019/04/16 19:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1529	1.5290	9.89	12.86	2.97	50.04	10:29
2	TOC	0.0971	0.9707	9.51	12.42	2.91	50.07	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1903221-001.10 10x	2.1972 ppm	0.0574 ppm	2.6100%	2019/04/16 20:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1566	21.5660	23.49	26.53	3.04	50.08	10:28
2	TOC	2.2378	22.3778	24.04	27.12	3.08	50.09	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K1903076-001.01 20x	0.4290 ppm	0.0783 ppm	18.2600%	2019/04/16 20:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4844	4.8437	12.14	15.22	3.08	50.09	10:28
2	TOC	0.3736	3.7359	11.39	14.47	3.08	50.11	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	RB	0.1147 ppm	0.1145 ppm	99.8400%	2019/04/16 21:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0337	0.3372	9.08	12.03	2.95	50.12	10:29
2	TOC	0.1956	1.9563	10.18	13.17	2.99	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.1634 ppm (PASS)	0.0000 ppm	0%	2019/04/16 21:36

Pos	Base Analysis	ID	Rep	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run

	Type		#							Time
B	TOC	25 ppm	1	25.1634	251.6338	180.27	183.25	2.98	50.13	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0434 ppm (PASS)	0.0000 ppm	0%	2019/04/16 21:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0434	0.4339	9.76	12.81	3.05	50.14	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.0306 ppm	0.0000 ppm	0.0000%	2019/04/16 22:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0306	0.3063	9.06	12.10	3.04	50.16	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	26.2815 ppm (PASS)	0.0000 ppm	0%	2019/04/16 22:20

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	26.2815	262.8154	187.86	190.82	2.96	50.15	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample

From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1903076-002.01 20x	0.9021 ppm	0.1349 ppm	14.9500%	2019/04/16 22:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9975	9.9749	15.62	18.70	3.08	50.15	10:27
2	TOC	0.8067	8.0671	14.33	17.33	3.00	50.14	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1903076-003.01 20x	2.0081 ppm	0.0731 ppm	3.6400%	2019/04/16 23:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0598	20.5981	22.83	25.80	2.96	50.14	10:27
2	TOC	1.9564	19.5639	22.13	25.22	3.09	50.16	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1903076-004.01 20x	1.2177 ppm	0.1015 ppm	8.3300%	2019/04/16 23:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2895	12.8948	17.60	20.71	3.10	50.14	10:28
2	TOC	1.1460	11.4599	16.63	19.55	2.92	50.16	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1903076-005.01 20x	2.2080 ppm	0.1773 ppm	8.0300%	2019/04/16 23:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3334	23.3339	24.69	27.78	3.09	50.17	10:30
2	TOC	2.0826	20.8265	22.99	25.94	2.95	50.14	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1903076-006.01 20x	2.8704 ppm	0.2040 ppm	7.1100%	2019/04/17 00:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	2.7261	27.2614	27.36	30.57	3.21	50.15	10:27
2	TOC	3.0146	30.1460	29.31	32.29	2.98	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1903076-007.01 10000x	33.1423 ppm	0.4242 ppm	1.2800%	2019/04/17 00:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	32.8423	328.4235	231.78	234.84	3.06	50.14	10:27
2	TOC	33.4422	334.4223	235.86	238.88	3.03	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	RB	0.0714 ppm	0.1157 ppm	162.0700%	2019/04/17 01:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3297	3.2969	11.09	14.06	2.97	50.13	10:28
2	TOC	0.1190	1.1902	9.66	12.73	3.07	50.14	10:30
3	TOC	0.1072	1.0723	9.58	12.45	2.87	50.13	10:28
4	TOC	0.0000	0.0000	8.62	11.84	3.21	50.16	10:28
5	TOC	0.0022	0.0219	8.87	12.06	3.19	50.12	10:26
6	TOC	0.0131	0.1310	8.94	11.95	3.01	50.12	10:25
7	TOC	0.0000	0.0000	8.47	11.68	3.21	50.14	10:27
8	TOC	0.0000	0.0000	8.59	11.61	3.03	50.11	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.2789 ppm (PASS)	0.0000 ppm	0%	2019/04/17 03:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.2789	252.7888	181.05	184.13	3.08	50.11	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/04/17 03:30

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	9.26	12.39	3.13	50.11	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	28	TOC	FB	0.0000 ppm	0.0000 ppm	0.0000%	2019/04/17 03:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.67	11.85	3.18	50.12	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	K1903076-003.01 doc 20x	0.7832 ppm	0.0541 ppm	6.9000%	2019/04/17 03:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8214	8.2144	14.43	17.46	3.04	50.10	10:29
2	TOC	0.7450	7.4498	13.91	16.98	3.07	50.10	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	30	TOC	K1903076-003.01 ms doc 20x	27.4005 ppm	0.0000 ppm	0.0000%	2019/04/17 04:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.4005	274.0049	194.84	197.94	3.09	50.11	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	RB	0.0002 ppm	0.0005 ppm	244.9500%	2019/04/17 04:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0012	0.0116	8.86	12.08	3.22	50.10	10:26
2	TOC	0.0000	0.0000	8.33	11.38	3.05	50.10	10:25
3	TOC	0.0000	0.0000	8.26	11.38	3.12	50.10	10:27
4	TOC	0.0000	0.0000	8.16	11.30	3.14	50.10	10:31
5	TOC	0.0000	0.0000	7.93	11.02	3.09	50.12	10:30
6	TOC	0.0000	0.0000	7.92	11.05	3.13	50.11	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.8511 (IC) (v1245)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.7665 ppm (PASS)	0.0000 ppm	0%	2019/04/17 06:02

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.7665	247.6650	177.58	180.61	3.04	50.11	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/04/17 06:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.66	11.91	3.25	50.10	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1244	2.4323	1.4770	0.0000	0.0000	0.0000	2019/04/10 13:35	Fusion1 (Fusion1)
v1245	1.6743	1.4170	0.0000	0.0000	0.0000	2019/04/16 12:21	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v30
Ver Creation: 2019/03/05 17:42
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC
Calibration curve formula: TOC: y = 6.788x + 9.463
r^2 value: TOC: r^2 = 0.99963

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4
Ver Creation: 2019/02/21 17:57
Comment:
Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7

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PreSpargeTime	2.00 mins	SyringeSpeedDIWater	7
SystemFlow	500 ml/min	NDIRPressurization	60 psig
		SyringeSpeedSampleDispense	5
		SyringeSpeedSampleAspirate	4
		SyringeSpeedUVDispense	5
		SyringeSpeedUVAspirate	5
		SyringeSpeedICDispense	5
		SyringeSpeedICAspirate	5
		NDIRPressureStabilize	1.75 min
		SampleMixing	Off
		SampleMixingCycles	1
		SampleMixingVolume	10.0
		LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/04/17 06:33

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	25.704	0.0441	25.6596	25.65955	25.7	4/16/2019
3	[TOC] CCB [0 ppm]	1	0.052	0.0441	0.0081	0.00805	<0.5	4/16/2019
4	MB1	1	0.050	0.0441	0.0061	0.00605	<0.5	4/16/2019
5	[TOC] LCS [24ppm]	1	26.908	0.0441	26.8639	26.86385	26.9	4/16/2019
6	K1903367-001	1	0.054	0.0441	0.0099	0.00985	<0.5	4/16/2019
7	K1903367-001d	1	0.077	0.0441	0.0333	0.03325	<0.5	4/16/2019
8	K1903367-002	1	0.068	0.0441	0.0242	0.02415	<0.5	4/16/2019
9	K1903367-002d	1	0.099	0.0441	0.0547	0.05465	<0.5	4/16/2019
10	MDL	1	0.294	0.0441	0.2497	0.24965	<0.5	4/16/2019
11	K1903297-001	1	2.409	0.0441	2.3654	2.36535	2.4	4/16/2019
12	K1903297-001d	1	2.430	0.0441	2.3859	2.38585	2.39	4/16/2019
13	K1903297-001ms	1	29.310	0.0441	29.2663	29.26625	29.27	4/16/2019
14	K1903192-002	1	1.099	0.0441	1.0550	1.05495	1.05	4/16/2019
15	K1903192-002d	1	1.096	0.0441	1.0522	1.05215	1.1	4/16/2019
16	C] CCV 25 ppm [25 p	1	25.457	0.0441	25.4128	25.41275	25.4	4/16/2019
17	[TOC] CCB [0 ppm]	1	0.068	0.0441	0.0240	0.02395	<0.5	4/16/2019
18	K1903227-001	1	3.428	0.0441	3.3837	3.38365	3.4	4/16/2019
19	K1903227-001d	1	3.340	0.0441	3.2956	3.29555	3.3	4/16/2019
20	K1903227-002	1	3.389	0.0441	3.3454	3.34535	3.35	4/16/2019
21	K1903227-002d	1	3.333	0.0441	3.2885	3.28845	3.29	4/16/2019
22	K1903227-003	1	0.229	0.0441	0.1848	0.18475	<0.5	4/16/2019
23	K1903227-003d	1	0.187	0.0441	0.1429	0.14285	<0.5	4/16/2019
24	K1903227-004	1	0.492	0.0441	0.4479	0.44785	<0.5	4/16/2019
25	K1903227-004d	1	0.459	0.0441	0.4153	0.41525	<0.5	4/16/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

	date	time
Analyzed By: BCD	Date Analyzed 4/16/19	
Reviewed By: [signature]	Date Reviewed 04/18/19	

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1903133-002	100	9.167	0.0441	9.1230	912.295	912.30	4/16/2019
27	K1903133-002d	100	9.122	0.0441	9.0782	907.815	907.82	4/16/2019
28	K1903133-003	100	9.482	0.0441	9.4377	943.765	943.8	4/16/2019
29	K1903133-003d	100	9.383	0.0441	9.3391	933.905	933.9	4/16/2019
30	K1903221-001	10	2.157	0.0441	2.1126	21.1255	21.1	4/16/2019
31	K1903221-001d	10	2.238	0.0441	2.1938	21.9375	21.9	4/16/2019
32	K1903076-001	20	0.484	0.0441	0.4404	8.807	8.8	4/16/2019
33	K1903076-001d	20	0.374	0.0441	0.3296	6.591	6.6	4/16/2019
34	C] CCV 25 ppm [25 p	1	25.163	0.0441	25.1194	25.11935	25.1	4/16/2019
35	[TOC] CCB [0 ppm]	1	0.043	0.0441	-0.0006	-0.00065	<0.5	4/16/2019
36	K1903076-002	20	0.998	0.0441	0.9535	19.069	19.1	4/16/2019
37	K1903076-002d	20	0.807	0.0441	0.7627	15.253	15.3	4/16/2019
38	K1903076-003	20	2.060	0.0441	2.0158	40.315	40.3	4/16/2019
39	K1903076-003d	20	1.956	0.0441	1.9124	38.247	38.2	4/16/2019
40	K1903076-004	20	1.290	0.0441	1.2455	24.909	24.9	4/16/2019
41	K1903076-004d	20	1.146	0.0441	1.1020	22.039	22.0	4/16/2019
42	K1903076-005	20	2.333	0.0441	2.2894	45.787	45.8	4/16/2019
43	K1903076-005d	20	2.083	0.0441	2.0386	40.771	40.8	4/16/2019
44	K1903076-006	20	2.726	0.0441	2.6821	53.641	53.6	4/17/2019
45	K1903076-006d	20	3.015	0.0441	2.9706	59.411	59.4	4/17/2019
46	K1903076-007	10000	32.842	0.0441	32.7983	327982.5	327982.5	4/17/2019
47	K1903076-007d	10000	33.442	0.0441	33.3982	333981.5	333981.5	4/17/2019
48	C] CCV 25 ppm [25 p	1	25.279	0.0441	25.2349	25.23485	25.2	4/17/2019
49	[TOC] CCB [0 ppm]	1	0.000	0.0441	-0.0441	-0.04405	<0.5	4/17/2019
~~50~~		~~1~~		0.0000	0.0000	0	~~<0.5~~	

Analyzed By:	BCD	Date Analyzed	4/16/19
Reviewed By:	[signature]	Date Reviewed	04/18/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	MB2	1	0.031	0.0441	-0.0135	-0.01345	<0.5	4/16/2019
3	[TOC] LCS [24ppm]	1	26.282	0.0441	26.2375	26.23745	26.2	4/16/2019
4	C] CCV 25 ppm [25 p	1	25.279	0.0441	25.2349	25.23485	25.2	4/17/2019
5	[TOC] CCB [0 ppm]	1	0.000	0.0441	-0.0441	-0.04405	<0.5	4/17/2019
6	K1903076-003	20	0.821	0.0441	0.7774	15.547	15.55	4/17/2019
7	K1903076-003d	20	0.745	0.0441	0.7010	14.019	14.0	4/17/2019
8	K1903076-003ms	20	27.401	0.0441	27.3565	547.129	547	4/17/2019
9	C] CCV 25 ppm [25 p	1	24.767	0.0441	24.7225	24.72245	24.72	4/17/2019
10	[TOC] CCB [0 ppm]	1	0.000	0.0441	-0.0441	-0.04405	<0.5	4/17/2019
11		1		0.0000	0.0000	0	<0.5	
12		1		0.0000	0.0000	0	<0.5	
13		1		0.0000	0.0000	0	<0.5	
14		1		0.0000	0.0000	0	<0.5	
15		1		0.0000	0.0000	0	<0.5	
16		1		0.0000	0.0000	0	<0.5	
17		1		0.0000	0.0000	0	<0.5	
18		1		0.0000	0.0000	0	<0.5	
19		1		0.0000	0.0000	0	<0.5	
20		1		0.0000	0.0000	0	<0.5	
21		1		0.0000	0.0000	0	<0.5	
22		1		0.0000	0.0000	0	<0.5	
23		1		0.0000	0.0000	0	<0.5	
24		1		0.0000	0.0000	0	<0.5	
25		1		0.0000	0.0000	0	<0.5	

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

	date	time
Analyzed By: BCD	Date Analyzed 4/16/19	
Reviewed By: [signature]	Date Reviewed 04/18/19	

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

StarLIMS Run: 632160, 632162

Analysis: TOC/DOC

Method: 9060, 415.1, SM 5310 C, 9060A

CCV: 11-GEN-05-77C 50 ppm LCS: 11-GEN-05-77D 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

Spike ID: 11-GEN-05-70O 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-77I

21 % H3PO4: 11-GEN-05-77H

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: NA

Analyzed By: BCD	Date Analyzed: 4/16/19
Reviewed By:	Date Reviewed: 04/18/19

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1910478; 1910480; 1910483; 1911288

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2241 (237388)

General Set Information: There were four field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1910480001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.

Method QC data: The method blank (LMB 649380) was less than 1/2 the CRDL. The recovery for the LCS (649381) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 1910837002/03 of Work Order 1910837. 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 649378) is reported from the analysis of the Laboratory Control Sample (LCS – 649381) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Thomas Bosch April 24, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: April 25, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1910483**
Project ID: HS19040653
Purchase Order: HS19040653
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_041019_BIX	1910483001	04/10/19	04/12/19	

ANALYTICAL REPORT

Workorder: 34-1910483
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_041019_BIX**	Sampling Site: NA	Collected: 04/10/2019
Lab ID: 1910483001	Media: 125 mL Nalgene	Received: 04/12/2019
Matrix: Water	Sampling Parameter: NA	

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:** LCMS04
	Batch: ELMS/2241 (HBN: 237388)	**Percent Solid:** NA
	Analyzed: 04/23/2019 10:03	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 04/24/2019 07:51	/S/ Stephen Brose 04/25/2019 07:42

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1910483
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1910483

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2241 (HBN: 237388)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 649380
Analyzed: 04/23/2019 09:20
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 649381
Analyzed: 04/23/2019 08:53
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.01	4.00	100	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

	Sample	MS	MSD
	1910837001	1910837002	1910837003
Analyzed:	04/23/2019 10:30	04/23/2019 10:43	04/23/2019 10:57
Dilution:	1	1	1
Units:	ug/L	ug/L	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.81	4	95.1	78.8	123.8	3.95	98.8	3.74	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
04/24/2019 07:52	04/25/2019 07:42

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

00938224

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18698/#2

Subcontract Chain of Custody

COC ID: 11111

1910483

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19040653
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19040653-02**	**LH18/24-SP650_041019_BIX**	**Water**	**10 Apr 2019 14:00**
	SUB_Perch-6850			19 Apr 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: R Cuts Date/Time: 4/11/19 18 00

Received By: Jamaica Jessop Date/Time: 04/12/19 9:55

Cooler ID(s): _____ Temperature(s): _____

ADVANCE SOLUTIONS | RIGHT PARTNER

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19040653	***Split:***	**Workorder ID:** 1910483	**Level:** ENV_LVL4	**Requested Analysis**
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly	
Comments:			**Preservatives**	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	COOL	EPA 6850, DoD QSM												
1	04/10/2019 14:00	LH18/24-SP650_041019_BIX	1910483001		Water	A	1		A												
2																					
3																					
4																					
5																					
6																					
7																					
8																					
9																					
10																					

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath/Julie	04/12/2019 09:55	ALS Sample Receiving	Sample Login
Julie Warath R.33.1	4/13/19 1300 4.22.19/13:05	SB TJBush	storage 6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

Fri, 04/12/19 12:22 PM

ALSCOCV3.1

00938225

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 416483

Date/Time of Receipt: 04-17-19 9:55

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9309	3 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Tam Vantassell (Signature) Tam Vantassell (Printed Name) 04-17-19 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

00938227

Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159469-434 RIT2 EXP 01/20

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 11APR19
ACTWGT: 8.65 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO **PAUL POPE**
ALS LABORATORY GROUP
960 WEST LEVOY DRIVE

SALT LAKE CITY UT 84123
(800) 356-9135
REF: HS19040654/653/652 RJ

FedEx Express

TRK# 0201 **4809 7832 8001**

FRI - 12 APR 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US **SLC**

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
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Batch Worklist

Batch: ELMS/ 2241 **Created:** 4/23/2019 07:43 **Instrument:** **HBN:** 237388

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1910478 [ENV_LVL4]
Workorder: 1910480 [ENV_LVL4]
Workorder: 1910483 [ENV_LVL4]
Workorder: 1910837 [ENV_LVL4]
Workorder: 1911288 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	649377	CCV for HBN 237388 [ELMS/2241]				CCV	3		E685041C3Q	5311		4/25/2019	
2	649378	RLVS for HBN 237388 [ELMS/2241				RLVS	3		E685041C3Q	5311		4/25/2019	
3	649379	ICS for HBN 237388 [ELMS/2241]				ICS	3		E6850..D3Q	5311		4/25/2019	
4	649380	LMB for HBN 237388 [ELMS/2241]				LMB	3		E6850Q413Q	5311		4/25/2019	
5	649381	LCS for HBN 237388 [ELMS/2241]				LCS	3		E6850Q413Q	5311		4/25/2019	
6	1910478001	LH18/24-SP650_041019_BIX				SAMPLE	3	1910478001-A	E6850Q41.3	5480	5/8/2019	4/25/2019	
7	1910480001	LH18/24-SP140_041019				SAMPLE	3	1910480001-A	E6850Q41.3	5480	5/8/2019	4/25/2019	
8	1910483001	LH18/24-SP650_041019_BIX				SAMPLE	3	1910483001-A	E6850Q41.3	5480	5/8/2019	4/25/2019	
9	1910837001	43MW01				SAMPLE	3	1910837001-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
10	1910837002	43MW01MS				MS	3	1910837002-A	E6850Q413Q	5480		4/25/2019	
11	1910837003	43MW01MSD				MSD	3	1910837003-A	E6850Q413Q	5480		4/25/2019	
12	1910837004	43MW03				SAMPLE	3	1910837004-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
13	1910837005	43MW04				SAMPLE	3	1910837005-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
14	1910837006	43MW05				SAMPLE	3	1910837006-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
15	1910837007	43MW06				SAMPLE	3	1910837007-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
16	649382	CCV for HBN 237388 [ELMS/2241]				CCV	3		E685041C3Q	5311		4/25/2019	
17	1910837008	DUP040919				FLDDUP	3	1910837008-A	E6850Q41.3	5480	5/7/2019	4/29/2019	
18	1910837009	EB041019				EQBK	3	1910837009-A	E6850Q41.3	5480	5/8/2019	4/29/2019	
19	1911288001	LH18/24-SP650_041719_BIX				SAMPLE	3	1911288001-A	E6850Q41.3	5480	5/15/2019	5/2/2019	
20	649383	CCV for HBN 237388 [ELMS/2241]				CCV	3		E685041C3Q	5311		4/25/2019	

00938228

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1910478 (001); 1910480 (001); 1910483 (001); 1911288 (001); 1910837 (001-09) ELMS Batch/HBN ID: 2241 (237388)
Prep Date: 04/22/2019 Analysis Date: 04/23/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\APR\23APR19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by TNB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 41830 was used for LCS 649381; Target = 4.0µg/L. ASTM type II water was used for LMB 649380.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1910837002/03 (Client ID: 43MW01). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field sample 1910480001 was analyzed and reported from a 1:1,000 dilution. The reporting limit has been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\APR\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\237388-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 649378) is reported from the analysis of the Laboratory Control Sample (LCS – 649381) at a level 4.0µg/L.
6) Due to limitations of the Chemstation Software, many of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2241 HBN: 237388 Sample Set IDs if Applicable: 1910478 / 1910480 / 1910483 / 1910837 / 1911288	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SM
Standards traceability checked and meets criteria	TB	SM
Standard curve coefficients evaluated and meet criteria	TB	SM
ICVs analyzed and meet acceptance criteria	TB	SM
CCVs analyzed and meet acceptance criteria	TB	SM
Method Blanks analyzed and meet acceptance criteria	TB	SM
Retention Time Windows checked	TB	SM
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SM
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SM
RLVS analyzed	TB	SM
Preparation and analysis hold times met	TB	SM
Preparation deviations and re-preparations noted when performed	TB	SM
Analysis deviations and re-analyses noted when performed	TB	SM
Sample dilution factors noted on reports	TB	SM
Electronic records in HBN transcription accuracy and completeness checked	TB	SM
Preparation and analysis calculations checked	TB	SM
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SM
Manual integrations checked	TB	SM

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/18/2018 02:09PM	**Expires:** 09/18/2019
MFG Lot: TNB: 09/18/2018		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK	Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659	**Created By:** Thomas Bosch	**Amount:** 100 mL
MFG: AccuStandard	**Create Date:** 09/17/2018 09:09AM	**Expires:** 07/25/2020
MFG Lot: 218065075		**Usable:** No
Part ID: IC-PER-10X-1		**Lab Lot:** CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	**Created By:** ALS Support (Lims)	**Amount:** 1000 L
MFG: DCL In House	**Create Date:** 10/06/2005 09:10AM	**Expires:** 11/07/2025
MFG Lot: Not Provided		**Usable:** Yes
Part ID: Not Provided		**Lab Lot:** LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT	Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701 **Created By:** Thomas Bosch **Amount:** 10 mL
MFG: ALS/SLC **Create Date:** 09/18/2018 02:09PM **Expires:** 09/18/2019
MFG Lot: TNB: 09/18/2018 **Usable:** Yes
Pipette ID: Not Provided **Lab Lot:** CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description: 6850 QC WKG STD 100ug/L

Standard: 41831
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
41830	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	05/09/2019

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 41830
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/09/2018 10:05AM

Amount: 10 mL
Expires: 05/09/2019
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description: ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK Description: 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

AccuStandard®

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

USstandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

OR-ORG/INO-001
Rev. 5/18

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

00938247

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
	*	649377 CCV@25	Vial 71	1	Control	1	1.36054e6	8.855	24.00623
	*	649381 QC@4.0	Vial 72	1	Control	2	2.53898e5	9.046	4.01121
	*	649379 ICS@4.0	Vial 73	1	Control	3	1.82631e5	8.636	3.34158
	*	649380 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
	*	1910478001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
	*	1910480001 1K	Vial 76	1	Sample	6	3.37161e5	9.026	5552.18188
	*	1910483001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
	*	1911288001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
	*	1910837001	Vial 79	1	Sample	9	0.00000	0.000	0.00000
	*	1910837002 MS	Vial 80	1	Sample	10	2.21785e5	9.050	3.80586
	*	1910837003 MSD	Vial 81	1	Sample	11	2.20802e5	9.038	3.95111
	*	1910837004	Vial 82	1	Sample	12	0.00000	0.000	0.00000
	*	1910837005	Vial 83	1	Sample	13	0.00000	0.000	0.00000
	*	1910837006	Vial 84	1	Sample	14	0.00000	0.000	0.00000
	*	649382 CCV@25	Vial 71	1	Control	15	1.31128e6	8.938	24.26925
	*	1910837007	Vial 85	1	Sample	16	6.42400e4	9.045	1.26400
	*	1910837008	Vial 86	1	Sample	17	0.00000	0.000	0.00000
	*	1910837009	Vial 87	1	Sample	18	0.00000	0.000	0.00000
	*	1909952003 10K	Vial 88	1	Sample	19	5.40192e5	9.131	9.36492e4
	*	649383 CCV@25	Vial 71	1	Control	20	1.31963e6	8.922	24.70624

#	*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
	*	649377 CCV@25	Vial 71	1	Control	1	4.18181e5	8.869	24.80861
	*	649381 QC@4.0	Vial 72	1	Control	2	8.36399e4	9.058	4.29372
	*	649379 ICS@4.0	Vial 73	1	Control	3	6.48502e4	8.654	3.82172
	*	649380 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
	*	1910478001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
	*	1910480001 1K	Vial 76	1	Sample	6	1.09251e5	9.041	5913.57786
	*	1910483001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
	*	1911288001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
	*	1910837001	Vial 79	1	Sample	9	0.00000	0.000	0.00000
	*	1910837002 MS	Vial 80	1	Sample	10	7.41215e4	9.057	4.12337
	*	1910837003 MSD	Vial 81	1	Sample	11	7.23834e4	9.061	4.20632
	*	1910837004	Vial 82	1	Sample	12	0.00000	0.000	0.00000
	*	1910837005	Vial 83	1	Sample	13	0.00000	0.000	0.00000
	*	1910837006	Vial 84	1	Sample	14	0.00000	0.000	0.00000
	*	649382 CCV@25	Vial 71	1	Control	15	4.00971e5	8.953	24.95975
	*	1910837007	Vial 85	1	Sample	16	2.34854e4	9.061	1.36511
	*	1910837008	Vial 86	1	Sample	17	0.00000	0.000	0.00000
	*	1910837009	Vial 87	1	Sample	18	0.00000	0.000	0.00000
	*	1909952003 10K	Vial 88	1	Sample	19	1.70464e5	9.151	9.83177e4
	*	649383 CCV@25	Vial 71	1	Control	20	4.01823e5	8.937	25.30992

#	*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
	*	649377 CCV@25	Vial 71	1	Control	1	1.72840e5	8.867	5.00000
	*	649381 QC@4.0	Vial 72	1	Control	2	2.08542e5	9.066	5.00000
	*	649379 ICS@4.0	Vial 73	1	Control	3	1.81824e5	8.654	5.00000
	*	649380 LMB	Vial 74	1	Control	4	2.16871e5	9.008	5.00000
	*	1910478001	Vial 75	1	Sample	5	1.72857e5	8.404	5.00000
	*	1910480001 1K	Vial 76	1	Sample	6	1.97149e5	9.050	5000.00000
	*	1910483001	Vial 77	1	Sample	7	1.65412e5	8.420	5.00000
	*	1911288001	Vial 78	1	Sample	8	1.81749e5	8.489	5.00000

Batch Report: C:\HPCHEM\1\DATA\23APR19D\23APR19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	1910837001	Vial 79	1	Sample	9	1.87599e5	9.028	5.00000
*	1910837002 MS	Vial 80	1	Sample	10	1.92507e5	9.073	5.00000
*	1910837003 MSD	Vial 81	1	Sample	11	1.84256e5	9.062	5.00000
*	1910837004	Vial 82	1	Sample	12	1.80138e5	8.810	5.00000
*	1910837005	Vial 83	1	Sample	13	1.97954e5	9.090	5.00000
*	1910837006	Vial 84	1	Sample	14	1.83017e5	9.051	5.00000
*	649382 CCV@25	Vial 71	1	Control	15	1.64671e5	8.965	5.00000
*	1910837007	Vial 85	1	Sample	16	1.84879e5	9.067	5.00000
*	1910837008	Vial 86	1	Sample	17	1.96777e5	8.752	5.00000
*	1910837009	Vial 87	1	Sample	18	1.91613e5	9.161	5.00000
*	1909952003 10K	Vial 88	1	Sample	19	1.83509e5	9.157	5.00000e4
*	649383 CCV@25	Vial 71	1	Control	20	1.62618e5	8.942	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\APR\23APR19D.S

Sequence Table:

Method and Injection Info Part:

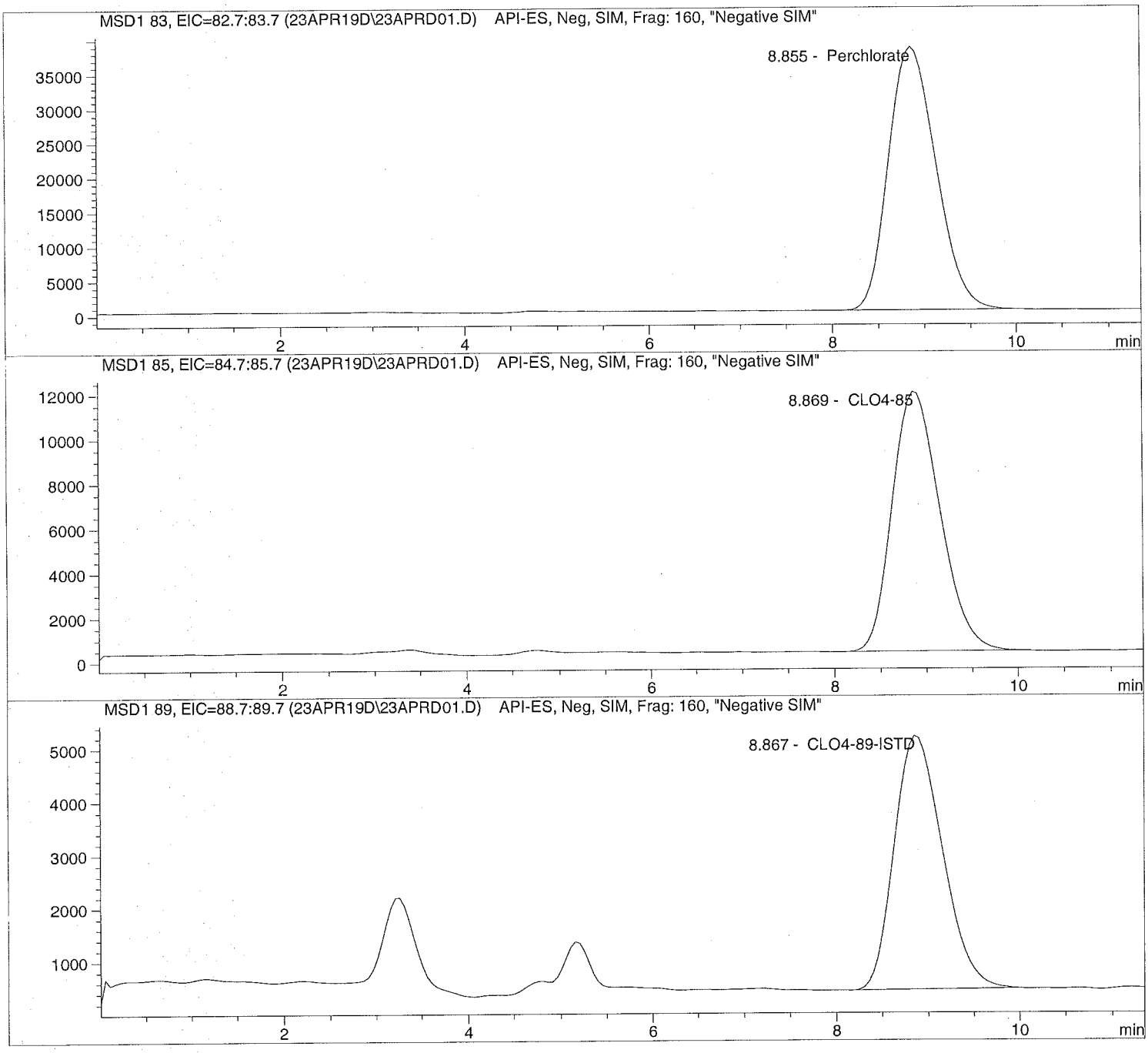
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	649377	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	649381	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	649379	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	649380	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1910478001		CLO4-AQN	1	Sample		
6	Vial 76	1910480001	1K	CLO4-AQN	1	Sample		
7	Vial 77	1910483001		CLO4-AQN	1	Sample		
8	Vial 78	1911288001		CLO4-AQN	1	Sample		
9	Vial 79	1910837001		CLO4-AQN	1	Sample		
10	Vial 80	1910837002	MS	CLO4-AQN	1	Sample		
11	Vial 81	1910837003	MSD	CLO4-AQN	1	Sample		
12	Vial 82	1910837004		CLO4-AQN	1	Sample		
13	Vial 83	1910837005		CLO4-AQN	1	Sample		
14	Vial 84	1910837006		CLO4-AQN	1	Sample		
15	Vial 71	649382	CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1910837007		CLO4-AQN	1	Sample		
17	Vial 86	1910837008		CLO4-AQN	1	Sample		
18	Vial 87	1910837009		CLO4-AQN	1	Sample		
19	Vial 71	649383	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD01.D Sample Name: 649377 CCV@25

Injection Date:	4/23/2019 08:37:56	Seq Line:	1
Sample Name:	649377 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD01.D Sample Name: 649377 CCV@25

Injection Date:	4/23/2019 08:37:56	Seq Line:	1
Sample Name:	649377 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.855	PBA	1360543.6	24.0062	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.869	PBA	418181.2	24.8086	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.867	PBA	172839.5	5.0000	CLO4-89-ISTD

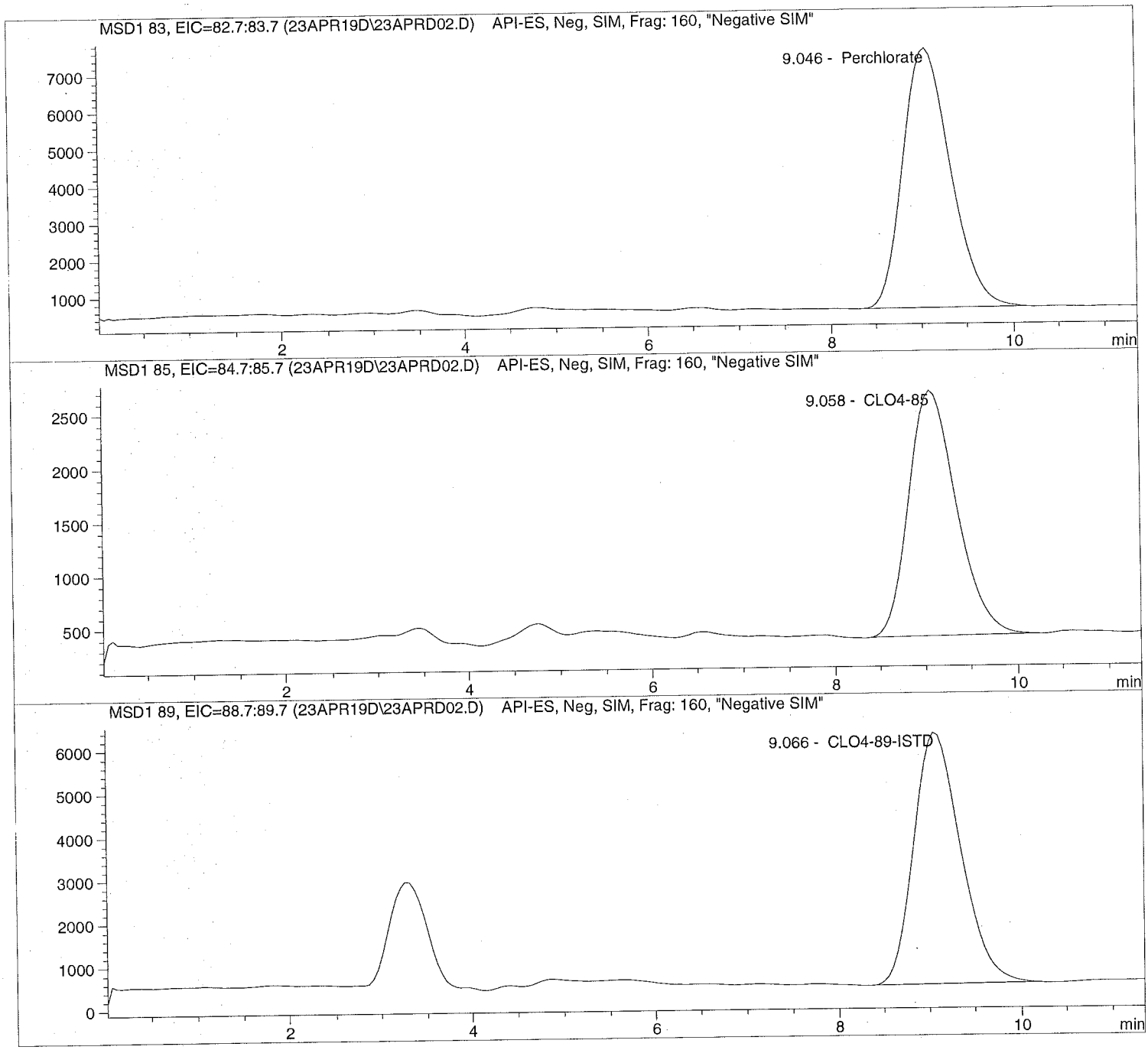
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD02.D Sample Name: 649381 QC@4.0

Injection Date:	4/23/2019 08:53:38	Seq Line:	2
Sample Name:	649381 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD02.D Sample Name: 649381 QC@4.0

Injection Date:	4/23/2019 08:53:38	Seq Line:	2
Sample Name:	649381 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.046	PBA	253897.8	4.0112	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.058	PBA	83639.9	4.2937	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.066	PBA	208541.6	5.0000	CLO4-89-ISTD

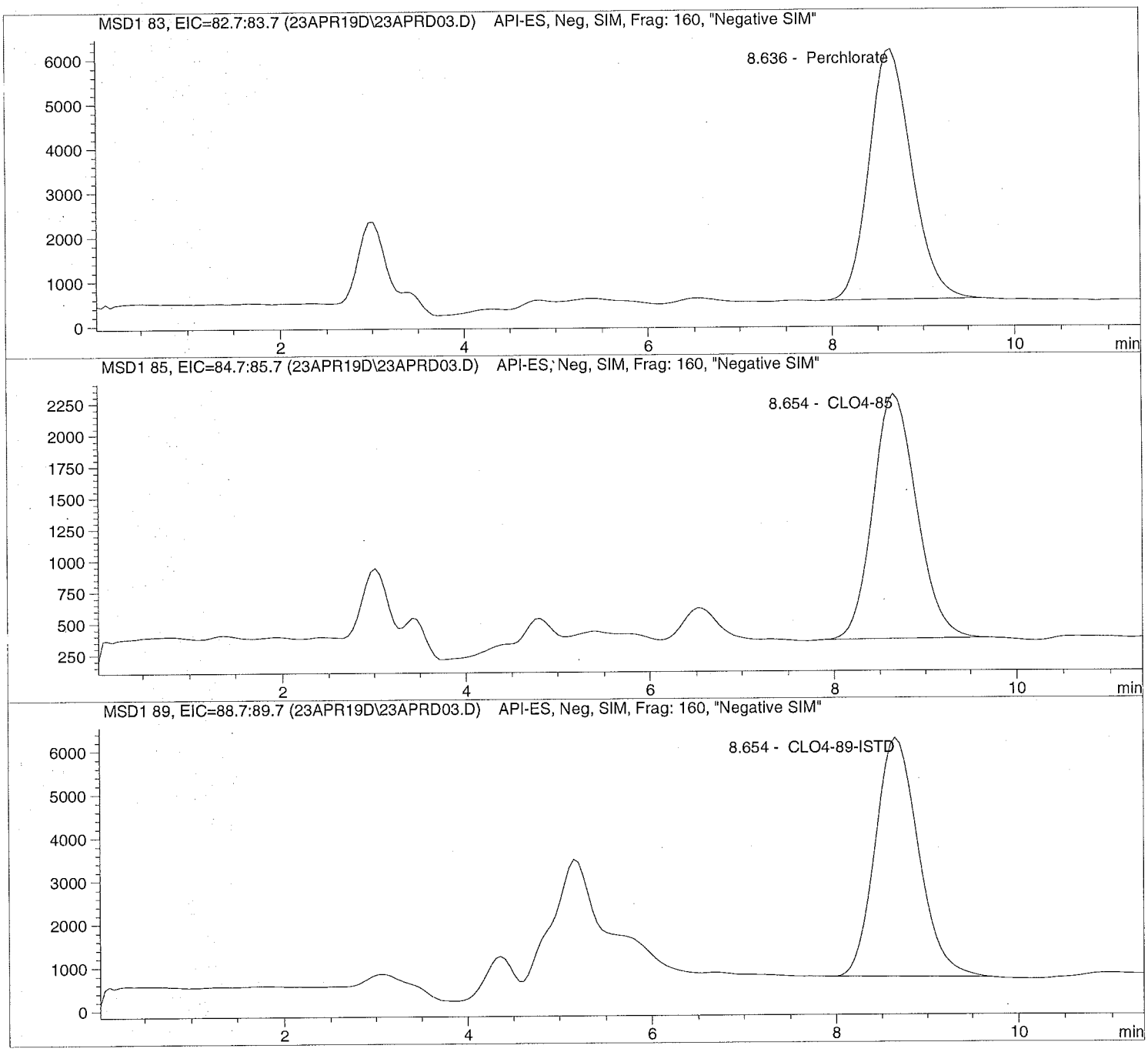
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD03.D Sample Name: 649379 ICS@4.0

Injection Date:	4/23/2019 09:07:01	Seq Line:	3
Sample Name:	649379 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD03.D Sample Name: 649379 ICS@4.0

Injection Date:	4/23/2019 09:07:01	Seq Line:	3
Sample Name:	649379 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.636	PBA	182630.9	3.3416	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.654	PBA	64850.2	3.8217	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.654	PBA	181823.6	5.0000	CLO4-89-ISTD

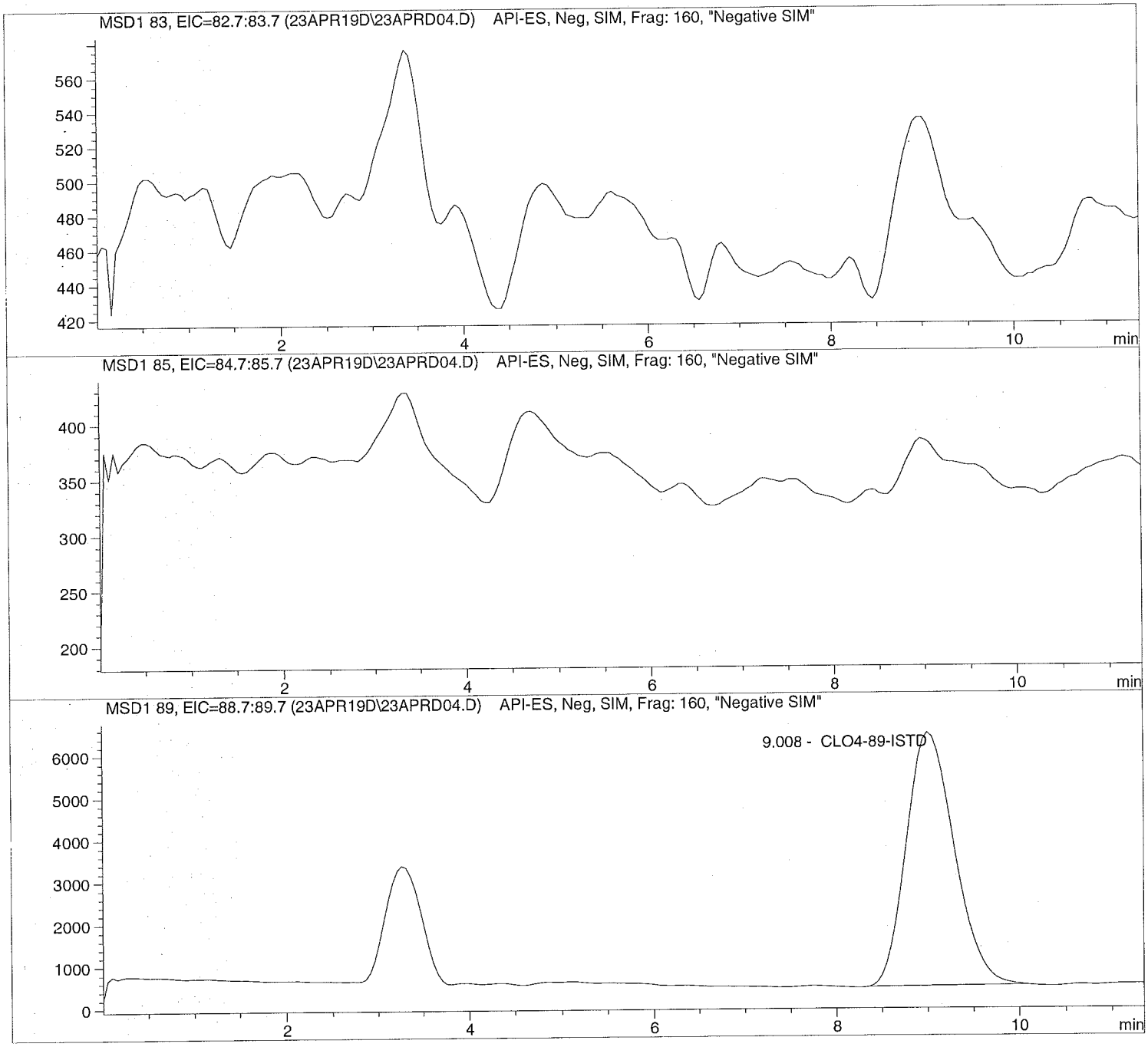
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD04.D Sample Name: 649380 LMB

Injection Date:	4/23/2019 09:20:26	Seq Line:	4
Sample Name:	649380 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD04.D Sample Name: 649380 LMB

Injection Date:	4/23/2019 09:20:26	Seq Line:	4
Sample Name:	649380 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.008	PBA	216871.1	5.0000	CLO4-89-ISTD

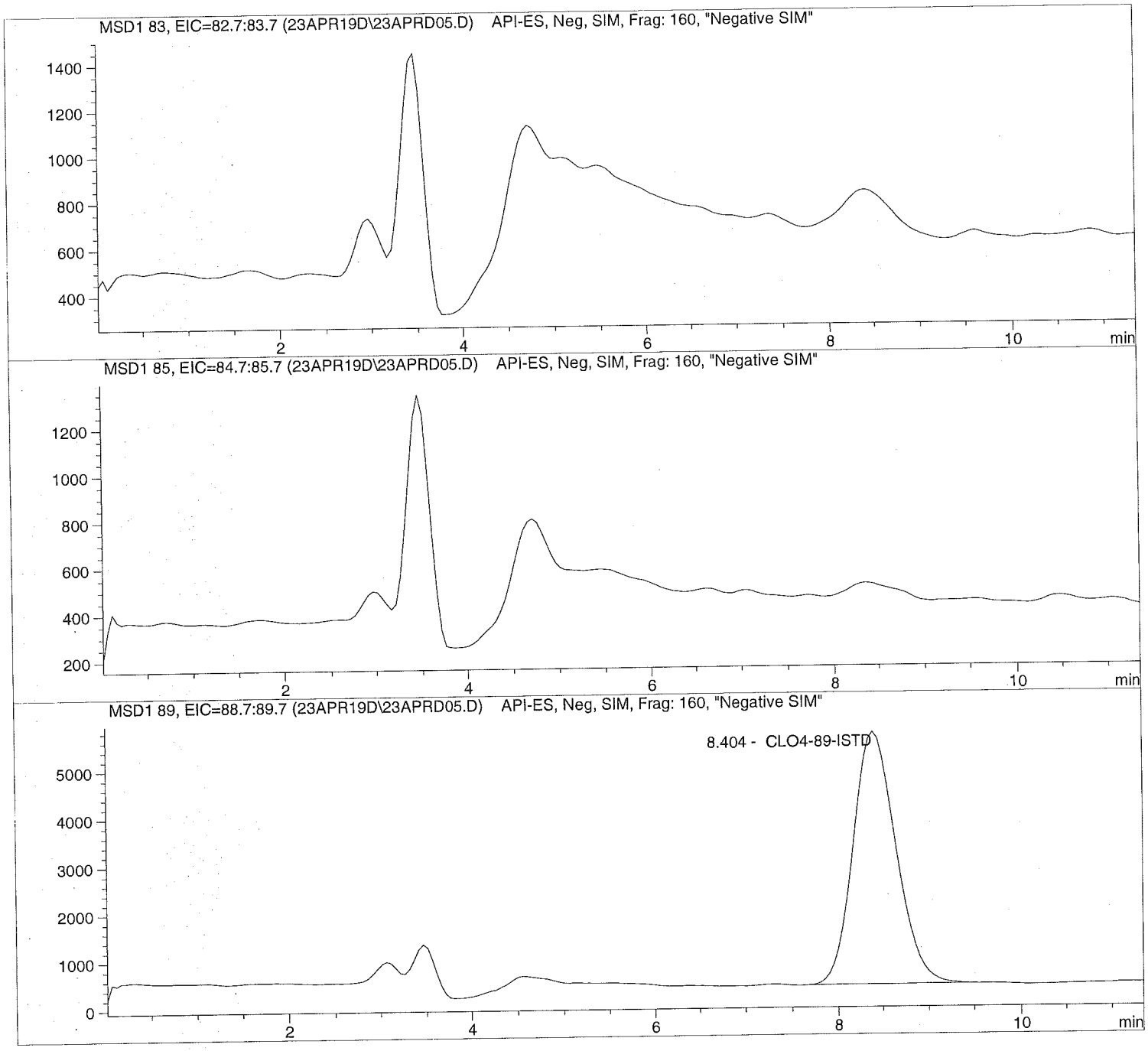
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD05.D Sample Name: 1910478001

Injection Date:	4/23/2019 09:36:37	Seq Line:	5
Sample Name:	1910478001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD05.D Sample Name: 1910478001

Injection Date:	4/23/2019 09:36:37	Seq Line:	5
Sample Name:	1910478001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.404	PBA	172857.1	5.0000	CLO4-89-ISTD

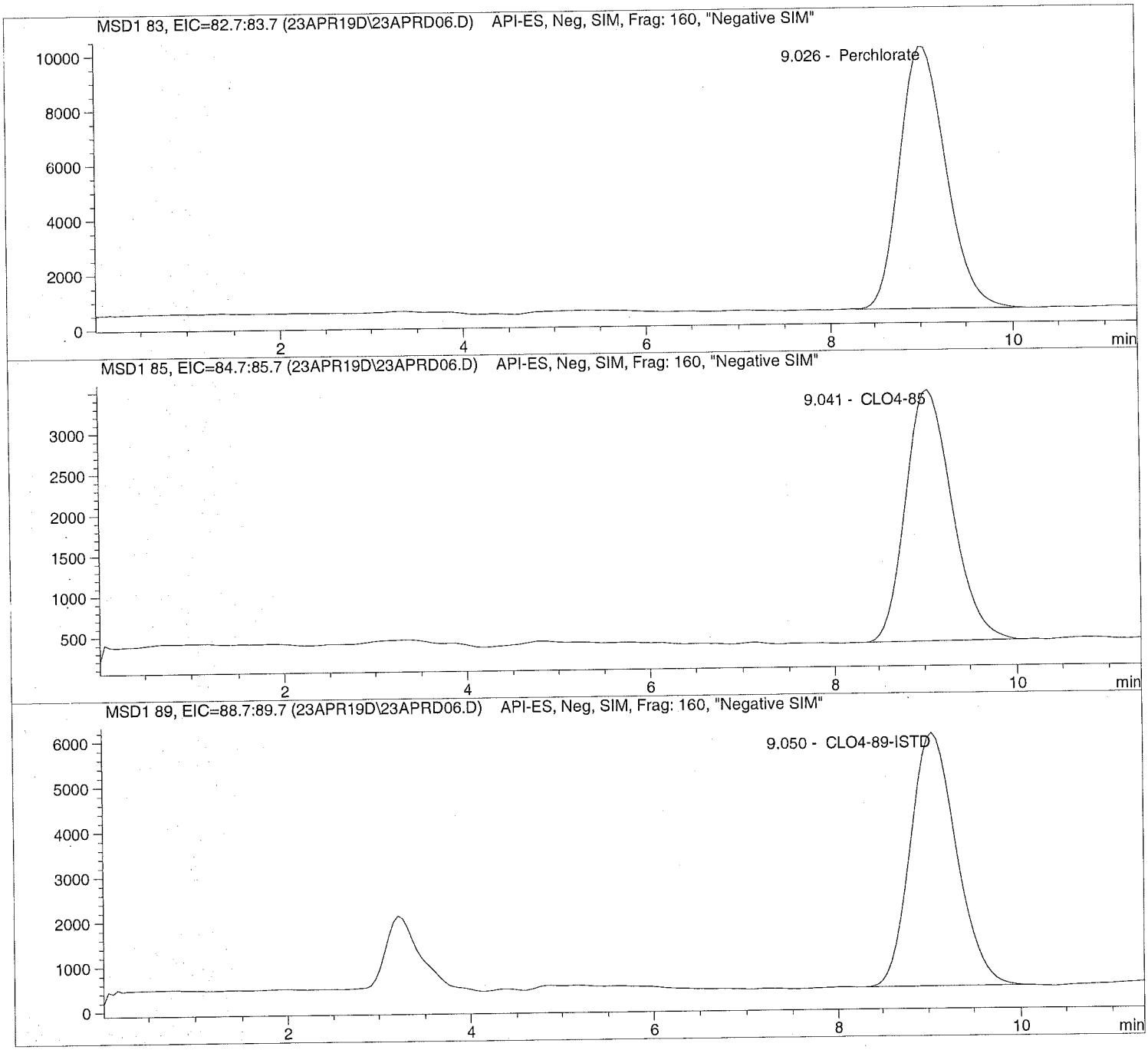
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD06.D Sample Name: 1910480001 1K

Injection Date:	4/23/2019 09:49:59	Seq Line:	6
Sample Name:	1910480001 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD06.D Sample Name: 1910480001 1K

Injection Date:	4/23/2019 09:49:59	Seq Line:	6
Sample Name:	1910480001 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.026	BBA	337160.7	5552.1819	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.041	PBA	109251.5	5913.5779	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.050	PBA	197148.5	5000.0000	CLO4-89-ISTD

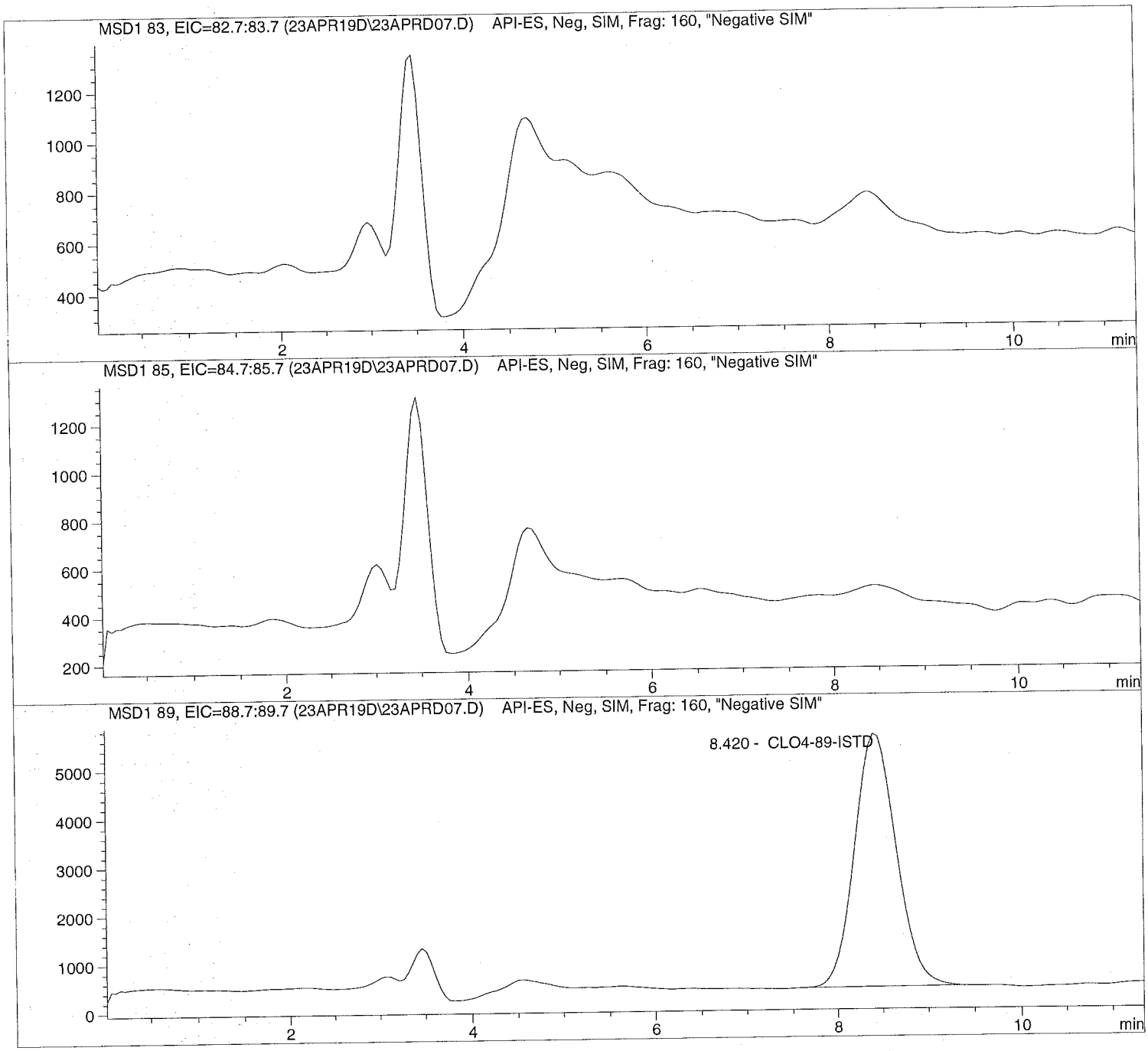
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD07.D Sample Name: 1910483001

Injection Date:	4/23/2019 10:03:26	Seq Line:	7
Sample Name:	1910483001	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD07.D Sample Name: 1910483001

Injection Date:	4/23/2019 10:03:26	Seq Line:	7
Sample Name:	1910483001	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.420	PBA	165412.1	5.0000	CLO4-89-ISTD

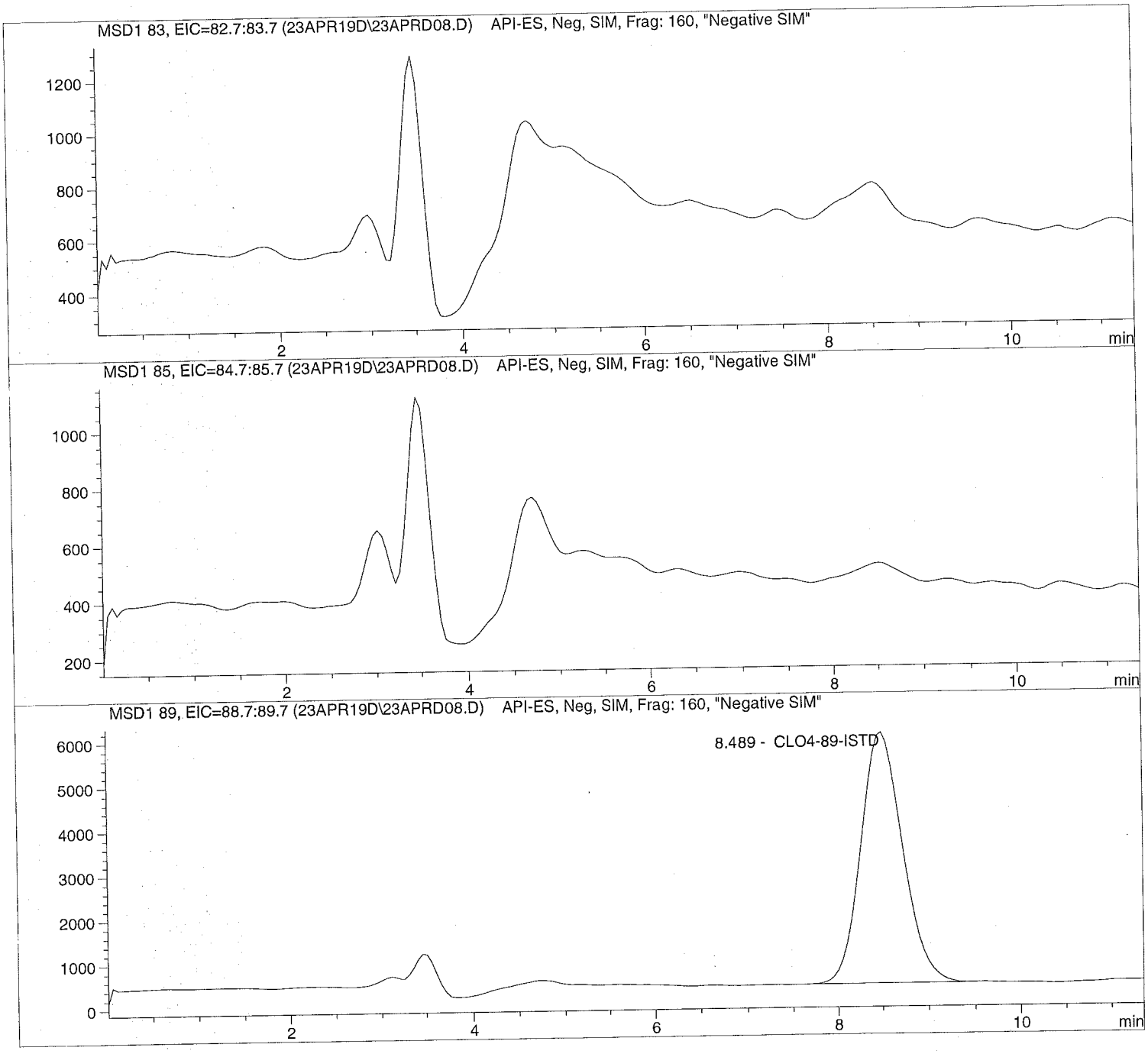
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD08.D Sample Name: 1911288001

Injection Date:	4/23/2019 10:16:48	Seq Line:	8
Sample Name:	1911288001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD08.D Sample Name: 1911288001

Injection Date:	4/23/2019 10:16:48	Seq Line:	8
Sample Name:	1911288001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.489	BBA	181749.4	5.0000	CLO4-89-ISTD

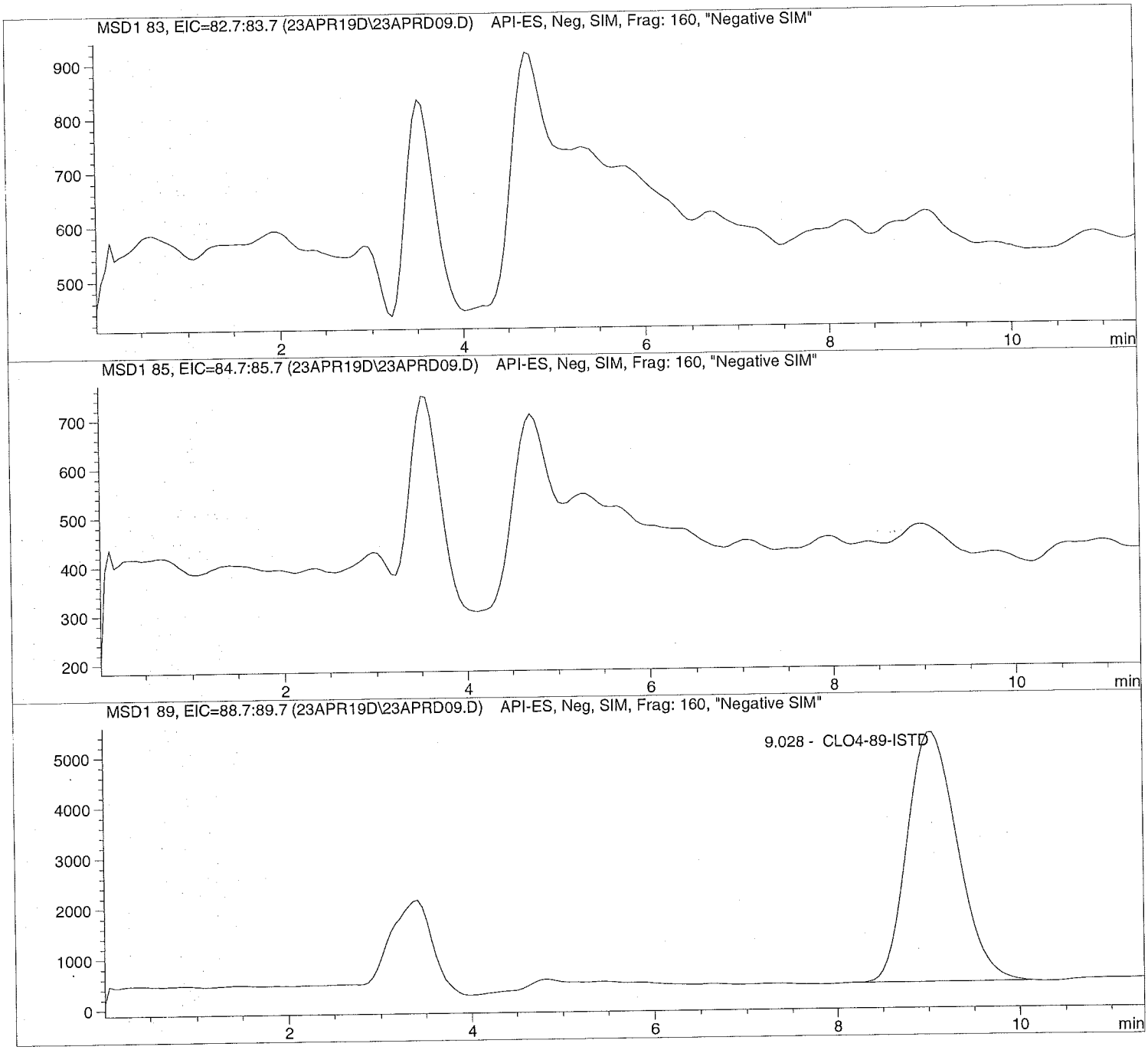
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD09.D Sample Name: 1910837001

Injection Date:	4/23/2019 10:30:16	Seq Line:	9
Sample Name:	1910837001	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD09.D Sample Name: 1910837001

Injection Date:	4/23/2019 10:30:16	Seq Line:	9
Sample Name:	1910837001	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.028	BBA	187599.0	5.0000	CLO4-89-ISTD

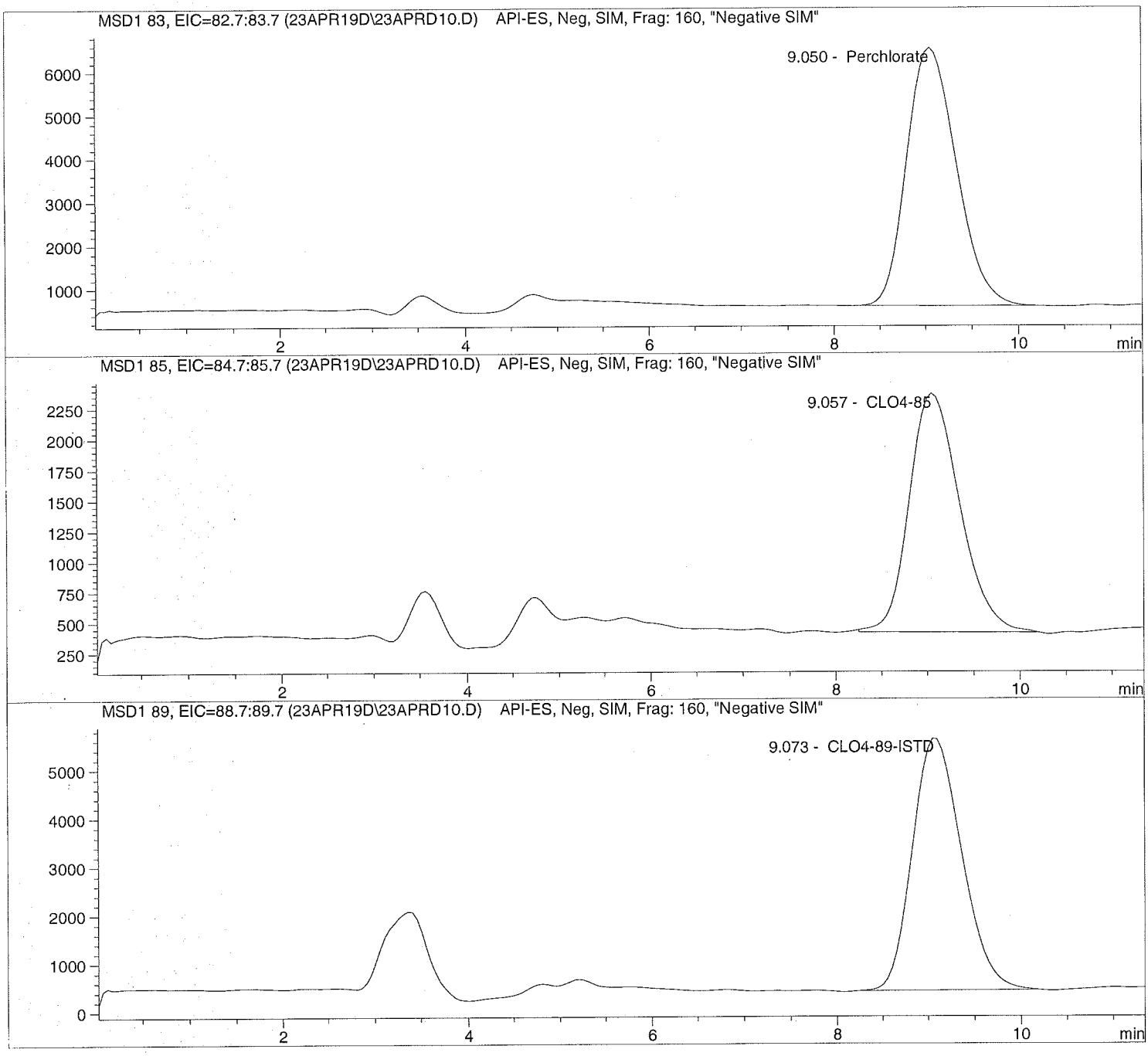
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD10.D Sample Name: 1910837002 MS

Injection Date:	4/23/2019 10:43:43	Seq Line:	10
Sample Name:	1910837002 MS	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD10.D Sample Name: 1910837002 MS

Injection Date:	4/23/2019 10:43:43	Seq Line:	10
Sample Name:	1910837002 MS	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.050	PBA	221785.2	3.8059	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.057	BBA	74121.5	4.1234	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.073	PBA	192506.7	5.0000	CLO4-89-ISTD

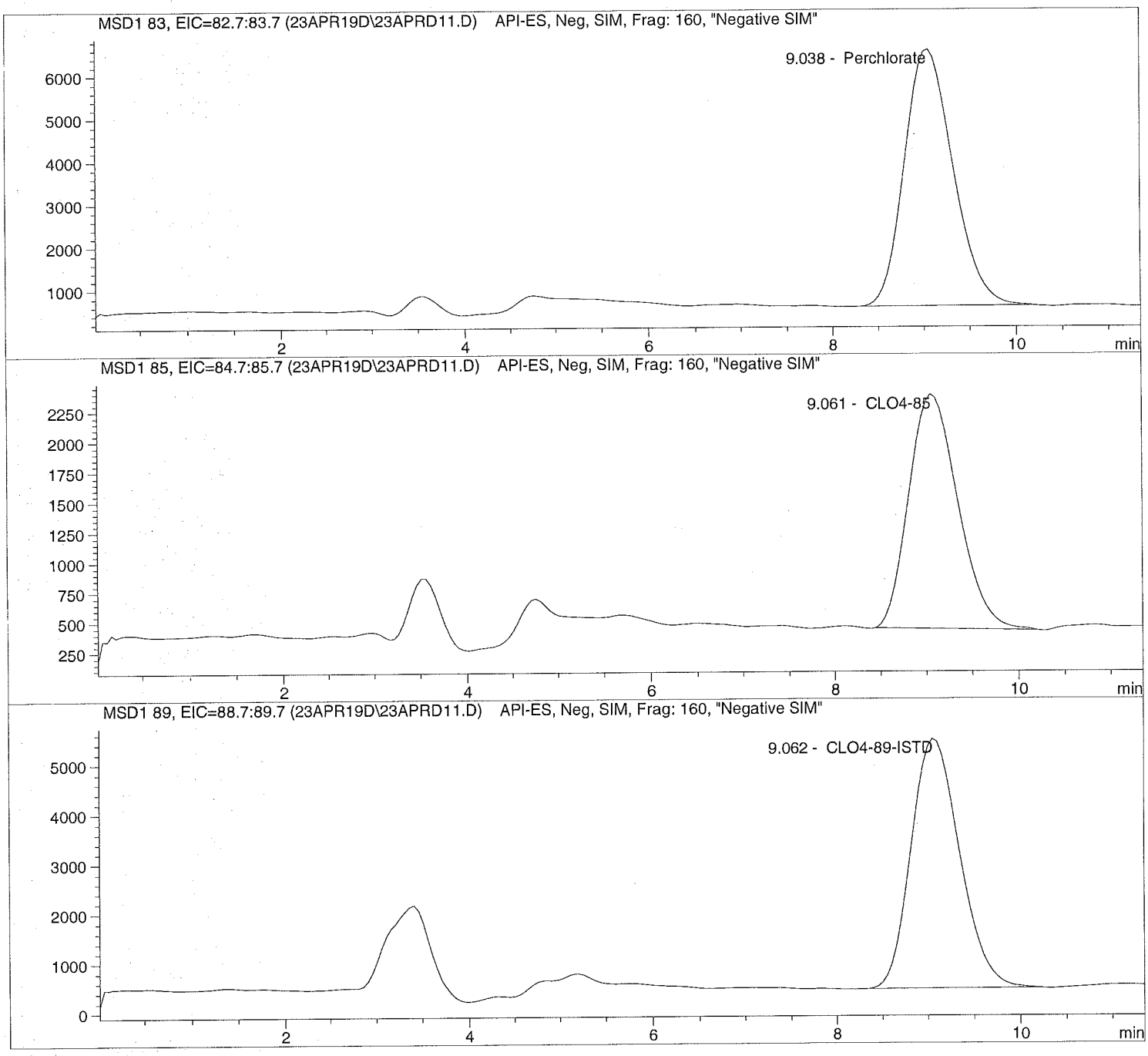
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD11.D Sample Name: 1910837003 MSD

Injection Date:	4/23/2019 10:57:05	Seq Line:	11
Sample Name:	1910837003 MSD	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD11.D Sample Name: 1910837003 MSD

Injection Date:	4/23/2019 10:57:05	Seq Line:	11
Sample Name:	1910837003 MSD	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.038	PBA	220802.4	3.9511	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.061	BBA	72383.4	4.2063	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.062	PBA	184256.2	5.0000	CLO4-89-ISTD

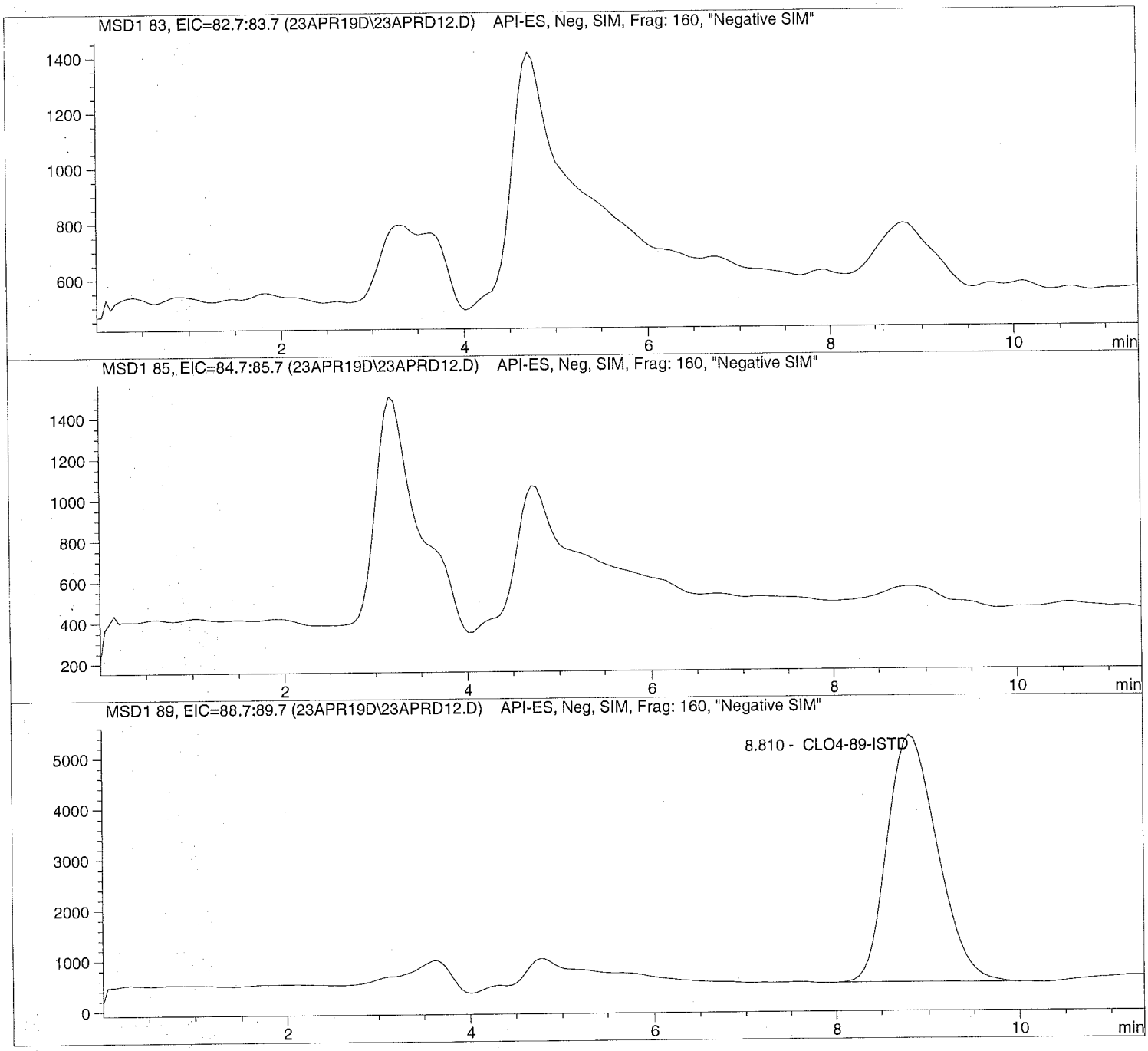
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD12.D Sample Name: 1910837004

Injection Date:	4/23/2019 11:10:26	Seq Line:	12
Sample Name:	1910837004	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD12.D Sample Name: 1910837004

Injection Date:	4/23/2019 11:10:26	Seq Line:	12
Sample Name:	1910837004	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	180138.5	5.0000	CLO4-89-ISTD

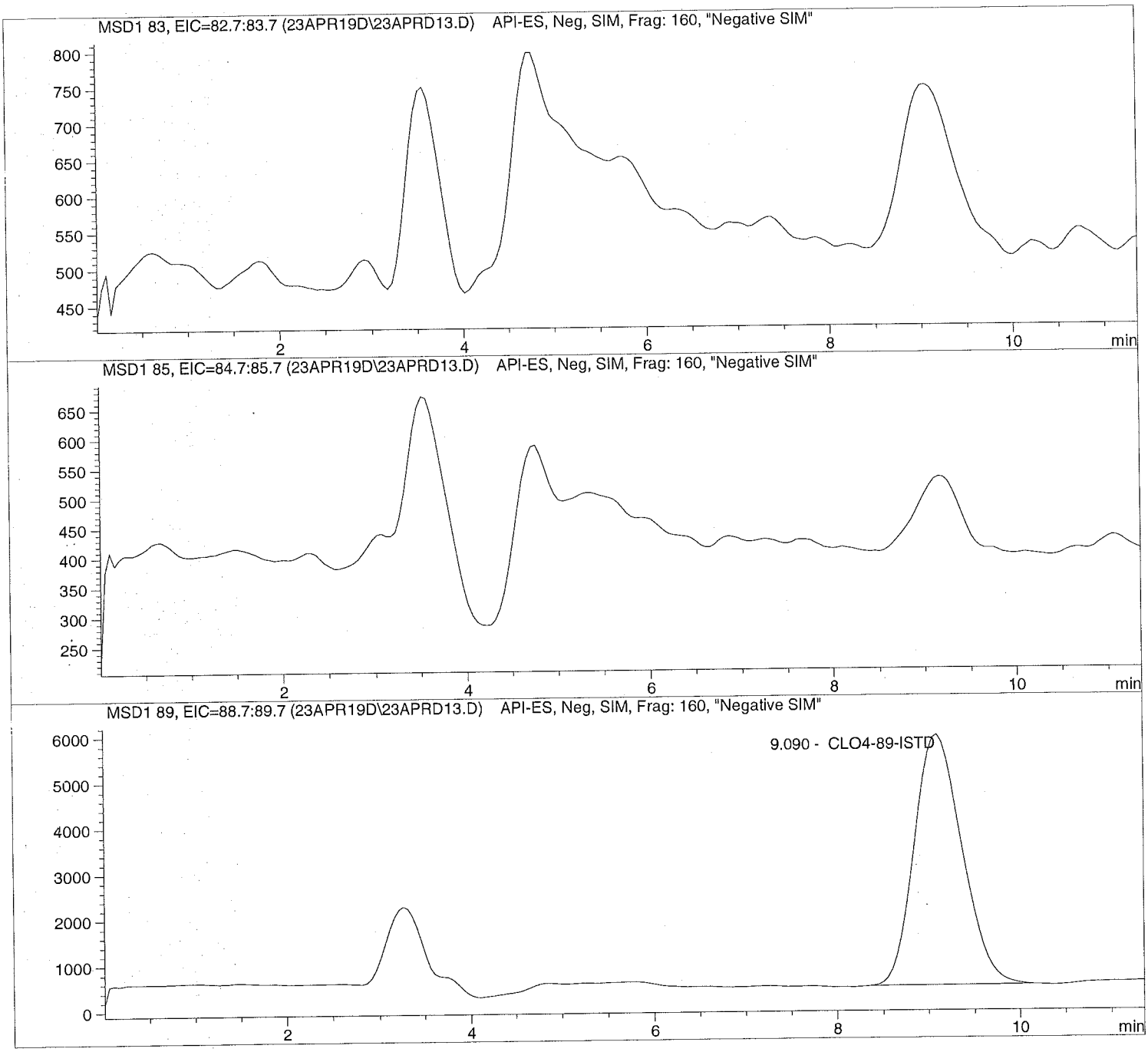
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD13.D Sample Name: 1910837005

Injection Date:	4/23/2019 11:23:52	Seq Line:	13
Sample Name:	1910837005	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD13.D Sample Name: 1910837005

Injection Date:	4/23/2019 11:23:52	Seq Line:	13
Sample Name:	1910837005	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.090	BBA	197954.5	5.0000	CLO4-89-ISTD

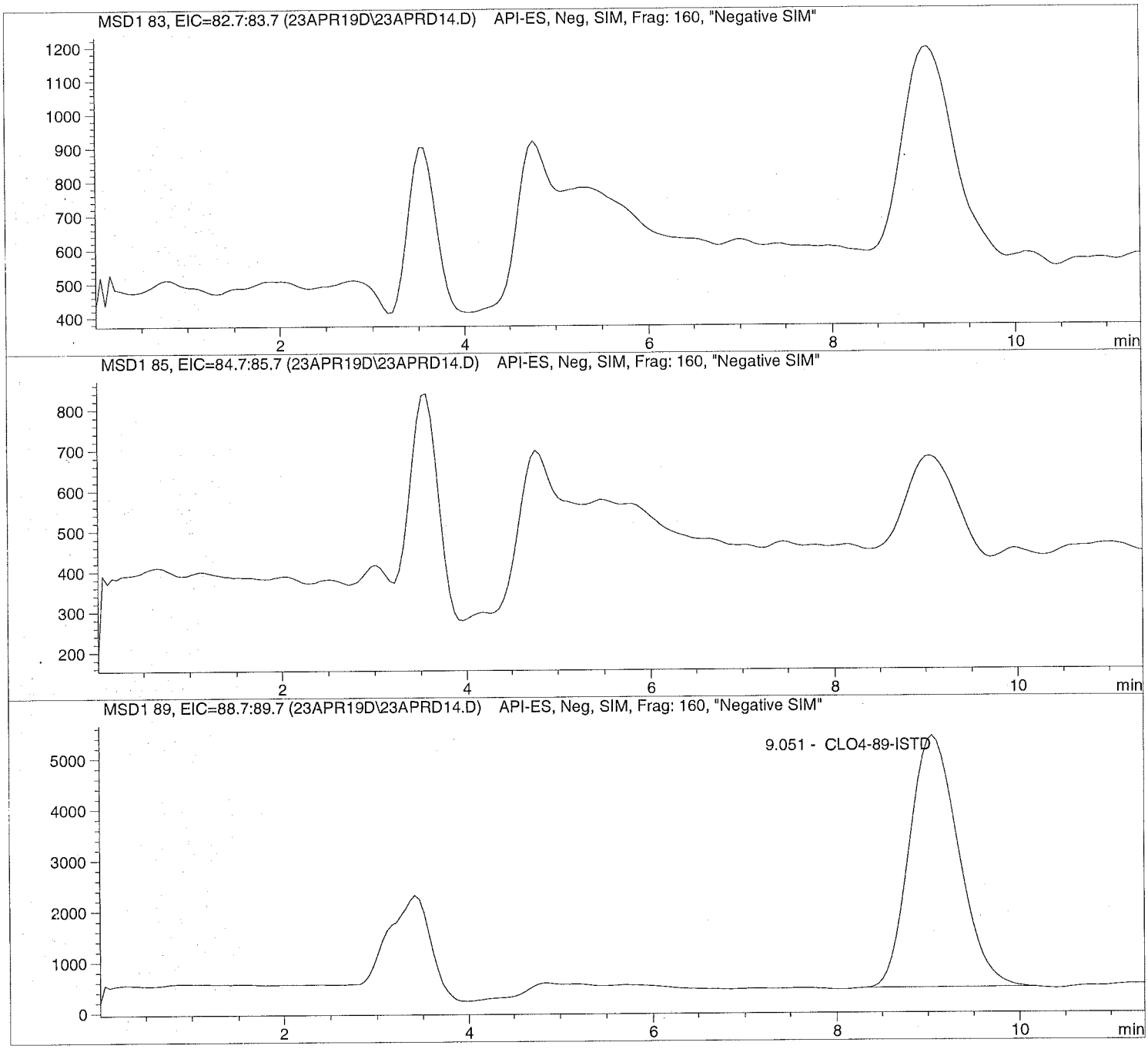
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD14.D Sample Name: 1910837006

Injection Date:	4/23/2019 11:37:15	Seq Line:	14
Sample Name:	1910837006	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD14.D Sample Name: 1910837006

Injection Date:	4/23/2019 11:37:15	Seq Line:	14
Sample Name:	1910837006	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.051	BBA	183017.4	5.0000	CLO4-89-ISTD

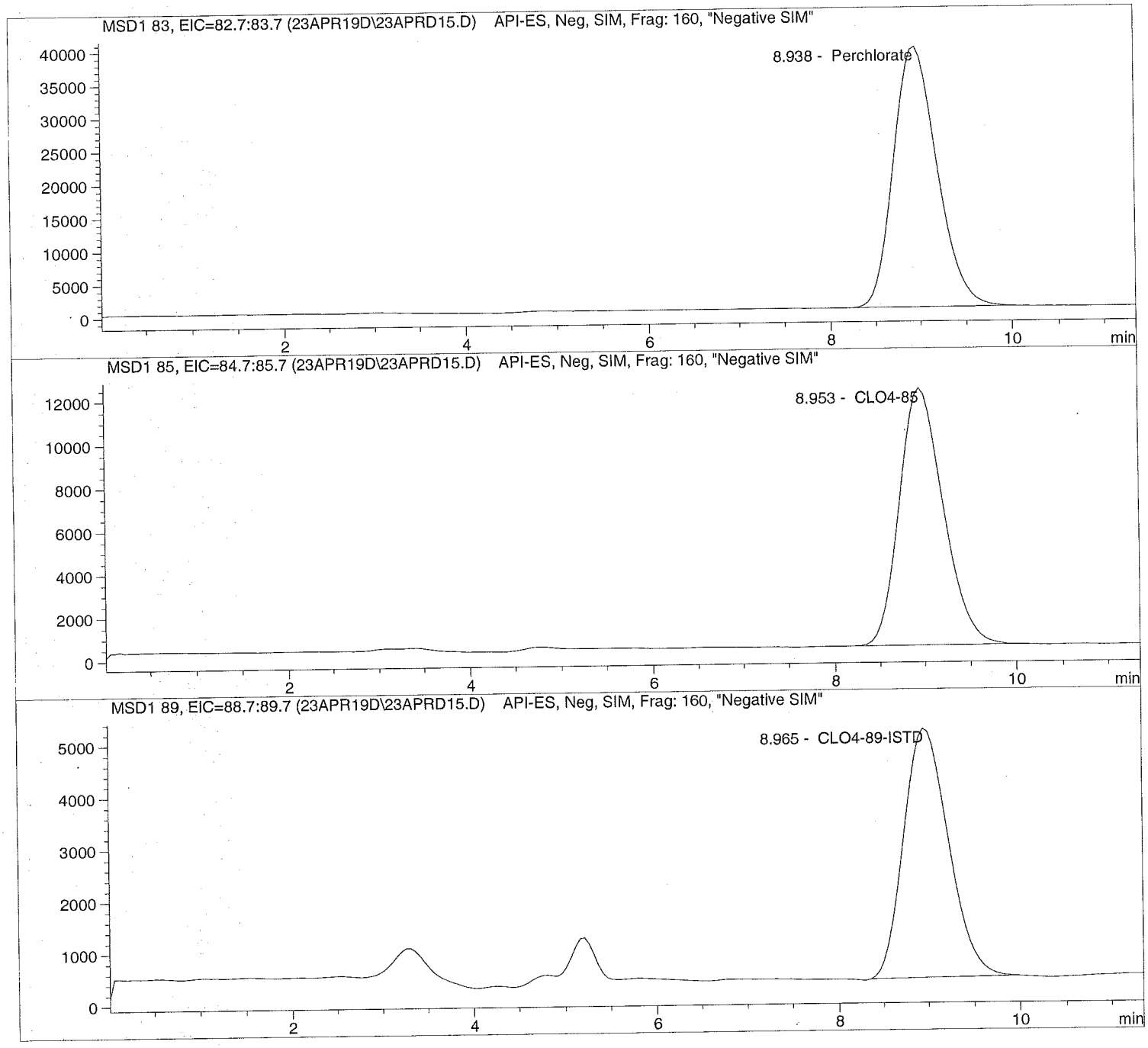
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD15.D Sample Name: 649382 CCV@25

Injection Date:	4/23/2019 11:50:37	Seq Line:	15
Sample Name:	649382 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD15.D Sample Name: 649382 CCV@25

Injection Date:	4/23/2019 11:50:37	Seq Line:	15
Sample Name:	649382 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.938	PBA	1311276.0	24.2693	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.953	BBA	400971.3	24.9597	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.965	PBA	164670.7	5.0000	CLO4-89-ISTD

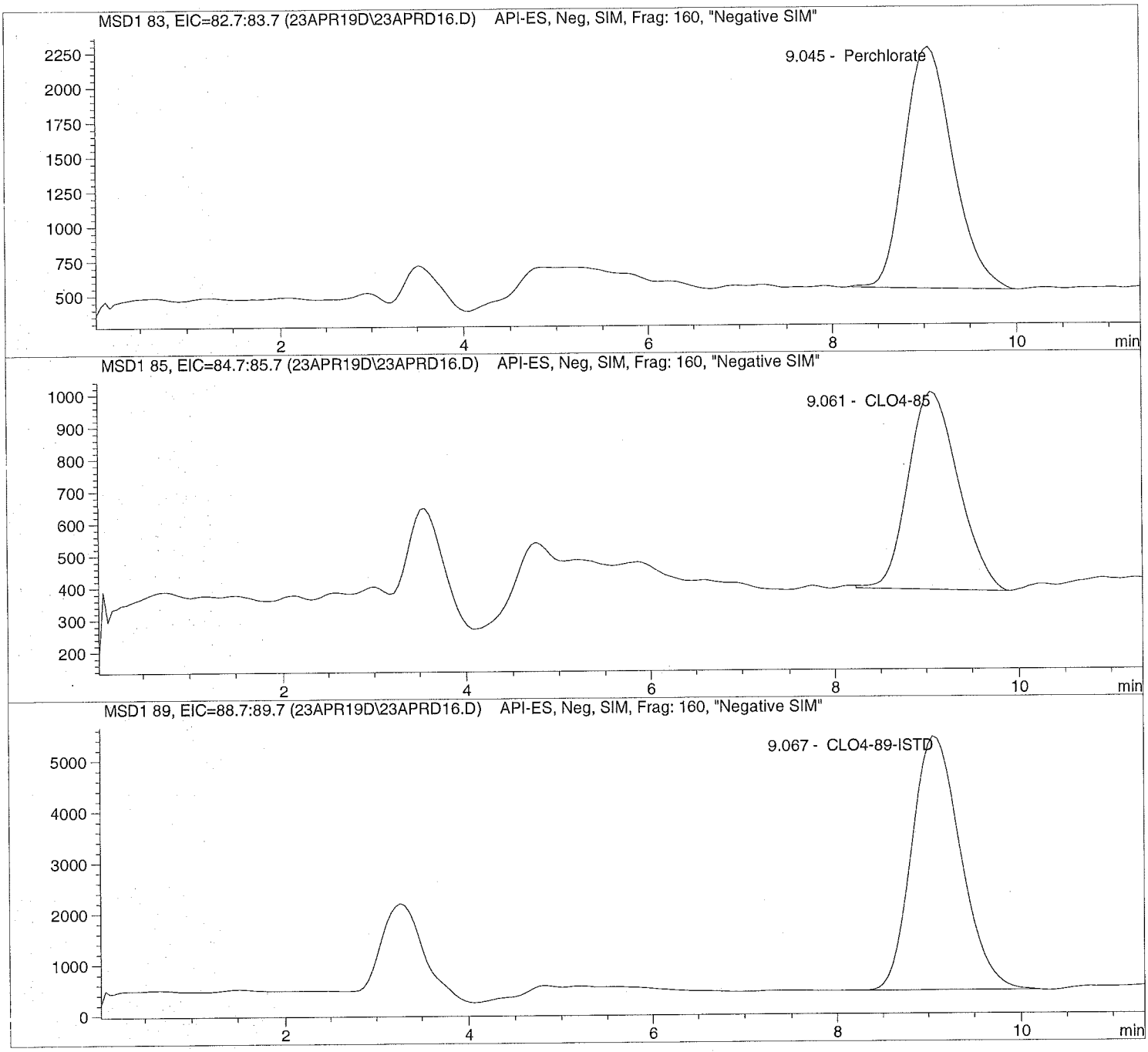
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD16.D Sample Name: 1910837007

Injection Date:	4/23/2019 12:03:59	Seq Line:	16
Sample Name:	1910837007	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD16.D Sample Name: 1910837007

Injection Date:	4/23/2019 12:03:59	Seq Line:	16
Sample Name:	1910837007	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.045	BBA	64240.0	1.2640	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.061	BBA	23485.4	1.3651	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.067	PBA	184879.5	5.0000	CLO4-89-ISTD

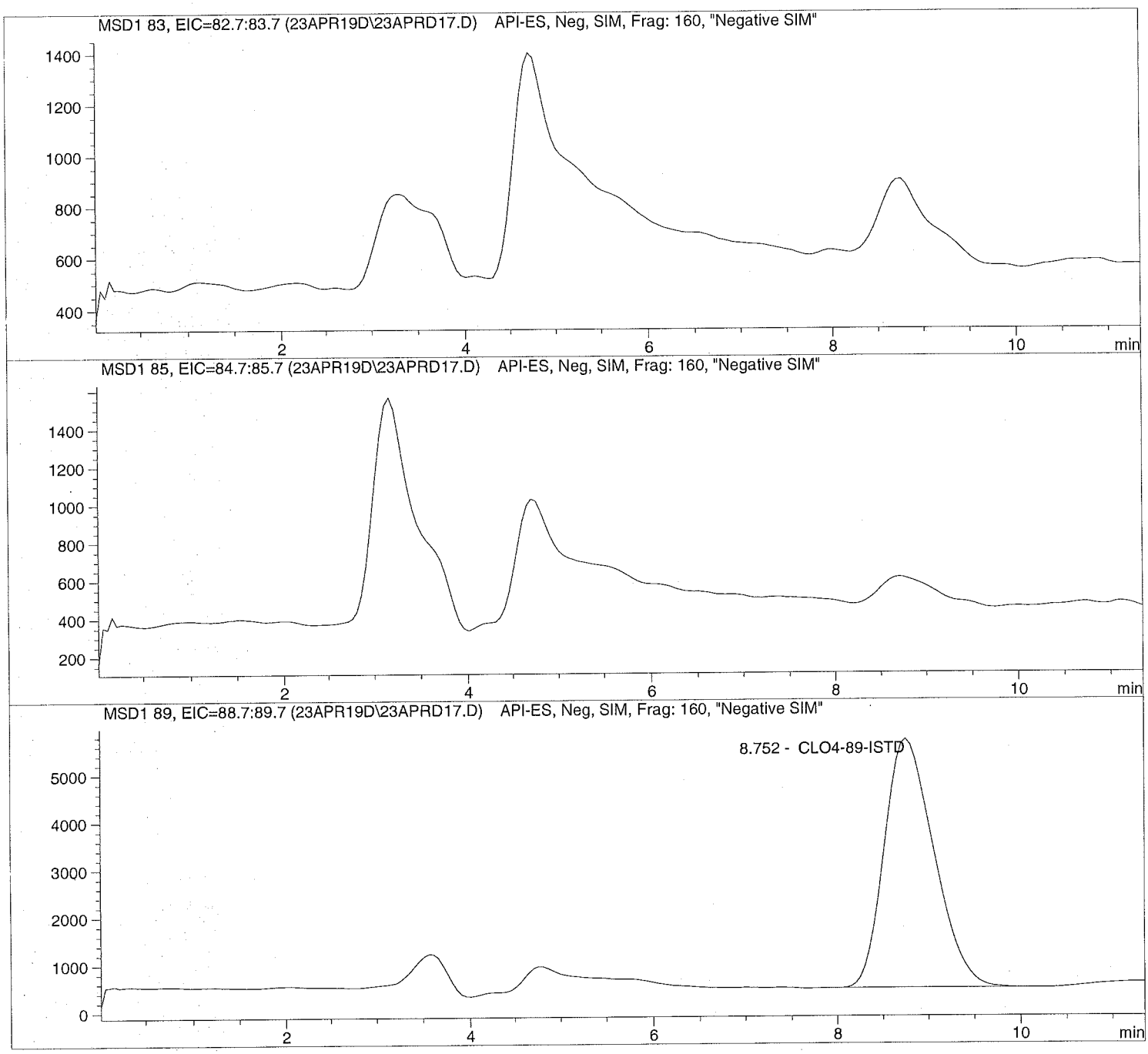
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD17.D Sample Name: 1910837008

Injection Date:	4/23/2019 12:17:22	Seq Line:	17
Sample Name:	1910837008	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD17.D Sample Name: 1910837008

Injection Date:	4/23/2019 12:17:22	Seq Line:	17
Sample Name:	1910837008	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.752	PBA	196776.6	5.0000	CLO4-89-ISTD

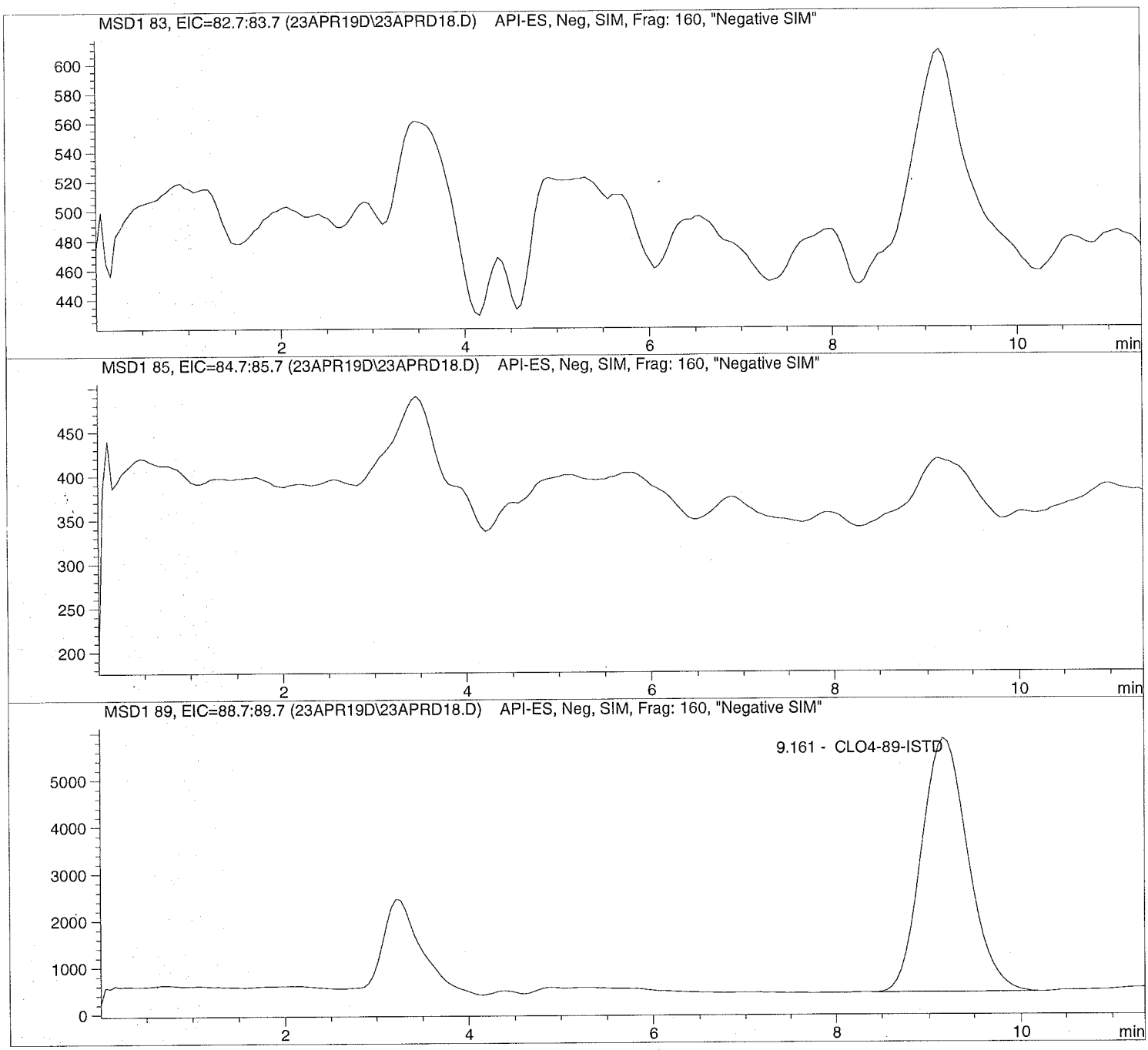
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD18.D Sample Name: 1910837009

Injection Date:	4/23/2019 12:30:43	Seq Line:	18
Sample Name:	1910837009	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD18.D Sample Name: 1910837009

Injection Date:	4/23/2019 12:30:43	Seq Line:	18
Sample Name:	1910837009	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.161	BBA	191613.1	5.0000	CLO4-89-ISTD

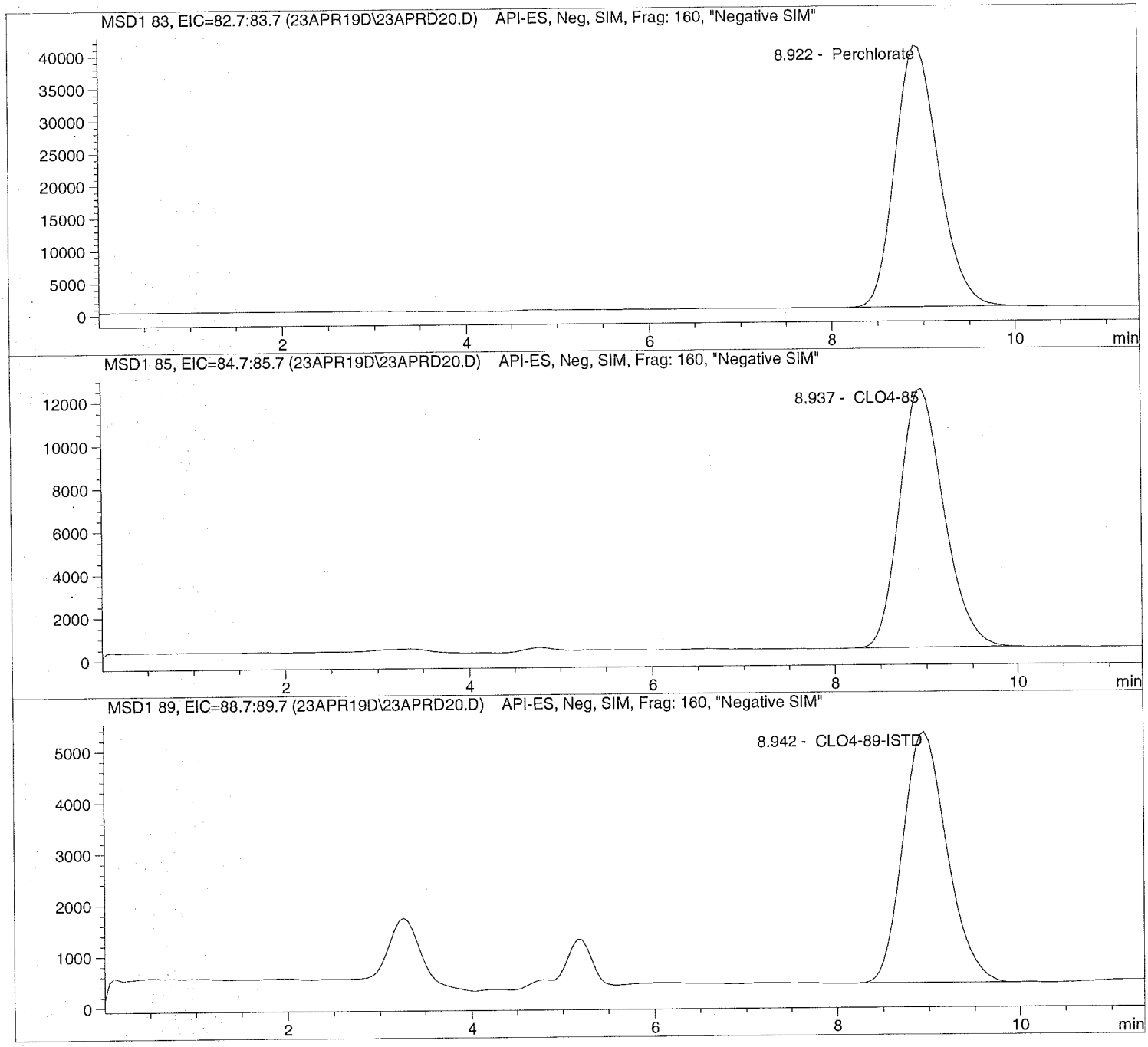
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD20.D Sample Name: 649383 CCV@25

Injection Date:	4/23/2019 13:01:17	Seq Line:	20
Sample Name:	649383 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23APR19D\23APRD20.D Sample Name: 649383 CCV@25

Injection Date:	4/23/2019 13:01:17	Seq Line:	20
Sample Name:	649383 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.922	PBA	1319634.0	24.7062	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.937	PBA	401823.2	25.3099	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.942	PBA	162618.0	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

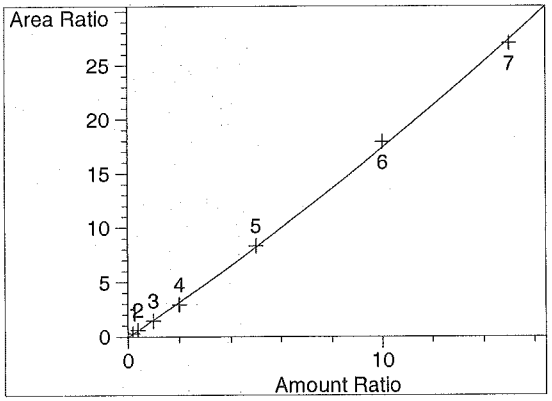
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

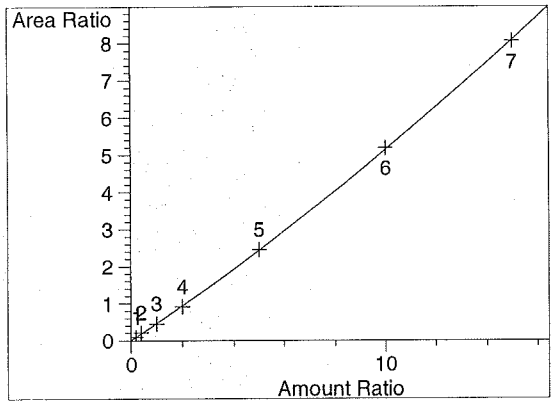
Peak Sum Table

No Entries in table

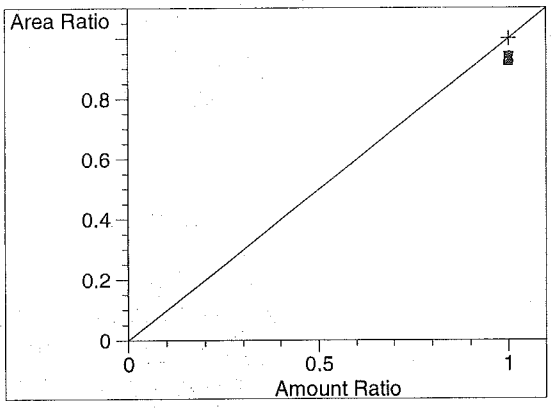
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Report: C:\HPCHEM\1\DATA\19MAR19I\19MAR19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

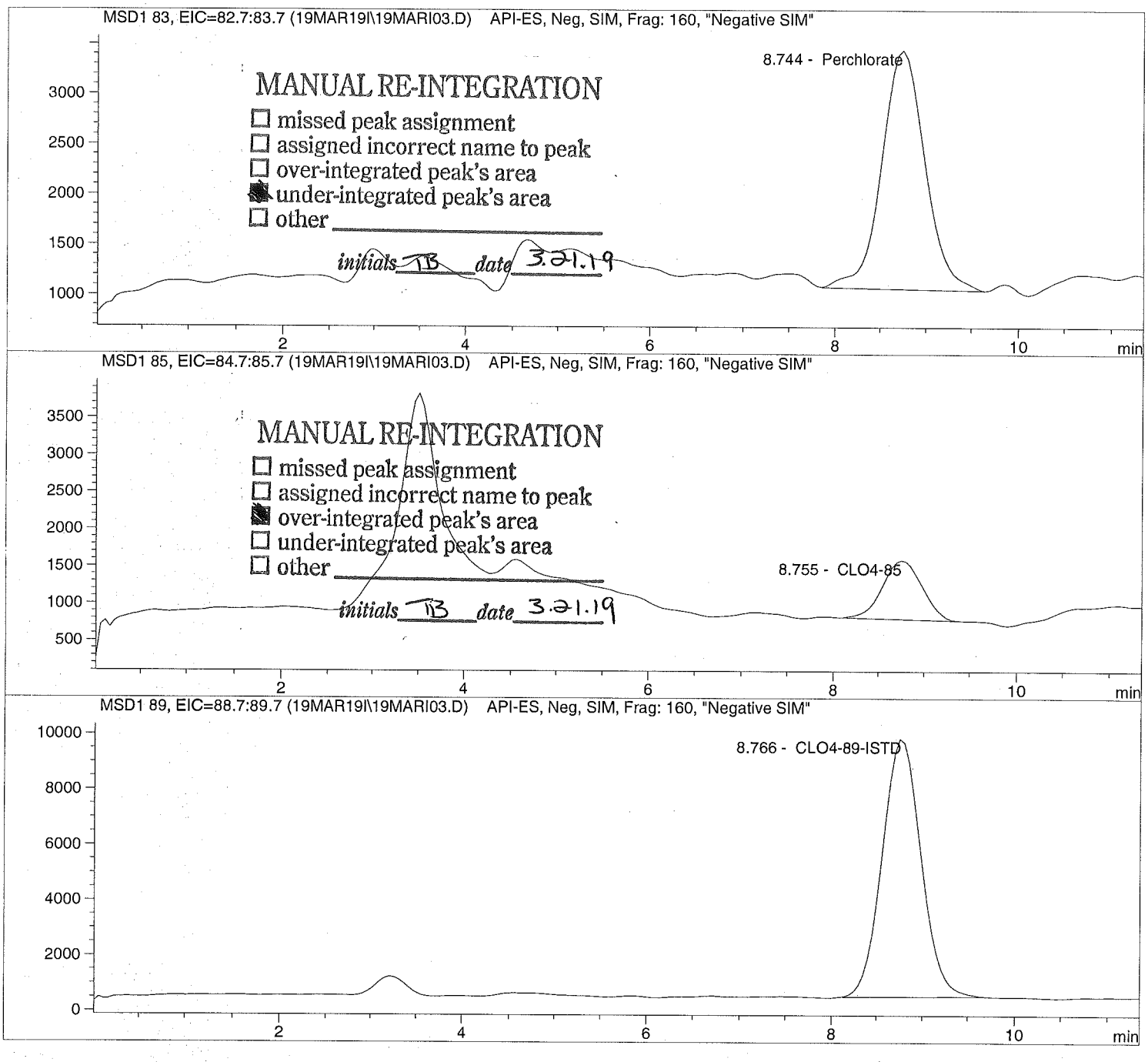
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L 00938294

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

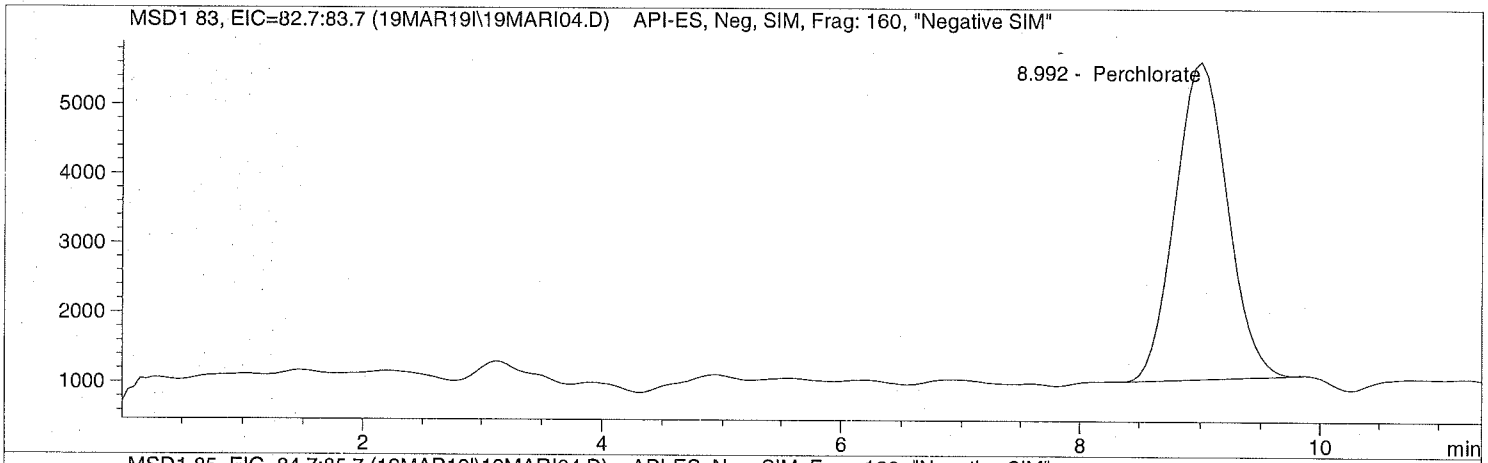
*** End of Report ***

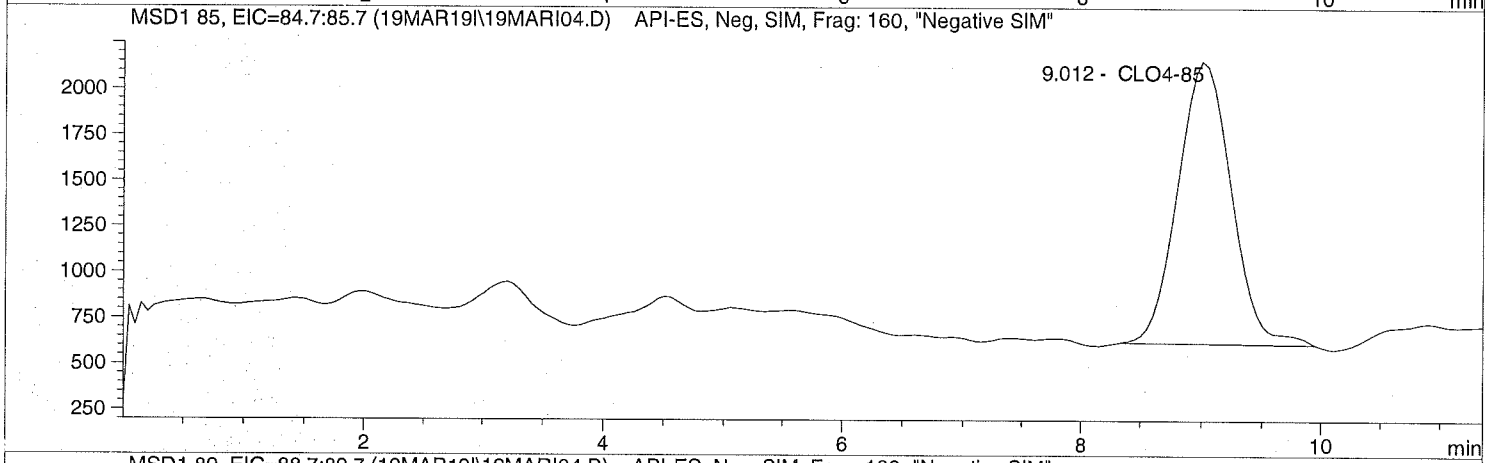
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L 00938296

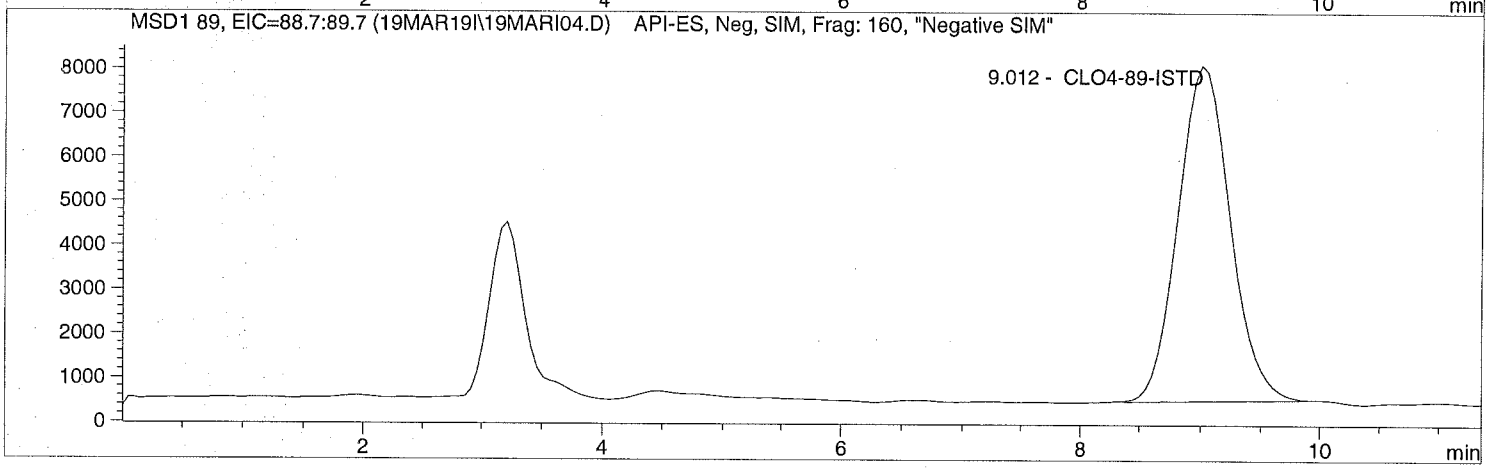
Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

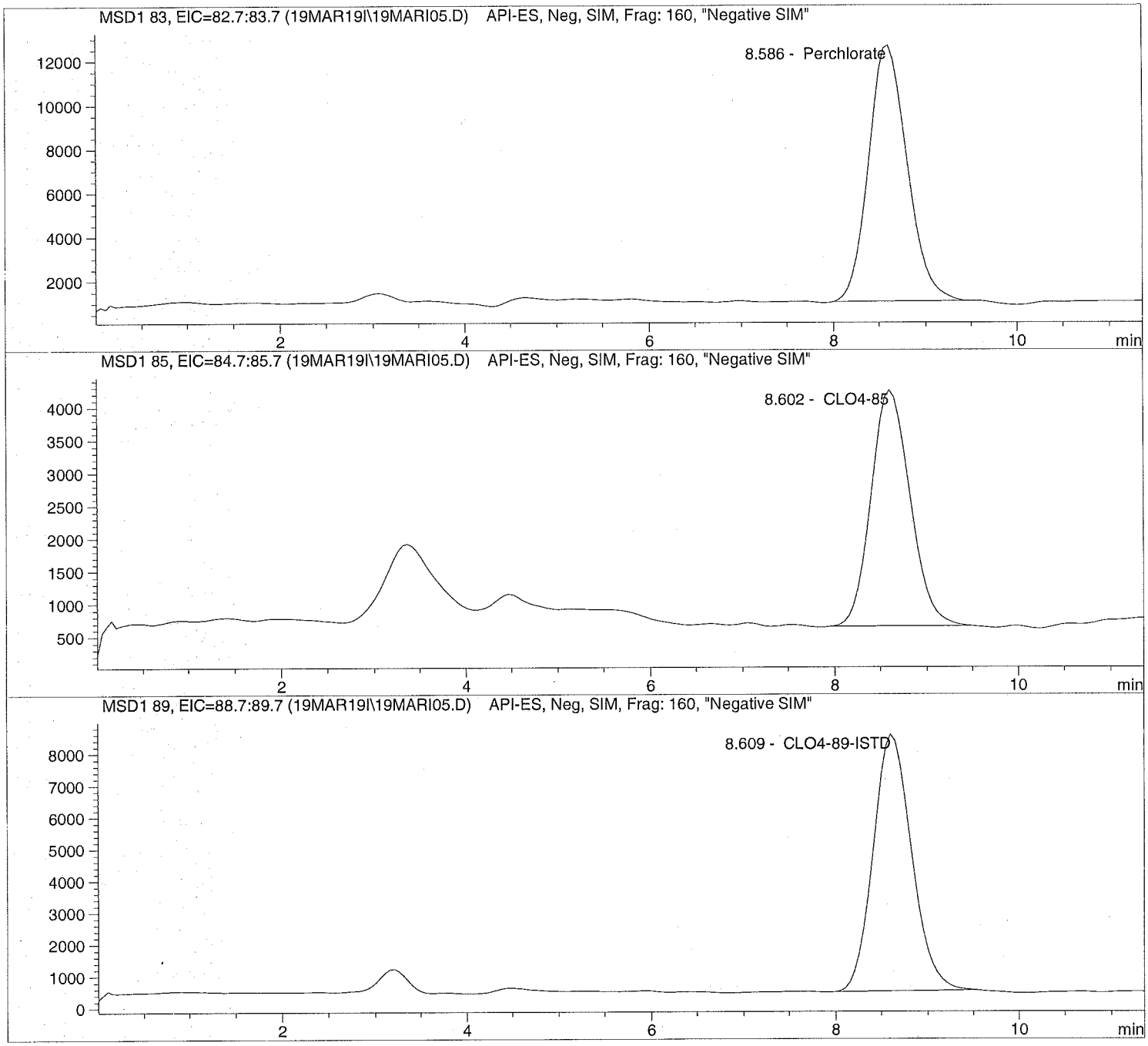
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

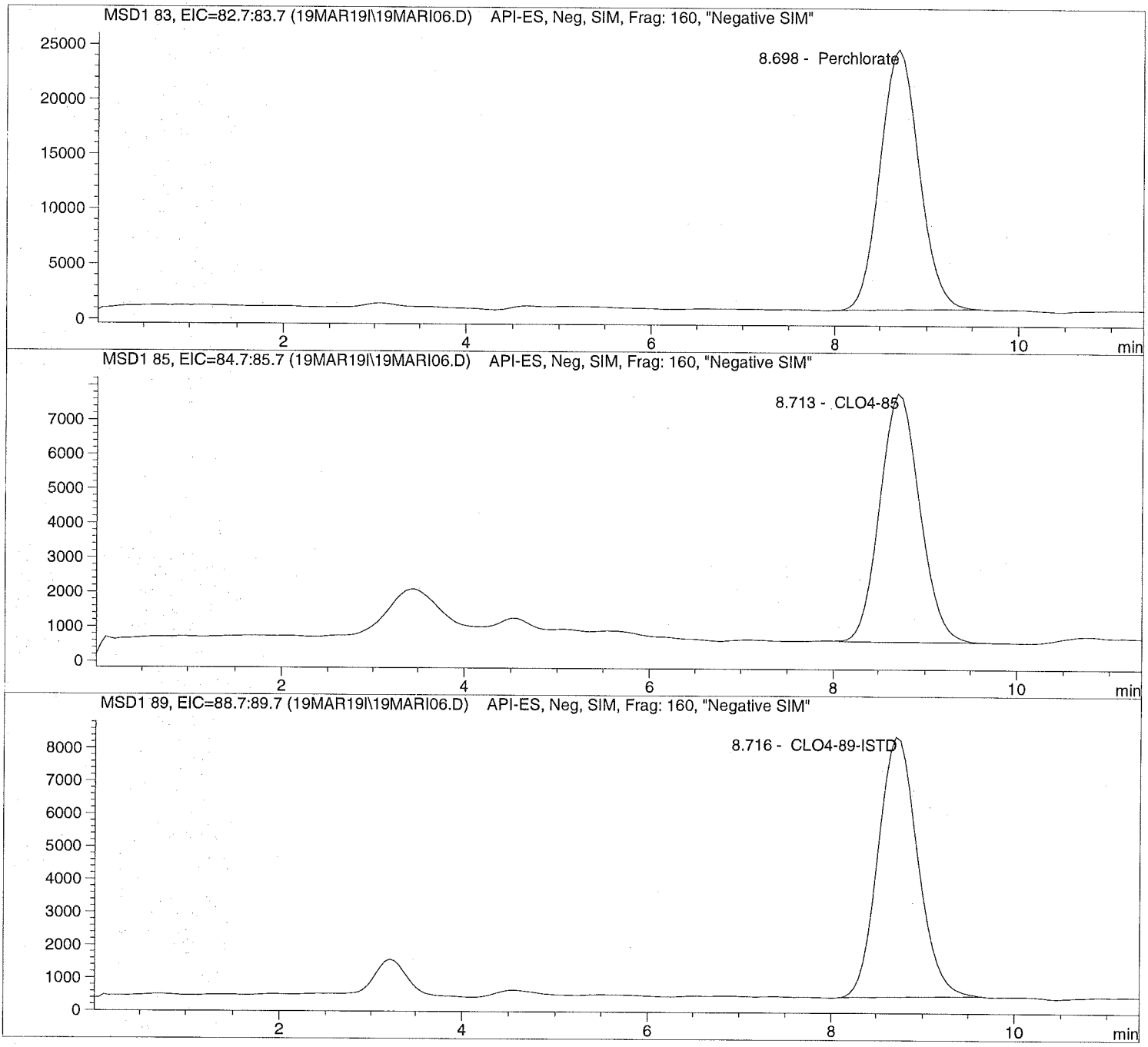
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

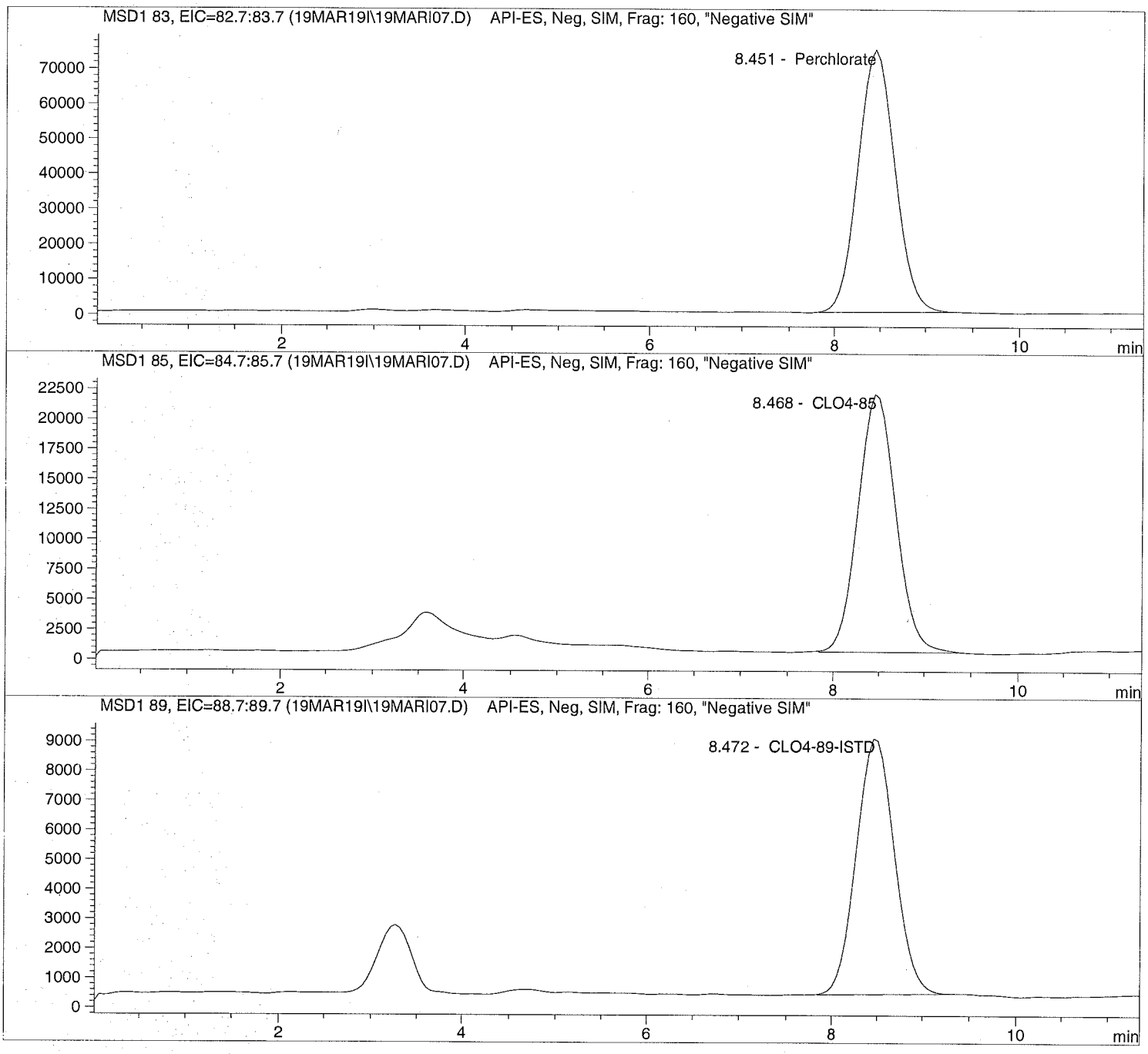
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L 00938302

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

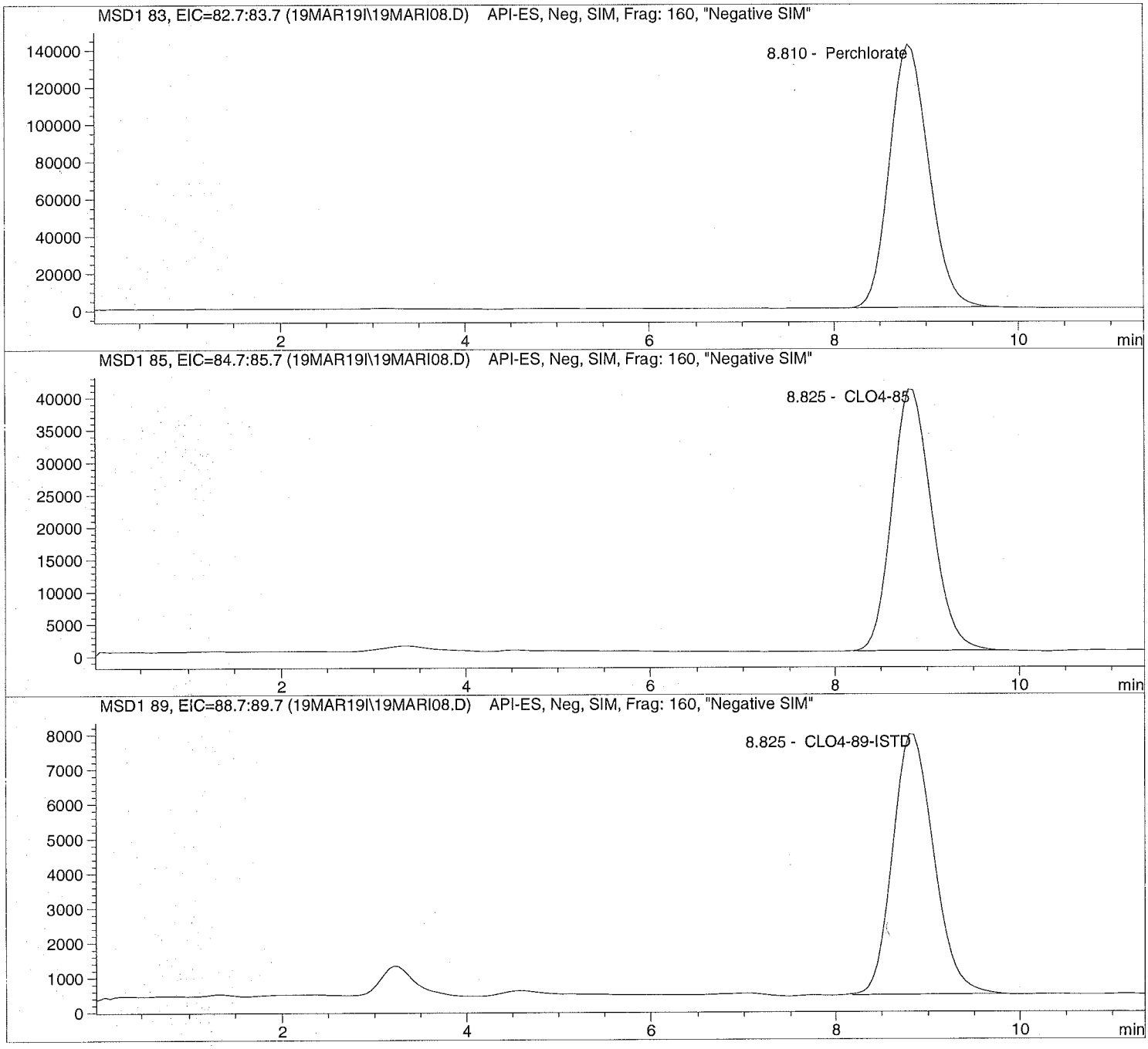
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

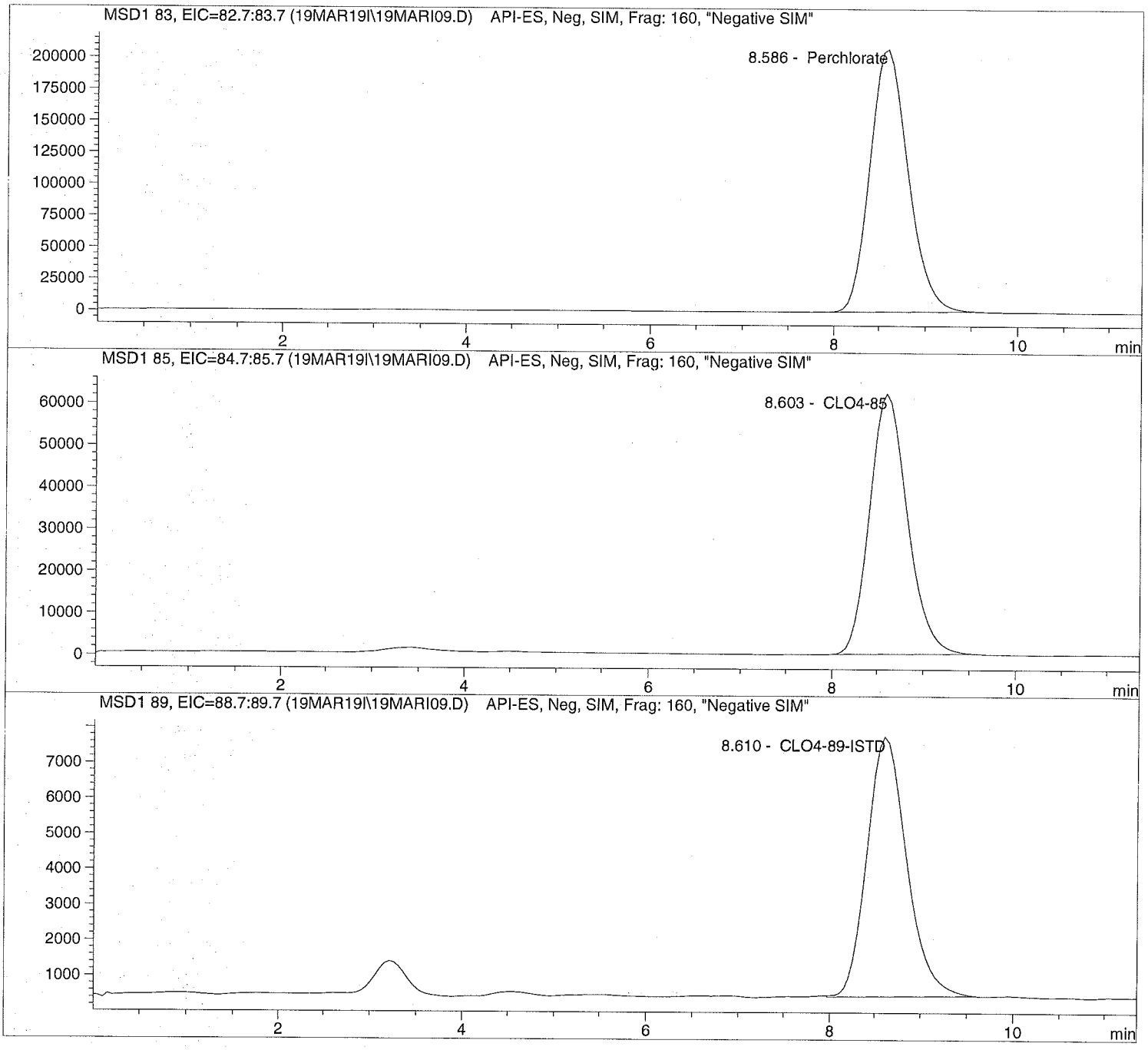
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

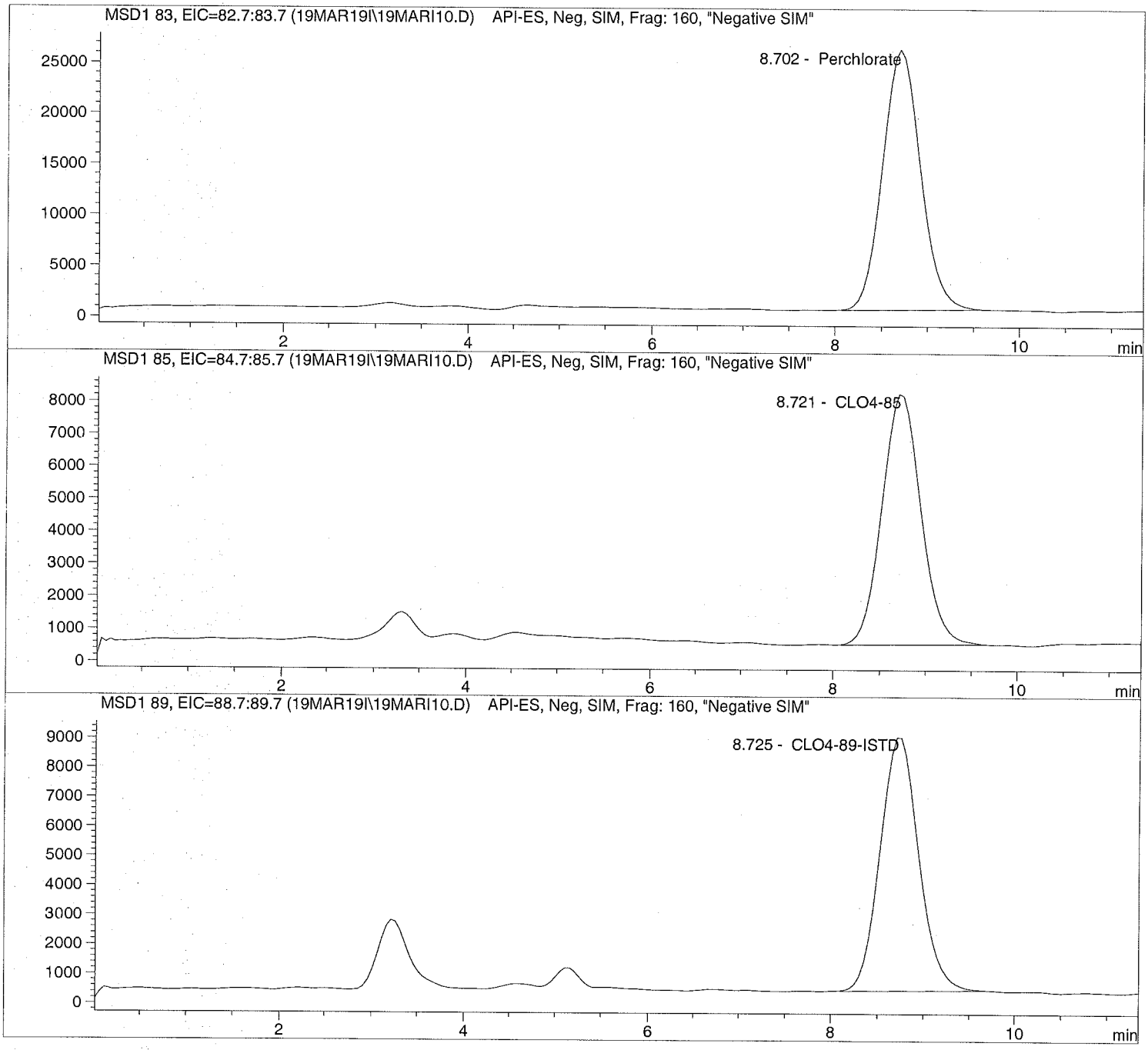
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L 00938308

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

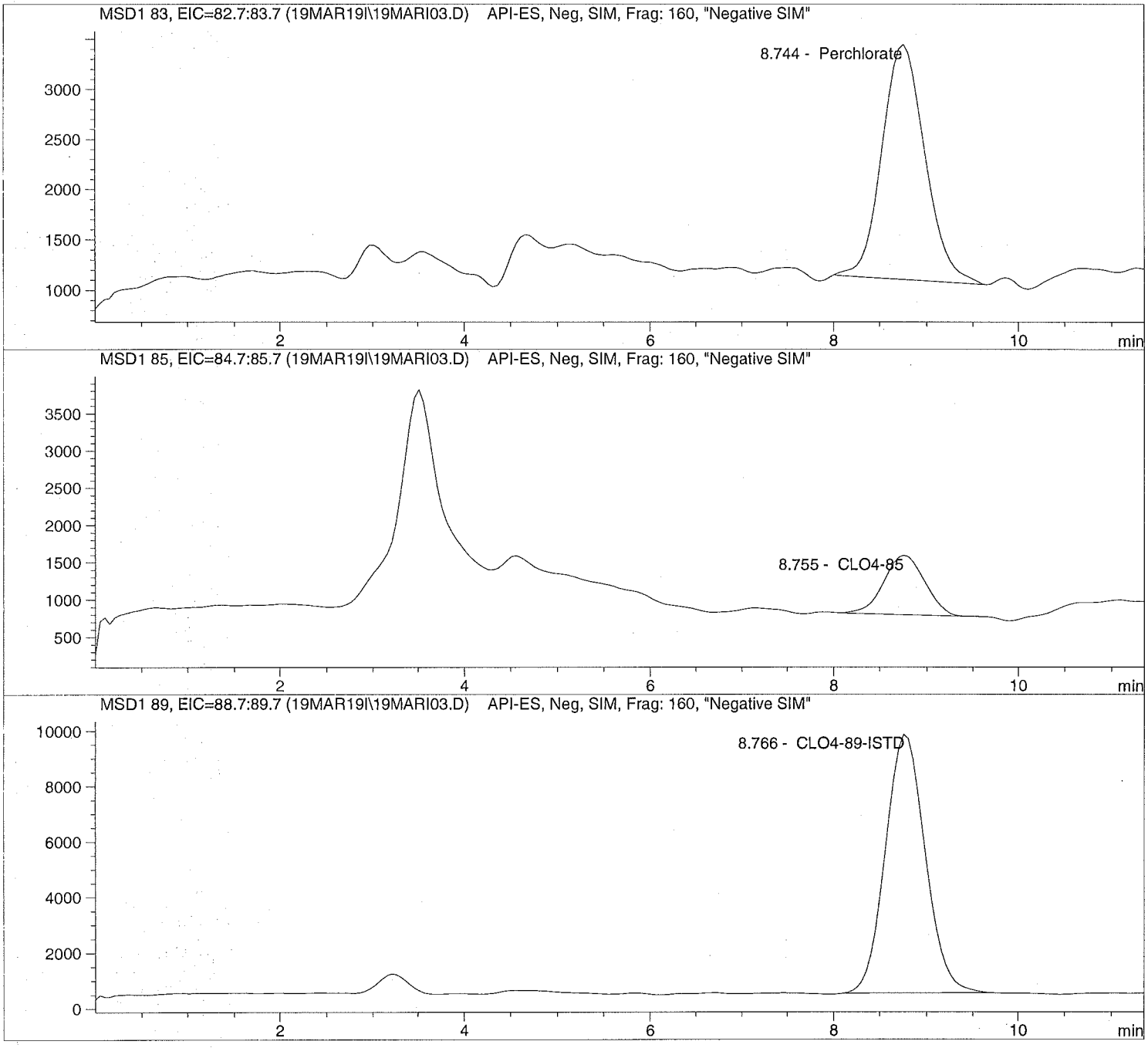
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

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May 15, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19050138**

Laboratory Results for: **Longhorn GW Treatment Plant Bi-Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on May 02, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

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Houston, TX 77099
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F: +1 281 530 5887

May 23, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19050397**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on May 08, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

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May 23, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19050398**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples**

Dear Marcia,

ALS Environmental received 3 sample(s) on May 08, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

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F: +1 281 530 5887

May 23, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19050401**

Laboratory Results for: **LH18/24 GW Treatment Plant Monthly Influent Samples**

Dear Marcia,

ALS Environmental received 1 sample(s) on May 08, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

June 03, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19050886**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on May 15, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

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Houston, TX 77099
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F: +1 281 530 5887

May 29, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19050920**

Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 2 sample(s) on May 15, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

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Houston, TX 77099
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June 03, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19051289**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on May 22, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 03-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19051289

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19051289-01	LH18/24-SP650_052119	Water		21-May-2019 14:00	22-May-2019 09:20	☐
HS19051289-02	LH18/24-SP650_052119_BIX	Water		21-May-2019 14:00	22-May-2019 09:20	☐

ALS Houston, US Date: 03-Jun-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order:

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

• The analysis for TOC was subcontracted to ALS Environmental in Holland, MI. Final report attached.

WetChemistry by Method E365.3

Batch ID: R339400

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E350.3

Batch ID: R339366

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 03-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19051289

Sample ID: LH18/24-SP650_052119 Lab ID:HS19051289-01

Collection Date: 21-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: RG
Nitrogen, Ammonia (As N)	**11**		**0.20**	**0.10**	**0.20**	**mg/L**	1	29-May-2019 11:30
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: KVL
Phosphorus, Total Orthophosphate (As P)	**2.47**		**0.100**	**0.200**	**0.250**	**mg/L**	10	22-May-2019 18:19
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	31-May-2019 09:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 03-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19051289

Sample ID: LH18/24-SP650_052119_BIX Lab ID:HS19051289-02

Collection Date: 21-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jun-2019 09:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 03-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19051289

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R339366	**Test Name :** AMMONIA AS N BY E350.3(ISE)			**Matrix:** Water		
HS19051289-01	LH18/24-SP650_052119	21 May 2019 14:00			29 May 2019 11:30	1
Batch ID R339400	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3			**Matrix:** Water		
HS19051289-01	LH18/24-SP650_052119	21 May 2019 14:00			22 May 2019 18:19	10
Batch ID R339529	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS			**Matrix:** Water		
HS19051289-01	LH18/24-SP650_052119	21 May 2019 14:00			31 May 2019 09:09	1
Batch ID R339630	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19051289-02	LH18/24-SP650_052119_BIX	21 May 2019 14:00			03 Jun 2019 09:25	1

ALS Houston, US Date: 03-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19051289

QC BATCH REPORT

Batch ID: R339366 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R339366** Units: **mg/L** Analysis Date: **29-May-2019 11:30**
Client ID: Run ID: **WetChem_HS_339366** SeqNo: **5096552** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R339366** Units: **mg/L** Analysis Date: **29-May-2019 11:30**
Client ID: Run ID: **WetChem_HS_339366** SeqNo: **5096551** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.48	0.20	10	0	105	85 - 115				

MS Sample ID: **HS19051199-01MS** Units: **mg/L** Analysis Date: **29-May-2019 11:30**
Client ID: Run ID: **WetChem_HS_339366** SeqNo: **5096554** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.69	0.20	10	0.3169	104	80 - 120				

MSD Sample ID: **HS19051199-01MSD** Units: **mg/L** Analysis Date: **29-May-2019 11:30**
Client ID: Run ID: **WetChem_HS_339366** SeqNo: **5096553** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.81	0.20	10	0.3169	105	80 - 120	10.69	1.12	20	

The following samples were analyzed in this batch: HS19051289-01

ALS Houston, US Date: 03-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19051289

QC BATCH REPORT

Batch ID: R339400 (0) **Instrument: UV-2450** **Method: ORTHO PHOSPHATE (PO4) AS P BY E365.3**

MBLK Sample ID: **MBLK-R339400** Units: **mg/L** Analysis Date: **22-May-2019 18:19**
Client ID: Run ID: **UV-2450_339400** SeqNo: **5097260** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0200	0.0250								U

LCS Sample ID: **LCS-R339400** Units: **mg/L** Analysis Date: **22-May-2019 18:19**
Client ID: Run ID: **UV-2450_339400** SeqNo: **5097259** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.248	0.0250	0.25	0	99.2	85 - 115				

MS Sample ID: **HS19051289-01MS** Units: **mg/L** Analysis Date: **22-May-2019 18:19**
Client ID: **LH18/24-SP650_052119** Run ID: **UV-2450_339400** SeqNo: **5097262** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	5.03	0.250	2.5	2.47	102	80 - 120				

MSD Sample ID: **HS19051289-01MSD** Units: **mg/L** Analysis Date: **22-May-2019 18:19**
Client ID: **LH18/24-SP650_052119** Run ID: **UV-2450_339400** SeqNo: **5097261** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	4.98	0.250	2.5	2.47	100	80 - 120	5.03	0.999	20	

The following samples were analyzed in this batch: HS19051289-01

ALS Houston, US Date: 03-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS19051289**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 03-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19051289

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19051289-01	LH18/24-SP650_052119	Login	22/05/2019 11:49:20	NDR	WET250
HS19051289-01	LH18/24-SP650_052119	Login	22/05/2019 11:49:20	NDR	WET250
HS19051289-01	LH18/24-SP650_052119	Login	22/05/2019 11:49:20	NDR	Sub
HS19051289-02	LH18/24-SP650_052119_BIX	Login	22/05/2019 11:49:20	NDR	Sub

ALS Houston, US Date: 03-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19051289
Date/Time Received: **22-May-2019 09:20**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 22-May-2019 Date
Reviewed by: *RJ Modashia* eSignature — 22-May-2019 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	3.0C /3.0c UC/C	IR25
Cooler(s)/Kit(s):	43734	
Date/Time sample(s) sent to storage:	05/22/2019 12:30PM	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

00938331

bhate Environmental Associates, Inc.

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / GWTP

Client Name:

Collected by: Scott Beesinger

Field Sample ID (20 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (1)	Sample Number (2)	Sample Matrix (3)	Number of containers	Sample Analysis Requested (5): TDC	Ammonia-N	Perch Lobate	Ortho Phosphate	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control	GI-MS
LH8/24-SP60-052119		21 MAY 2019	1400	-	N		WG	4	X	X		X				
LH8/24-SP60-052119-BIX		21 MAY 2019	1400	-	N		WG	1			X					
				-												
				-												
				-												
				-												
				-												
				-												
				-												
				-												
				-												
				-												

COMMENTS: STANDARD TAT

HS19051289

Bhate Environmental Associates, Inc.
118/24 Longhorn GW Treatment Plant Weekly Sampl

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time	
1. Scott Beesinger	5/21/19	1430	1. Nilesh Rawal	5.22.19	08:30	M
2.			2.		09.20	
3.			3.			

Sample Deliver Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill Number

Analytical Lab: ALS 10450 Stanciff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 05-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-t) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

43734

Temp 4C 3.0 IR # 25

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

43734

CUSTODY SEAL

Date: 5/21/19 Time: 1430
Name: Scott Beesiner
Company: BHATE

Seal Broken By: SN
Date: 05/22/19

43734 MAY 2 2 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

43734

ORIGIN ID:SGRA (303) 597-2450
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202

MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 02MAY19
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 28x14x14 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656

REF: LONGHORN GW TREATMENT PLANT – BO 65296 – RJ

RMA:

FedEx Express

FedEx
PKG 0221 4809 7833 4599

WED - 22 MAY 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

TID 162786 21MAY19 GGGA 553C1/D69C/8CBA

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
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F : +1 360 636 1068
www.alsglobal.com

May 31, 2019

Analytical Report for Service Request No: K1904714

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS19051289

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory May 23, 2019
For your reference, these analyses have been assigned our service request number **K1904714.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
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F : +1 360 636 1068
www.alsglobal.com

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
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ALS Environmental

Client: ALS Environmental - US
Project: HS19051289
Sample Matrix: Water

Service Request: K1904714
Date Received: 05/23/2019

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 05/23/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 05/31/2019

Chain of Custody

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IC19047

10450 Stancliff Rd, Ste 210
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F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **11350**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19051289
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19051289-01**	**LH18/24-SP650_052119**	**Water**	**21 May 2019 14:00**
	TOC Analysis for DOD Level IV			31 May 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Mussman Date/Time: 5/22/19 18:00

Received By: N Pedersen Date/Time: 5.23.19 950

Cooler ID(s): Temperature(s):

00938342

PC_____

Cooler Receipt and Preservation Form

Client ALS Houston Service Request *K19*

Received: 5.23.19 Opened: 5.23.19 By: NP Unloaded: 5.23.19 By: NP

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other*_____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected. Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.3	0.5				0.2	11350	4809 7834 1763	

4. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* (NA) Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: RUSH

General Chemistry

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www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1904714
Project:	HS19051289	**Date Collected:**	05/21/19
Sample Matrix:	Water	**Date Received:**	05/23/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_052119	K1904714-001	**1.65**	0.50	0.20	0.07	1	05/24/19 16:28	
Method Blank	K1904714-MB	ND U	0.50	0.20	0.07	1	05/24/19 13:50	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1904714
Project	HS19051289	**Date Collected:**	05/21/19
Sample Matrix:	Water	**Date Received:**	05/23/19
		Date Analyzed:	05/24/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_052119	**Units:**	mg/L
Lab Code:	K1904714-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K1904714-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	1.65	1.68	1.67	2	10

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1904714
Project:	HS19051289	**Date Analyzed:**	05/24/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	636915

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1904714-LCS	25.1	25.0	100	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1904714
Project: HS19051289

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	636915	KQ1907129-01	05/24/19 13:21	25.0	24.6	98	90-110
CCV2	636915	KQ1907129-02	05/24/19 17:25	25.0	24.5	98	90-110
CCV3	636915	KQ1907129-03	05/24/19 22:07	25.0	24.1	96	90-110
CCV4	636915	KQ1907129-04	05/25/19 03:05	25.0	23.6	94	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1904714
Project: HS19051289

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	636915	KQ1907129-05	05/24/19 13:36	0.50	0.20	0.07	ND	U
CCB2	636915	KQ1907129-06	05/24/19 17:39	0.50	0.20	0.07	ND	U
CCB3	636915	KQ1907129-07	05/24/19 22:50	0.50	0.20	0.07	ND	U
CCB4	636915	KQ1907129-08	05/25/19 03:19	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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Work Request # Original (_____) KI904547, 4594, 4614, 4668, 4667, 4710, 4714, 4716, 4679, 4715, 4597, 4713, 4684, 4686, 4718

Tier: II II II II II II IV III II IV II IV III IV III

Date Analyzed: 5/24/19

Analyst: BCP

Run # TOC: 636915, 636916, 636917 DOC: 636919

Analysis: ~~5/24/19~~ BCP 5/29/19 TOC/DOC

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	yes/no/NA
2.	Holding times met for all analyses and for all samples?	yes/no/NA
3.	Are calculations correct?	yes/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/NA
5.	All quality control criteria met?	yes/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	yes/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	yes/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	yes/no/NA
9.	Are results for methods blanks all ND?	yes/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/no/NA
11.	Are all exceptions explained?	yes/no/NA
12.	Have all applicable service requests been reviewed?	yes/no/NA
13.	Are all samples labeled correctly?	yes/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	yes/no/NA
15.	Are detection limits and units reported correctly?	yes/no/NA
16.	Is the unused space on the benchsheet crossed out?	yes/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/no/NA

COMMENTS: KI904618-2/3/4 and KI904667-1 are overdiluted, and have been sent for reanalysis, KI904716-1/1d, KI904594-4/4d, KI904594-5/5d, KI904716-1/1d, KI904718-1/1d, and KI904718-2/2d report a high %RSD. However these samples are less than 5x the MRL.

Final Approved by: [signature] Date: 05/29/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 636915 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
K1904547-001	Carbon, Total Organic	N/A		Water	17.90 mg/L	10 mL	3580 mg/L	200	20	100			5/25/19 00:44:00	N
K1904594-001	Carbon, Total Organic	N/A		Ground Water	7.02 mg/L	10 mL	7.02 mg/L	1	0.07	0.50			5/24/19 16:57:00	N
K1904594-002	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/24/19 17:54:00	N
K1904594-003	Carbon, Total Organic	N/A		Ground Water	0.20 mg/L	10 mL	0.20 mg/L J	1	0.07	0.50			5/24/19 18:22:00	N
K1904594-004	Carbon, Total Organic	N/A		Ground Water	0.47 mg/L	10 mL	0.47 mg/L J	1	0.07	0.50			5/24/19 18:50:00	N
K1904594-005	Carbon, Total Organic	N/A		Ground Water	0.42 mg/L	10 mL	0.42 mg/L J	1	0.07	0.50			5/24/19 19:18:00	N
K1904594-006	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/24/19 19:46:00	N
K1904614-001	Carbon, Total Organic	N/A		Water	1.65 mg/L	10 mL	1.65 mg/L	1	0.07	0.50			5/24/19 20:14:00	N
K1904614-002	Carbon, Total Organic	N/A		Water	1.46 mg/L	10 mL	1.46 mg/L	1	0.07	0.50			5/24/19 20:43:00	N
K1904618-001	Carbon, Total Organic	N/A		Water	0.95 mg/L	10 mL	95 mg/L	100	7	50			5/24/19 21:11:00	N
K1904618-002	Carbon, Total Organic	N/A		Water	0.47 mg/L	10 mL	47 mg/L J	100	7	50			5/24/19 21:39:00	Y
K1904618-003	Carbon, Total Organic	N/A		Water	0.48 mg/L	10 mL	48 mg/L J	100	7	50			5/24/19 22:07:00	N
K1904618-004	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	50 mg/L U	100	7	50			5/24/19 23:34:00	N
K1904667-001	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	50 mg/L U	100	7	50			5/25/19 01:12:00	N
K1904667-002	Carbon, Total Organic	N/A		Water	2.06 mg/L	10 mL	2.06 mg/L	1	0.07	0.50			5/25/19 01:40:00	N
K1904710-001	Carbon, Total Organic	N/A		Water	2.21 mg/L	10 mL	2.21 mg/L	1	0.07	0.50			5/24/19 15:32:00	N
K1904710-002	Carbon, Total Organic	N/A		Water	2.24 mg/L	10 mL	2.24 mg/L	1	0.07	0.50			5/24/19 16:00:00	N
K1904714-001	Carbon, Total Organic	N/A		Water	1.65 mg/L	10 mL	1.65 mg/L	1	0.07	0.50			5/24/19 16:28:00	N
K1904716-001	Carbon, Total Organic	N/A		Ground Water	0.15 mg/L	10 mL	0.15 mg/L J	1	0.07	0.50			5/24/19 14:35:00	Y
KQ1907129-01	Carbon, Total Organic	CCV		Ground Water	24.62 mg/L	10 mL	24.6 mg/L	1					5/24/19 13:21:00	N
KQ1907129-02	Carbon, Total Organic	CCV		Ground Water	24.54 mg/L	10 mL	24.5 mg/L	1					5/24/19 17:25:00	N
KQ1907129-03	Carbon, Total Organic	CCV		Ground Water	24.11 mg/L	10 mL	24.1 mg/L	1					5/24/19 22:07:00	N
KQ1907129-04	Carbon, Total Organic	CCV		Ground Water	23.57 mg/L	10 mL	23.6 mg/L	1					5/25/19 03:05:00	N
KQ1907129-05	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/24/19 13:36:00	N
KQ1907129-06	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/24/19 17:39:00	N
KQ1907129-07	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/24/19 22:50:00	N
KQ1907129-08	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/25/19 03:19:00	N

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

05/29/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 636915 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	T
KQ1907129-09	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/24/19 13:50:00	N	
KQ1907129-10	Carbon, Total Organic	LCS		Ground Water	25.12 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		5/24/19 14:05:00	N	
KQ1907129-11	Carbon, Total Organic	MS	K1904716-001	Ground Water	25.06 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		5/24/19 15:03:00	N	
KQ1907129-12	Carbon, Total Organic	MS	K1904618-002	Water	26.07 mg/L	10 mL	2610 mg/L	100	7	50	102		5/25/19 00:02:00	N	
KQ1907129-13	Carbon, Total Organic	DUP	K1904716-001	Ground Water	0.11 mg/L	10 mL	0.11 mg/L J	1	0.07	0.50		32*	5/24/19 14:35:00	N	
KQ1907129-14	Carbon, Total Organic	DUP	K1904710-001	Water	2.25 mg/L	10 mL	2.25 mg/L	1	0.07	0.50		2	5/24/19 15:32:00	N	
KQ1907129-15	Carbon, Total Organic	DUP	K1904710-002	Water	2.22 mg/L	10 mL	2.22 mg/L	1	0.07	0.50		<1	5/24/19 16:00:00	N	
KQ1907129-16	Carbon, Total Organic	DUP	K1904714-001	Water	1.68 mg/L	10 mL	1.68 mg/L	1	0.07	0.50		2	5/24/19 16:28:00	N	
KQ1907129-17	Carbon, Total Organic	DUP	K1904594-001	Ground Water	7.00 mg/L	10 mL	7.00 mg/L	1	0.07	0.50		<1	5/24/19 16:57:00	N	
KQ1907129-18	Carbon, Total Organic	DUP	K1904594-002	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	5/24/19 17:54:00	N	
KQ1907129-19	Carbon, Total Organic	DUP	K1904594-003	Ground Water	0.21 mg/L	10 mL	0.21 mg/L J	1	0.07	0.50		2	5/24/19 18:22:00	N	
KQ1907129-20	Carbon, Total Organic	DUP	K1904594-004	Ground Water	0.27 mg/L	10 mL	0.27 mg/L J	1	0.07	0.50		54*	5/24/19 18:50:00	N	
KQ1907129-21	Carbon, Total Organic	DUP	K1904594-005	Ground Water	0.32 mg/L	10 mL	0.32 mg/L J	1	0.07	0.50		27*	5/24/19 19:18:00	N	
KQ1907129-22	Carbon, Total Organic	DUP	K1904594-006	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	5/24/19 19:46:00	N	I
KQ1907129-23	Carbon, Total Organic	DUP	K1904614-001	Water	1.62 mg/L	10 mL	1.62 mg/L	1	0.07	0.50		2	5/24/19 20:14:00	N	I
KQ1907129-24	Carbon, Total Organic	DUP	K1904614-002	Water	1.46 mg/L	10 mL	1.46 mg/L	1	0.07	0.50		<1	5/24/19 20:43:00	N	I
KQ1907129-25	Carbon, Total Organic	DUP	K1904618-001	Water	0.98 mg/L	10 mL	98 mg/L	100	7	50		3	5/24/19 21:11:00	N	I
KQ1907129-26	Carbon, Total Organic	DUP	K1904618-002	Water	0.47 mg/L	10 mL	47 mg/L J	100	7	50		<1	5/24/19 21:39:00	N	I
KQ1907129-27	Carbon, Total Organic	DUP	K1904618-003	Water	0.47 mg/L	10 mL	47 mg/L J	100	7	50		3	5/24/19 22:07:00	N	I
KQ1907129-28	Carbon, Total Organic	DUP	K1904618-004	Water	0.00 mg/L	10 mL	50 mg/L U	100	7	50		NC	5/24/19 23:34:00	N	I
KQ1907129-29	Carbon, Total Organic	DUP	K1904547-001	Water	17.64 mg/L	10 mL	3530 mg/L	200	20	100		1	5/25/19 00:44:00	N	I
KQ1907129-30	Carbon, Total Organic	DUP	K1904667-001	Water	0.00 mg/L	10 mL	50 mg/L U	100	7	50		NC	5/25/19 01:12:00	N	I
KQ1907129-31	Carbon, Total Organic	DUP	K1904667-002	Water	2.07 mg/L	10 mL	2.07 mg/L	1	0.07	0.50		<1	5/25/19 01:40:00	N	I

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 636916 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?
K1904679-001	Carbon, Total Organic	N/A		Water	11.53 mg/L	10 mL	57.6 mg/L	5	0.4	2.5			5/25/19 02:08:00	N
K1904679-002	Carbon, Total Organic	N/A		Water	1.25 mg/L	10 mL	12.5 mg/L	10	0.7	5.0			5/25/19 02:37:00	N
K1904679-003	Carbon, Total Organic	N/A		Water	0.87 mg/L	10 mL	0.87 mg/L	1	0.07	0.50			5/25/19 03:34:00	N
K1904679-004	Carbon, Total Organic	N/A		Water	0.42 mg/L	10 mL	0.42 mg/L J	1	0.07	0.50			5/25/19 04:02:00	N
K1904715-001	Carbon, Total Organic	N/A		Water	2.96 mg/L	10 mL	2.96 mg/L	1	0.07	0.50			5/25/19 04:30:00	N
K1904715-002	Carbon, Total Organic	N/A		Water	3.88 mg/L	10 mL	3.88 mg/L	1	0.07	0.50			5/25/19 04:58:00	N
K1904715-003	Carbon, Total Organic	N/A		Water	2.91 mg/L	10 mL	2.91 mg/L	1	0.07	0.50			5/25/19 05:26:00	N
K1904715-004	Carbon, Total Organic	N/A		Water	1.08 mg/L	10 mL	1.08 mg/L	1	0.07	0.50			5/25/19 05:55:00	N
K1904715-005	Carbon, Total Organic	N/A		Water	1.09 mg/L	10 mL	1.09 mg/L	1	0.07	0.50			5/25/19 06:23:00	N
K1904715-006	Carbon, Total Organic	N/A		Water	2.95 mg/L	10 mL	2.95 mg/L	1	0.07	0.50			5/25/19 06:51:00	Y
K1904715-007	Carbon, Total Organic	N/A		Water	3.04 mg/L	10 mL	3.04 mg/L	1	0.07	0.50			5/25/19 08:47:00	N
K1904715-008	Carbon, Total Organic	N/A		Water	4.20 mg/L	10 mL	4.20 mg/L	1	0.07	0.50			5/25/19 09:15:00	N
K1904715-009	Carbon, Total Organic	N/A		Water	1.37 mg/L	10 mL	1.37 mg/L	1	0.07	0.50			5/25/19 09:43:00	N
KQ1907130-01	Carbon, Total Organic	CCV		Water	24.11 mg/L	10 mL	24.1 mg/L	1					5/25/19 22:35:00	N
KQ1907130-02	Carbon, Total Organic	CCV		Water	23.57 mg/L	10 mL	23.6 mg/L	1					5/25/19 03:05:00	N
KQ1907130-03	Carbon, Total Organic	CCV		Water	23.98 mg/L	10 mL	24.0 mg/L	1					5/25/19 07:48:00	N
KQ1907130-04	Carbon, Total Organic	CCV		Water	24.37 mg/L	10 mL	24.4 mg/L	1					5/25/19 12:05:00	N
KQ1907130-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/25/19 22:50:00	N
KQ1907130-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/25/19 03:19:00	N
KQ1907130-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/25/19 08:03:00	N
KQ1907130-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/25/19 12:20:00	N
KQ1907130-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/25/19 23:04:00	N
KQ1907130-10	Carbon, Total Organic	LCS		Water	24.46 mg/L	10 mL	24.5 mg/L	1	0.07	0.50	98		5/25/19 23:19:00	N
KQ1907130-11	Carbon, Total Organic	MS	K1904715-006	Water	28.02 mg/L	10 mL	28.0 mg/L	1	0.07	0.50	100		5/25/19 07:19:00	N
KQ1907130-12	Carbon, Total Organic	DUP	K1904679-001	Water	11.27 mg/L	10 mL	56.4 mg/L	5	0.4	2.5		2	5/25/19 02:08:00	N
KQ1907130-13	Carbon, Total Organic	DUP	K1904679-002	Water	1.22 mg/L	10 mL	12.2 mg/L	10	0.7	5.0		3	5/25/19 02:37:00	N
KQ1907130-14	Carbon, Total Organic	DUP	K1904679-003	Water	0.95 mg/L	10 mL	0.95 mg/L	1	0.07	0.50		9	5/25/19 03:34:00	N
KQ1907130-15	Carbon, Total Organic	DUP	K1904679-004	Water	0.41 mg/L	10 mL	0.41 mg/L J	1	0.07	0.50		2	5/25/19 04:02:00	N
KQ1907130-16	Carbon, Total Organic	DUP	K1904715-001	Water	2.94 mg/L	10 mL	2.94 mg/L	1	0.07	0.50		<1	5/25/19 04:30:00	N
KQ1907130-17	Carbon, Total Organic	DUP	K1904715-002	Water	3.90 mg/L	10 mL	3.90 mg/L	1	0.07	0.50		<1	5/25/19 04:58:00	N
KQ1907130-18	Carbon, Total Organic	DUP	K1904715-003	Water	2.90 mg/L	10 mL	2.90 mg/L	1	0.07	0.50		<1	5/25/19 05:26:00	N
KQ1907130-19	Carbon, Total Organic	DUP	K1904715-004	Water	1.08 mg/L	10 mL	1.08 mg/L	1	0.07	0.50		<1	5/25/19 05:55:00	N
KQ1907130-20	Carbon, Total Organic	DUP	K1904715-005	Water	1.06 mg/L	10 mL	1.06 mg/L	1	0.07	0.50		3	5/25/19 06:23:00	N
KQ1907130-21	Carbon, Total Organic	DUP	K1904715-006	Water	2.90 mg/L	10 mL	2.90 mg/L	1	0.07	0.50		2	5/25/19 06:51:00	N
KQ1907130-22	Carbon, Total Organic	DUP	K1904715-007	Water	2.98 mg/L	10 mL	2.98 mg/L	1	0.07	0.50		2	5/25/19 08:47:00	N
KQ1907130-23	Carbon, Total Organic	DUP	K1904715-008	Water	4.13 mg/L	10 mL	4.13 mg/L	1	0.07	0.50		2	5/25/19 09:15:00	N

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

05/29/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 636916 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1907130-24	Carbon, Total Organic	DUP	K1904715-009	Water	1.37 mg/L	10 mL	1.37 mg/L	1	0.07	0.50		<1	5/25/19 09:43:00	N	IV

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 636917 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	
K1904597-001	Carbon, Total Organic	N/A		Water	8.03 mg/L	10 mL	803 mg/L	100	7	50			5/25/19 13:59:00	N	
K1904597-002	Carbon, Total Organic	N/A		Water	7.05 mg/L	10 mL	705 mg/L	100	7	50			5/25/19 14:27:00	N	
K1904713-001	Carbon, Total Organic	N/A		Ground Water	1.27 mg/L	10 mL	1.27 mg/L	1	0.07	0.50			5/25/19 15:23:00	N	
K1904713-002	Carbon, Total Organic	N/A		Ground Water	1.45 mg/L	10 mL	1.45 mg/L	1	0.07	0.50			5/25/19 15:51:00	N	
K1904713-003	Carbon, Total Organic	N/A		Ground Water	0.70 mg/L	10 mL	0.70 mg/L	1	0.07	0.50			5/25/19 16:19:00	N	
K1904713-004	Carbon, Total Organic	N/A		Ground Water	1.59 mg/L	10 mL	1.59 mg/L	1	0.07	0.50			5/25/19 16:47:00	N	
K1904715-011	Carbon, Total Organic	N/A		Water	1.33 mg/L	10 mL	1.33 mg/L	1	0.07	0.50			5/25/19 10:12:00	Y	
K1904715-016	Carbon, Total Organic	N/A		Water	8.57 mg/L	10 mL	8.57 mg/L	1	0.07	0.50			5/25/19 11:09:00	N	
K1904715-017	Carbon, Total Organic	N/A		Water	6.24 mg/L	10 mL	6.24 mg/L	1	0.07	0.50			5/25/19 11:37:00	N	
K1904715-018	Carbon, Total Organic	N/A		Water	40.02 mg/L	10 mL	40.0 mg/L	1	0.07	0.50			5/25/19 12:34:00	N	
K1904715-019	Carbon, Total Organic	N/A		Water	12.59 mg/L	10 mL	12.6 mg/L	1	0.07	0.50			5/25/19 13:03:00	N	
K1904715-020	Carbon, Total Organic	N/A		Water	17.75 mg/L	10 mL	17.8 mg/L	1	0.07	0.50			5/25/19 13:31:00	N	
KQ1907131-01	Carbon, Total Organic	CCV		Water	23.98 mg/L	10 mL	24.0 mg/L	1					5/25/19 07:48:00	N	
KQ1907131-02	Carbon, Total Organic	CCV		Water	24.37 mg/L	10 mL	24.4 mg/L	1					5/25/19 12:05:00	N	
KQ1907131-03	Carbon, Total Organic	CCV		Water	23.98 mg/L	10 mL	24.0 mg/L	1					5/25/19 17:15:00	N	
KQ1907131-04	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/25/19 08:03:00	N	
KQ1907131-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/25/19 12:20:00	N	
KQ1907131-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/25/19 17:30:00	N	
KQ1907131-07	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/25/19 08:18:00	N	
KQ1907131-08	Carbon, Total Organic	LCS		Water	24.71 mg/L	10 mL	24.7 mg/L	1	0.07	0.50	99		5/25/19 08:32:00	N	
KQ1907131-09	Carbon, Total Organic	MS	K1904715-011	Water	26.81 mg/L	10 mL	26.8 mg/L	1	0.07	0.50	102		5/25/19 10:40:00	N	
KQ1907131-10	Carbon, Total Organic	DUP	K1904715-011	Water	1.30 mg/L	10 mL	1.30 mg/L	1	0.07	0.50		2	5/25/19 10:12:00	N	
KQ1907131-11	Carbon, Total Organic	DUP	K1904715-016	Water	8.90 mg/L	10 mL	8.90 mg/L	1	0.07	0.50		4	5/25/19 11:09:00	N	
KQ1907131-12	Carbon, Total Organic	DUP	K1904715-017	Water	6.27 mg/L	10 mL	6.27 mg/L	1	0.07	0.50		<1	5/25/19 11:37:00	N	
KQ1907131-13	Carbon, Total Organic	DUP	K1904715-018	Water	40.34 mg/L	10 mL	40.3 mg/L	1	0.07	0.50		<1	5/25/19 12:34:00	N	I
KQ1907131-14	Carbon, Total Organic	DUP	K1904715-019	Water	12.20 mg/L	10 mL	12.2 mg/L	1	0.07	0.50		3	5/25/19 13:03:00	N	I
KQ1907131-15	Carbon, Total Organic	DUP	K1904715-020	Water	17.66 mg/L	10 mL	17.7 mg/L	1	0.07	0.50		<1	5/25/19 13:31:00	N	I
KQ1907131-16	Carbon, Total Organic	DUP	K1904597-001	Water	7.76 mg/L	10 mL	776 mg/L	100	7	50		3	5/25/19 13:59:00	N	
KQ1907131-17	Carbon, Total Organic	DUP	K1904597-002	Water	7.04 mg/L	10 mL	704 mg/L	100	7	50		<1	5/25/19 14:27:00	N	
KQ1907131-18	Carbon, Total Organic	DUP	K1904713-001	Ground Water	1.28 mg/L	10 mL	1.28 mg/L	1	0.07	0.50		<1	5/25/19 15:23:00	N	
KQ1907131-19	Carbon, Total Organic	DUP	K1904713-002	Ground Water	1.45 mg/L	10 mL	1.45 mg/L	1	0.07	0.50		<1	5/25/19 15:51:00	N	I
KQ1907131-20	Carbon, Total Organic	DUP	K1904713-003	Ground Water	0.68 mg/L	10 mL	0.68 mg/L	1	0.07	0.50		3	5/25/19 16:19:00	N	I

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

05/29/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 636917 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	T
KQ1907131-21	Carbon, Total Organic	DUP	K1904713-004	Ground Water	1.55 mg/L	10 mL	1.55 mg/L	1	0.07	0.50		2	5/25/19 16:47:00	N	

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 636919 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	
K1904684-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	10.77 mg/L	10 mL	10.8 mg/L	1	0.07	0.50			5/25/19 19:11:00	N	I
K1904684-002	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.40 mg/L	10 mL	2.40 mg/L	1	0.07	0.50			5/25/19 19:39:00	Y	I
K1904684-003	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	2.77 mg/L	10 mL	2.77 mg/L	1	0.07	0.50			5/25/19 20:37:00	N	I
K1904684-004	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	8.57 mg/L	10 mL	8.57 mg/L	1	0.07	0.50			5/25/19 21:34:00	N	I
K1904686-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	4.98 mg/L	10 mL	4.98 mg/L	1	0.07	0.50			5/25/19 22:02:00	N	
K1904686-002	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	12.28 mg/L	10 mL	12.3 mg/L	1	0.07	0.50			5/25/19 22:31:00	N	I
K1904716-001	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.26 mg/L	10 mL	0.26 mg/L J	1	0.07	0.50			5/25/19 18:14:00	Y	I
K1904718-001	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.47 mg/L	10 mL	0.47 mg/L J	1	0.07	0.50			5/25/19 22:59:00	N	I
K1904718-002	Carbon, Dissolved Organic (DOC)	N/A		Ground Water	0.24 mg/L	10 mL	0.24 mg/L J	1	0.07	0.50			5/25/19 23:27:00	N	I
KQ1907132-01	Carbon, Dissolved Organic CCV (DOC)			Ground Water	23.98 mg/L	10 mL	24.0 mg/L	1					5/25/19 17:15:00	N	I
KQ1907132-02	Carbon, Dissolved Organic CCV (DOC)			Ground Water	23.80 mg/L	10 mL	23.8 mg/L	1					5/25/19 21:05:00	N	I
KQ1907132-03	Carbon, Dissolved Organic CCV (DOC)			Ground Water	23.87 mg/L	10 mL	23.9 mg/L	1					5/26/19 00:23:00	N	I
KQ1907132-04	Carbon, Dissolved Organic CCB (DOC)			Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/25/19 17:30:00	N	I
KQ1907132-05	Carbon, Dissolved Organic CCB (DOC)			Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/25/19 21:19:00	N	I
KQ1907132-06	Carbon, Dissolved Organic CCB (DOC)			Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/26/19 00:38:00	N	I
KQ1907132-07	Carbon, Dissolved Organic MB (DOC)			Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/25/19 17:45:00	N	II
KQ1907132-08	Carbon, Dissolved Organic LCS (DOC)			Ground Water	24.79 mg/L	10 mL	24.8 mg/L	1	0.07	0.50	99		5/25/19 17:59:00	N	II
KQ1907132-09	Carbon, Dissolved Organic MS (DOC)		K1904716-001	Ground Water	25.39 mg/L	10 mL	25.4 mg/L	1	0.07	0.50	101		5/25/19 18:42:00	N	II
KQ1907132-11	Carbon, Dissolved Organic DUP (DOC)		K1904716-001	Ground Water	0.15 mg/L	10 mL	0.15 mg/L J	1	0.07	0.50		54*	5/25/19 18:14:00	N	II
KQ1907132-16	Carbon, Dissolved Organic DUP (DOC)		K1904686-001	Surface Water	4.91 mg/L	10 mL	4.91 mg/L	1	0.07	0.50		1	5/25/19 22:02:00	N	I
KQ1907132-17	Carbon, Dissolved Organic DUP (DOC)		K1904686-002	Ground Water	12.23 mg/L	10 mL	12.2 mg/L	1	0.07	0.50		<1	5/25/19 22:31:00	N	I
KQ1907132-18	Carbon, Dissolved Organic DUP (DOC)		K1904718-001	Ground Water	0.29 mg/L	10 mL	0.29 mg/L J	1	0.07	0.50		48*	5/25/19 22:59:00	N	II
KQ1907132-19	Carbon, Dissolved Organic DUP (DOC)		K1904718-002	Ground Water	0.28 mg/L	10 mL	0.28 mg/L J	1	0.07	0.50		17*	5/25/19 23:27:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 636919 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tie
KQ1907132-20	Carbon, Dissolved Organic (DOC)	MS	K1904684-002	Surface Water	27.21 mg/L	10 mL	27.2 mg/L	1	0.07	0.50	99		5/25/19 20:08:00	N	I
KQ1907132-21	Carbon, Dissolved Organic (DOC)	DUP	K1904684-001	Surface Water	10.94 mg/L	10 mL	10.9 mg/L	1	0.07	0.50		2	5/25/19 19:11:00	N	I
KQ1907132-22	Carbon, Dissolved Organic (DOC)	DUP	K1904684-002	Surface Water	2.35 mg/L	10 mL	2.35 mg/L	1	0.07	0.50		2	5/25/19 19:39:00	N	II
KQ1907132-23	Carbon, Dissolved Organic (DOC)	DUP	K1904684-003	Surface Water	2.79 mg/L	10 mL	2.79 mg/L	1	0.07	0.50		<1	5/25/19 20:37:00	N	II
KQ1907132-24	Carbon, Dissolved Organic (DOC)	DUP	K1904684-004	Surface Water	8.94 mg/L	10 mL	8.94 mg/L	1	0.07	0.50		4	5/25/19 21:34:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	23.978	0.0000	23.9780	23.978	24.0	5/25/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/25/2019
4	MB3	1	0.000	0.0000	0.0000	0	<0.5	5/25/2019
5	[TOC] LCS [25ppm]	1	24.708	0.0000	24.7077	24.7077	24.7	5/25/2019
6	K1904715-011	1	1.332	0.0000	1.3315	1.3315	1.33	5/25/2019
7	K1904715-011d	1	1.301	0.0000	1.3010	1.301	1.3	5/25/2019
8	K1904715-011ms	1	26.806	0.0000	26.8061	26.8061	27	5/25/2019
9	K1904715-016	1	8.570	0.0000	8.5704	8.5704	8.57	5/25/2019
10	K1904715-016d	1	8.904	0.0000	8.9036	8.9036	8.90	5/25/2019
11	K1904715-017	1	6.238	0.0000	6.2378	6.2378	6.2	5/25/2019
12	K1904715-017d	1	6.265	0.0000	6.2651	6.2651	6.27	5/25/2019
13	C] CCV 25 ppm [25 p	1	24.367	0.0000	24.3668	24.3668	24.37	5/25/2019
14	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/25/2019
15	K1904715-018	1	40.018	0.0000	40.0182	40.0182	40.0	5/25/2019
16	K1904715-018d	1	40.342	0.0000	40.3419	40.3419	40.3	5/25/2019
17	K1904715-019	1	12.595	0.0000	12.5948	12.5948	12.59	5/25/2019
18	K1904715-019d	1	12.198	0.0000	12.1984	12.1984	12.2	5/25/2019
19	K1904715-020	1	17.752	0.0000	17.7522	17.7522	17.8	5/25/2019
20	K1904715-020d	1	17.660	0.0000	17.6597	17.6597	17.66	5/25/2019
21	K1904597-001	100	8.028	0.0000	8.0276	802.76	802.76	5/25/2019
22	K1904597-001d	100	7.761	0.0000	7.7611	776.11	776.1	5/25/2019
23	K1904597-002	100	7.049	0.0000	7.0488	704.88	704.9	5/25/2019
24	K1904597-002d	100	7.043	0.0000	7.0428	704.28	704.28	5/25/2019
25	K1904713-001	1	1.272	0.0000	1.2720	1.272	1.27	5/25/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By:	BCD	Date Analyzed	5/24/19
Reviewed By:		Date Reviewed	05/29/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1904713-001d	1	1.279	0.0000	1.2786	1.2786	1.28	5/25/2019
27	K1904713-002	1	1.455	0.0000	1.4545	1.4545	1.45	5/25/2019
28	K1904713-002d	1	1.454	0.0000	1.4542	1.4542	1.5	5/25/2019
29	K1904713-003	1	0.699	0.0000	0.6989	0.6989	0.7	5/25/2019
30	K1904713-003d	1	0.680	0.0000	0.6797	0.6797	0.7	5/25/2019
31	K1904713-004	1	1.585	0.0000	1.5850	1.585	1.6	5/25/2019
32	K1904713-004d	1	1.549	0.0000	1.5486	1.5486	1.5	5/25/2019
33	C] CCV 25 ppm [25 p	1	23.979	0.0000	23.9794	23.9794	24.0	5/25/2019
34	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/25/2019
35		1		0.0000	0.0000	0	<0.5	
36		1		0.0000	0.0000	0	<0.5	
37		1		0.0000	0.0000	0	<0.5	
38		1		0.0000	0.0000	0	<0.5	
39		1		0.0000	0.0000	0	<0.5	
40		1		0.0000	0.0000	0	<0.5	
41		1		0.0000	0.0000	0	<0.5	
42		1		0.0000	0.0000	0	<0.5	
43		1		0.0000	0.0000	0	<0.5	
44		1		0.0000	0.0000	0	<0.5	
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By: BCP	Date Analyzed 5/24/19
Reviewed By:	Date Reviewed 05/29/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	24.111	0.0000	24.1106	24.1106	24.1	5/24/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/24/2019
4	MB2	1	0.000	0.0000	0.0000	0	<0.5	5/24/2019
5	[TOC] LCS [24ppm]	1	24.464	0.0000	24.4640	24.464	24.5	5/24/2019
6	K1904679-001	5	11.526	0.0000	11.5257	57.6285	57.63	5/25/2019
7	K1904679-001d	5	11.271	0.0000	11.2706	56.353	56.4	5/25/2019
8	K1904679-002	10	1.252	0.0000	1.2518	12.518	13	5/25/2019
9	K1904679-002d	10	1.215	0.0000	1.2151	12.151	12.15	5/25/2019
10	C] CCV 25 ppm [25 p	1	23.566	0.0000	23.5658	23.5658	23.57	5/25/2019
11	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/25/2019
12	K1904679-003	1	0.866	0.0000	0.8663	0.8663	0.87	5/25/2019
13	K1904679-003d	1	0.952	0.0000	0.9523	0.9523	0.95	5/25/2019
14	K1904679-004	1	0.421	0.0000	0.4209	0.4209	<0.5	5/25/2019
15	K1904679-004d	1	0.413	0.0000	0.4134	0.4134	<0.5	5/25/2019
16	K1904715-001	1	2.956	0.0000	2.9564	2.9564	3.0	5/25/2019
17	K1904715-001d	1	2.944	0.0000	2.9435	2.9435	2.94	5/25/2019
18	K1904715-002	1	3.879	0.0000	3.8787	3.8787	3.9	5/25/2019
19	K1904715-002d	1	3.902	0.0000	3.9021	3.9021	3.9	5/25/2019
20	K1904715-003	1	2.909	0.0000	2.9093	2.9093	2.91	5/25/2019
21	K1904715-003d	1	2.897	0.0000	2.8968	2.8968	2.90	5/25/2019
22	K1904715-004	1	1.078	0.0000	1.0780	1.078	1.1	5/25/2019
23	K1904715-004d	1	1.082	0.0000	1.0818	1.0818	1.1	5/25/2019
24	K1904715-005	1	1.091	0.0000	1.0914	1.0914	1.09	5/25/2019
25	K1904715-005d	1	1.060	0.0000	1.0603	1.0603	1.06	5/25/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

date time

Analyzed By:	BCP	Date Analyzed	5/29/19
Reviewed By:		Date Reviewed	05/29/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1904715-006	1	2.953	0.0000	2.9533	2.9533	2.95	5/25/2019
27	K1904715-006d	1	2.904	0.0000	2.9043	2.9043	2.90	5/25/2019
28	K1904715-006ms	1	28.017	0.0000	28.0166	28.0166	28.0	5/25/2019
29	C] CCV 25 ppm [25 p	1	23.978	0.0000	23.9780	23.978	24.0	5/25/2019
30	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/25/2019
31	K1904715-007	1	3.041	0.0000	3.0407	3.0407	3.0	5/25/2019
32	K1904715-007d	1	2.983	0.0000	2.9825	2.9825	3.0	5/25/2019
33	K1904715-008	1	4.196	0.0000	4.1963	4.1963	4.2	5/25/2019
34	K1904715-008d	1	4.130	0.0000	4.1300	4.13	4.1	5/25/2019
35	K1904715-009	1	1.373	0.0000	1.3726	1.3726	1.4	5/25/2019
36	K1904715-009d	1	1.375	0.0000	1.3748	1.3748	1.4	5/25/2019
37	C] CCV 25 ppm [25 p	1	24.367	0.0000	24.3668	24.3668	24.4	5/25/2019
38	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/25/2019
39		1		0.0000	0.0000	0	<0.5	
40		1		0.0000	0.0000	0	<0.5	
41		1		0.0000	0.0000	0	<0.5	
42		1		0.0000	0.0000	0	<0.5	
43		1		0.0000	0.0000	0	<0.5	
44		1		0.0000	0.0000	0	<0.5	
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By:	BLD	Date Analyzed	5/24/19
Reviewed By:	[signature]	Date Reviewed	05/29/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	24.619	0.0000	24.6186	24.6186	24.6	5/24/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/24/2019
4	MB1	1	0.000	0.0000	0.0000	0	<0.5	5/24/2019
5	[TOC] LCS [24ppm]	1	25.116	0.0000	25.1159	25.1159	25.1	5/24/2019
6	K1904716-001	1	0.153	0.0000	0.1531	0.1531	<0.5	5/24/2019
7	K1904716-001d	1	0.111	0.0000	0.1111	0.1111	<0.5	5/24/2019
8	K1904716-001ms	1	25.056	0.0000	25.0556	25.0556	25	5/24/2019
9	K1904710-001	1	2.205	0.0000	2.2050	2.205	2.21	5/24/2019
10	K1904710-001d	1	2.248	0.0000	2.2481	2.2481	2.25	5/24/2019
11	K1904710-002	1	2.237	0.0000	2.2374	2.2374	2.2	5/24/2019
12	K1904710-002d	1	2.217	0.0000	2.2166	2.2166	2.22	5/24/2019
13	K1904714-001	1	1.652	0.0000	1.6518	1.6518	1.65	5/24/2019
14	K1904714-001d	1	1.678	0.0000	1.6783	1.6783	1.68	5/24/2019
15	K1904594-001	1	7.016	0.0000	7.0158	7.0158	7.0	5/24/2019
16	K1904594-001d	1	7.004	0.0000	7.0038	7.0038	7.0	5/24/2019
17	C] CCV 25 ppm [25 p	1	24.537	0.0000	24.5370	24.537	24.54	5/24/2019
18	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/24/2019
19	K1904594-002	1	0.000	0.0000	0.0000	0	<0.5	5/24/2019
20	K1904594-002d	1	0.000	0.0000	0.0000	0	<0.5	5/24/2019
21	K1904594-003	1	0.203	0.0000	0.2030	0.203	<0.5	5/24/2019
22	K1904594-003d	1	0.207	0.0000	0.2070	0.207	<0.5	5/24/2019
23	K1904594-004	1	0.471	0.0000	0.4711	0.4711	<0.5	5/24/2019
24	K1904594-004d	1	0.272	0.0000	0.2720	0.272	<0.5	5/24/2019
25	K1904594-005	1	0.416	0.0000	0.4160	0.416	<0.5	5/24/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

date time

Analyzed By: BKP	Date Analyzed 5/24/19
Reviewed By: [signature]	Date Reviewed 05/29/19

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ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1904594-005d	1	0.317	0.0000	0.3165	0.3165	<0.5	5/24/2019
27	K1904594-006	1	0.000	0.0000	0.0000	0	<0.5	5/24/2019
28	K1904594-006d	1	0.000	0.0000	0.0000	0	<0.5	5/24/2019
29	K1904614-001	1	1.649	0.0000	1.6490	1.649	1.6	5/24/2019
30	K1904614-001d	1	1.618	0.0000	1.6179	1.6179	1.6	5/24/2019
31	K1904614-002	1	1.456	0.0000	1.4563	1.4563	1.5	5/24/2019
32	K1904614-002d	1	1.456	0.0000	1.4558	1.4558	1.5	5/24/2019
33	K1904618-001	100	0.949	0.0000	0.9492	94.92	94.9	5/24/2019
34	K1904618-001d	100	0.982	0.0000	0.9822	98.22	98.2	5/24/2019
35	K1904618-002	100	0.468	0.0000	0.4675	46.75	46.8	5/24/2019
36	K1904618-002d	100	0.471	0.0000	0.4710	47.1	47.1	5/24/2019
37	K1904618-003	100	0.480	0.0000	0.4797	47.97	48.0	5/24/2019
38	K1904618-003d	100	0.465	0.0000	0.4650	46.5	46.5	5/24/2019
39	C] CCV 25 ppm [25 p	1	24.111	0.0000	24.1106	24.1106	24.1	5/24/2019
40	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/24/2019
41	K1904618-004	100	0.000	0.0000	0.0000	0	<0.5	5/24/2019
42	K1904618-004d	100	0.000	0.0000	0.0000	0	<0.5	5/24/2019
43	K1904618-002ms	100	26.071	0.0000	26.0707	2607.07	2607.1	5/25/2019
44	K1904547-001	200	17.897	0.0000	17.8966	3579.32	3579.3	5/25/2019
45	K1904547-001d	200	17.645	0.0000	17.6447	3528.94	3528.9	5/25/2019
46	K1904667-001	100	0.000	0.0000	0.0000	0	<0.5	5/25/2019
47	K1904667-001d	100	0.000	0.0000	0.0000	0	<0.5	5/25/2019
48	K1904667-002	1	2.060	0.0000	2.0601	2.0601	2.1	5/25/2019
49	K1904667-002d	1	2.072	0.0000	2.0724	2.0724	2.1	5/25/2019
50	C] CCV 25 ppm [25 p	1	23.566	0.0000	23.5658	23.5658	23.6	5/25/2019

Analyzed By:	BED	Date Analyzed	5/24/19
Reviewed By:		Date Reviewed	05/29/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/25/2019
52		1		0.0000	0.0000	0	<0.5	
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By: BCD	Date Analyzed 5/24/19
Reviewed By:	Date Reviewed 05/29/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	23.979	0.0000	23.9794	23.9794	24.0	5/25/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/25/2019
4	MB4	1	0.000	0.0000	0.0000	0	<0.5	5/25/2019
5	[TOC] LCS [25ppm]	1	24.794	0.0000	24.7942	24.7942	24.8	5/25/2019
6	K1904716-001	1	0.264	0.0000	0.2642	0.2642	<0.5	5/25/2019
7	K1904716-001d	1	0.152	0.0000	0.1523	0.1523	<0.5	5/25/2019
8	K1904716-001ms	1	25.393	0.0000	25.3933	25.3933	25	5/25/2019
9	K1904684-001	1	10.773	0.0000	10.7732	10.7732	10.77	5/25/2019
10	K1904684-001d	1	10.940	0.0000	10.9403	10.9403	10.94	5/25/2019
11	K1904684-002	1	2.403	0.0000	2.4025	2.4025	2.4	5/25/2019
12	K1904684-002d	1	2.347	0.0000	2.3473	2.3473	2.35	5/25/2019
13	K1904684-002ms	1	27.210	0.0000	27.2097	27.2097	27.21	5/25/2019
14	K1904684-003	1	2.771	0.0000	2.7713	2.7713	2.77	5/25/2019
15	K1904684-003d	1	2.792	0.0000	2.7922	2.7922	2.8	5/25/2019
16	C] CCV 25 ppm [25 p	1	23.805	0.0000	23.8048	23.8048	23.8	5/25/2019
17	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/25/2019
18	K1904684-004	1	8.565	0.0000	8.5652	8.5652	8.6	5/25/2019
19	K1904684-004d	1	8.939	0.0000	8.9391	8.9391	8.9	5/25/2019
20	K1904686-001	1	4.979	0.0000	4.9785	4.9785	4.98	5/25/2019
21	K1904686-001d	1	4.910	0.0000	4.9095	4.9095	4.91	5/25/2019
22	K1904686-002	1	12.277	0.0000	12.2766	12.2766	12.3	5/25/2019
23	K1904686-002d	1	12.229	0.0000	12.2286	12.2286	12.2	5/25/2019
24	K1904718-001	1	0.472	0.0000	0.4723	0.4723	<0.5	5/25/2019
25	K1904718-001d	1	0.290	0.0000	0.2899	0.2899	<0.5	5/25/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

date time

Analyzed By:	RD	Date Analyzed	5/29/19
Reviewed By:		Date Reviewed	05/29/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1904718-002	1	0.238	0.0000	0.2376	0.2376	<0.5	5/25/2019
27	K1904718-002d	1	0.282	0.0000	0.2815	0.2815	<0.5	5/25/2019
28	C] CCV 25 ppm [25 p	1	23.873	0.0000	23.8734	23.8734	23.9	5/26/2019
29	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/26/2019
30		1		0.0000	0.0000	0	<0.5	
31		1		0.0000	0.0000	0	<0.5	
32		1		0.0000	0.0000	0	<0.5	
33		1		0.0000	0.0000	0	<0.5	
34		1		0.0000	0.0000	0	<0.5	
35		1		0.0000	0.0000	0	<0.5	
36		1		0.0000	0.0000	0	<0.5	
37		1		0.0000	0.0000	0	<0.5	
38		1		0.0000	0.0000	0	<0.5	
39		1		0.0000	0.0000	0	<0.5	
40		1		0.0000	0.0000	0	<0.5	
41		1		0.0000	0.0000	0	<0.5	
42		1		0.0000	0.0000	0	<0.5	
43		1		0.0000	0.0000	0	<0.5	
44		1		0.0000	0.0000	0	<0.5	
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By:	BCP	Date Analyzed	5/24/19
Reviewed By:		Date Reviewed	05/29/19

TOC: 636915, 636916, 636917
DOC: 636919

Schedule: 05242019

Version: 8
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/05/24 12:28 - Friday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1904716-001.07	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1904716-001.07 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1904710-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1904710-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1904714-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1904594-001.11	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1904594-002.11	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1904594-003.12	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1904594-004.11	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1904594-005.11	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1904594-006.11	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1904614-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1904614-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1904618-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1904618-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1904618-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1904618-004.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1904618-002.01 ms 100x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
23	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1904547-001.01 200x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1904667-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1904667-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1904679-001.15 5x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1904679-002.15 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1904679-003.14	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1904679-004.14	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1904715-001.11	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K1904715-002.11	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K1904715-003.11	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1904715-004.11	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1904715-005.11	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1904715-006.11	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1904715-006.11 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
38	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

05/29/19

Schedule: 05242019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	Status
D	Check Standard	[TOC] CCB [0 ppm]	[CAS_wat_010711] [CAS_wat_010711]	1	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	[CAS_wat_010711] [CAS_wat_010711]	1	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	2	True	Ready
A1	Sample	K1904715-005.11	[CAS_wat_010711] [CAS_wat_010711]	2	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	2	True	Ready
A3	Sample	K1904715-011.11	[CAS_wat_010711] [CAS_wat_010711]	2	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	1	True	Ready
A5	Sample	[illegible]	[CAS_wat_010711] [CAS_wat_010711]	1	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	2	True	Ready
A7	Sample	K1904715-017.11	[CAS_wat_010711] [CAS_wat_010711]	2	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	[CAS_wat_010711] [CAS_wat_010711]	1	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	2	True	Ready
A9	Sample	K1904715-019.11	[CAS_wat_010711] [CAS_wat_010711]	2	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	2	True	Ready
B1	Sample	K1904837-001.01 1:5dil	[CAS_wat_010711] [CAS_wat_010711]	2	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	2	True	Ready
B3	Sample	PB	[CAS_wat_010711] [CAS_wat_010711]	2	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	2	True	Ready
B5	Sample	K1904715-002.01	[CAS_wat_010711] [CAS_wat_010711]	2	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	2	True	Ready
B7	Sample	K1904715-004.01	[CAS_wat_010711] [CAS_wat_010711]	2	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	2	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	[CAS_wat_010711] [CAS_wat_010711]	1	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	[CAS_wat_010711] [CAS_wat_010711]	1	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	2	True	Ready
B9	Sample	K1904715-007.02 1:5dil dup	[CAS_wat_010711] [CAS_wat_010711]	1	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	1	True	Ready
C2	Sample	K1904834-001.06 diss	[CAS_wat_010711] [CAS_wat_010711]	2	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	2	True	Ready
C4	Sample	K1904834-002.06 1:5dil diss	[CAS_wat_010711] [CAS_wat_010711]	1	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	1	True	Ready
C6	Sample	K1904834-003.06 diss	[CAS_wat_010711] [CAS_wat_010711]	2	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	[CAS_wat_010711] [CAS_wat_010711]	1	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	2	True	Ready
C8	Sample	K1904834-001.06 diss	[CAS_wat_010711] [CAS_wat_010711]	2	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	2	True	Ready
D0	Sample	K1904715-001.02 diss	[CAS_wat_010711] [CAS_wat_010711]	2	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	2	True	Ready
D2	Sample	PB	[CAS_wat_010711] [CAS_wat_010711]	2	True	Ready
[illegible]	[illegible]	[illegible]	[illegible]	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	[CAS_wat_010711] [CAS_wat_010711]	1	True	Ready
					False	

Fusion Report - 05242019
Friday, May 24, 2019 10:30 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/05/29 09:22 - Wednesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	05242019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v8)		
Comment:			

Report Results

05/29/19

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/05/24 10:30

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	14.07	17.29	3.22	49.94	07:57
2	TC Clean	6.92	10.04	3.12	49.78	07:18
3	TC Clean	2.48	5.56	3.08	49.69	07:02
4	TC Clean	1.55	4.76	3.20	49.66	07:03

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/05/24 11:05

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.95	14.93	2.98	49.80	07:58
2	TC Clean	4.18	7.21	3.03	49.63	07:13
3	TC Clean	1.92	4.77	2.85	49.64	07:02

4	TC Clean	1.53	4.54	3.01	49.63	07:01

Sample Type: Clean — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/05/24 11:39

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.06	14.97	2.90	49.79	07:58
2	TC Clean	3.59	6.68	3.08	49.64	07:16
3	TC Clean	1.83	4.89	3.06	49.87	07:03
4	TC Clean	1.33	4.32	2.99	49.73	07:01

Sample Type: Blank (Creating v1260) — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2019/05/24 12:15

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.97	14.96	2.98	49.85	07:59
2	TC Clean	3.57	6.65	3.07	49.70	07:17
3	TC Clean	1.65	4.65	3.00	49.67	07:02
4	TC Clean	1.05	4.19	3.14	49.65	07:02
5	Reagent Blank	3.50	6.42	2.91	49.70	08:12
6	Acid Blank	1.27	4.19	2.92	49.83	08:02

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/24 13:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.72	10.68	2.96	49.95	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6186 ppm (PASS)	0.0000 ppm	0%	2019/05/24 13:21

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6186	246.1859	176.57	179.59	3.02	49.92	10:33

Completion State: Success - Criteria met.

Success Action: Do Nothing

Method: CAS_salt_010711 (v4)

Calibration: CAS_salt_010711 (v30)

STD Conc - Pos B: 50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/24 13:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.02	9.06	3.03	49.99	10:33

Completion State: Success - Criteria met.

Success Action: Do Nothing

Method: CAS_salt_010711 (v4)

Calibration: CAS_salt_010711 (v30)

STD Conc - Pos D: 0 ppmC

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/24 13:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.40	8.36	2.95	50.01	10:35

Dilution: 1:10

Blank Contribution: (TC) 8.7499 (IC) (v1260)

Method: CAS_salt_010711 (v4)

Calibration: CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS

From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.1159 ppm (PASS)	0.0000 ppm	0%	2019/05/24 14:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.1159	251.1594	179.95	182.81	2.87	49.98	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/24 14:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.70	10.81	3.11	49.93	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K1904716-001.07	0.1321 ppm	0.0297 ppm	22.4800%	2019/05/24 14:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1531	1.5308	9.79	12.79	3.00	49.98	10:30
2	TOC	0.1111	1.1109	9.50	12.60	3.09	49.94	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1904716-001.07 ms	25.0556 ppm	0.0000 ppm	0.0000%	2019/05/24 15:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.0556	250.5562	178.83	181.77	2.95	49.90	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/24 15:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.25	10.24	2.99	49.86	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC)	CAS_salt_010711	CAS_salt_010711

(v1260) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1904710-001.01	2.2265 ppm	0.0305 ppm	1.3700%	2019/05/24 15:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2050	22.0495	23.72	26.79	3.07	49.87	10:28
2	TOC	2.2481	22.4812	24.01	27.04	3.03	49.96	10:26

Dilution 1:10
Blank Contribution (TC) 8.7499 (IC) (v1260)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1904710-002.01	2.2270 ppm	0.0147 ppm	0.6600%	2019/05/24 16:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2374	22.3736	23.94	26.92	2.98	49.91	10:30
2	TOC	2.2166	22.1659	23.80	26.74	2.94	49.98	10:25

Dilution 1:10
Blank Contribution (TC) 8.7499 (IC) (v1260)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1904714-001.01	1.6650 ppm	0.0188 ppm	1.1300%	2019/05/24 16:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6518	16.5177	19.96	23.22	3.26	49.90	10:29
2	TOC	1.6783	16.7828	20.14	23.09	2.95	49.87	10:26

Dilution 1:10
Blank Contribution (TC) 8.7499 (IC) (v1260)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1904594-001.11	7.0098 ppm	0.0085 ppm	0.1200%	2019/05/24 16:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.0158	70.1584	56.37	59.48	3.11	49.86	10:27
2	TOC	7.0038	70.0376	56.29	59.23	2.94	49.87	10:27

Dilution 1:10
Blank Contribution (TC) 8.7499 (IC) (v1260)
Method CAS_salt_010711 (v4)
Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.5370 ppm (PASS)	0.0000 ppm	0%	2019/05/24 17:25

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5370	245.3697	176.02	179.04	3.03	49.92	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/24 17:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.88	8.79	2.91	49.92	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K1904594-002.11	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/24 17:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.69	8.70	3.00	49.92	10:28
2	TOC	0.0000	0.0000	5.59	8.59	3.00	49.91	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K1904594-003.12	0.2050 ppm	0.0028 ppm	1.3700%	2019/05/24 18:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2030	2.0302	10.13	13.10	2.97	49.90	10:28
2	TOC	0.2070	2.0700	10.16	13.18	3.03	49.92	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1904594-004.11	0.3716 ppm	0.1408 ppm	37.9100%	2019/05/24 18:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4711	4.7114	11.95	15.09	3.14	49.91	10:27
2	TOC	0.2720	2.7197	10.60	13.77	3.18	49.93	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1904594-005.11	0.3663 ppm	0.0704 ppm	19.2300%	2019/05/24 19:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4160	4.1605	11.57	14.57	2.99	49.95	10:28
2	TOC	0.3165	3.1646	10.90	14.00	3.10	49.94	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1904594-006.11	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/24 19:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.07	9.22	3.15	49.96	10:29
2	TOC	0.0000	0.0000	6.24	9.16	2.92	49.99	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1904614-001.01	1.6334 ppm	0.0220 ppm	1.3500%	2019/05/24 20:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6490	16.4897	19.94	22.86	2.92	50.00	10:32
2	TOC	1.6179	16.1788	19.73	22.72	2.99	49.99	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1904614-002.01	1.4561 ppm	0.0003 ppm	0.0200%	2019/05/24 20:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4563	14.5627	18.64	21.68	3.04	49.99	10:28

2	TOC	1.4558	14.5583	18.63	21.66	3.03	50.00	10:28

Dilution 1:10 | **Blank Contribution** (TC) 8.7499 (IC) (v1260) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1904618-001.01 100x	0.9657 ppm	0.0233 ppm	2.4200%	2019/05/24 21:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9492	9.4920	15.19	18.13	2.94	50.00	10:30
2	TOC	0.9822	9.8220	15.42	18.34	2.92	50.01	10:29

Dilution 1:10 | **Blank Contribution** (TC) 8.7499 (IC) (v1260) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K1904618-002.01 100x	0.4692 ppm	0.0025 ppm	0.5300%	2019/05/24 21:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4675	4.6746	11.92	14.92	2.99	50.03	10:26
2	TOC	0.4710	4.7100	11.95	14.98	3.03	50.03	10:25

Dilution 1:10 | **Blank Contribution** (TC) 8.7499 (IC) (v1260) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K1904618-003.01 100x	0.4723 ppm	0.0104 ppm	2.2100%	2019/05/24 22:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4797	4.7969	12.01	15.09	3.08	50.05	10:28
2	TOC	0.4650	4.6496	11.91	15.03	3.12	50.06	10:31

Dilution 1:10 | **Blank Contribution** (TC) 8.7499 (IC) (v1260) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.1106 ppm (PASS)	0.0000 ppm	0%	2019/05/24 22:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1106	241.1063	173.12	176.14	3.02	50.06	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/24 22:50

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.74	8.69	2.95	50.06	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/24 23:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.19	8.19	3.00	50.07	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.4640 ppm (PASS)	0.0000 ppm	0%	2019/05/24 23:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.4640	244.6405	175.52	178.56	3.04	50.08	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1904618-004.01 100x	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/24 23:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.64	8.78	3.14	50.06	10:30
2	TOC	0.0000	0.0000	4.96	8.04	3.08	50.08	10:25

Dilution 1:10

Blank Contribution (TC) 8.7499 (IC) (v1260)

Method CAS_salt_010711 (v4)

Calibration CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1904618-002.01 ms 100x	26.0707 ppm	0.0000 ppm	0.0000%	2019/05/25 00:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.0707	260.7066	185.72	188.72	3.00	50.09	10:30

Dilution 1:10

Blank Contribution (TC) 8.7499 (IC) (v1260)

Method CAS_salt_010711 (v4)

Calibration CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/25 00:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.63	8.75	3.12	50.08	10:28
2	TOC	0.0000	0.0000	5.25	8.28	3.02	50.08	10:28

Dilution 1:10

Blank Contribution (TC) 8.7499 (IC) (v1260)

Method CAS_salt_010711 (v4)

Calibration CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1904547-001.01 200x	17.7706 ppm	0.1781 ppm	1.0000%	2019/05/25 00:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	17.8966	178.9660	130.23	133.30	3.07	50.10	10:29
2	TOC	17.6447	176.4469	128.52	131.63	3.11	50.10	10:28

Dilution 1:10

Blank Contribution (TC) 8.7499 (IC) (v1260)

Method CAS_salt_010711 (v4)

Calibration CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1904667-001.01 100x	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/25 01:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.54	9.61	3.07	50.12	10:25

2	TOC	0.0000	0.0000	5.67	8.77	3.11	50.12	10:30

Dilution 1:10 | **Blank Contribution** (TC) 8.7499 (IC) (v1260) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1904667-002.01	2.0663 ppm	0.0086 ppm	0.4200%	2019/05/25 01:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0601	20.6014	22.73	25.73	2.99	50.14	10:29
2	TOC	2.0724	20.7237	22.82	25.91	3.10	50.13	10:28

Dilution 1:10 | **Blank Contribution** (TC) 8.7499 (IC) (v1260) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1904679-001.15 5x	11.3982 ppm	0.1804 ppm	1.5800%	2019/05/25 02:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.5257	115.2575	86.99	89.90	2.92	50.13	10:31
2	TOC	11.2706	112.7059	85.25	88.31	3.05	50.13	10:27

Dilution 1:10 | **Blank Contribution** (TC) 8.7499 (IC) (v1260) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1904679-002.15 10x	1.2335 ppm	0.0259 ppm	2.1000%	2019/05/25 02:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2518	12.5179	17.25	20.43	3.18	50.14	10:30
2	TOC	1.2151	12.1511	17.00	20.15	3.15	50.17	10:26

Dilution 1:10 | **Blank Contribution** (TC) 8.7499 (IC) (v1260) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.5658 ppm (PASS)	0.0000 ppm	0%	2019/05/25 03:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.5658	235.6584	169.43	172.53	3.10	50.16	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/25 03:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.74	8.82	3.07	50.13	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1904679-003.14	0.9093 ppm	0.0608 ppm	6.6900%	2019/05/25 03:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8663	8.6626	14.63	17.71	3.08	50.10	10:27
2	TOC	0.9523	9.5229	15.21	18.24	3.03	50.11	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K1904679-004.14	0.4172 ppm	0.0053 ppm	1.2700%	2019/05/25 04:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4209	4.2091	11.61	14.83	3.22	50.09	10:27
2	TOC	0.4134	4.1339	11.56	14.71	3.16	50.10	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K1904715-001.11	2.9500 ppm	0.0092 ppm	0.3100%	2019/05/25 04:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9564	29.5643	28.82	31.85	3.03	50.09	10:27

2	TOC	2.9435	29.4347	28.73	31.76	3.03	50.10	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K1904715-002.11	3.8904 ppm	0.0166 ppm	0.4300%	2019/05/25 04:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.8787	38.7866	35.08	38.10	3.03	50.12	10:24
2	TOC	3.9021	39.0208	35.24	38.41	3.17	50.09	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K1904715-003.11	2.9030 ppm	0.0089 ppm	0.3100%	2019/05/25 05:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9093	29.0929	28.50	31.58	3.08	50.12	10:28
2	TOC	2.8968	28.9677	28.41	31.40	2.98	50.10	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1904715-004.11	1.0799 ppm	0.0027 ppm	0.2500%	2019/05/25 05:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0780	10.7795	16.07	19.17	3.11	50.10	10:28
2	TOC	1.0818	10.8179	16.09	19.07	2.97	50.10	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1904715-005.11	1.0758 ppm	0.0220 ppm	2.0400%	2019/05/25 06:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0914	10.9136	16.16	19.17	3.01	50.09	10:30
2	TOC	1.0603	10.6028	15.95	19.07	3.12	50.11	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◈	36	TOC	K1904715-006.11	2.9288 ppm	0.0347 ppm	1.1800%	2019/05/25 06:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9533	29.5334	28.80	31.86	3.06	50.09	10:27
2	TOC	2.9043	29.0428	28.46	31.63	3.17	50.10	10:28

Dilution 1:10

Blank Contribution (TC) 8.7499 (IC) (v1260)

Method CAS_salt_010711 (v4)

Calibration CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K1904715-006.11 ms	28.0166 ppm	0.0000 ppm	0.0000%	2019/05/25 07:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.0166	280.1661	198.92	202.04	3.12	50.11	10:34

Dilution 1:10

Blank Contribution (TC) 8.7499 (IC) (v1260)

Method CAS_salt_010711 (v4)

Calibration CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/25 07:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.37	9.49	3.13	50.10	10:29

Dilution 1:10

Blank Contribution (TC) 8.7499 (IC) (v1260)

Method CAS_salt_010711 (v4)

Calibration CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.9780 ppm (PASS)	0.0000 ppm	0%	2019/05/25 07:48

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9780	239.7804	172.22	175.41	3.18	50.11	10:34

Completion State Success - Criteria met.

Success Action Do Nothing

Method CAS_salt_010711 (v4)

Calibration CAS_salt_010711 (v30)

STD Conc - Pos B 50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0	0 / infinity	0.0000	0.0000	0%	2019/05/25 08:03

					ppm]	(NA / NA)	ppm (PASS)	ppm		

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.25	8.37	3.12	50.12	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/25 08:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.76	7.88	3.13	50.11	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.7077 ppm (PASS)	0.0000 ppm	0%	2019/05/25 08:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.7077	247.0772	177.18	180.17	2.99	50.10	10:36

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	40	TOC	K1904715-007.11	3.0116 ppm	0.0411 ppm	1.3700%	2019/05/25 08:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0407	30.4070	29.39	32.62	3.23	50.11	10:31
2	TOC	2.9825	29.8251	28.99	32.15	3.16	50.08	10:28

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	41	TOC	K1904715-008.11	4.1631 ppm	0.0469 ppm	1.1300%	2019/05/25 09:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.1963	41.9628	37.23	40.27	3.03	50.08	10:25
2	TOC	4.1300	41.2998	36.78	39.89	3.11	50.08	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	K1904715-009.11	1.3737 ppm	0.0016 ppm	0.1100%	2019/05/25 09:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3726	13.7259	18.07	21.26	3.19	50.05	10:31
2	TOC	1.3748	13.7480	18.08	21.16	3.08	50.06	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	K1904715-011.11	1.3162 ppm	0.0216 ppm	1.6400%	2019/05/25 10:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3315	13.3149	17.79	20.78	3.00	50.08	10:29
2	TOC	1.3010	13.0100	17.58	20.73	3.15	50.08	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	K1904715-011.11 ms	26.8061 ppm	0.0000 ppm	0.0000%	2019/05/25 10:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.8061	268.0608	190.71	193.84	3.13	50.06	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/25 10:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	0.0000	0.0000	5.67	8.83	3.16	50.07	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1904715-016.11	8.7370 ppm	0.2356 ppm	2.7000%	2019/05/25 11:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.5704	85.7036	66.92	70.09	3.16	50.07	10:26
2	TOC	8.9036	89.0360	69.19	72.43	3.24	50.07	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	K1904715-017.11	6.2515 ppm	0.0193 ppm	0.3100%	2019/05/25 11:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.2378	62.3784	51.09	54.39	3.30	50.06	10:29
2	TOC	6.2651	62.6509	51.28	54.30	3.03	50.06	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	**24.3668** ppm (PASS)	0.0000 ppm	0%	2019/05/25 12:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3668	243.6682	174.86	177.87	3.01	50.04	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	**0.0000** ppm (PASS)	0.0000 ppm	0%	2019/05/25 12:20

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.86	8.85	2.99	50.02	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	48	TOC	K1904715-018.11	40.1800 ppm	0.2289 ppm	0.5700%	2019/05/25 12:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	40.0182	400.1819	280.39	283.31	2.92	50.03	10:33
2	TOC	40.3419	403.4185	282.59	285.62	3.03	50.07	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	49	TOC	K1904715-019.11	12.3966 ppm	0.2803 ppm	2.2600%	2019/05/25 13:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.5948	125.9485	94.24	97.17	2.93	50.04	10:30
2	TOC	12.1984	121.9841	91.55	94.54	2.99	50.05	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	50	TOC	K1904715-020.11	17.7060 ppm	0.0654 ppm	0.3700%	2019/05/25 13:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	17.7522	177.5223	129.25	132.17	2.92	50.05	10:28
2	TOC	17.6597	176.5971	128.62	131.73	3.11	50.06	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	K1904597-001.01 100x	7.8944 ppm	0.1884 ppm	2.3900%	2019/05/25 13:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.0276	80.2763	63.24	66.36	3.12	50.09	10:28
2	TOC	7.7611	77.6113	61.43	64.62	3.19	50.07	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	52	TOC	K1904597-002.01 100x	7.0458 ppm	0.0043 ppm	0.0600%	2019/05/25 14:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.0488	70.4884	56.60	59.72	3.12	50.09	10:31
2	TOC	7.0428	70.4280	56.56	59.66	3.10	50.09	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	53	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/25 14:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.88	11.13	3.25	50.09	10:26
2	TOC	0.0000	0.0000	6.77	10.06	3.30	50.07	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	54	TOC	K1904713-001.01	1.2753 ppm	0.0047 ppm	0.3700%	2019/05/25 15:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2720	12.7198	17.38	20.50	3.12	50.07	10:26
2	TOC	1.2786	12.7860	17.43	20.46	3.03	50.04	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	55	TOC	K1904713-002.01	1.4544 ppm	0.0002 ppm	0.0100%	2019/05/25 15:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4545	14.5450	18.62	21.59	2.96	50.04	10:28
2	TOC	1.4542	14.5421	18.62	21.59	2.96	50.03	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	K1904713-003.01	0.6893 ppm	0.0135 ppm	1.9600%	2019/05/25 16:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6989	6.9890	13.49	16.55	3.05	50.02	10:27
2	TOC	0.6797	6.7975	13.36	16.49	3.13	50.02	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	57	TOC	K1904713-004.01	1.5668 ppm	0.0257 ppm	1.6400%	2019/05/25 16:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5850	15.8503	19.51	22.60	3.09	50.01	10:25
2	TOC	1.5486	15.4864	19.26	22.26	3.00	50.00	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.9794 ppm (PASS)	0.0000 ppm	0%	2019/05/25 17:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.9794	239.7937	172.23	175.28	3.04	49.99	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/25 17:30

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.26	8.53	3.27	50.00	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/25 17:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.58	7.73	3.15	49.99	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.7942 ppm (PASS)	0.0000 ppm	0%	2019/05/25 17:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.7942	247.9419	177.76	180.83	3.07	50.02	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	59	TOC	K1904716-001.02 doc	0.2083 ppm	0.0791 ppm	37.9700%	2019/05/25 18:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2642	2.6416	10.54	13.69	3.15	50.03	10:27
2	TOC	0.1523	1.5234	9.78	12.83	3.05	50.05	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	60	TOC	K1904716-001.02 ms doc	25.3933 ppm	0.0000 ppm	0.0000%	2019/05/25 18:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.3933	253.9328	181.12	184.15	3.03	50.06	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	61	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/25 18:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.40	8.43	3.03	50.08	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	62	TOC	K1904684-001.08 doc	10.8568 ppm	0.1181 ppm	1.0900%	2019/05/25 19:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.7732	107.7324	81.88	84.93	3.06	50.07	10:28
2	TOC	10.9403	109.4030	83.01	86.06	3.05	50.11	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	63	TOC	K1904684-002.08 doc	2.3749 ppm	0.0391 ppm	1.6400%	2019/05/25 19:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4025	24.0251	25.06	28.09	3.03	50.11	10:27
2	TOC	2.3473	23.4726	24.68	27.73	3.04	50.12	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	64	TOC	K1904684-002.08 ms doc	27.2097 ppm	0.0000 ppm	0.0000%	2019/05/25 20:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.2097	272.0974	193.45	196.51	3.07	50.13	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	65	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/25 20:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.61	8.73	3.12	50.15	10:34

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	66	TOC	K1904684-003.08 doc	2.7817 ppm	0.0148 ppm	0.5300%	2019/05/25 20:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7713	27.7125	27.56	30.66	3.10	50.15	10:27
2	TOC	2.7922	27.9217	27.70	30.80	3.09	50.17	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7499 (IC) (v1260)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.8048 ppm (PASS)	0.0000 ppm	0%	2019/05/25 21:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8048	238.0479	171.05	174.07	3.03	50.16	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/25 21:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.00	8.20	3.20	50.17	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	67	TOC	K1904684-004.08 doc	8.7522 ppm	0.2644 ppm	3.0200%	2019/05/25 21:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.5652	85.6520	66.89	69.81	2.92	50.19	10:32
2	TOC	8.9391	89.3910	69.43	72.35	2.92	50.19	10:27

Dilution 1:10 | **Blank Contribution** (TC) 8.7499 (IC) (v1260) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	68	TOC	K1904686-001.08 doc	4.9440 ppm	0.0489 ppm	0.9900%	2019/05/25 22:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.9785	49.7855	42.54	45.47	2.92	50.19	10:30
2	TOC	4.9095	49.0946	42.08	45.05	2.98	50.21	10:30

Dilution 1:10 | **Blank Contribution** (TC) 8.7499 (IC) (v1260) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	69	TOC	K1904686-002.08 doc	12.2526 ppm	0.0340 ppm	0.2800%	2019/05/25 22:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.2766	122.7664	92.08	94.99	2.91	50.19	10:27
2	TOC	12.2286	122.2861	91.76	94.84	3.08	50.20	10:27

Dilution 1:10 | **Blank Contribution** (TC) 8.7499 (IC) (v1260) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	70	TOC	K1904718-001.02 doc	0.3811 ppm	0.1290 ppm	33.8400%	2019/05/25 22:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4723	4.7232	11.96	14.92	2.96	50.20	10:30
2	TOC	0.2899	2.8994	10.72	13.65	2.93	50.20	10:24

Dilution 1:10 | **Blank Contribution** (TC) 8.7499 (IC) (v1260) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	71	TOC	K1904718-002.02 doc	0.2596 ppm	0.0310 ppm	11.9600%	2019/05/25 23:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2376	2.3764	10.36	13.39	3.03	50.18	10:27
2	TOC	0.2815	2.8154	10.66	13.69	3.03	50.18	10:30

Dilution 1:10 | **Blank Contribution** (TC) 8.7499 (IC) | **Method** CAS_salt_010711 | **Calibration** CAS_salt_010711

(v1260) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	72	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/25 23:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.69	7.57	2.88	50.20	10:30
2	TOC	0.0000	0.0000	4.50	7.59	3.09	50.17	10:25

Dilution: 1:10

Blank Contribution: (TC) 8.7499 (IC) (v1260)

Method: CAS_salt_010711 (v4)

Calibration: CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.8734 ppm (PASS)	0.0000 ppm	0%	2019/05/26 00:23

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.8734	238.7344	171.51	174.58	3.06	50.15	10:30

Completion State: Success - Criteria met.

Success Action: Do Nothing

Method: CAS_salt_010711 (v4)

Calibration: CAS_salt_010711 (v30)

STD Conc - Pos B: 50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/26 00:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.26	8.25	2.99	50.12	10:30

Completion State: Success - Criteria met.

Success Action: Do Nothing

Method: CAS_salt_010711 (v4)

Calibration: CAS_salt_010711 (v30)

STD Conc - Pos D: 0 ppmC

Meta Data Used in this Report

00938396

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1259	2.7557	2.3080	0.0000	0.0000	0.0000	2019/05/22 19:26	Fusion1 (Fusion1)
v1260	1.1683	1.2700	0.0000	0.0000	0.0000	2019/05/24 13:06	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v30
Calibration curve formula: TOC: y = 6.788x + 9.463
Ver Creation: 2019/03/05 17:42
r^2 value: TOC: r^2 = 0.99963
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4
Operator: Fusion1 (Fusion1)
Ver Creation: 2019/02/21 17:57
Comment:

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig

SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/05/26 00:55

ALS Environmental

StarLIMS Run: 636915, 636916, 636917, 636919

Analysis: TOC/DOC

Method: 415.1, SM 5310 C, 9060, 9060A

CCV: 11-GEN-05-77K 50 ppm LCS: 11-GEN-05-77D 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-78B

21 % H3PO4: 11-GEN-05-78C

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: NA

Analyzed By: BCP	Date Analyzed: 5/29/19 ~~5/29/19~~ BCP 5/29/19
Reviewed By:	Date Reviewed: 05/29/19

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1914602, 1914603, 1914871, 1915147

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2256 (240075)

General Set Information: There were nine field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1914603004/05 was analyzed and reported from a 1:10,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 655029) was less than 1/2 the CRDL. The recovery for the LCS (655030) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1914602001 (Client ID: LH18/24-SP650_051419_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 655027) is reported from the analysis of the Laboratory Control Sample (LCS – 655030) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Thomas Bosch May 30, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: May 30, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1914871**
Project ID: HS19051289
Purchase Order: HS19051289
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_05119_BIX	1914871001	05/21/19	05/23/19	

ANALYTICAL REPORT

Workorder: 34-1914871
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_05119_BIX**	Sampling Site: NA	Collected: 05/21/2019
Lab ID: 1914871001	Media: 125 mL Nalgene	Received: 05/23/2019
Matrix: Water	Sampling Parameter: NA	

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:** LCMS04
	Batch: ELMS/2256 (HBN: 240075)	**Percent Solid:** NA
	Analyzed: 05/28/2019 12:08	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 05/29/2019 10:39	/S/ Stephen Brose 05/30/2019 11:52

Laboratory Contact Information

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ANALYTICAL REPORT

Workorder: 34-1914871
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1914871

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2256 (HBN: 240075)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 655029
Analyzed: 05/28/2019 10:08
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 655030
Analyzed: 05/28/2019 09:39
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.20	4.00	105	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

	Sample	MS	MSD
	1914602001	655031	655032
Analyzed:	05/28/2019 10:21	05/28/2019 10:34	05/28/2019 10:48
Dilution:	1	1	1
Units:	ug/L	ug/L	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	5.09	5	102	78.8	123.8	4.88	97.7	4.08	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
05/29/2019 13:04	05/30/2019 11:52

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

W 1914871

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F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 11351**

1914871

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19051289
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19051289-02**	**LH18/24-SP650_052119_BIX**	**Water**	**21 May 2019 14:00**
	SUB_Perch-6850			31 May 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 5/22/19 1800

Received By: _____ Date/Time: 5-23-19 1006

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19051289	***Split:***	**Workorder ID:** 1914871	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM	COOL
1	05/21/2019 14:00	LH18/24-SP650_05119_BIX	1914871001		Water	A	1	A	
2									
3									
4									
5									
6									
7									
8									
9									
10									

88 of 168

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	05/23/2019 10:06	ALS Sample Receiving	Sample Login
Julie Warath	5/23/19 1400	STB	storage
R.33.1	5.24.19/12:30	T. Boadi	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00938406

ALS-Salt Lake City-Related Information Report (CRIR)

1914871

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS HOUSTON

Project/Task/Site: HS1905289

Date/Time of Receipt: 5-23-19 10:06

Number of Coolers Received: (1)

Condition of Coolers:	(Acceptable)/Unacceptable	Temperature Control:	(Present)/Not Included
Cooler Custody Seals:	(Present)/Absent/NA		
	(Intact)/Broken/NA	Location Temp Taken:	(Control)/Between Samples
Container Custody Seals:	Present/(Absent)/NA		
	Intact/Broken/(NA)	Are all temperatures within project specific guidelines?	(Yes)/No/NA
Ice Present:	(Yes)/No/NA	VOA Headspace Present?	Yes/No/(NA)
	(Frozen)/Melted/NA		

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9428	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: _____ (Signature) GAYLEEN COATES (Printed Name) 5-23-19 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018

Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 1694689-434 RTE EXP 07/

5 16:00 A 1752 05.23

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 22M
ACTWGT: 5.40 LB
CAD: 300130/CAFE32
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19051289 - RJ

551C1/D66C/10

FedEx Express

J181118060501 av

THU - 23 MAY 3:00P
STANDARD OVERNIGHT

TRK# 0201 **4809 7834 1752**

AX BTFA

84123
UT-US **SLC**

Batch Worklist

Batch: ELMS/ 2256 **Created:** 5/28/2019 08:41 **Instrument:** **HBN:** 240075

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1914602 [ENV_LVL4]
Workorder: 1914603 [ENV_LVL4]
Workorder: 1914871 [ENV_LVL4]
Workorder: 1915147 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	655026	CCV for HBN 240075 [ELMS/2256]				CCV	3		E685041C3Q	5311		5/29/2019	
2	655027	RLVS for HBN 240075 [ELMS/2256				RLVS	3		E685041C3Q	5311		5/29/2019	
3	655028	ICS for HBN 240075 [ELMS/2256]				ICS	3		E6850..D3Q	5311		5/29/2019	
4	655029	LMB for HBN 240075 [ELMS/2256]				LMB	3		E6850Q413Q	5311		5/29/2019	
5	655030	LCS for HBN 240075 [ELMS/2256]				LCS	3		E6850Q413Q	5311		5/29/2019	
6	1914602001	LH18/24-SP650_051419_BIX				SAMPLE	3	1914602001-A	E6850Q41.3	5480	6/11/2019	5/31/2019	
7	655031	LH18/24-SP650...(1914602001MS)				MS	3		E6850Q413Q	5311		5/29/2019	
8	655032	LH18/24-SP65...(1914602001MSD)				MSD	3		E6850Q413Q	5311		5/29/2019	
9	1914603001	50WW18-190516				SAMPLE	3	1914603001-A	E6850Q41.3	5480	6/13/2019	5/31/2019	
10	1914603002	50WW17-190516				SAMPLE	3	1914603002-A	E6850Q41.3	5480	6/13/2019	5/31/2019	
11	1914603003	50WW21-190516				SAMPLE	3	1914603003-A	E6850Q41.3	5480	6/13/2019	5/31/2019	
12	1914603004	50WW12-190516				SAMPLE	3	1914603004-A	E6850Q41.3	5480	6/13/2019	5/31/2019	
13	1914603005	50WW12-190517-FD				FLDDUP	3	1914603005-A	E6850Q41.3	5480	6/13/2019	5/31/2019	
14	1914871001	LH18/24-SP650_05119_BIX				SAMPLE	3	1914871001-A	E6850Q41.3	5480	6/18/2019	6/6/2019	
15	1915147001	50WW15-190523				SAMPLE	3	1915147001-A	E6850Q41.3	5480	6/20/2019	5/29/2019	
16	1915147002	50WW27-190523				SAMPLE	3	1915147002-A	E6850Q41.3	5480	6/20/2019	5/29/2019	
17	655033	CCV for HBN 240075 [ELMS/2256]				CCV	3		E685041C3Q	5311		5/29/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1914602 (001), 1914603 (001-05), 1914871 (001), 1915147 (001)
ELMS Batch/HBN ID: 2256 (240075)
Prep Date: 05/24/2019 Analysis Date: 05/28/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\MAY\28MAY19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 655030; Target = 4.0µg/L. ASTM type II water was used for LMB 655029.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1914602001 (Client ID: LH18/24-SP650_051419_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:
1) Results reported in µg/L. Field samples 1914603004/05 required 1:10,000 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\MAY\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\240075-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 655027) is reported from the analysis of the Laboratory Control Sample (LCS – 655030) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2256 HBN: 240075 Sample Set IDs if Applicable: 1914602 1914603 1914871 / 1915147	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK	Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED TESTING LABORATORY

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

Standard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	655026 CCV@25	Vial 71	1	Control	1	2.51535e6	9.014	26.37917
*	655030 QC@4.0	Vial 72	1	Control	2	4.51078e5	8.943	4.19596
*	655028 ICS@4.0	Vial 73	1	Control	3	4.02631e5	8.668	4.27965
*	655029 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1914602001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	655031 146021S	Vial 76	1	Sample	6	4.52005e5	8.454	5.08666
*	655032 146021D	Vial 77	1	Sample	7	4.57024e5	8.493	4.88333
*	1914603001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1914603002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1914603003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1914603004 10K	Vial 81	1	Sample	11	6.15140e5	9.032	6.46842e4
*	1914603005 10K	Vial 82	1	Sample	12	7.46250e5	9.051	7.56269e4
*	1914871001	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1915147001	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1915147002	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	655033 CCV@25	Vial 71	1	Control	16	2.26382e6	9.030	25.44543

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	655026 CCV@25	Vial 71	1	Control	1	7.44700e5	9.032	26.32416
*	655030 QC@4.0	Vial 72	1	Control	2	1.45202e5	8.967	4.39774
*	655028 ICS@4.0	Vial 73	1	Control	3	1.38337e5	8.681	4.78850
*	655029 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1914602001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	655031 146021S	Vial 76	1	Sample	6	1.50468e5	8.472	5.54931
*	655032 146021D	Vial 77	1	Sample	7	1.53323e5	8.504	5.36140
*	1914603001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1914603002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1914603003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1914603004 10K	Vial 81	1	Sample	11	1.94510e5	9.049	6.75291e4
*	1914603005 10K	Vial 82	1	Sample	12	2.32860e5	9.068	7.82104e4
*	1914871001	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1915147001	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1915147002	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	655033 CCV@25	Vial 71	1	Control	16	6.82139e5	9.049	25.81384

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	655026 CCV@25	Vial 71	1	Control	1	2.89154e5	9.034	5.00000
*	655030 QC@4.0	Vial 72	1	Control	2	3.53403e5	8.961	5.00000
*	655028 ICS@4.0	Vial 73	1	Control	3	3.08985e5	8.691	5.00000
*	655029 LMB	Vial 74	1	Control	4	3.47474e5	9.079	5.00000
*	1914602001	Vial 75	1	Sample	5	3.09553e5	8.502	5.00000
*	655031 146021S	Vial 76	1	Sample	6	2.89563e5	8.478	5.00000
*	655032 146021D	Vial 77	1	Sample	7	3.05514e5	8.517	5.00000
*	1914603001	Vial 78	1	Sample	8	2.25289e5	8.279	5.00000
*	1914603002	Vial 79	1	Sample	9	2.22697e5	8.383	5.00000
*	1914603003	Vial 80	1	Sample	10	2.34373e5	8.224	5.00000
*	1914603004 10K	Vial 81	1	Sample	11	3.06845e5	9.055	5.00000e4
*	1914603005 10K	Vial 82	1	Sample	12	3.16468e5	9.072	5.00000e4
*	1914871001	Vial 83	1	Sample	13	2.66978e5	8.492	5.00000
*	1915147001	Vial 84	1	Sample	14	2.34476e5	8.342	5.00000
*	1915147002	Vial 85	1	Sample	15	2.47416e5	8.369	5.00000
*	655033 CCV@25	Vial 71	1	Control	16	2.70388e5	9.054	5.00000

Sequence Table:

Method and Injection Info Part:

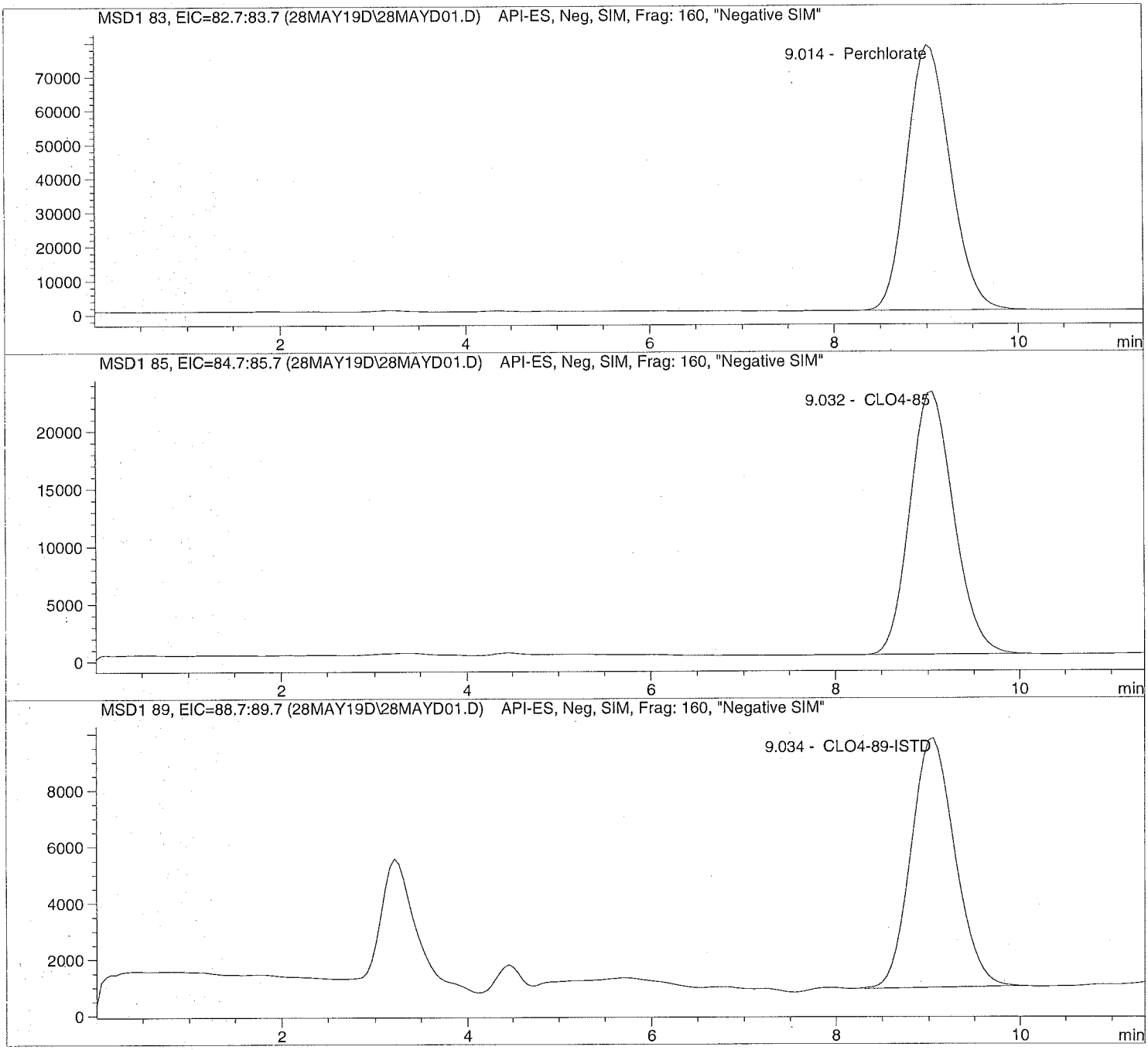
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	655026	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	655030	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	655028	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	655029	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1914602001		CLO4-AQN	1	Sample		
6	Vial 76	655031	146021S	CLO4-AQN	1	Sample		
7	Vial 77	655032	146021D	CLO4-AQN	1	Sample		
8	Vial 78	1914603001		CLO4-AQN	1	Sample		
9	Vial 79	1914603002		CLO4-AQN	1	Sample		
10	Vial 80	1914603003		CLO4-AQN	1	Sample		
11	Vial 81	1914603004	10K	CLO4-AQN	1	Sample		
12	Vial 82	1914603005	10K	CLO4-AQN	1	Sample		
13	Vial 83	1914871001		CLO4-AQN	1	Sample		
14	Vial 84	1915147001		CLO4-AQN	1	Sample		
15	Vial 85	1915147002		CLO4-AQN	1	Sample		
16	Vial 71	655033	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD01.D Sample Name: 655026 CCV@25

Injection Date:	5/28/2019 09:22:28	Seq Line:	1
Sample Name:	655026 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	5/28/2019 09:22:28	Seq Line:	1
Sample Name:	655026 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.014	PBA	2515348.3	26.3792	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.032	PBA	744700.3	26.3242	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.034	BBA	289154.0	5.0000	CLO4-89-ISTD

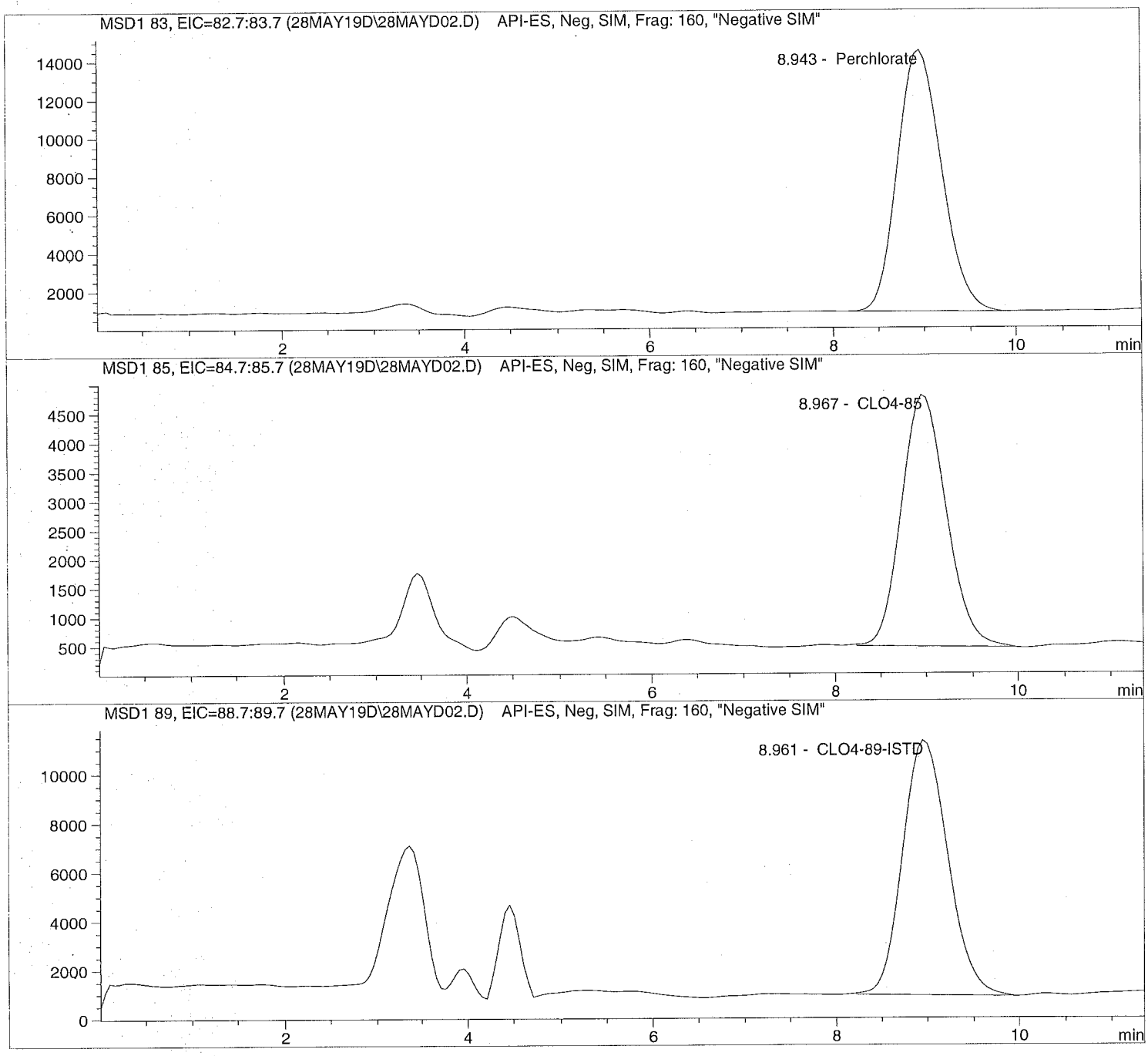
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD02.D Sample Name: 655030 QC@4.0

Injection Date:	5/28/2019 09:39:12	Seq Line:	2
Sample Name:	655030 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	5/28/2019 09:39:12	Seq Line:	2
Sample Name:	655030 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.943	PBA	451078.5	4.1960	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.967	BBA	145201.9	4.3977	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.961	BBA	353402.8	5.0000	CLO4-89-ISTD

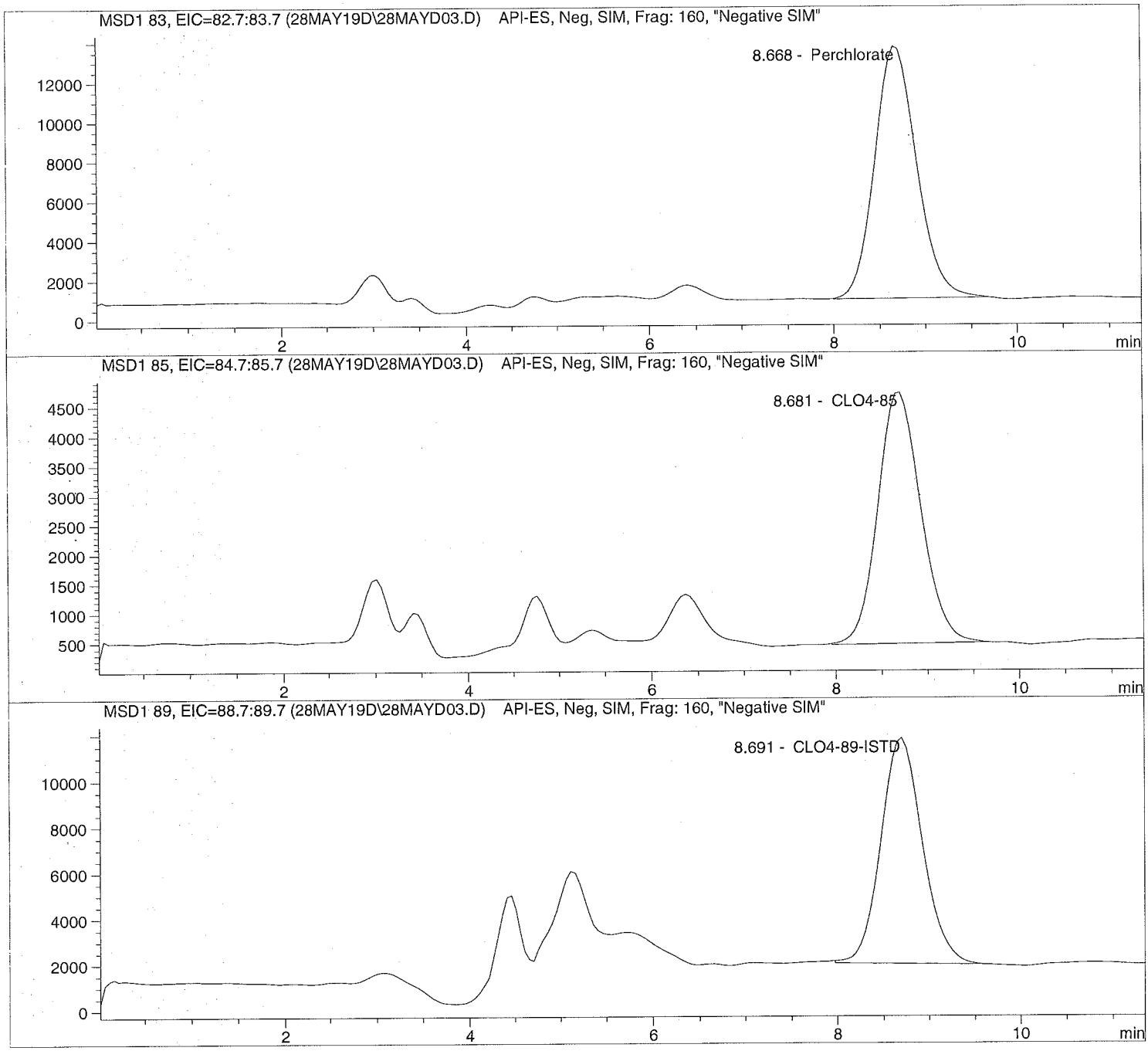
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD03.D Sample Name: 655028 ICS@4.0

Injection Date:	5/28/2019 09:54:31	Seq Line:	3
Sample Name:	655028 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	5/28/2019 09:54:31	Seq Line:	3
Sample Name:	655028 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.668	PBA	402631.1	4.2796	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.681	BBA	138337.3	4.7885	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.691	BBA	308984.7	5.0000	CLO4-89-ISTD

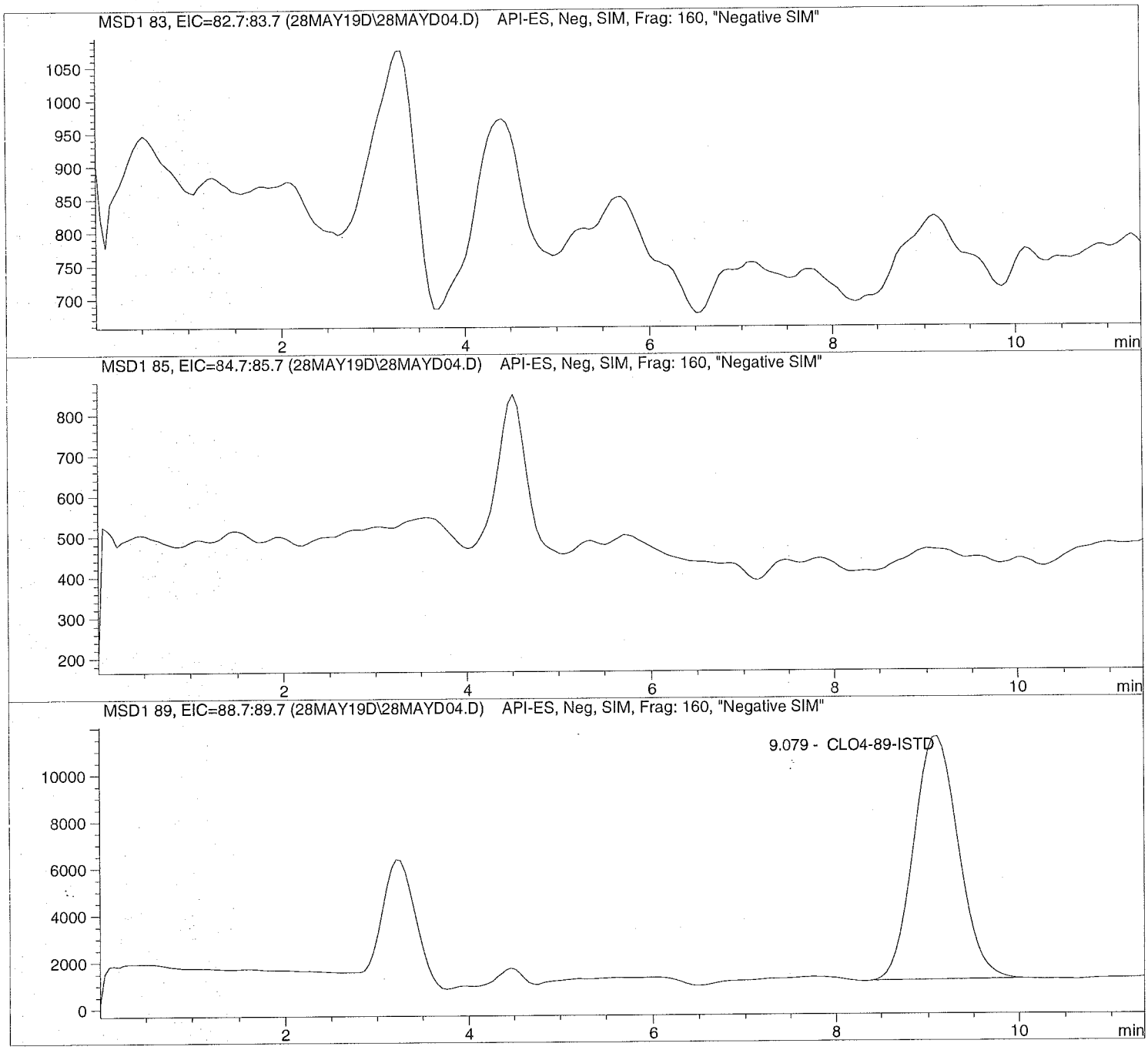
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD04.D Sample Name: 655029 LMB

Injection Date:	5/28/2019 10:08:00	Seq Line:	4
Sample Name:	655029 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD04.D Sample Name: 655029 LMB

Injection Date:	5/28/2019 10:08:00	Seq Line:	4
Sample Name:	655029 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.079	PBA	347474.2	5.0000	CLO4-89-ISTD

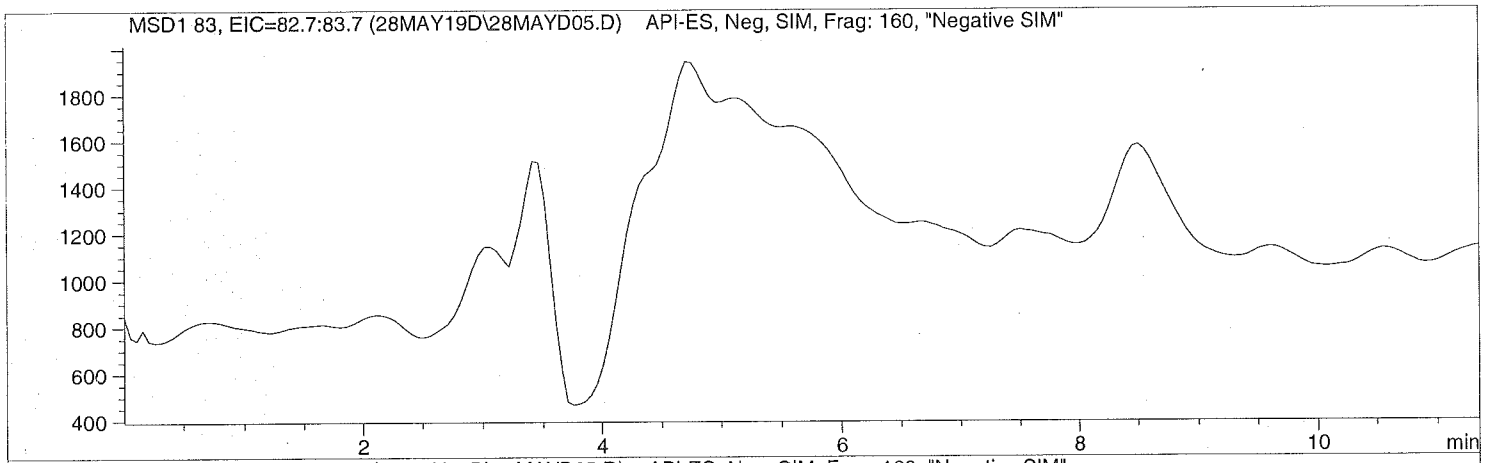
*** End of Report ***

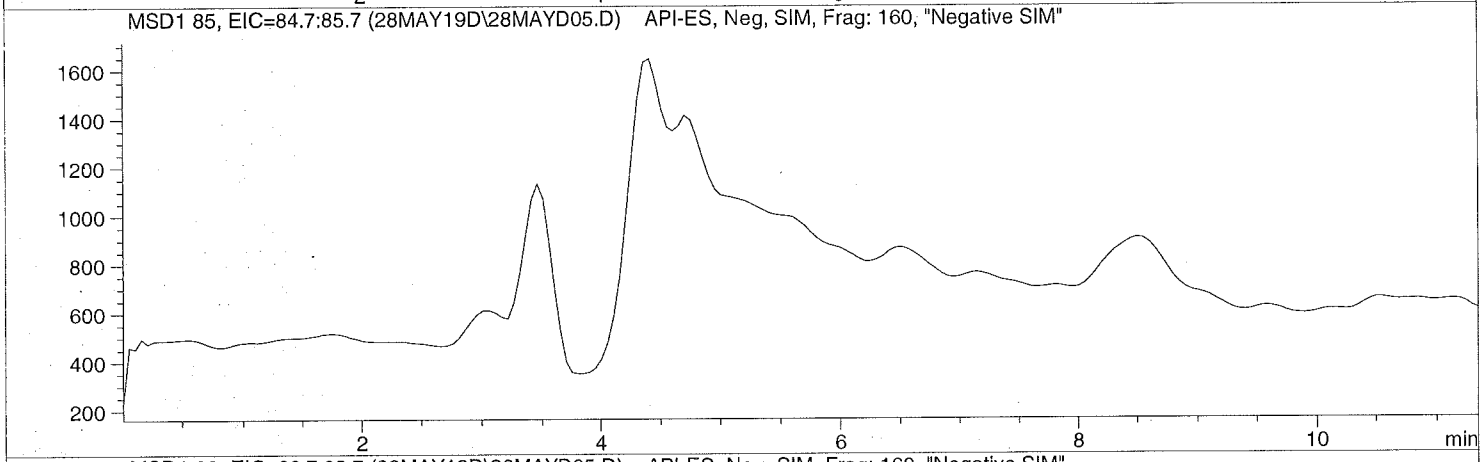
Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD05.D Sample Name: 1914602001

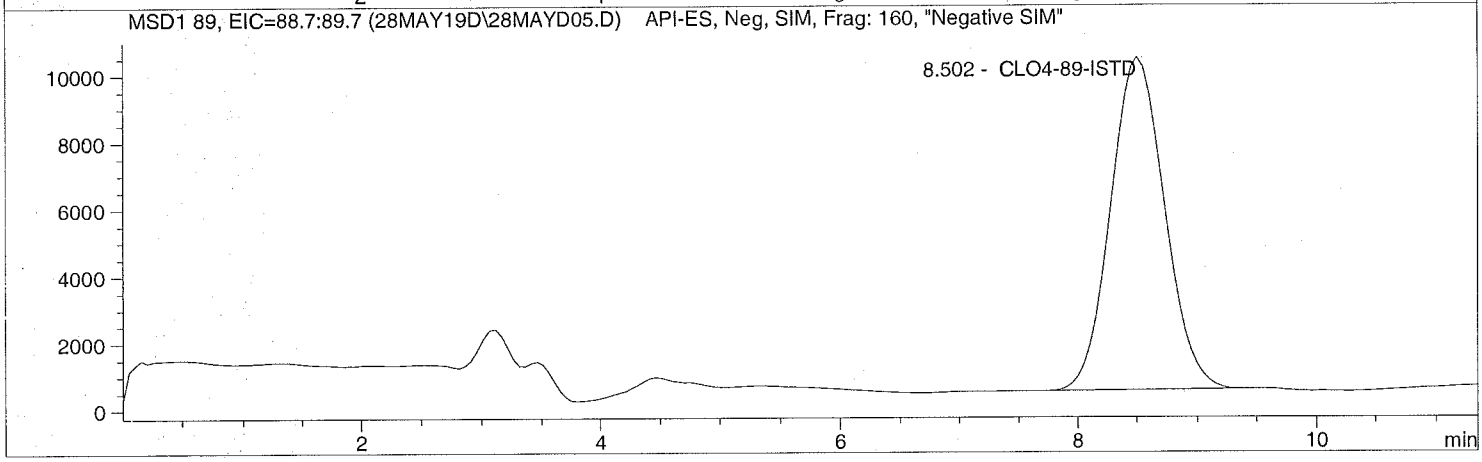
Injection Date:	5/28/2019 10:21:23	Seq Line:	5
Sample Name:	1914602001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD05.D Sample Name: 1914602001

Injection Date:	5/28/2019 10:21:23	Seq Line:	5
Sample Name:	1914602001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	PBA	309553.4	5.0000	CLO4-89-ISTD

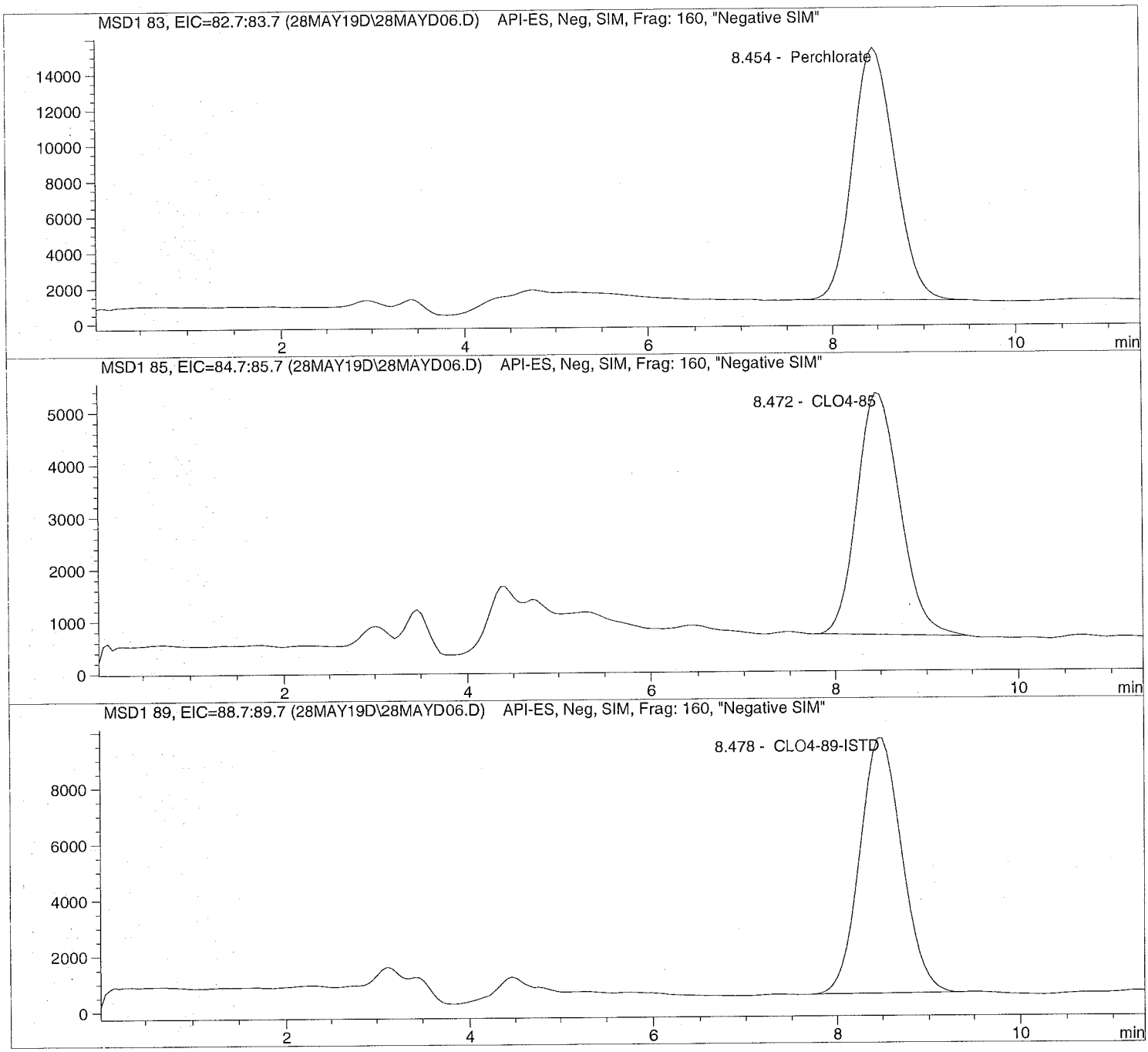
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD06.D Sample Name: 655031 146021S

Injection Date:	5/28/2019 10:34:49	Seq Line:	6
Sample Name:	655031 146021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	5/28/2019 10:34:49	Seq Line:	6
Sample Name:	655031 146021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.454	BBA	452005.2	5.0867	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	PBA	150468.2	5.5493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.478	PBA	289563.3	5.0000	CLO4-89-ISTD

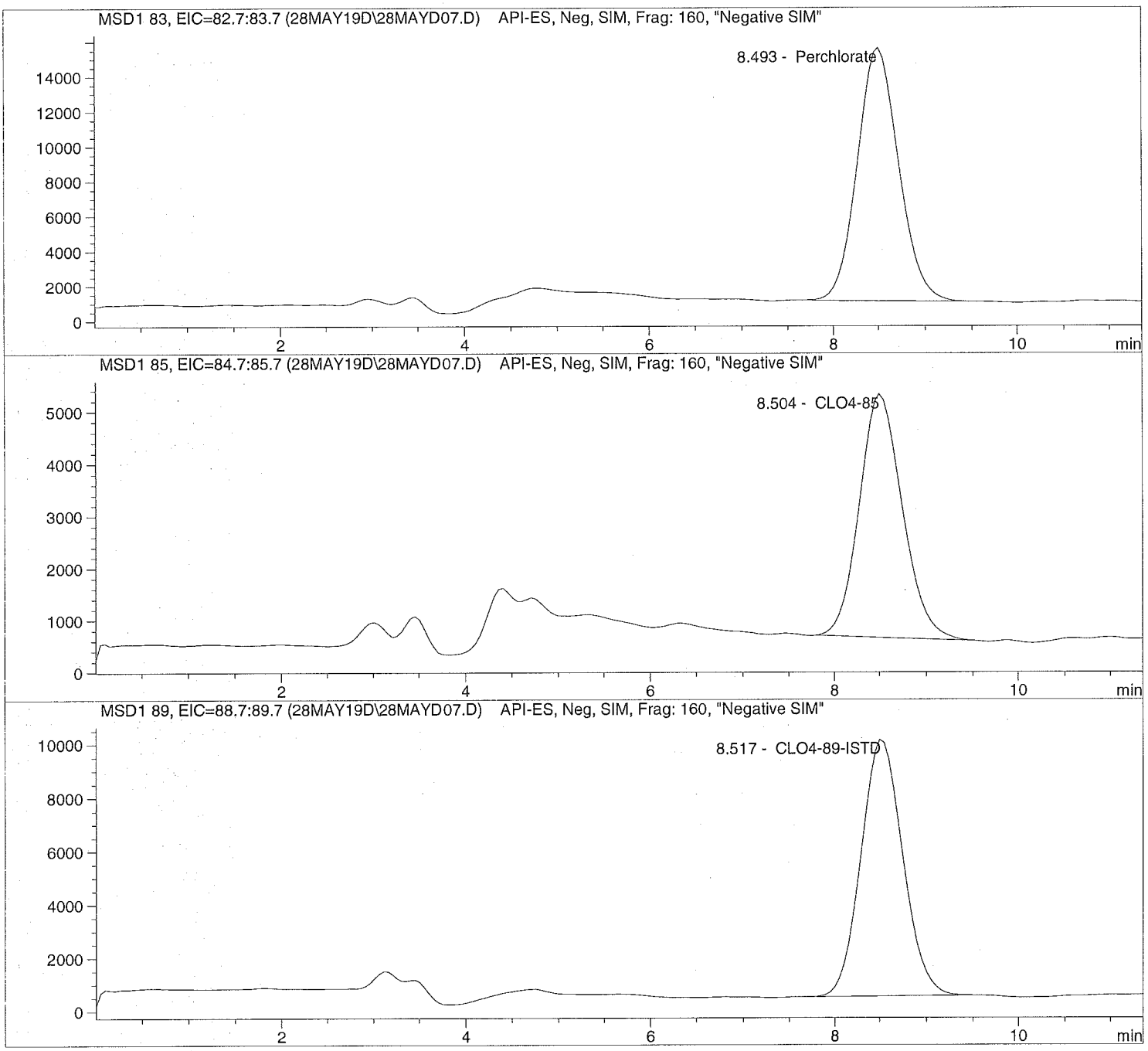
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD07.D Sample Name: 655032 146021D

Injection Date:	5/28/2019 10:48:16	Seq Line:	7
Sample Name:	655032 146021D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	5/28/2019 10:48:16	Seq Line:	7
Sample Name:	655032 146021D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.493	BBA	457024.3	4.8833	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.504	PBA	153322.9	5.3614	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.517	PBA	305513.7	5.0000	CLO4-89-ISTD

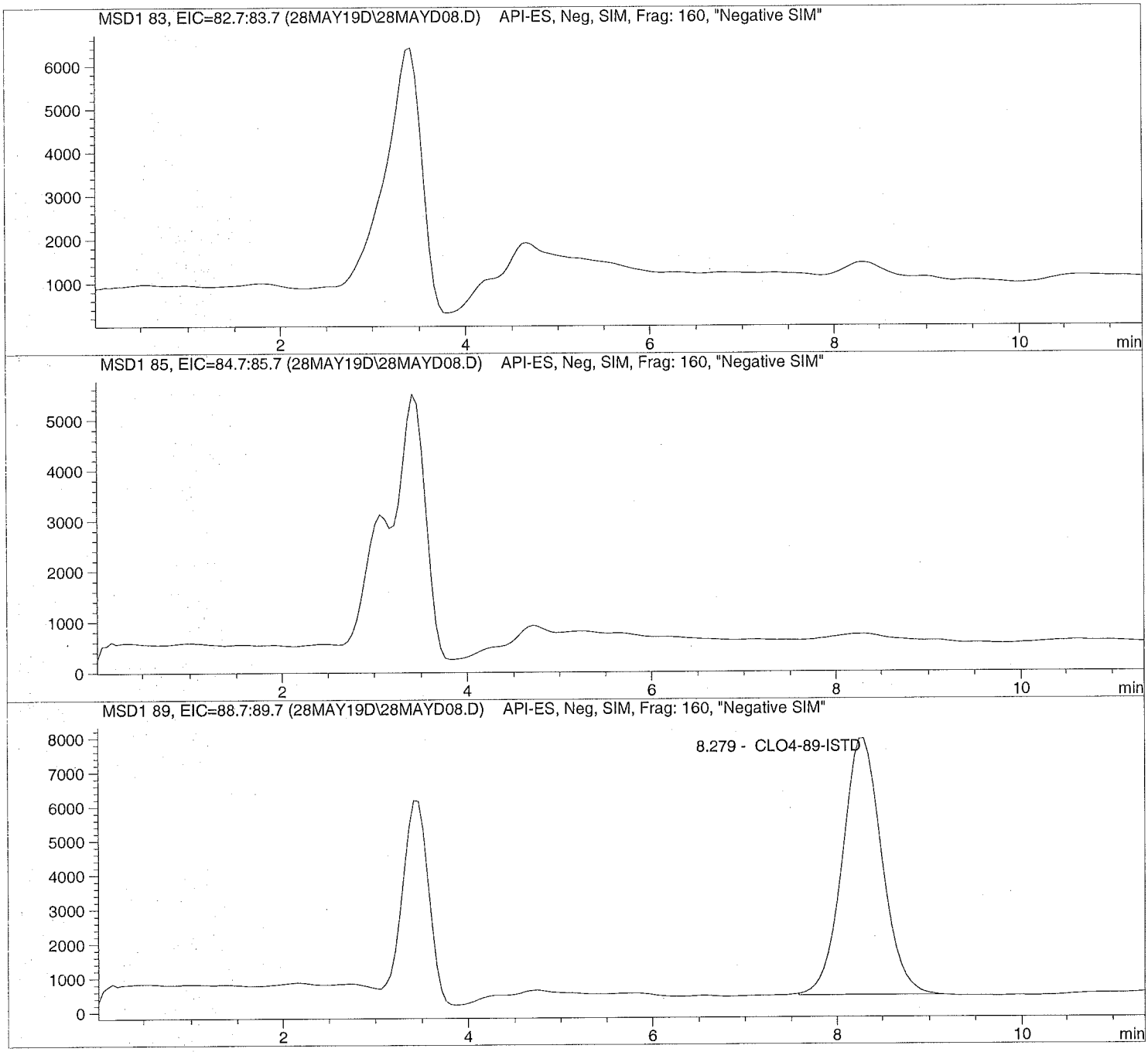
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD08.D Sample Name: 1914603001

Injection Date:	5/28/2019 11:01:42	Seq Line:	8
Sample Name:	1914603001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD08.D Sample Name: 1914603001

Injection Date:	5/28/2019 11:01:42	Seq Line:	8
Sample Name:	1914603001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.279	BBA	225288.9	5.0000	CLO4-89-ISTD

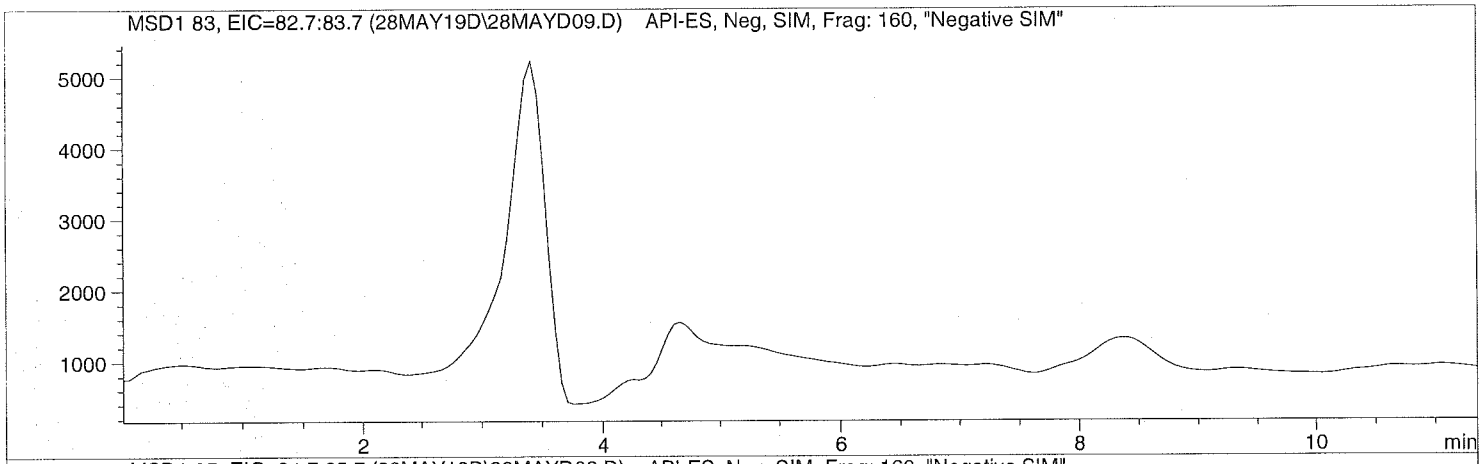
*** End of Report ***

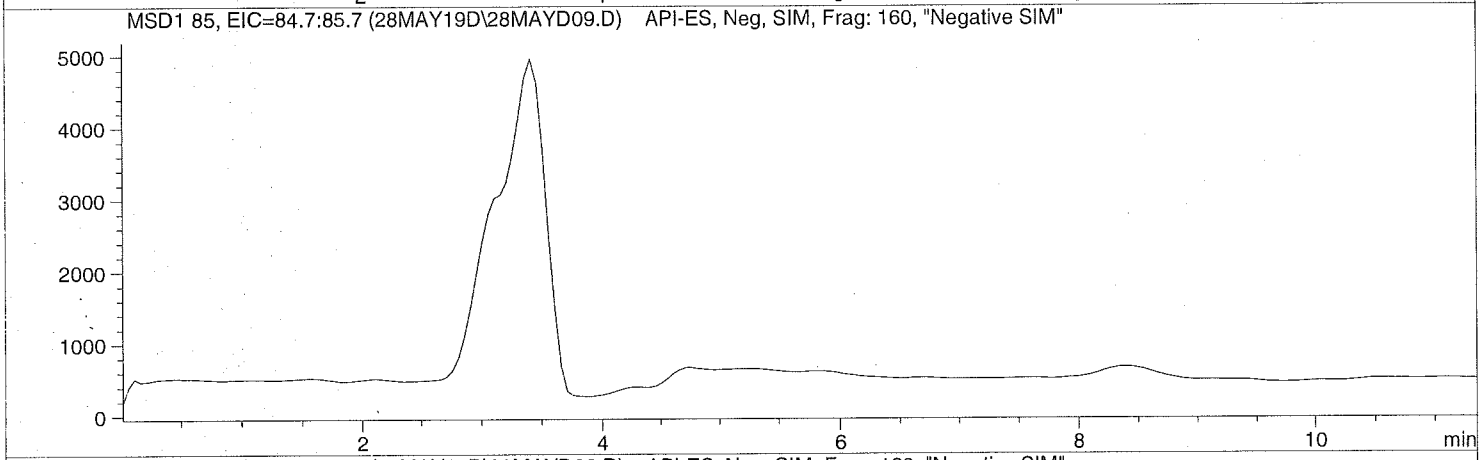
Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD09.D Sample Name: 1914603002

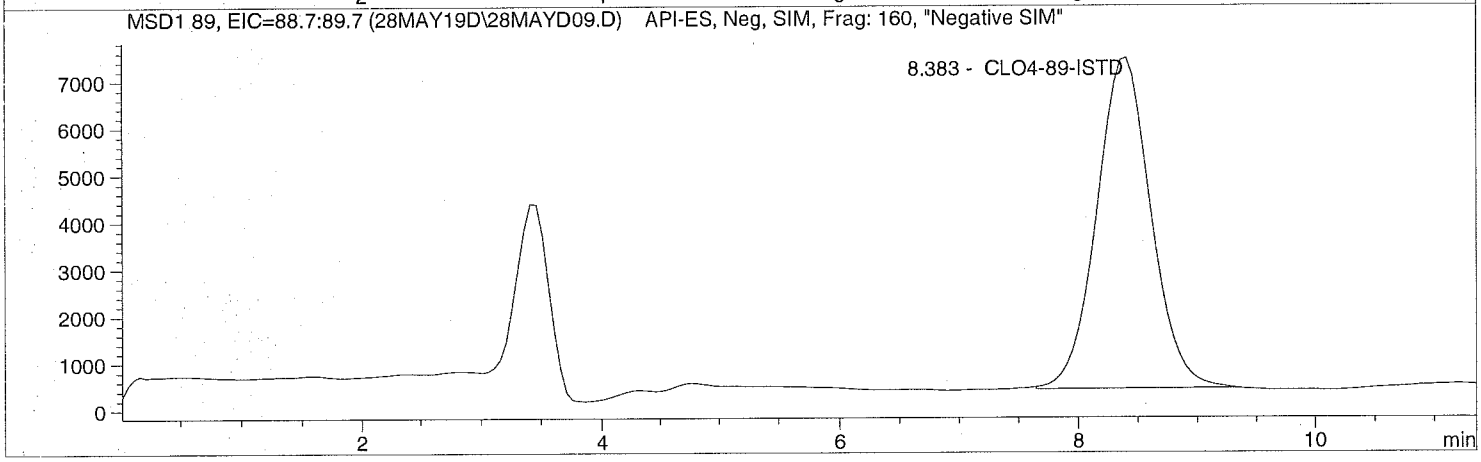
Injection Date:	5/28/2019 11:15:07	Seq Line:	9
Sample Name:	1914603002	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD09.D Sample Name: 1914603002

Injection Date:	5/28/2019 11:15:07	Seq Line:	9
Sample Name:	1914603002	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.383	BBA	222696.7	5.0000	CLO4-89-ISTD

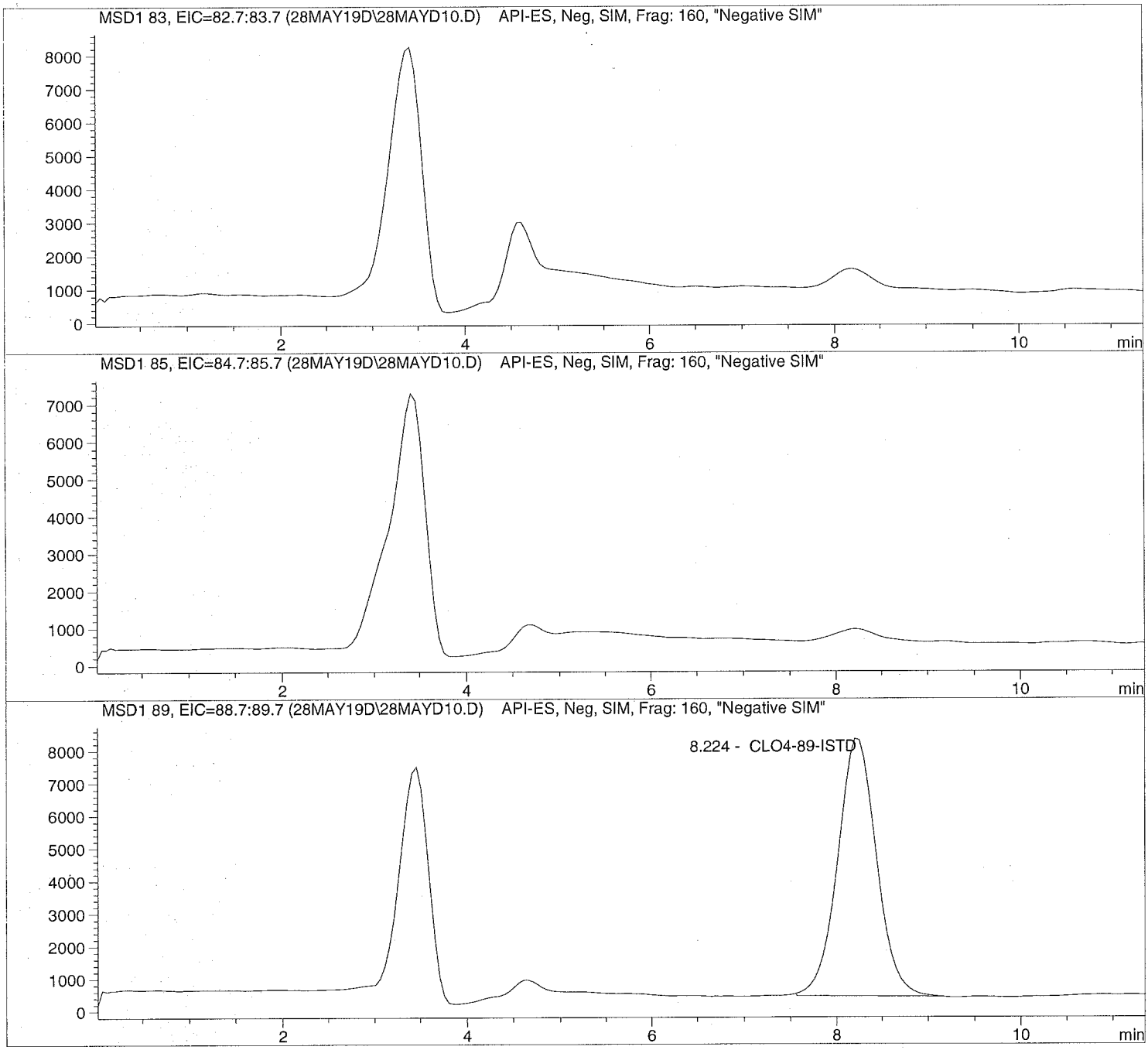
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD10.D Sample Name: 1914603003

Injection Date:	5/28/2019 11:28:30	Seq Line:	10
Sample Name:	1914603003	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD10.D Sample Name: 1914603003

Injection Date:	5/28/2019 11:28:30	Seq Line:	10
Sample Name:	1914603003	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.224	BBA	234372.9	5.0000	CLO4-89-ISTD

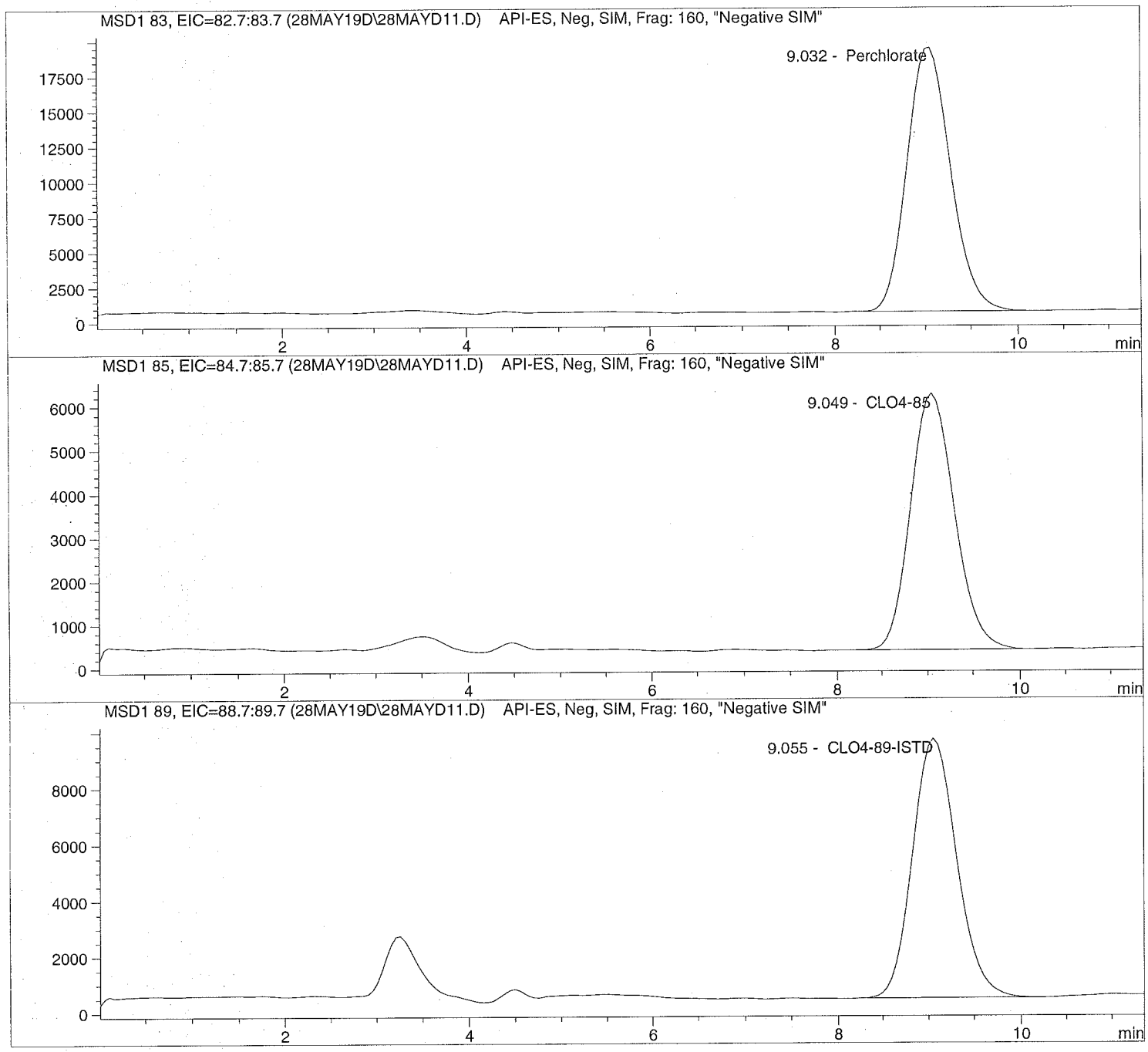
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD11.D Sample Name: 1914603004 10K

Injection Date:	5/28/2019 11:41:53	Seq Line:	11
Sample Name:	1914603004 10K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD11.D Sample Name: 1914603004 10K

Injection Date:	5/28/2019 11:41:53	Seq Line:	11
Sample Name:	1914603004 10K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.032	BBA	615140.4	64684.2479	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.049	BBA	194510.4	67529.1287	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

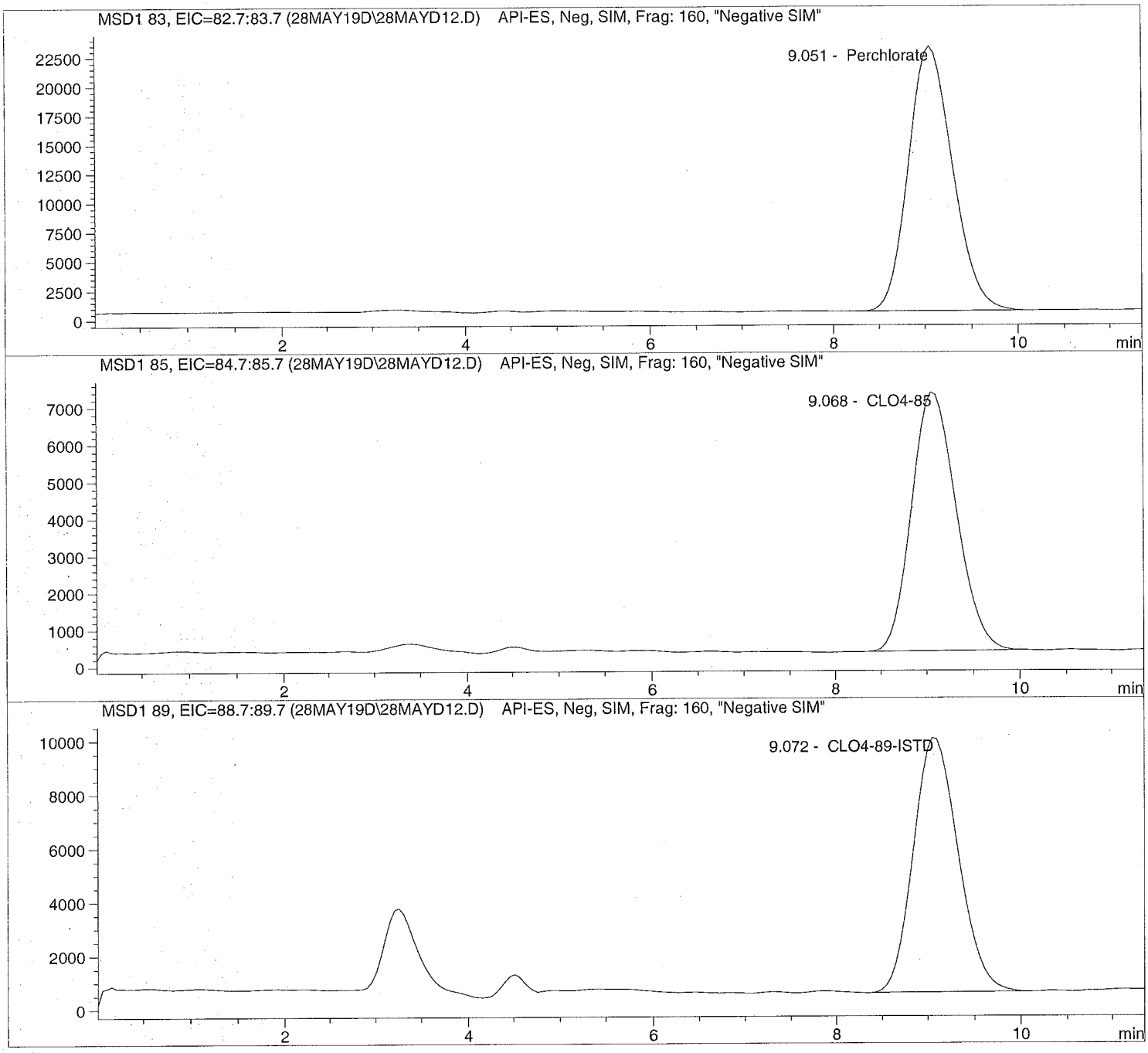
RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.055	BBA	306844.5	50000.0000	CLO4-89-ISTD

*** End of Report ***

Injection Date:	5/28/2019 11:55:16	Seq Line:	12
Sample Name:	1914603005 10K	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	5/28/2019 11:55:16	Seq Line:	12
Sample Name:	1914603005 10K	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.051	PBA	746250.2	75626.8976	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.068	BBA	232859.8	78210.3806	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.072	PBA	316467.9	50000.0000	CLO4-89-ISTD

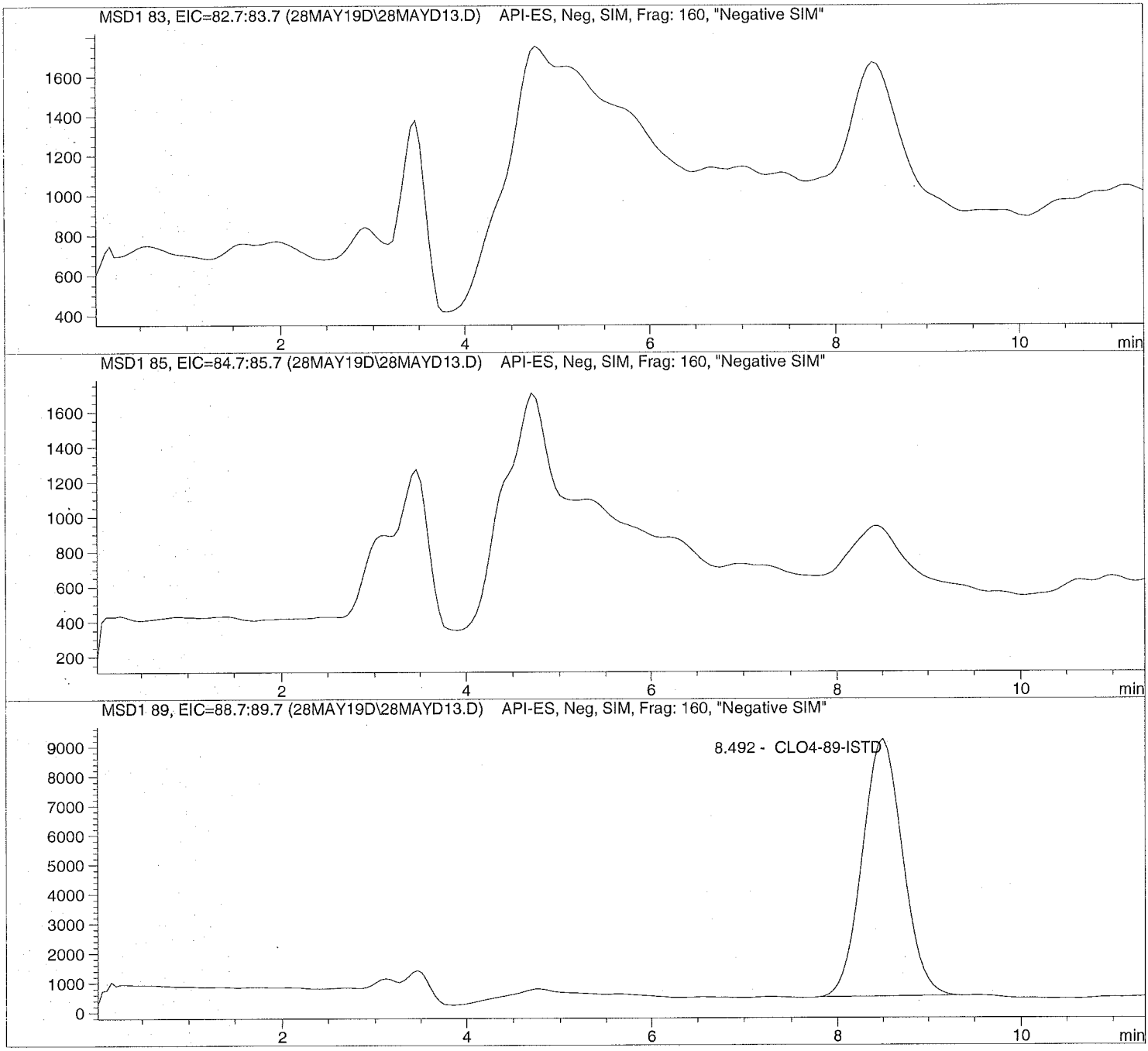
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD13.D Sample Name: 1914871001

Injection Date:	5/28/2019 12:08:42	Seq Line:	13
Sample Name:	1914871001	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD13.D Sample Name: 1914871001

Injection Date:	5/28/2019 12:08:42	Seq Line:	13
Sample Name:	1914871001	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.492	PBA	266978.1	5.0000	CLO4-89-ISTD

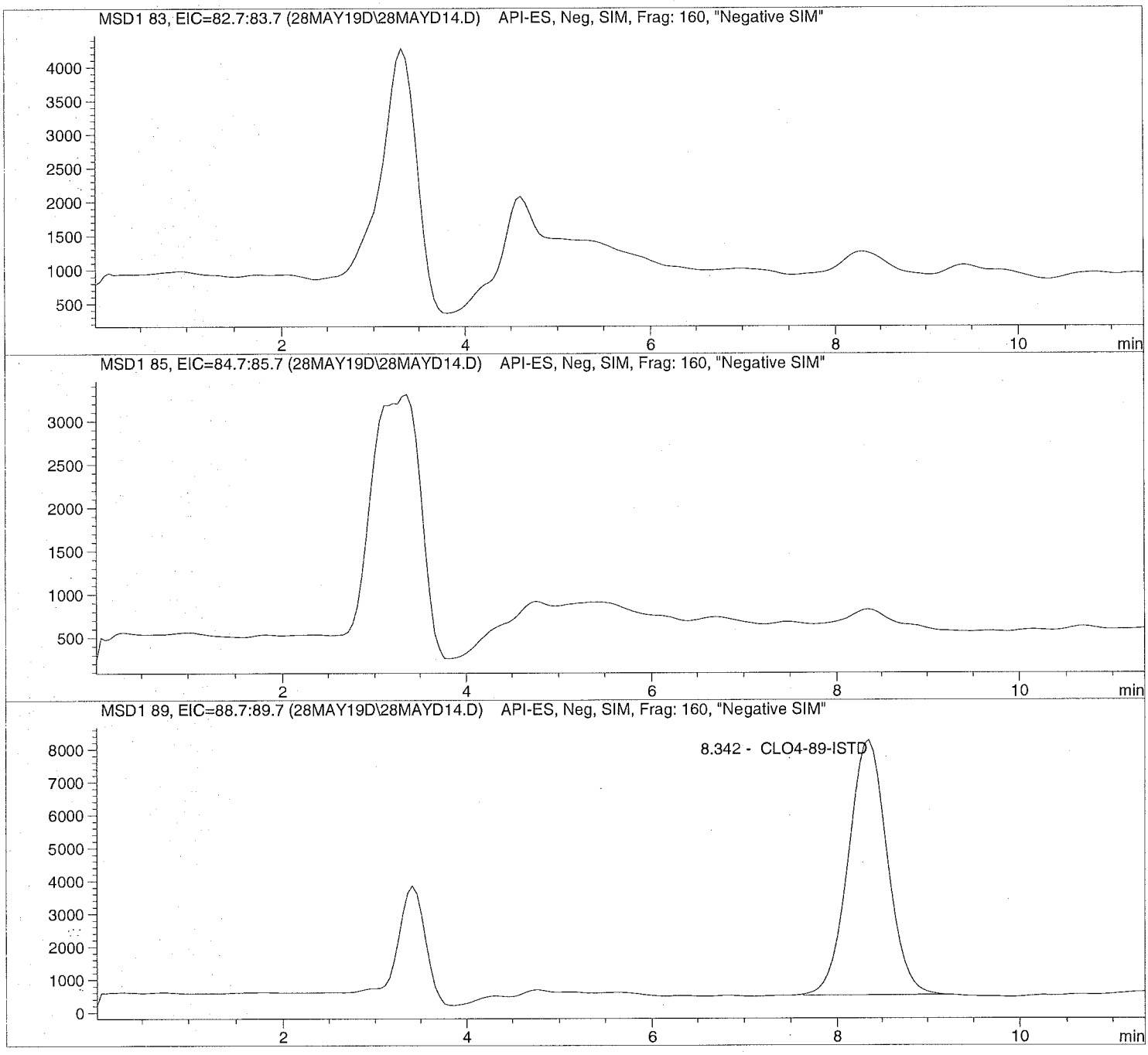
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD14.D Sample Name: 1915147001

Injection Date:	5/28/2019 12:22:08	Seq Line:	14
Sample Name:	1915147001	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD14.D Sample Name: 1915147001

Injection Date:	5/28/2019 12:22:08	Seq Line:	14
Sample Name:	1915147001	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.342	BBA	234476.0	5.0000	CLO4-89-ISTD

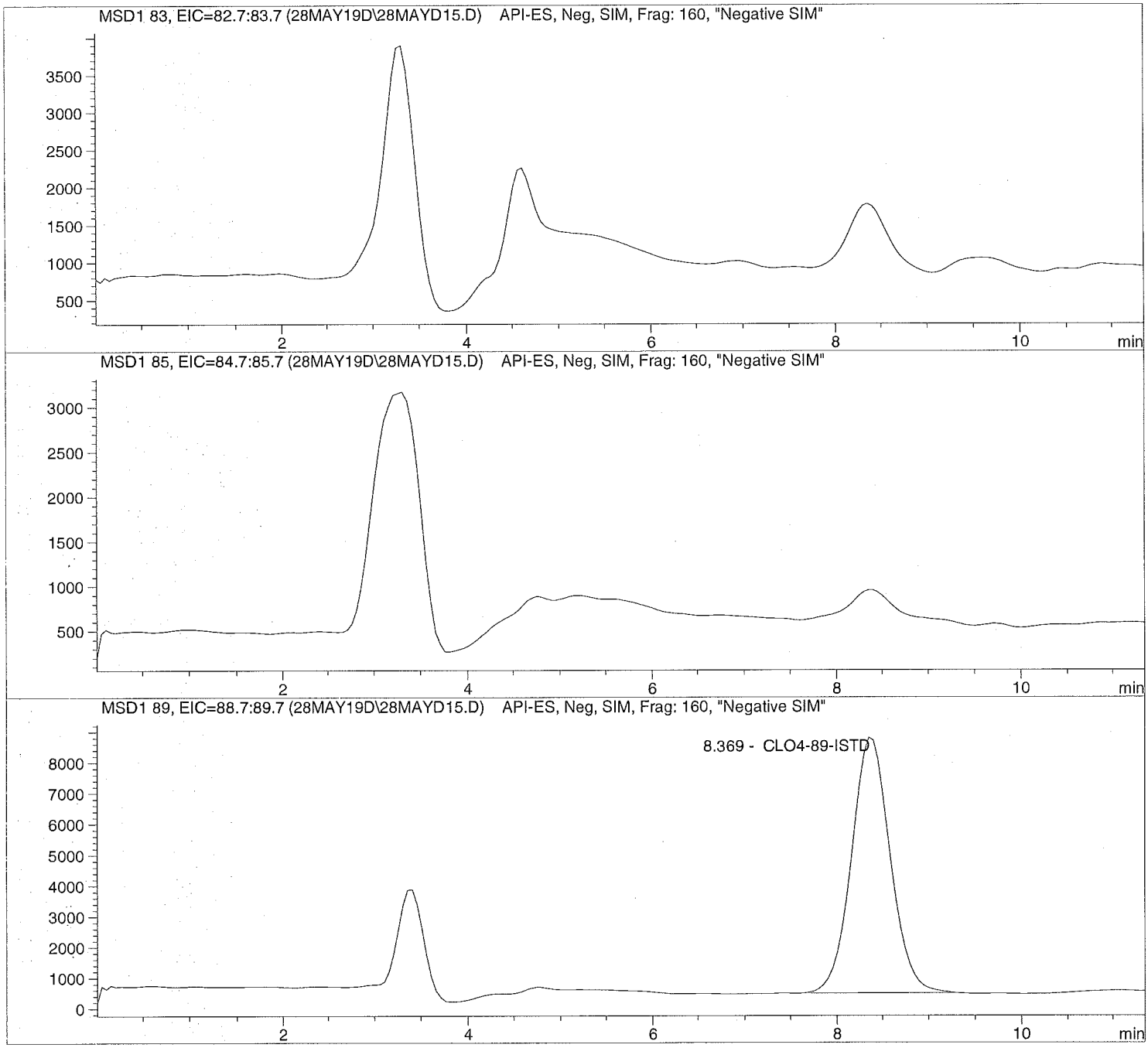
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD15.D Sample Name: 1915147002

Injection Date:	5/28/2019 12:35:29	Seq Line:	15
Sample Name:	1915147002	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD15.D Sample Name: 1915147002

Injection Date:	5/28/2019 12:35:29	Seq Line:	15
Sample Name:	1915147002	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.369	BBA	247415.5	5.0000	CLO4-89-ISTD

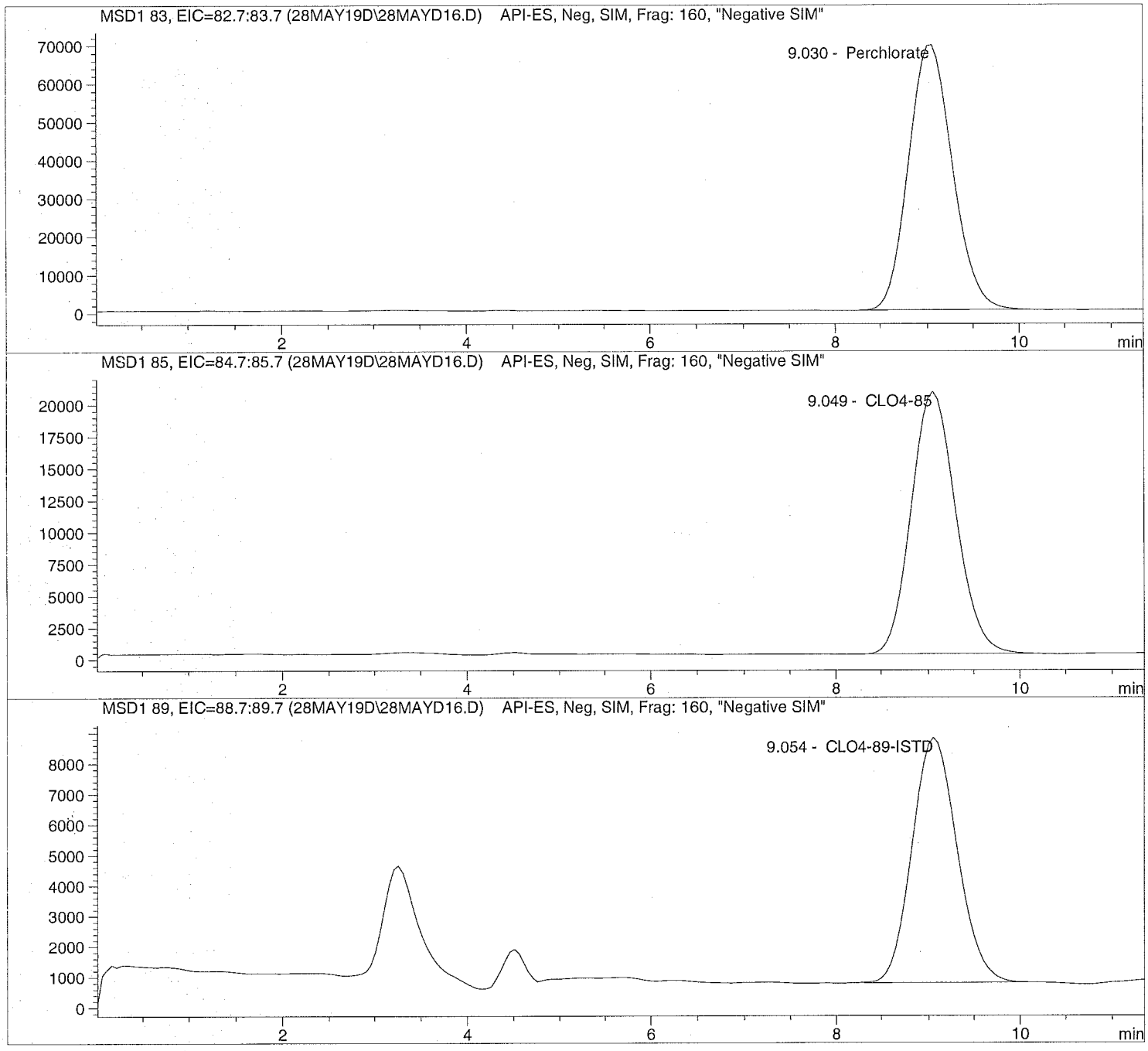
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD16.D Sample Name: 655033 CCV@25

Injection Date:	5/28/2019 13:28:26	Seq Line:	16
Sample Name:	655033 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	5/28/2019 13:28:26	Seq Line:	16
Sample Name:	655033 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.030	PBA	2263822.8	25.4454	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.049	PBA	682139.4	25.8138	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.054	BBA	270387.5	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

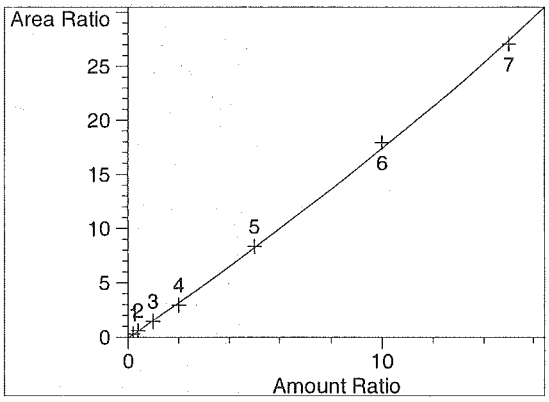
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

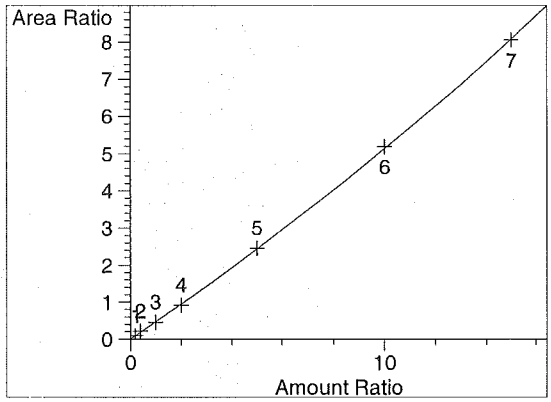
Peak Sum Table

No Entries in table

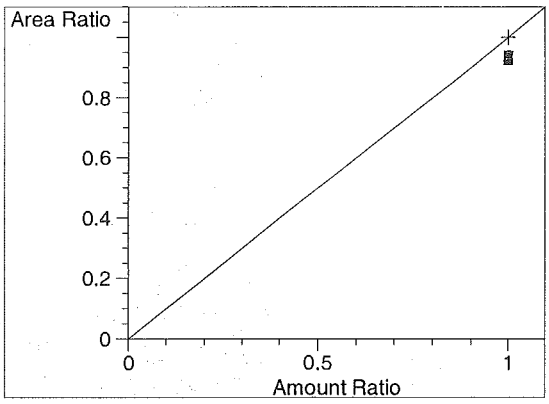
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

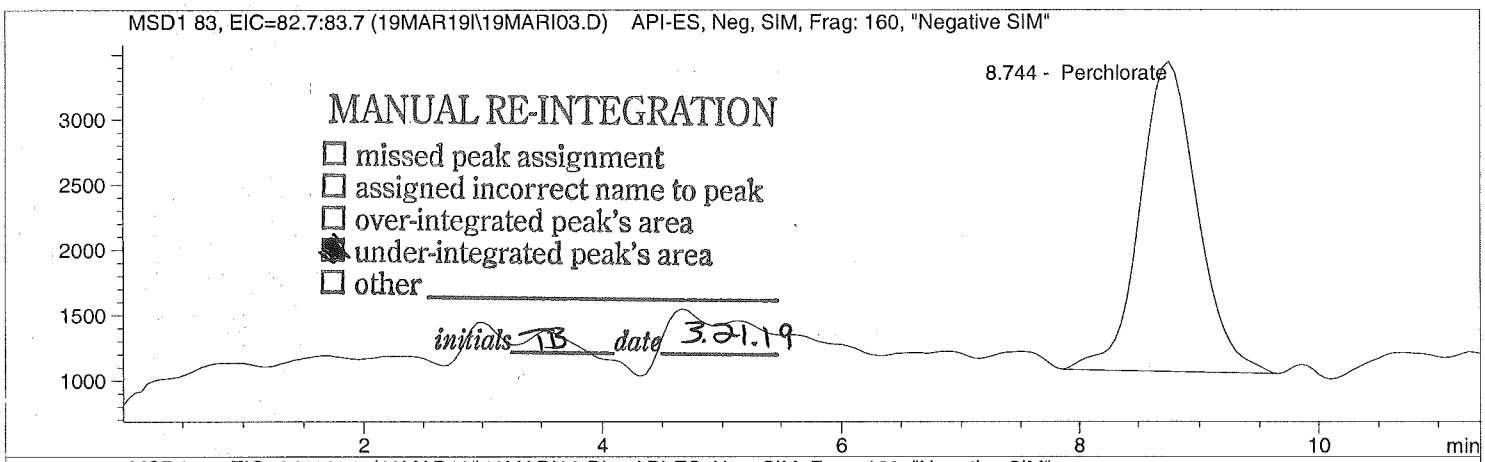
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

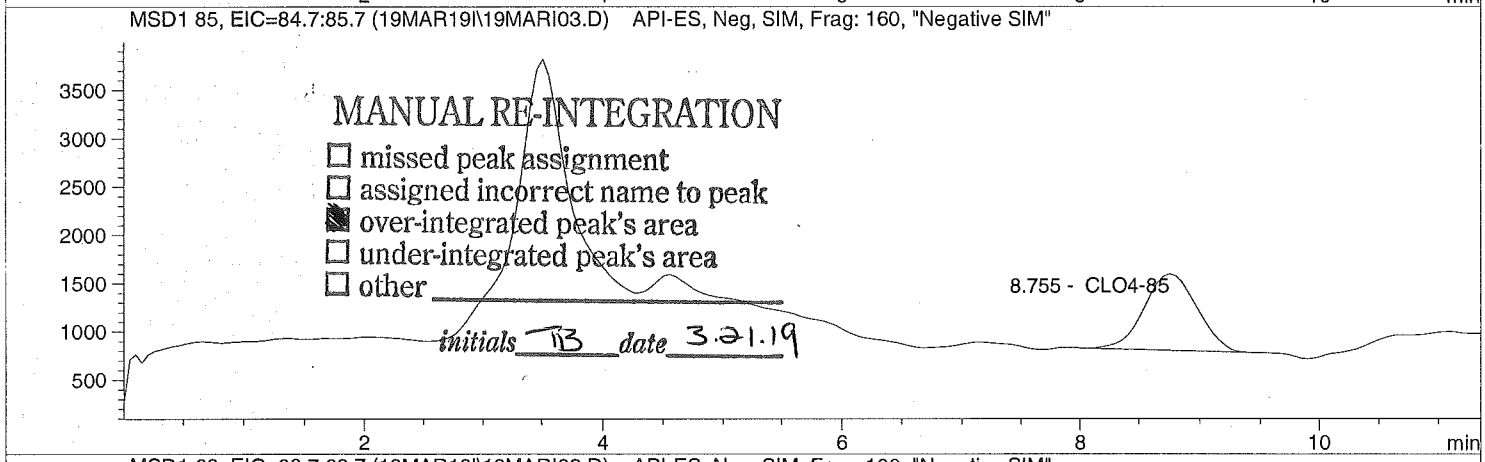
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

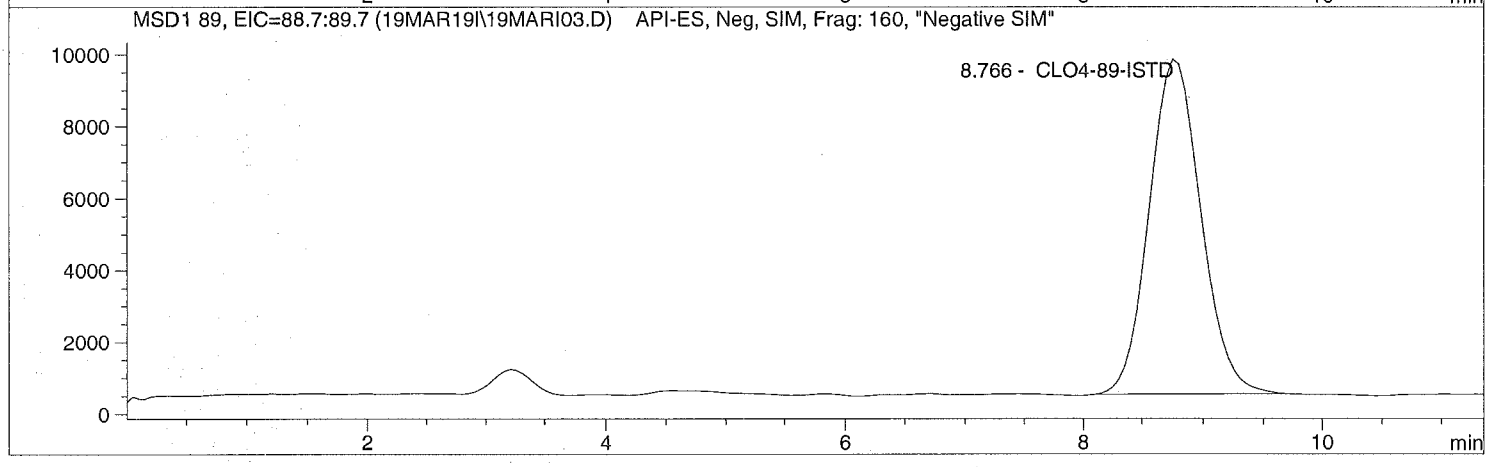
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

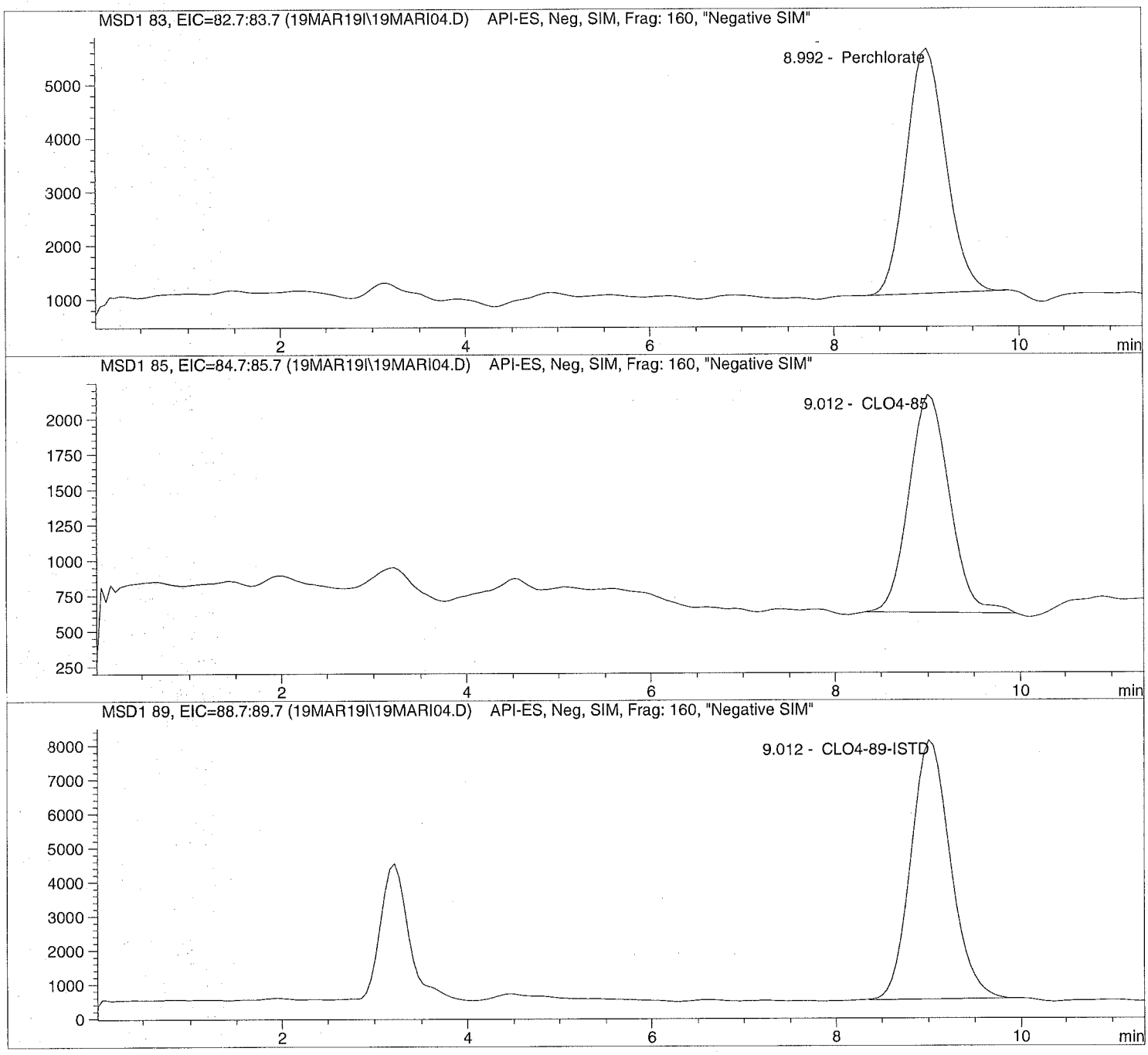
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

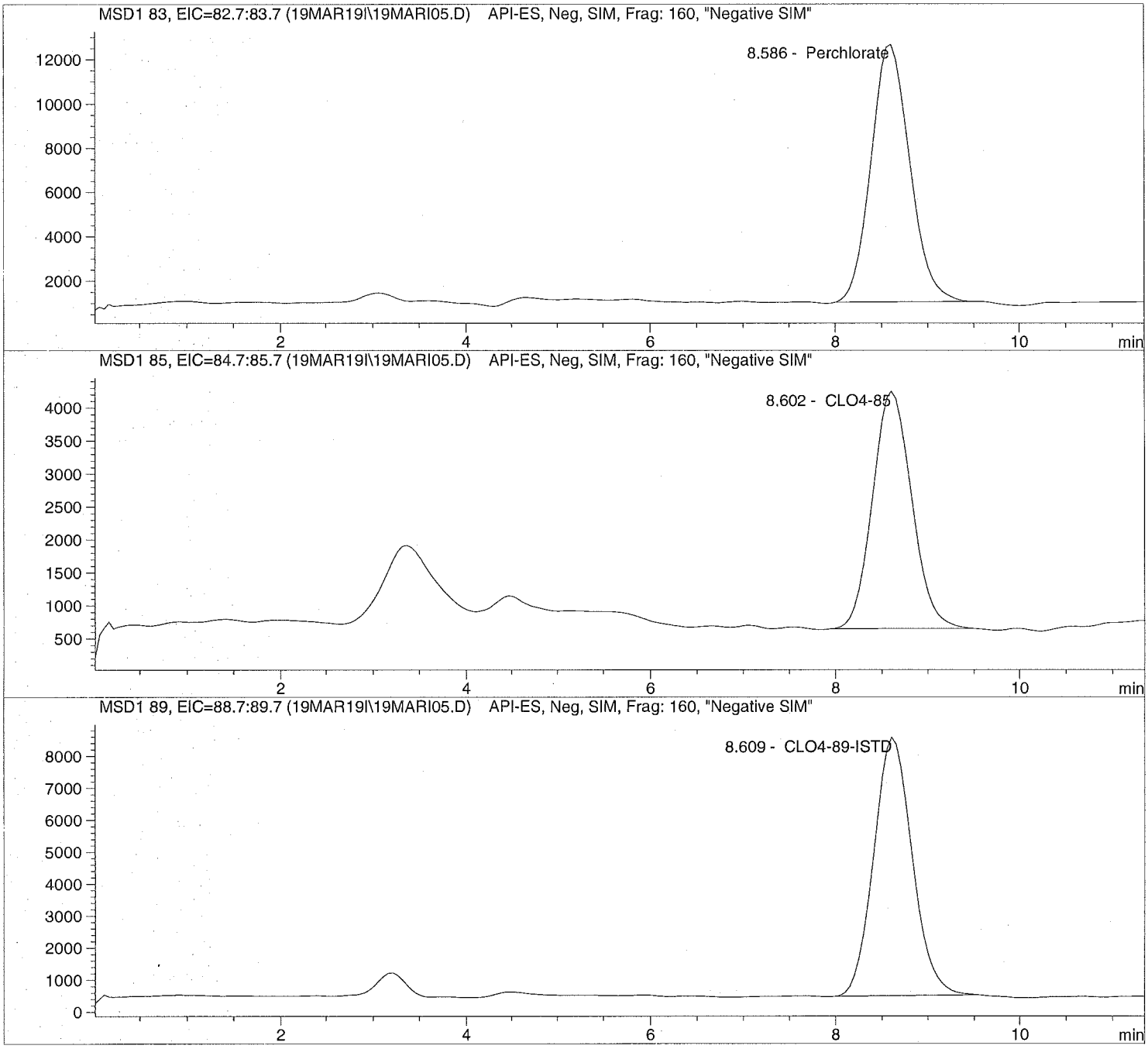
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

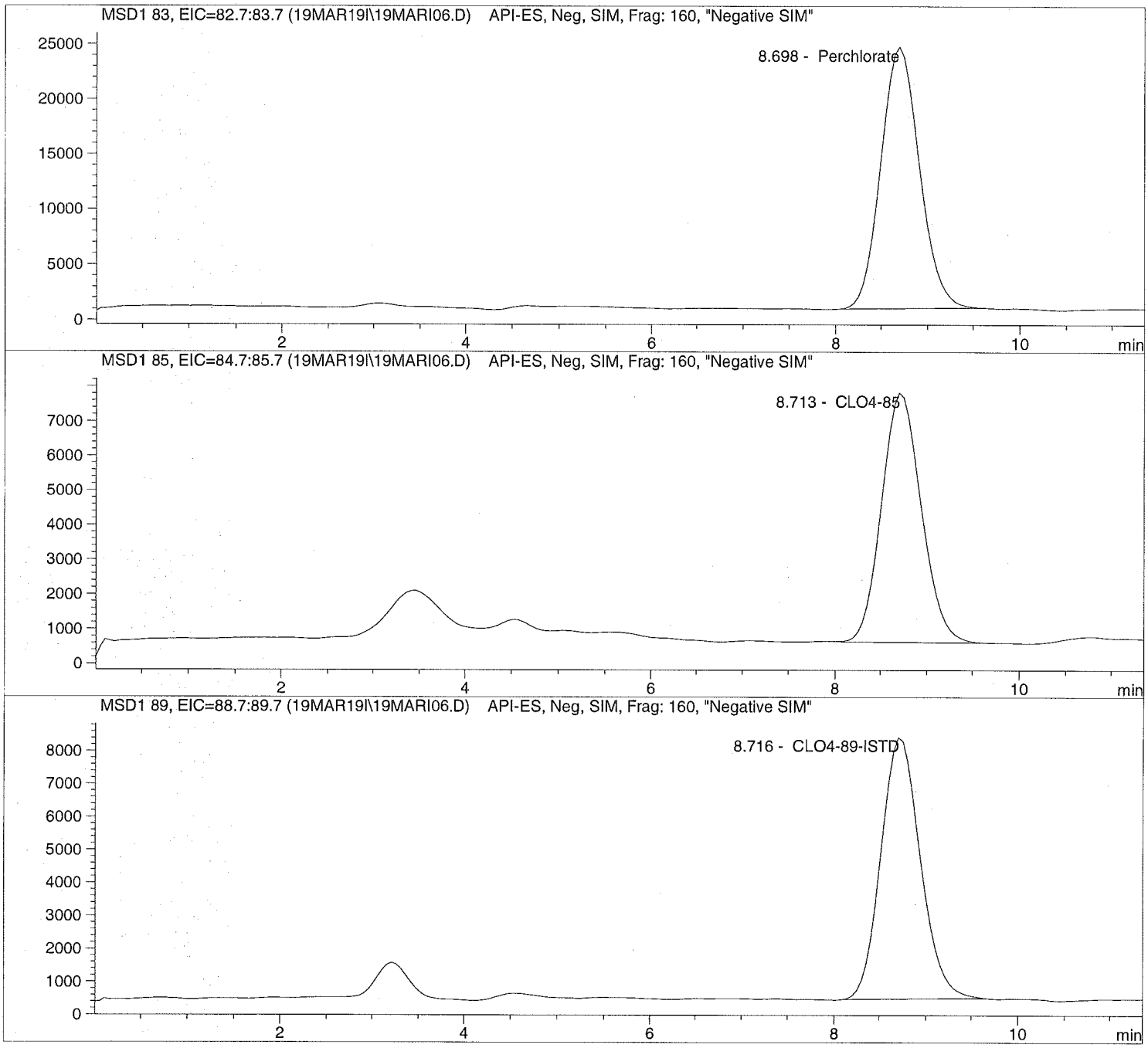
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

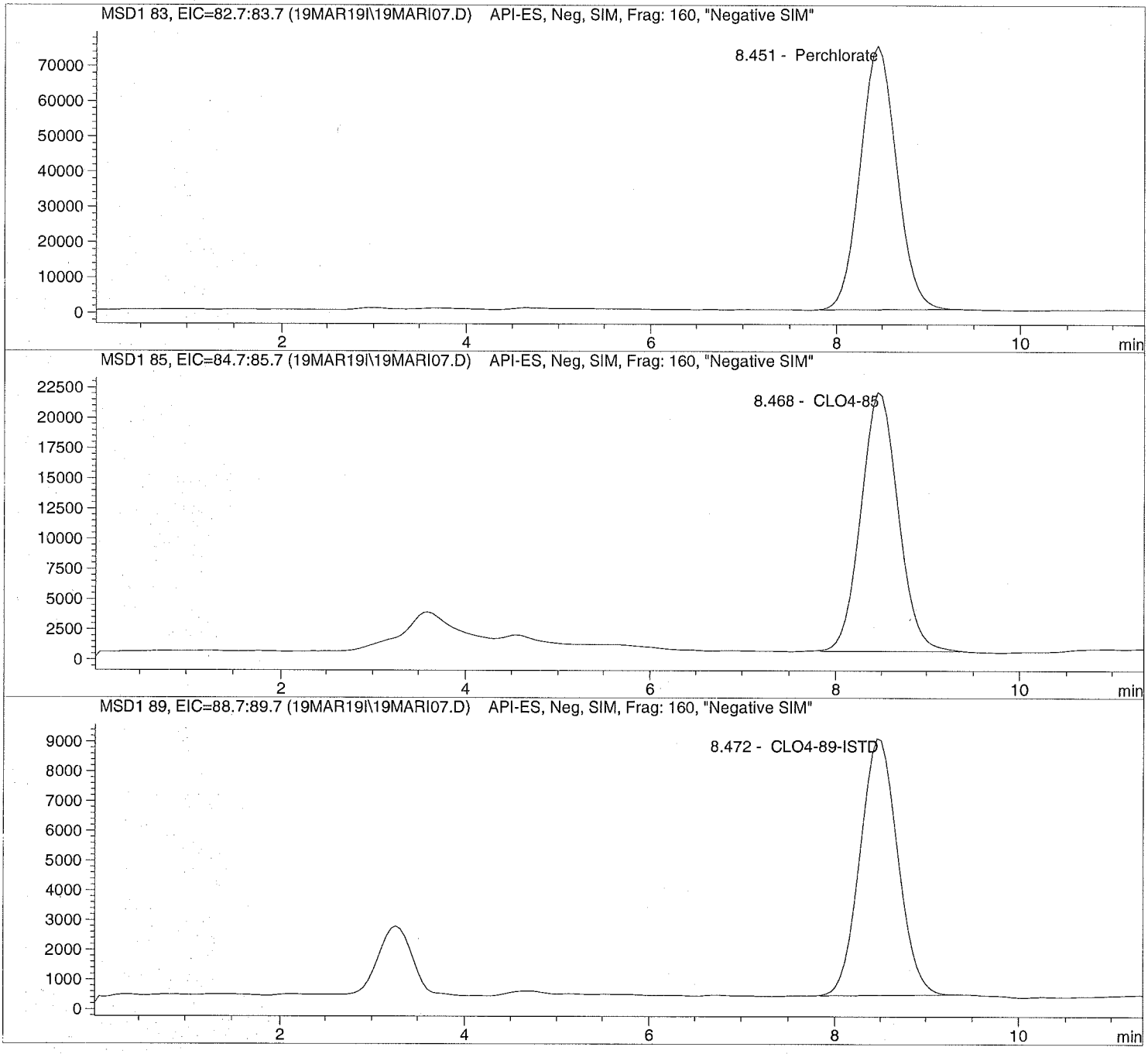
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

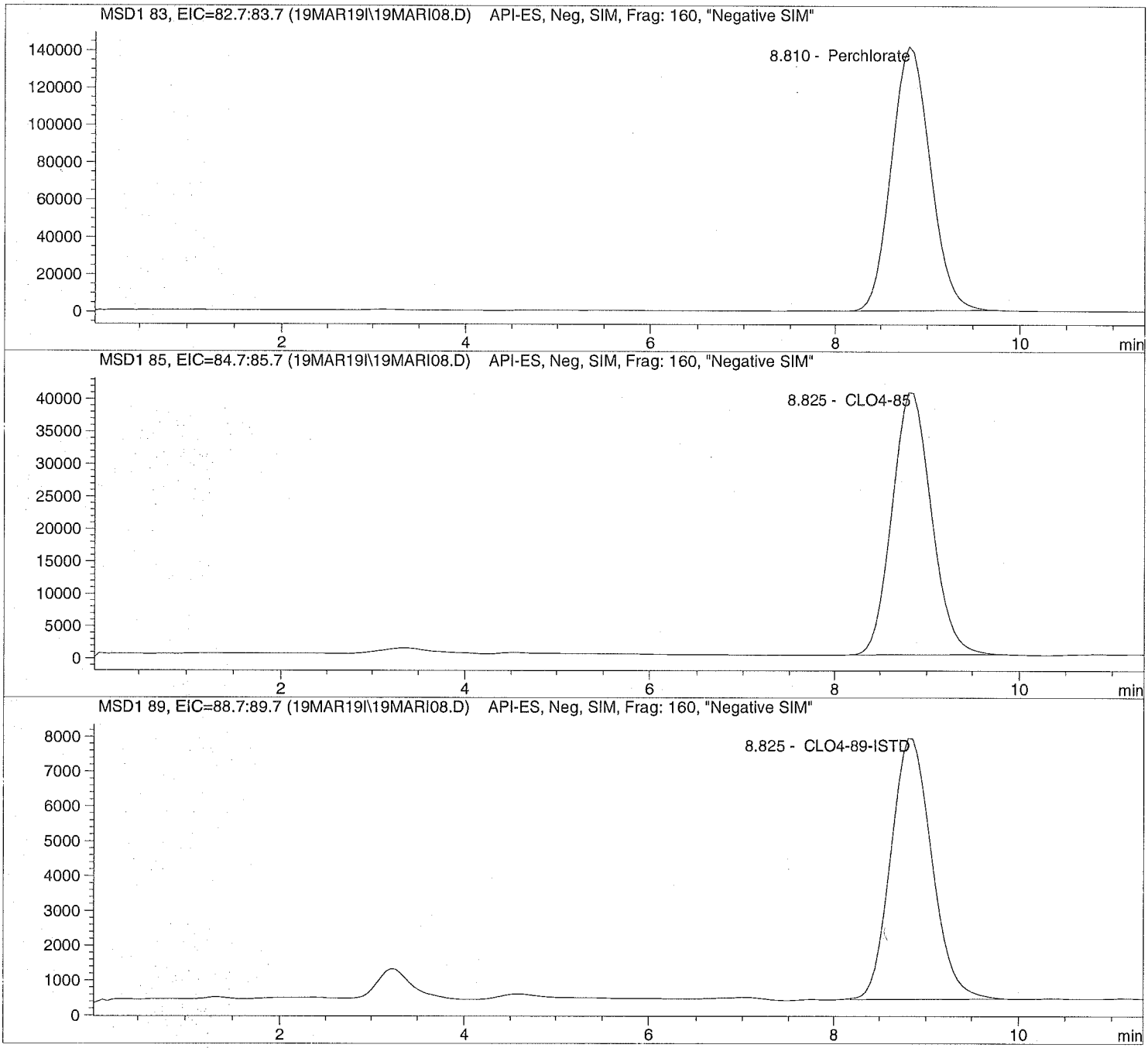
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

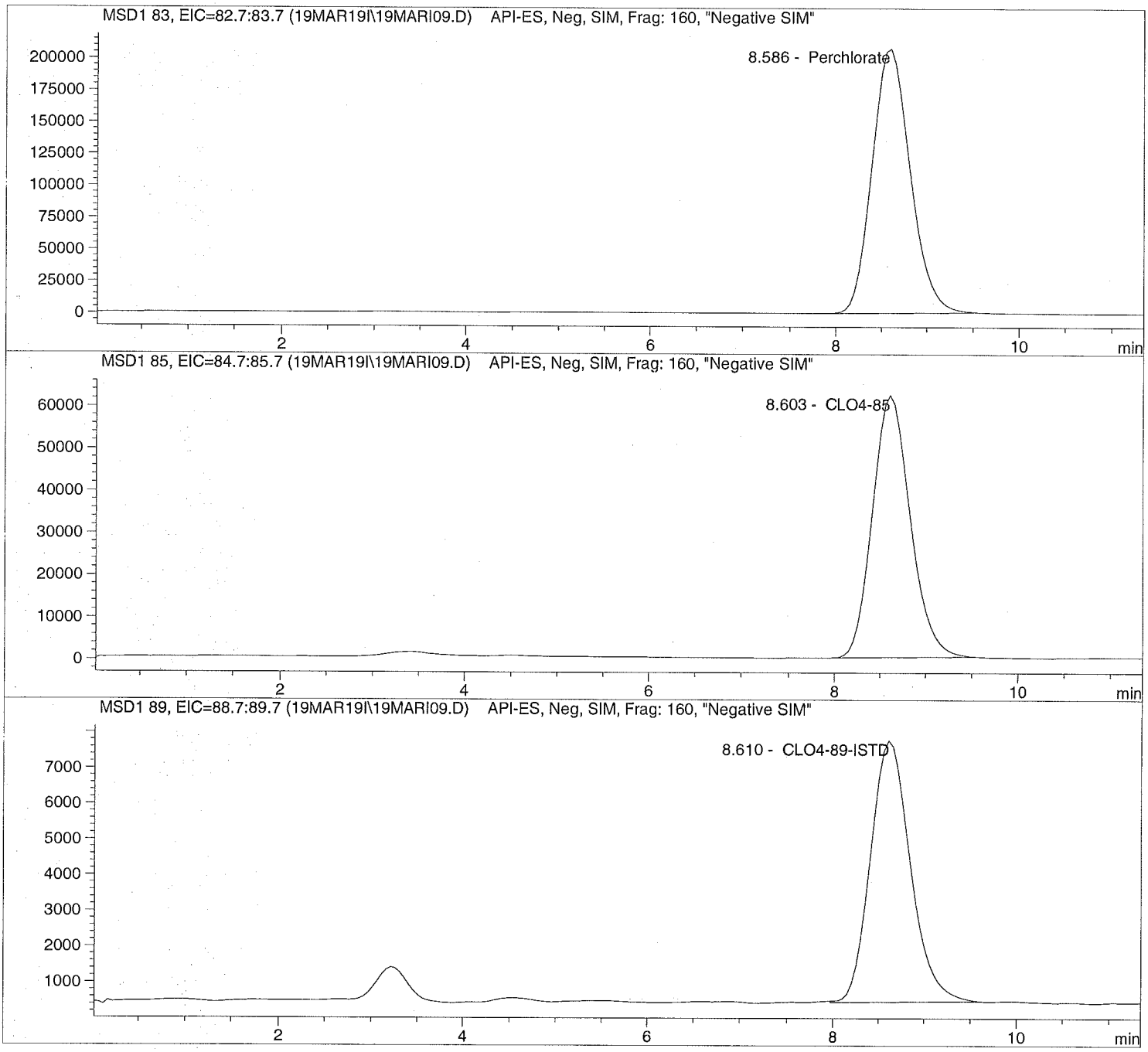
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

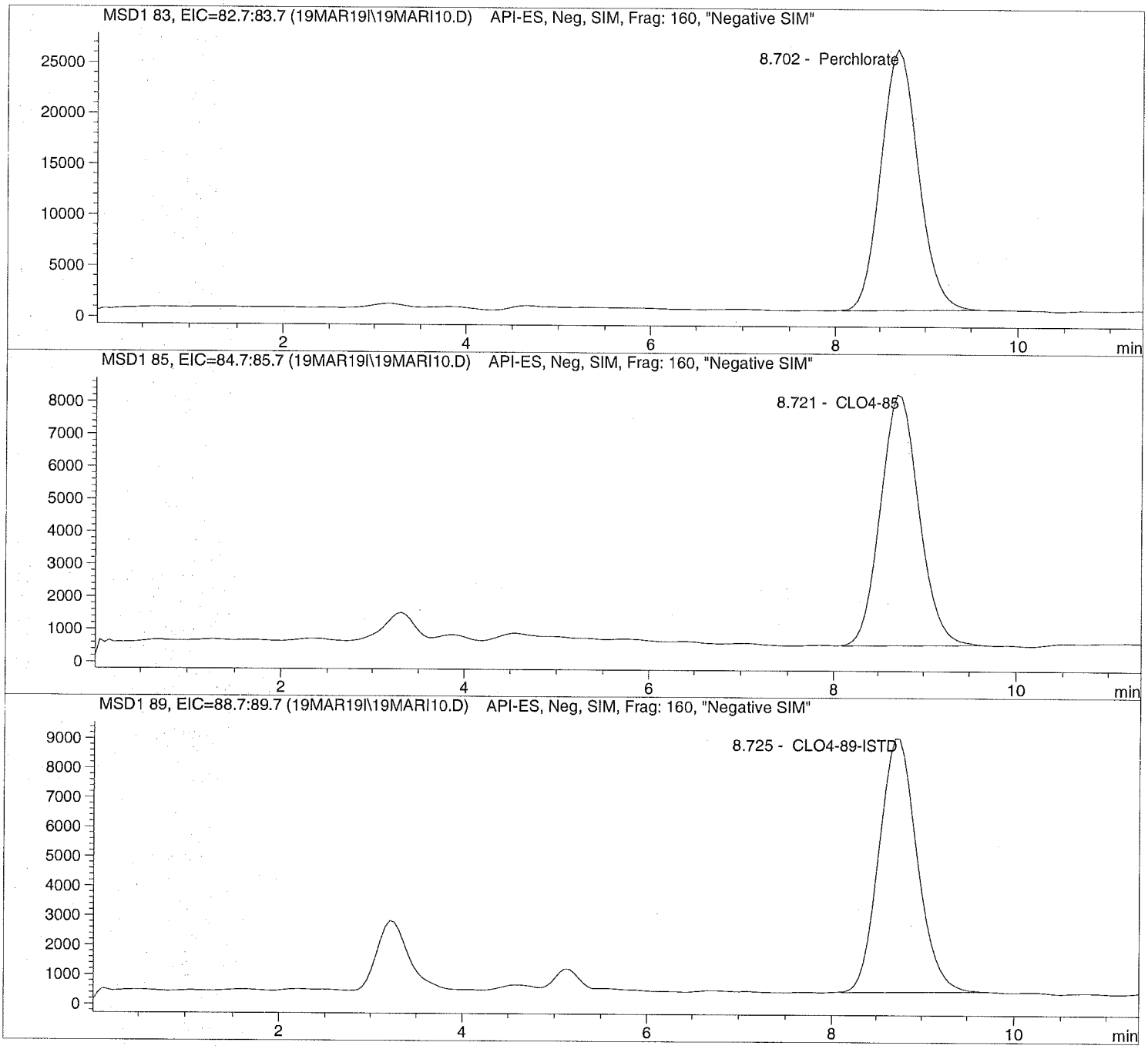
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L 00938482

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

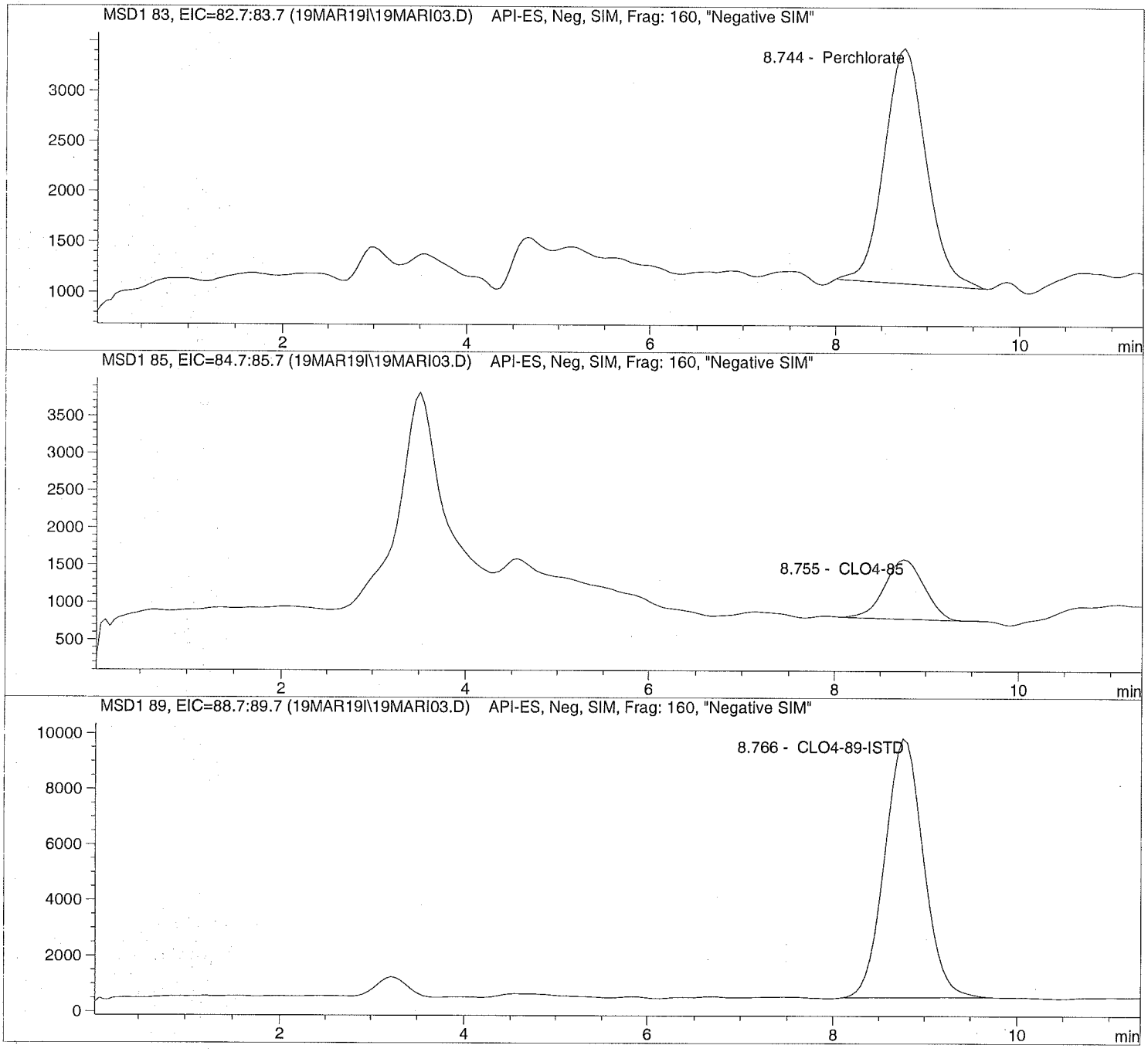
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Houston, US Date: 29-may-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19050920

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19050920-01	LH 18/24-SP650_051419	Water		14-May-2019 14:00	15-May-2019 09:13	☐
HS19050920-02	Trip Blank	Water	CG 040119 -193	14-May-2019 00:00	15-May-2019 09:13	☐

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19050920

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R339038

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E300

Batch ID: R339348

Sample ID: HS19051023-01MS

- MS and MSD are for an unrelated sample

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19050920
Sample ID: LH 18/24-SP650_051419 Lab ID:HS19050920-01
Collection Date: 14-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	23-May-2019 15:14
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 15:14
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	23-May-2019 15:14
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	23-May-2019 15:14
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	23-May-2019 15:14
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	23-May-2019 15:14
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 15:14
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 15:14
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	23-May-2019 15:14
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	23-May-2019 15:14
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 15:14
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	23-May-2019 15:14
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	23-May-2019 15:14
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 15:14
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 15:14
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 15:14
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	23-May-2019 15:14
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	23-May-2019 15:14
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: LH 18/24-SP650_051419
Collection Date: 14-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19050920
Lab ID:HS19050920-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
cis-1,2-Dichloroethene	**1.8**		**0.20**	**0.50**	**1.0**	**UG/L**	1	23-May-2019 15:14
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	23-May-2019 15:14
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	23-May-2019 15:14
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	23-May-2019 15:14
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	23-May-2019 15:14
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 15:14
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
Trichloroethene	**0.56**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	23-May-2019 15:14
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 15:14
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 15:14
Surr: 1,2-Dichloroethane-d4	*88.7*			**0**	*81-118*	*%REC*	*1*	*23-May-2019 15:14*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*23-May-2019 15:14*
Surr: Dibromofluoromethane	*90.2*			**0**	*80-119*	*%REC*	*1*	*23-May-2019 15:14*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*23-May-2019 15:14*
ANIONS BY E300.0		**Method:E300**						Analyst: KMU
Chloride	**231**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-May-2019 18:51
Sulfate	**24.1**		**2.00**	**5.00**	**5.00**	**mg/L**	10	28-May-2019 18:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 14-May-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19050920
Lab ID:HS19050920-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	23-May-2019 14:01
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 14:01
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	23-May-2019 14:01
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	23-May-2019 14:01
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	23-May-2019 14:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	23-May-2019 14:01
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 14:01
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 14:01
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	23-May-2019 14:01
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	23-May-2019 14:01
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 14:01
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	23-May-2019 14:01
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	23-May-2019 14:01
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 14:01
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 14:01
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 14:01
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	23-May-2019 14:01
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	23-May-2019 14:01
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 14-May-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19050920
Lab ID:HS19050920-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	23-May-2019 14:01
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	23-May-2019 14:01
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	23-May-2019 14:01
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	23-May-2019 14:01
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	23-May-2019 14:01
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	23-May-2019 14:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	23-May-2019 14:01
Surr: 1,2-Dichloroethane-d4	*85.6*			**0**	*81-118*	*%REC*	*1*	*23-May-2019 14:01*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*23-May-2019 14:01*
Surr: Dibromofluoromethane	*90.7*			**0**	*80-119*	*%REC*	*1*	*23-May-2019 14:01*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*23-May-2019 14:01*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19050920

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R339038	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19050920-01	LH 18/24-SP650_051419	14 May 2019 14:00			23 May 2019 15:14	1
HS19050920-02	Trip Blank	14 May 2019 00:00			23 May 2019 14:01	1
Batch ID R339348	**Test Name :** ANIONS BY E300.0			**Matrix:** Water		
HS19050920-01	LH 18/24-SP650_051419	14 May 2019 14:00			28 May 2019 18:51	10

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19050920

QC BATCH REPORT

Batch ID: R339038 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190523** Units: **UG/L** Analysis Date: **23-May-2019 13:37**
Client ID: Run ID: **VOA6_339038** SeqNo: **5088106** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19050920

QC BATCH REPORT

Batch ID: R339038 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190523** Units: **UG/L** Analysis Date: **23-May-2019 13:37**
Client ID: Run ID: **VOA6_339038** SeqNo: **5088106** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*42.31*	*1.0*	*50*	*0*	*84.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.85*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*44.45*	*1.0*	*50*	*0*	*88.9*	*80 - 119*				
Surr: Toluene-d8	*54.01*	*1.0*	*50*	*0*	*108*	*89 - 112*				

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19050920

QC BATCH REPORT

Batch ID: R339038 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190523** Units: **UG/L** Analysis Date: **23-May-2019 12:49**
Client ID: Run ID: **VOA6_339038** SeqNo: **5088105** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.5	1.0	20	0	97.5	78 - 124				
1,1,1-Trichloroethane	19.76	1.0	20	0	98.8	74 - 131				
1,1,2,2-Tetrachloroethane	21.3	1.0	20	0	107	71 - 121				
1,1,2-Trichloroethane	21.63	1.0	20	0	108	80 - 119				
1,1-Dichloroethane	21.15	1.0	20	0	106	77 - 125				
1,1-Dichloroethene	19.2	1.0	20	0	96.0	71 - 131				
1,1-Dichloropropene	19.25	1.0	20	0	96.3	78 - 125				
1,2,3-Trichlorobenzene	23.82	1.0	20	0	119	69 - 129				
1,2,3-Trichloropropane	20.72	1.0	20	0	104	73 - 122				
1,2,4-Trichlorobenzene	21.55	1.0	20	0	108	69 - 130				
1,2,4-Trimethylbenzene	20.1	1.0	20	0	101	76 - 124				
1,2-Dibromo-3-chloropropane	21.37	1.0	20	0	107	62 - 128				
1,2-Dibromoethane	20.6	1.0	20	0	103	77 - 121				
1,2-Dichlorobenzene	20.04	1.0	20	0	100	80 - 119				
1,2-Dichloroethane	19.59	1.0	20	0	97.9	73 - 128				
1,2-Dichloropropane	21.97	1.0	20	0	110	78 - 122				
1,3,5-Trimethylbenzene	20.04	1.0	20	0	100	75 - 124				
1,3-Dichlorobenzene	19.64	1.0	20	0	98.2	80 - 119				
1,3-Dichloropropane	21.54	1.0	20	0	108	80 - 119				
1,4-Dichlorobenzene	19.74	1.0	20	0	98.7	79 - 118				
2,2-Dichloropropane	20.16	1.0	20	0	101	60 - 139				
2-Butanone	47.43	2.0	40	0	119	56 - 143				
2-Chlorotoluene	20.07	1.0	20	0	100	79 - 122				
2-Hexanone	44.27	2.0	40	0	111	57 - 139				
4-Chlorotoluene	20.07	1.0	20	0	100	78 - 122				
4-Isopropyltoluene	19.32	1.0	20	0	96.6	77 - 127				
4-Methyl-2-pentanone	45.74	2.0	40	0	114	67 - 130				
Acetone	40.23	2.0	40	0	101	39 - 160				
Benzene	21.84	1.0	20	0	109	79 - 120				
Bromobenzene	19.73	1.0	20	0	98.6	80 - 120				
Bromochloromethane	21.37	1.0	20	0	107	78 - 123				
Bromodichloromethane	20.71	1.0	20	0	104	79 - 125				
Bromoform	20.06	1.0	20	0	100	66 - 130				
Bromomethane	21.23	1.0	20	0	106	53 - 141				

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19050920

QC BATCH REPORT

Batch ID: R339038 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190523** Units: **UG/L** Analysis Date: **23-May-2019 12:49**
Client ID: Run ID: **VOA6_339038** SeqNo: **5088105** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	46.74	2.0	40	0	117	64 - 133				
Carbon tetrachloride	17.45	1.0	20	0	87.2	72 - 136				
Chlorobenzene	20.98	1.0	20	0	105	82 - 118				
Chloroethane	19.26	1.0	20	0	96.3	60 - 138				
Chloroform	20.78	1.0	20	0	104	79 - 124				
Chloromethane	20.24	1.0	20	0	101	50 - 139				
cis-1,2-Dichloroethene	21.13	1.0	20	0	106	78 - 123				
cis-1,3-Dichloropropene	21.98	1.0	20	0	110	75 - 124				
Dibromochloromethane	19.61	1.0	20	0	98.1	74 - 126				
Dibromomethane	21.04	1.0	20	0	105	79 - 123				
Dichlorodifluoromethane	19.93	1.0	20	0	99.6	32 - 152				
Ethylbenzene	20.92	1.0	20	0	105	79 - 121				
Hexachlorobutadiene	19.44	1.0	20	0	97.2	66 - 134				
Isopropylbenzene	20.09	1.0	20	0	100	72 - 131				
m,p-Xylene	41.56	2.0	40	0	104	80 - 121				
Methylene chloride	22.29	2.0	20	0	111	74 - 124				
Naphthalene	22.91	1.0	20	0	115	61 - 128				
n-Butylbenzene	19.72	1.0	20	0	98.6	75 - 128				
n-Propylbenzene	19.52	1.0	20	0	97.6	76 - 126				
o-Xylene	21.13	1.0	20	0	106	78 - 122				
sec-Butylbenzene	19.19	1.0	20	0	95.9	77 - 126				
Styrene	21.17	1.0	20	0	106	78 - 123				
tert-Butylbenzene	19.28	1.0	20	0	96.4	78 - 124				
Tetrachloroethene	19.19	1.0	20	0	96.0	74 - 129				
Toluene	20.92	1.0	20	0	105	80 - 121				
trans-1,2-Dichloroethene	21.16	1.0	20	0	106	75 - 124				
trans-1,3-Dichloropropene	21.68	1.0	20	0	108	73 - 127				
Trichloroethene	20.35	1.0	20	0	102	79 - 123				
Trichlorofluoromethane	17.92	1.0	20	0	89.6	65 - 141				
Vinyl chloride	20.25	1.0	20	0	101	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.78*	*1.0*	*50*	*0*	*95.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*54.28*	*1.0*	*50*	*0*	*109*	*85 - 114*				
Surr: Dibromofluoromethane	*49.4*	*1.0*	*50*	*0*	*98.8*	*80 - 119*				
Surr: Toluene-d8	*46.25*	*1.0*	*50*	*0*	*92.5*	*89 - 112*				

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19050920

QC BATCH REPORT

Batch ID: R339038 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19051208-01MS** Units: **UG/L** Analysis Date: **23-May-2019 16:50**
Client ID: Run ID: **VOA6_339038** SeqNo: **5089895** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.41	1.0	20	0	87.0	78 - 124				
1,1,1-Trichloroethane	16.6	1.0	20	0	83.0	74 - 131				
1,1,2,2-Tetrachloroethane	21.34	1.0	20	0	107	71 - 121				
1,1,2-Trichloroethane	19.36	1.0	20	0	96.8	80 - 119				
1,1-Dichloroethane	16.85	1.0	20	0	84.2	77 - 125				
1,1-Dichloroethene	15.97	1.0	20	0	79.8	71 - 131				
1,1-Dichloropropene	18.18	1.0	20	0	90.9	78 - 125				
1,2,3-Trichlorobenzene	23.28	1.0	20	0	116	69 - 129				
1,2,3-Trichloropropane	20.1	1.0	20	0	100	73 - 122				
1,2,4-Trichlorobenzene	20.86	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	19.56	1.0	20	0	97.8	76 - 124				
1,2-Dibromo-3-chloropropane	21.49	1.0	20	0	107	62 - 128				
1,2-Dibromoethane	18.38	1.0	20	0	91.9	77 - 121				
1,2-Dichlorobenzene	19.44	1.0	20	0	97.2	80 - 119				
1,2-Dichloroethane	15.78	1.0	20	0	78.9	73 - 128				
1,2-Dichloropropane	18.44	1.0	20	0	92.2	78 - 122				
1,3,5-Trimethylbenzene	20.39	1.0	20	0	102	75 - 124				
1,3-Dichlorobenzene	19.4	1.0	20	0	97.0	80 - 119				
1,3-Dichloropropane	19.16	1.0	20	0	95.8	80 - 119				
1,4-Dichlorobenzene	19.2	1.0	20	0	96.0	79 - 118				
2,2-Dichloropropane	15.29	1.0	20	0	76.4	60 - 139				
2-Butanone	39.69	2.0	40	0	99.2	56 - 143				
2-Chlorotoluene	20.32	1.0	20	0	102	79 - 122				
2-Hexanone	40.16	2.0	40	0	100	57 - 139				
4-Chlorotoluene	19.95	1.0	20	0	99.7	78 - 122				
4-Isopropyltoluene	20.56	1.0	20	0	103	77 - 127				
4-Methyl-2-pentanone	42.86	2.0	40	0	107	67 - 130				
Acetone	39.28	2.0	40	11.37	69.8	39 - 160				
Benzene	18.07	1.0	20	0	90.3	79 - 120				
Bromobenzene	18.37	1.0	20	0	91.9	80 - 120				
Bromochloromethane	16.33	1.0	20	0	81.6	78 - 123				
Bromodichloromethane	16.47	1.0	20	0	82.3	79 - 125				
Bromoform	17.35	1.0	20	0	86.7	66 - 130				
Bromomethane	12.22	1.0	20	0	61.1	53 - 141				

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19050920

QC BATCH REPORT

Batch ID: R339038 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19051208-01MS** Units: **UG/L** Analysis Date: **23-May-2019 16:50**
Client ID: Run ID: **VOA6_339038** SeqNo: **5089895** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.81	2.0	40	0	89.5	64 - 133				
Carbon tetrachloride	15.71	1.0	20	0	78.5	72 - 136				
Chlorobenzene	18.87	1.0	20	0	94.3	82 - 118				
Chloroethane	17.53	1.0	20	0	87.6	60 - 138				
Chloroform	16.52	1.0	20	0	82.6	79 - 124				
Chloromethane	13.72	1.0	20	0	68.6	50 - 139				
cis-1,2-Dichloroethene	16.51	1.0	20	0	82.5	78 - 123				
cis-1,3-Dichloropropene	18.33	1.0	20	0	91.7	75 - 124				
Dibromochloromethane	17.38	1.0	20	0	86.9	74 - 126				
Dibromomethane	17.16	1.0	20	0	85.8	79 - 123				
Dichlorodifluoromethane	13.55	1.0	20	0	67.8	32 - 152				
Ethylbenzene	18.69	1.0	20	0	93.5	79 - 121				
Hexachlorobutadiene	19.72	1.0	20	0	98.6	66 - 134				
Isopropylbenzene	18.9	1.0	20	0	94.5	72 - 131				
m,p-Xylene	38.27	2.0	40	0	95.7	80 - 121				
Methylene chloride	17.13	2.0	20	0	85.7	74 - 124				
Naphthalene	22.01	1.0	20	0	110	61 - 128				
n-Butylbenzene	20.9	1.0	20	0	105	75 - 128				
n-Propylbenzene	20.99	1.0	20	0	105	76 - 126				
o-Xylene	19.56	1.0	20	0	97.8	78 - 122				
sec-Butylbenzene	21.38	1.0	20	0	107	77 - 126				
Styrene	18.43	1.0	20	0	92.1	78 - 123				
tert-Butylbenzene	20.87	1.0	20	0	104	78 - 124				
Tetrachloroethene	18.44	1.0	20	0	92.2	74 - 129				
Toluene	18.8	1.0	20	0	94.0	80 - 121				
trans-1,2-Dichloroethene	17.02	1.0	20	0	85.1	75 - 124				
trans-1,3-Dichloropropene	17.36	1.0	20	0	86.8	73 - 127				
Trichloroethene	17.35	1.0	20	0	86.8	79 - 123				
Trichlorofluoromethane	14.65	1.0	20	0	73.2	65 - 141				
Vinyl chloride	16.4	1.0	20	0	82.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.37*	*1.0*	*50*	*0*	*90.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.21*	*1.0*	*50*	*0*	*104*	*85 - 114*				
Surr: Dibromofluoromethane	*45.51*	*1.0*	*50*	*0*	*91.0*	*80 - 119*				
Surr: Toluene-d8	*53.95*	*1.0*	*50*	*0*	*108*	*89 - 112*				

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19050920

QC BATCH REPORT

Batch ID: R339038 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19051208-01MSD** Units: **UG/L** Analysis Date: **23-May-2019 17:14**
Client ID: Run ID: **VOA6_339038** SeqNo: **5089896** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	16.8	1.0	20	0	84.0	78 - 124	17.41	3.56	20	
1,1,1-Trichloroethane	16.03	1.0	20	0	80.1	74 - 131	16.6	3.52	20	
1,1,2,2-Tetrachloroethane	21.34	1.0	20	0	107	71 - 121	21.34	0	20	
1,1,2-Trichloroethane	18.78	1.0	20	0	93.9	80 - 119	19.36	3.01	20	
1,1-Dichloroethane	17.15	1.0	20	0	85.8	77 - 125	16.85	1.77	20	
1,1-Dichloroethene	15.44	1.0	20	0	77.2	71 - 131	15.97	3.35	20	
1,1-Dichloropropene	17.44	1.0	20	0	87.2	78 - 125	18.18	4.2	20	
1,2,3-Trichlorobenzene	23.29	1.0	20	0	116	69 - 129	23.28	0.0635	20	
1,2,3-Trichloropropane	20.35	1.0	20	0	102	73 - 122	20.1	1.24	20	
1,2,4-Trichlorobenzene	21.11	1.0	20	0	106	69 - 130	20.86	1.2	20	
1,2,4-Trimethylbenzene	19.32	1.0	20	0	96.6	76 - 124	19.56	1.24	20	
1,2-Dibromo-3-chloropropane	21.51	1.0	20	0	108	62 - 128	21.49	0.124	20	
1,2-Dibromoethane	18.04	1.0	20	0	90.2	77 - 121	18.38	1.89	20	
1,2-Dichlorobenzene	19.66	1.0	20	0	98.3	80 - 119	19.44	1.11	20	
1,2-Dichloroethane	15.95	1.0	20	0	79.8	73 - 128	15.78	1.05	20	
1,2-Dichloropropane	18.62	1.0	20	0	93.1	78 - 122	18.44	0.948	20	
1,3,5-Trimethylbenzene	20.28	1.0	20	0	101	75 - 124	20.39	0.566	20	
1,3-Dichlorobenzene	19.51	1.0	20	0	97.5	80 - 119	19.4	0.524	20	
1,3-Dichloropropane	18.59	1.0	20	0	92.9	80 - 119	19.16	3	20	
1,4-Dichlorobenzene	19.48	1.0	20	0	97.4	79 - 118	19.2	1.4	20	
2,2-Dichloropropane	14.72	1.0	20	0	73.6	60 - 139	15.29	3.77	20	
2-Butanone	40.95	2.0	40	0	102	56 - 143	39.69	3.13	20	
2-Chlorotoluene	20.12	1.0	20	0	101	79 - 122	20.32	0.972	20	
2-Hexanone	39.44	2.0	40	0	98.6	57 - 139	40.16	1.82	20	
4-Chlorotoluene	19.85	1.0	20	0	99.2	78 - 122	19.95	0.499	20	
4-Isopropyltoluene	20.77	1.0	20	0	104	77 - 127	20.56	1.02	20	
4-Methyl-2-pentanone	40.5	2.0	40	0	101	67 - 130	42.86	5.67	20	
Acetone	39.93	2.0	40	11.37	71.4	39 - 160	39.28	1.64	20	
Benzene	17.64	1.0	20	0	88.2	79 - 120	18.07	2.41	20	
Bromobenzene	18.22	1.0	20	0	91.1	80 - 120	18.37	0.842	20	
Bromochloromethane	16.23	1.0	20	0	81.2	78 - 123	16.33	0.571	20	
Bromodichloromethane	16.33	1.0	20	0	81.6	79 - 125	16.47	0.839	20	
Bromoform	17.2	1.0	20	0	86.0	66 - 130	17.35	0.86	20	
Bromomethane	12.23	1.0	20	0	61.2	53 - 141	12.22	0.114	20	

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19050920

QC BATCH REPORT

Batch ID: R339038 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19051208-01MSD** Units: **UG/L** Analysis Date: **23-May-2019 17:14**
Client ID: Run ID: **VOA6_339038** SeqNo: **5089896** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.7	2.0	40	0	86.8	64 - 133	35.81	3.14	20	
Carbon tetrachloride	15.13	1.0	20	0	75.7	72 - 136	15.71	3.74	20	
Chlorobenzene	18.16	1.0	20	0	90.8	82 - 118	18.87	3.83	20	
Chloroethane	17.12	1.0	20	0	85.6	60 - 138	17.53	2.37	20	
Chloroform	15.97	1.0	20	0	79.9	79 - 124	16.52	3.38	20	
Chloromethane	13.76	1.0	20	0	68.8	50 - 139	13.72	0.288	20	
cis-1,2-Dichloroethene	16.39	1.0	20	0	81.9	78 - 123	16.51	0.729	20	
cis-1,3-Dichloropropene	18.11	1.0	20	0	90.5	75 - 124	18.33	1.24	20	
Dibromochloromethane	17.15	1.0	20	0	85.8	74 - 126	17.38	1.3	20	
Dibromomethane	16.89	1.0	20	0	84.5	79 - 123	17.16	1.6	20	
Dichlorodifluoromethane	12.94	1.0	20	0	64.7	32 - 152	13.55	4.6	20	
Ethylbenzene	17.94	1.0	20	0	89.7	79 - 121	18.69	4.1	20	
Hexachlorobutadiene	19.72	1.0	20	0	98.6	66 - 134	19.72	0.0309	20	
Isopropylbenzene	18.21	1.0	20	0	91.1	72 - 131	18.9	3.72	20	
m,p-Xylene	36.7	2.0	40	0	91.7	80 - 121	38.27	4.18	20	
Methylene chloride	17.09	2.0	20	0	85.5	74 - 124	17.13	0.219	20	
Naphthalene	22.06	1.0	20	0	110	61 - 128	22.01	0.222	20	
n-Butylbenzene	20.89	1.0	20	0	104	75 - 128	20.9	0.0898	20	
n-Propylbenzene	20.77	1.0	20	0	104	76 - 126	20.99	1.07	20	
o-Xylene	18.77	1.0	20	0	93.8	78 - 122	19.56	4.12	20	
sec-Butylbenzene	20.91	1.0	20	0	105	77 - 126	21.38	2.21	20	
Styrene	17.89	1.0	20	0	89.4	78 - 123	18.43	2.97	20	
tert-Butylbenzene	20.7	1.0	20	0	104	78 - 124	20.87	0.801	20	
Tetrachloroethene	17.55	1.0	20	0	87.7	74 - 129	18.44	4.96	20	
Toluene	17.95	1.0	20	0	89.7	80 - 121	18.8	4.63	20	
trans-1,2-Dichloroethene	16.97	1.0	20	0	84.9	75 - 124	17.02	0.302	20	
trans-1,3-Dichloropropene	16.91	1.0	20	0	84.6	73 - 127	17.36	2.62	20	
Trichloroethene	17.05	1.0	20	0	85.3	79 - 123	17.35	1.74	20	
Trichlorofluoromethane	14.24	1.0	20	0	71.2	65 - 141	14.65	2.79	20	
Vinyl chloride	16.01	1.0	20	0	80.0	58 - 137	16.4	2.43	20	
Surr: 1,2-Dichloroethane-d4	*43.38*	*1.0*	*50*	*0*	*86.8*	*81 - 118*	*45.37*	*4.48*	*20*	
Surr: 4-Bromofluorobenzene	*51.71*	*1.0*	*50*	*0*	*103*	*85 - 114*	*52.21*	*0.97*	*20*	
Surr: Dibromofluoromethane	*45.46*	*1.0*	*50*	*0*	*90.9*	*80 - 119*	*45.51*	*0.114*	*20*	
Surr: Toluene-d8	*53.15*	*1.0*	*50*	*0*	*106*	*89 - 112*	*53.95*	*1.49*	*20*	

ALS Houston, US Date: 29-May-19

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP 18 24
WorkOrder:	HS19050920

QC BATCH REPORT

Batch ID:	**R339038 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19050920-01 HS19050920-02

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19050920

QC BATCH REPORT

Batch ID: R339348 (0) **Instrument: ICS2100** **Method: ANIONS BY E300.0**

MBLK Sample ID: **WBLKW1-052819** Units: **mg/L** Analysis Date: **28-May-2019 11:52**
Client ID: Run ID: **ICS2100_339348** SeqNo: **5096228** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-052819** Units: **mg/L** Analysis Date: **28-May-2019 12:14**
Client ID: Run ID: **ICS2100_339348** SeqNo: **5096229** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.74	0.500	20	0	98.7	90 - 110				
Sulfate	19.67	0.500	20	0	98.3	90 - 110				

LCSD Sample ID: **WLCSDW1-052819** Units: **mg/L** Analysis Date: **28-May-2019 12:28**
Client ID: Run ID: **ICS2100_339348** SeqNo: **5096230** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.3	0.500	20	0	96.5	90 - 110	19.74	2.29	20	
Sulfate	19.12	0.500	20	0	95.6	90 - 110	19.67	2.8	20	

MS Sample ID: **HS19051088-01MS** Units: **mg/L** Analysis Date: **28-May-2019 13:31**
Client ID: Run ID: **ICS2100_339348** SeqNo: **5096232** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	75.35	0.500	10	67.15	82.0	80 - 120				O
Sulfate	29.22	0.500	10	20.1	91.1	80 - 120				

MS Sample ID: **HS19051023-01MS** Units: **mg/L** Analysis Date: **28-May-2019 19:20**
Client ID: Run ID: **ICS2100_339348** SeqNo: **5096245** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	41.29	0.500	10	33.2	80.9	80 - 120				
Sulfate	137.1	0.500	10	133.1	39.8	80 - 120				SEO

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19050920

QC BATCH REPORT

Batch ID: R339348 (0) **Instrument: ICS2100** **Method: ANIONS BY E300.0**

MSD Sample ID: **HS19051088-01MSD** Units: **mg/L** Analysis Date: **28-May-2019 13:46**
Client ID: Run ID: **ICS2100_339348** SeqNo: **5096233** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	77.36	0.500	10	67.15	102	80 - 120	75.35	2.63	20	O
Sulfate	30.15	0.500	10	20.1	100	80 - 120	29.22	3.15	20	

MSD Sample ID: **HS19051023-01MSD** Units: **mg/L** Analysis Date: **28-May-2019 19:34**
Client ID: Run ID: **ICS2100_339348** SeqNo: **5096246** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	40.81	0.500	10	33.2	76.1	80 - 120	41.29	1.16	20	S
Sulfate	135.2	0.500	10	133.1	21.4	80 - 120	137.1	1.35	20	SEO

The following samples were analyzed in this batch: HS19050920-01

ALS Houston, US Date: 29-May-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19050920**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 29-may-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19050920

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19050920-01	LH 18/24-SP650_051419	Login	15/05/2019 17:51:02	JRM	Disposed
HS19050920-01	LH 18/24-SP650_051419	Login	15/05/2019 17:51:02	JRM	Disposed
HS19050920-02	Trip Blank	Login	15/05/2019 17:51:02	JRM	Disposed

ALS Houston, US Date: 29-May-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19050920
Date/Time Received: **15-May-2019 09:13**
Received by: **PMG**

Checklist completed by: *Jared R. Makan* eSignature 15-May-2019 Date
Reviewed by: *RJ Modashia* eSignature 16-May-2019 Date

Matrices: **Water**
Carrier name: **ALS Courier**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.5c/2.5c UC/C	IR25	
Cooler(s)/Kit(s):	44244		
Date/Time sample(s) sent to storage:	05/15/2019 17:55		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210, Houston, Tx. 77099 ATTN: R.J. Modashia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No.
NWO1312.0150.0
16.0001

Job:
GROUNDWATER TREATMENT PLANT
BI-WEEKLY SAMPLES

Prepared By:
Scott Beesinger

P.O Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC	Analyses: CHLORIDE, SULFATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_051419	Water	05/14/19 / 14:00		3	3		HCL	
LH18/24-SP650_051419	Water	05/14/19 / 14:00		1		1	NONE	
Trip Blank	Water	05/14/19		2	2		HCL	

HS19050920
Bhate Environmental Associates, Inc.
LHAAP 18 24

Additional Remarks: **STANDARD TAT ON ALL PARAMETERS.**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	05/14/19	14:30		5/15/19	09:13						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks

44244 2.5 °C 421

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44244

CUSTODY SEAL

Date: 5/14/19 Time: 1430
Name: Scott Beesinger
Company: Basin

Seal Broken By:
Date: 05/15/19

44244 MAY 15 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

44244

ALS

ORIGIN ID:SGRA (303) 587-2450
SCOTT BEESINER
BASIN ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 02MAY19
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LONGHORN GW TREATMENT PLANT - BO 65296 - RJ

DEPT:

FedEx Express

FedEx
TRK# 0221 4809 7833 4603

WED - 15 MAY 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA

FED 779562 14MAY19 SGGA

ALS Houston, US Date: 03-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19050886

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19050886-01	LH18/24-SP650_051419	Water		14-May-2019 14:00	15-May-2019 09:13	☐
HS19050886-02	LH18/24-SP650_051419_BIX	Water		14-May-2019 14:00	15-May-2019 09:13	☐

ALS Houston, US Date: 03-Jun-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order:

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

• The analysis for TOC was subcontracted to ALS Environmental in Kelso, WA Final report attached.

WetChemistry by Method E350.3

Batch ID: R338834

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E365.3

Batch ID: R338503

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 03-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19050886

Sample ID: LH18/24-SP650_051419 Lab ID:HS19050886-01

Collection Date: 14-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: RG
Nitrogen, Ammonia (As N)	**14**		**0.20**	**0.10**	**0.20**	**mg/L**	1	21-May-2019 14:00
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: KVL
Phosphorus, Total Orthophosphate (As P)	**4.22**		**0.100**	**0.200**	**0.250**	**mg/L**	10	15-May-2019 17:51
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	26-May-2019 11:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 03-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19050886

Sample ID: LH18/24-SP650_051419_BIX Lab ID:HS19050886-02

Collection Date: 14-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	01-Jun-2019 11:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 03-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19050886

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R338503	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3			**Matrix:** Water		
HS19050886-01	LH18/24-SP650_051419	14 May 2019 14:00			15 May 2019 17:51	10
Batch ID R338834	**Test Name :** AMMONIA AS N BY E350.3(ISE)			**Matrix:** Water		
HS19050886-01	LH18/24-SP650_051419	14 May 2019 14:00			21 May 2019 14:00	1
Batch ID R339170	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS			**Matrix:** Water		
HS19050886-01	LH18/24-SP650_051419	14 May 2019 14:00			26 May 2019 11:13	1
Batch ID R339602	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19050886-02	LH18/24-SP650_051419_BIX	14 May 2019 14:00			01 Jun 2019 11:51	1

ALS Houston, US Date: 03-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19050886

QC BATCH REPORT

Batch ID: R338503 (0) **Instrument: UV-2450** **Method: ORTHO PHOSPHATE (PO4) AS P BY E365.3**

MBLK Sample ID: **MBLK-R338503** Units: **mg/L** Analysis Date: **15-May-2019 17:51**
Client ID: Run ID: **UV-2450_338503** SeqNo: **5076707** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0200	0.0250								U

LCS Sample ID: **LCS-R338503** Units: **mg/L** Analysis Date: **15-May-2019 17:51**
Client ID: Run ID: **UV-2450_338503** SeqNo: **5076706** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.246	0.0250	0.25	0	98.4	85 - 115				

MS Sample ID: **HS19050886-01MS** Units: **mg/L** Analysis Date: **15-May-2019 17:51**
Client ID: **LH18/24-SP650_051419** Run ID: **UV-2450_338503** SeqNo: **5076709** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	6.72	0.250	2.5	4.22	100	80 - 120				

MSD Sample ID: **HS19050886-01MSD** Units: **mg/L** Analysis Date: **15-May-2019 17:51**
Client ID: **LH18/24-SP650_051419** Run ID: **UV-2450_338503** SeqNo: **5076708** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	6.72	0.250	2.5	4.22	100	80 - 120	6.72	0	20	

The following samples were analyzed in this batch: HS19050886-01

ALS Houston, US Date: 03-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19050886

QC BATCH REPORT

Batch ID: R338834 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R338834** Units: **mg/L** Analysis Date: **21-May-2019 14:00**
Client ID: Run ID: **WetChem_HS_338834** SeqNo: **5083325** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R338834** Units: **mg/L** Analysis Date: **21-May-2019 14:00**
Client ID: Run ID: **WetChem_HS_338834** SeqNo: **5083324** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.59	0.20	10	0	106	80 - 120				

MS Sample ID: **HS19050830-01MS** Units: **mg/L** Analysis Date: **21-May-2019 14:00**
Client ID: Run ID: **WetChem_HS_338834** SeqNo: **5083327** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	9.712	0.20	10	0.1423	95.7	80 - 120				

MSD Sample ID: **HS19050830-01MSD** Units: **mg/L** Analysis Date: **21-May-2019 14:00**
Client ID: Run ID: **WetChem_HS_338834** SeqNo: **5083326** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	9.861	0.20	10	0.1423	97.2	80 - 120	9.712	1.52	20	

The following samples were analyzed in this batch: HS19050886-01

ALS Houston, US Date: 03-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS19050886**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 03-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19050886

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19050886-01	LH18/24-SP650_051419	Login	15/05/2019 12:39:59	JRM	WET250
HS19050886-01	LH18/24-SP650_051419	Login	15/05/2019 12:39:59	JRM	WET250
HS19050886-01	LH18/24-SP650_051419	Login	15/05/2019 12:39:59	JRM	Sub
HS19050886-02	LH18/24-SP650_051419_BIX	Login	15/05/2019 12:39:59	JRM	Sub

ALS Houston, US Date: 03-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19050886
Date/Time Received: **15-May-2019 09:13**
Received by: **PMG**

Checklist completed by: *Jared R. Makan* eSignature 15-May-2019 Date
Reviewed by: *Corey Grandits* eSignature 15-May-2019 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☐	No ☐	Not Present ☑
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.5c/2.5c UC/C	IR25	
Cooler(s)/Kit(s):	44244		
Date/Time sample(s) sent to storage:	05/15/2019 12:45		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modshia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No.
NWO1312.0150.0
16.0001

Job:
GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

Prepared By:
Scott Beesinger

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_051419	Water	05/14/19 / 14:00		2	X	X			H2SO4	
LH18/24-SP650_051419	Water	05/14/19 / 14:00		1			X		NONE	
LH18/24-SP650_051419_BIX	Water	05/14/19 / 14:00		1				X	NONE	

Additional Remarks: **Standard TAT on all parameters**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	05/14/19	14:30		5/15/19	09:13						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks:

44244 2.50 #25 4/C-3.0"

HS19050886

Bhate Environmental Associates, Inc.
18/24 Longhorn GW Treatment Plant Weekly Sampl

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44244

CUSTODY SEAL

Date: 5/14/19 Time: 1430
Name: Scott Beesinger
Company: BHATE

Seal Broken By: JM
Date: 05/15/19

44244 MAY 15 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

44244

ORIGIN ID:SGRA (303) 597-2450
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 02MAY19
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LONGHORN GW TREATMENT PLANT – BO 65296 – RJ

RMA:

FedEx Express

FedEx
TRK 0221 4809 7833 4603

WED - 15 MAY 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA

779552 14MAY19 OGGA 653C1/D66C/0CdA

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1914602, 1914603, 1914871, 1915147

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2256 (240075)

General Set Information: There were nine field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1914603004/05 was analyzed and reported from a 1:10,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 655029) was less than 1/2 the CRDL. The recovery for the LCS (655030) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1914602001 (Client ID: LH18/24-SP650_051419_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 655027) is reported from the analysis of the Laboratory Control Sample (LCS – 655030) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Thomas Bosch May 30, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: May 30, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1914602**
Project ID: HS19050886
Purchase Order: HS19050886
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_051419_BIX	1914602001	05/14/19	05/17/19	

ANALYTICAL REPORT

Workorder: 34-1914602
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_051419_BIX**	Sampling Site: NA	Collected: 05/14/2019
Lab ID: 1914602001	Media: 125 mL Nalgene	Received: 05/17/2019
Matrix: Water	Sampling Parameter: NA	

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:** LCMS04
	Batch: ELMS/2256 (HBN: 240075)	**Percent Solid:** NA
	Analyzed: 05/28/2019 10:21	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 05/29/2019 10:39	/S/ Stephen Brose 05/30/2019 11:52

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1914602
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1914602

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2256 (HBN: 240075)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 655029
Analyzed: 05/28/2019 10:08
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 655030
Analyzed: 05/28/2019 09:39
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.20	4.00	105	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

	Sample	MS	MSD
	1914602001	655031	655032
Analyzed:	05/28/2019 10:21	05/28/2019 10:34	05/28/2019 10:48
Dilution:	1	1	1
Units:	ug/L	ug/L	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	5.09	5	102	78.8	123.8	4.88	97.7	4.08	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
05/29/2019 13:04	05/30/2019 11:52

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

18698 / # 2

SAMPLING STATE: **Dept of Defense**

COC ID: **11325**

1914602

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19050886
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19050886-02**	**LH18/24-SP650_051419_BIX**	**Water**	**14 May 2019 14:00**
	SUB_Perch-6850			23 May 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 5/16/19 1800

Received By: _____ Date/Time: 5-17-19 0903

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19050886	Split:	Workorder ID: 1914602	Level: ENV_LVL4	Requested Analysis
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly	
Comments:			Preservatives	
			COOL	
			Containers	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count	EPA 6850, DoD QSM
1	05/14/2019 14:00	LH18/24-SP650_051419_BIX	1914602001		Water	A	1	A
2								
3								
4								
5								
6								
7								
8								
9								
10								

22 of 155

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	05/17/2019 09:03	ALS Sample Receiving	Sample Login
Julie Warath	5/21/19 1000	14B	storage
R.33.1	5.24.19/12:30	T. Bond	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00938531

ALS-Salt Lake City-Related Information Report (CRIR)

1914602

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS HOUSTON

Project/Task/Site: HS1905088L

Date/Time of Receipt: 5.17.19 0903

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA		
	Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9403	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: _____ (Signature) KAYLEEN COATES (Printed Name) 5.17.19 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018

Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159469-494 RIT2 EXP 01/20

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 16MAY19
ACTWGT: 5.00 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19050886 - RJ

FedEx Express

FRI - 17 MAY 3:00P
STANDARD OVERNIGHT

TRK# 0201 4809 7833 8664

AX BTFA

84123
UT-US SLC

Batch Worklist

Batch: ELMS/ 2256 **Created:** 5/28/2019 08:41 **Instrument:** **HBN:** 240075
Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1914602 [ENV_LVL4]
Workorder: 1914603 [ENV_LVL4]
Workorder: 1914871 [ENV_LVL4]
Workorder: 1915147 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	655026	CCV for HBN 240075 [ELMS/2256]				CCV	3		E685041C3Q	5311		5/29/2019	
2	655027	RLVS for HBN 240075 [ELMS/2256				RLVS	3		E685041C3Q	5311		5/29/2019	
3	655028	ICS for HBN 240075 [ELMS/2256]				ICS	3		E6850..D3Q	5311		5/29/2019	
4	655029	LMB for HBN 240075 [ELMS/2256]				LMB	3		E6850Q413Q	5311		5/29/2019	
5	655030	LCS for HBN 240075 [ELMS/2256]				LCS	3		E6850Q413Q	5311		5/29/2019	
6	1914602001	LH18/24-SP650_051419_BIX				SAMPLE	3	1914602001-A	E6850Q41.3	5480	6/11/2019	5/31/2019	
7	655031	LH18/24-SP650...(1914602001MS)				MS	3		E6850Q413Q	5311		5/29/2019	
8	655032	LH18/24-SP65...(1914602001MSD)				MSD	3		E6850Q413Q	5311		5/29/2019	
9	1914603001	50WW18-190516				SAMPLE	3	1914603001-A	E6850Q41.3	5480	6/13/2019	5/31/2019	
10	1914603002	50WW17-190516				SAMPLE	3	1914603002-A	E6850Q41.3	5480	6/13/2019	5/31/2019	
11	1914603003	50WW21-190516				SAMPLE	3	1914603003-A	E6850Q41.3	5480	6/13/2019	5/31/2019	
12	1914603004	50WW12-190516				SAMPLE	3	1914603004-A	E6850Q41.3	5480	6/13/2019	5/31/2019	
13	1914603005	50WW12-190517-FD				FLDDUP	3	1914603005-A	E6850Q41.3	5480	6/13/2019	5/31/2019	
14	1914871001	LH18/24-SP650_05119_BIX				SAMPLE	3	1914871001-A	E6850Q41.3	5480	6/18/2019	6/6/2019	
15	1915147001	50WW15-190523				SAMPLE	3	1915147001-A	E6850Q41.3	5480	6/20/2019	5/29/2019	
16	1915147002	50WW27-190523				SAMPLE	3	1915147002-A	E6850Q41.3	5480	6/20/2019	5/29/2019	
17	655033	CCV for HBN 240075 [ELMS/2256]				CCV	3		E685041C3Q	5311		5/29/2019	

00938534

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1914602 (001), 1914603 (001-05), 1914871 (001), 1915147 (001)
ELMS Batch/HBN ID: 2256 (240075)
Prep Date: 05/24/2019 Analysis Date: 05/28/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\MAY\28MAY19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 655030; Target = 4.0µg/L. ASTM type II water was used for LMB 655029.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1914602001 (Client ID: LH18/24-SP650_051419_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:
1) Results reported in µg/L. Field samples 1914603004/05 required 1:10,000 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\MAY\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\240075-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 655027) is reported from the analysis of the Laboratory Control Sample (LCS – 655030) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2256 HBN: 240075 Sample Set IDs if Applicable: 1914602 1914603 1914871 / 1915147	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/18/2018 02:09PM	**Expires:** 09/18/2019
MFG Lot: TNB: 09/18/2018		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK	Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659	**Created By:** Thomas Bosch	**Amount:** 100 mL
MFG: AccuStandard	**Create Date:** 09/17/2018 09:09AM	**Expires:** 07/25/2020
MFG Lot: 218065075		**Usable:** No
Part ID: IC-PER-10X-1		**Lab Lot:** CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: **109**	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT	Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/18/2018 02:09PM	**Expires:** 09/18/2019
MFG Lot: TNB: 09/18/2018		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

AccuStandard®

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

Unstandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	655026 CCV@25	Vial 71	1	Control	1	2.51535e6	9.014	26.37917
*	655030 QC@4.0	Vial 72	1	Control	2	4.51078e5	8.943	4.19596
*	655028 ICS@4.0	Vial 73	1	Control	3	4.02631e5	8.668	4.27965
*	655029 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1914602001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	655031 146021S	Vial 76	1	Sample	6	4.52005e5	8.454	5.08666
*	655032 146021D	Vial 77	1	Sample	7	4.57024e5	8.493	4.88333
*	1914603001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1914603002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1914603003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1914603004 10K	Vial 81	1	Sample	11	6.15140e5	9.032	6.46842e4
*	1914603005 10K	Vial 82	1	Sample	12	7.46250e5	9.051	7.56269e4
*	1914871001	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1915147001	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1915147002	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	655033 CCV@25	Vial 71	1	Control	16	2.26382e6	9.030	25.44543

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	655026 CCV@25	Vial 71	1	Control	1	7.44700e5	9.032	26.32416
*	655030 QC@4.0	Vial 72	1	Control	2	1.45202e5	8.967	4.39774
*	655028 ICS@4.0	Vial 73	1	Control	3	1.38337e5	8.681	4.78850
*	655029 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1914602001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	655031 146021S	Vial 76	1	Sample	6	1.50468e5	8.472	5.54931
*	655032 146021D	Vial 77	1	Sample	7	1.53323e5	8.504	5.36140
*	1914603001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1914603002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1914603003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1914603004 10K	Vial 81	1	Sample	11	1.94510e5	9.049	6.75291e4
*	1914603005 10K	Vial 82	1	Sample	12	2.32860e5	9.068	7.82104e4
*	1914871001	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1915147001	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1915147002	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	655033 CCV@25	Vial 71	1	Control	16	6.82139e5	9.049	25.81384

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	655026 CCV@25	Vial 71	1	Control	1	2.89154e5	9.034	5.00000
*	655030 QC@4.0	Vial 72	1	Control	2	3.53403e5	8.961	5.00000
*	655028 ICS@4.0	Vial 73	1	Control	3	3.08985e5	8.691	5.00000
*	655029 LMB	Vial 74	1	Control	4	3.47474e5	9.079	5.00000
*	1914602001	Vial 75	1	Sample	5	3.09553e5	8.502	5.00000
*	655031 146021S	Vial 76	1	Sample	6	2.89563e5	8.478	5.00000
*	655032 146021D	Vial 77	1	Sample	7	3.05514e5	8.517	5.00000
*	1914603001	Vial 78	1	Sample	8	2.25289e5	8.279	5.00000
*	1914603002	Vial 79	1	Sample	9	2.22697e5	8.383	5.00000
*	1914603003	Vial 80	1	Sample	10	2.34373e5	8.224	5.00000
*	1914603004 10K	Vial 81	1	Sample	11	3.06845e5	9.055	5.00000e4
*	1914603005 10K	Vial 82	1	Sample	12	3.16468e5	9.072	5.00000e4
*	1914871001	Vial 83	1	Sample	13	2.66978e5	8.492	5.00000
*	1915147001	Vial 84	1	Sample	14	2.34476e5	8.342	5.00000
*	1915147002	Vial 85	1	Sample	15	2.47416e5	8.369	5.00000
*	655033 CCV@25	Vial 71	1	Control	16	2.70388e5	9.054	5.00000

Sequence Table:

Method and Injection Info Part:

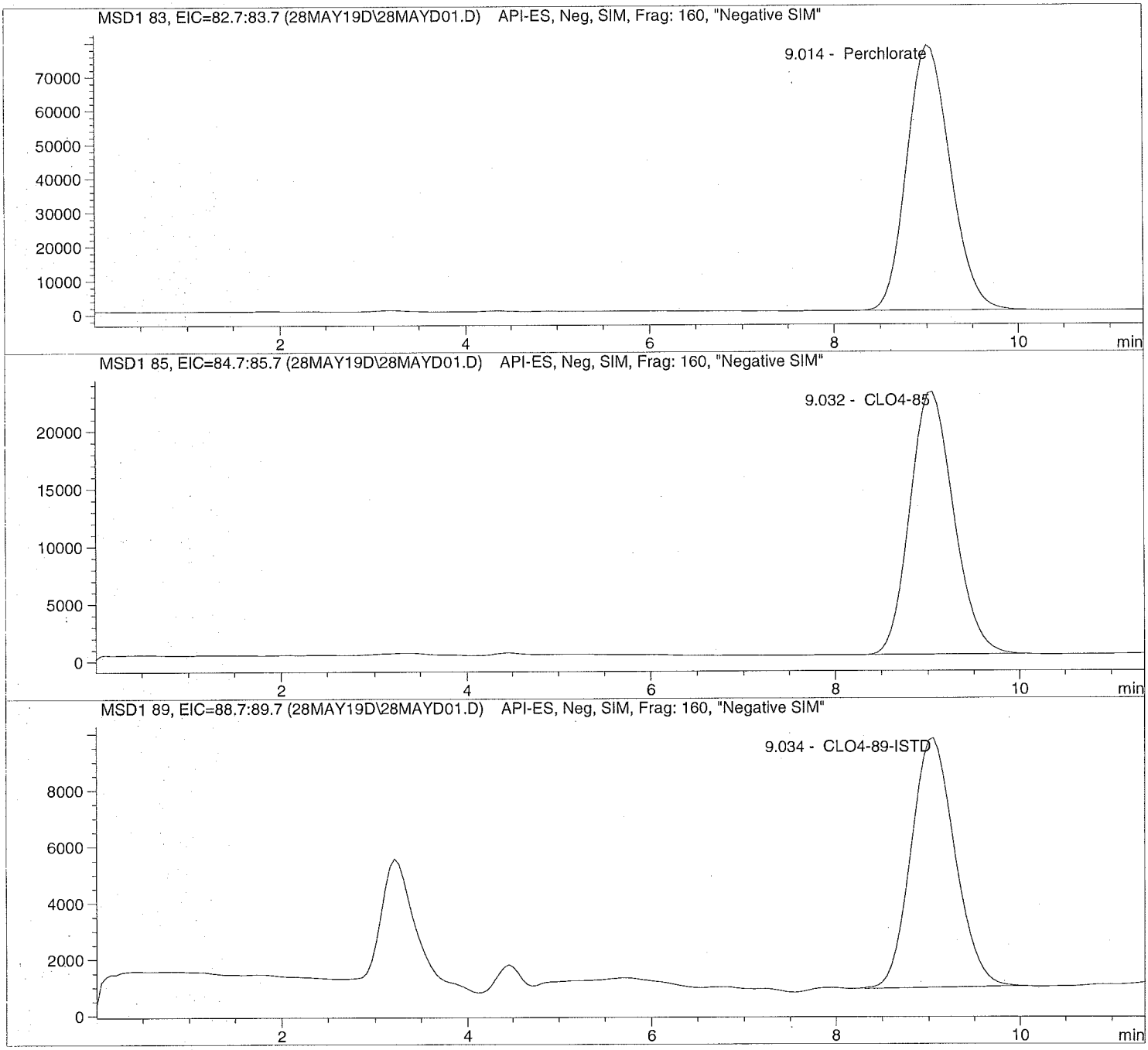
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	655026	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	655030	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	655028	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	655029	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1914602001		CLO4-AQN	1	Sample		
6	Vial 76	655031	146021S	CLO4-AQN	1	Sample		
7	Vial 77	655032	146021D	CLO4-AQN	1	Sample		
8	Vial 78	1914603001		CLO4-AQN	1	Sample		
9	Vial 79	1914603002		CLO4-AQN	1	Sample		
10	Vial 80	1914603003		CLO4-AQN	1	Sample		
11	Vial 81	1914603004	10K	CLO4-AQN	1	Sample		
12	Vial 82	1914603005	10K	CLO4-AQN	1	Sample		
13	Vial 83	1914871001		CLO4-AQN	1	Sample		
14	Vial 84	1915147001		CLO4-AQN	1	Sample		
15	Vial 85	1915147002		CLO4-AQN	1	Sample		
16	Vial 71	655033	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD01.D Sample Name: 655026 CCV@25

Injection Date:	5/28/2019 09:22:28	Seq Line:	1
Sample Name:	655026 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	5/28/2019 09:22:28	Seq Line:	1
Sample Name:	655026 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.014	PBA	2515348.3	26.3792	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.032	PBA	744700.3	26.3242	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.034	BBA	289154.0	5.0000	CLO4-89-ISTD

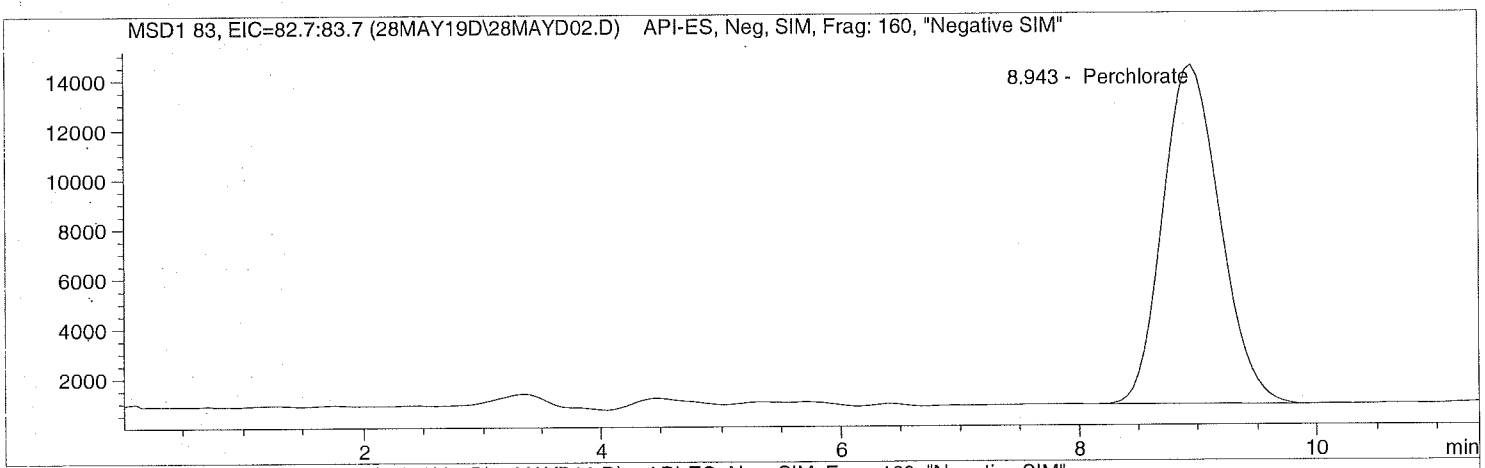
*** End of Report ***

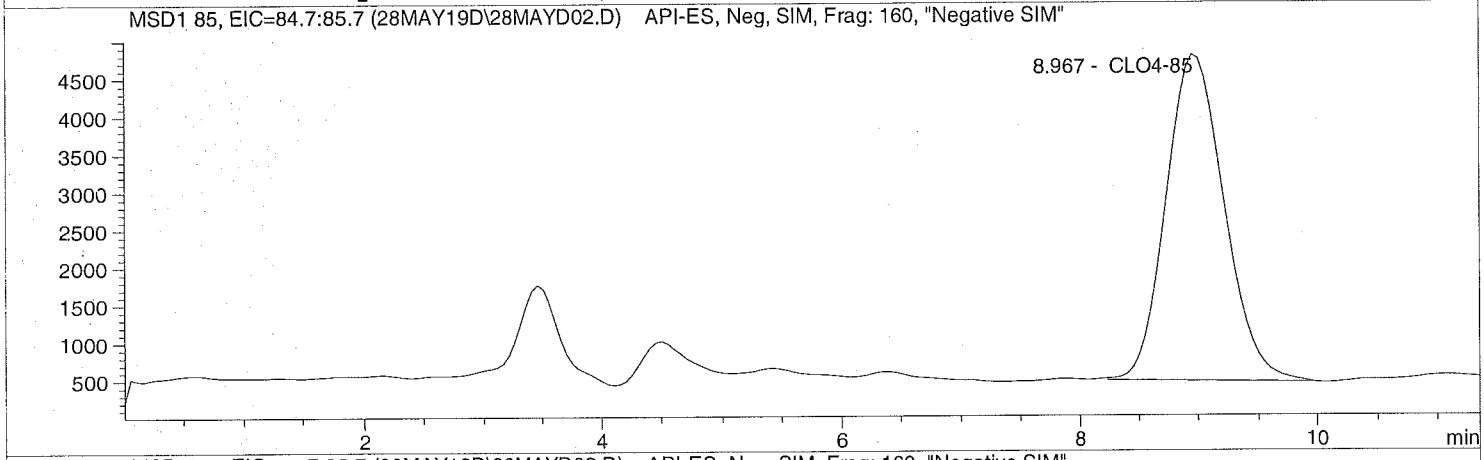
Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD02.D Sample Name: 655030 QC@4.0

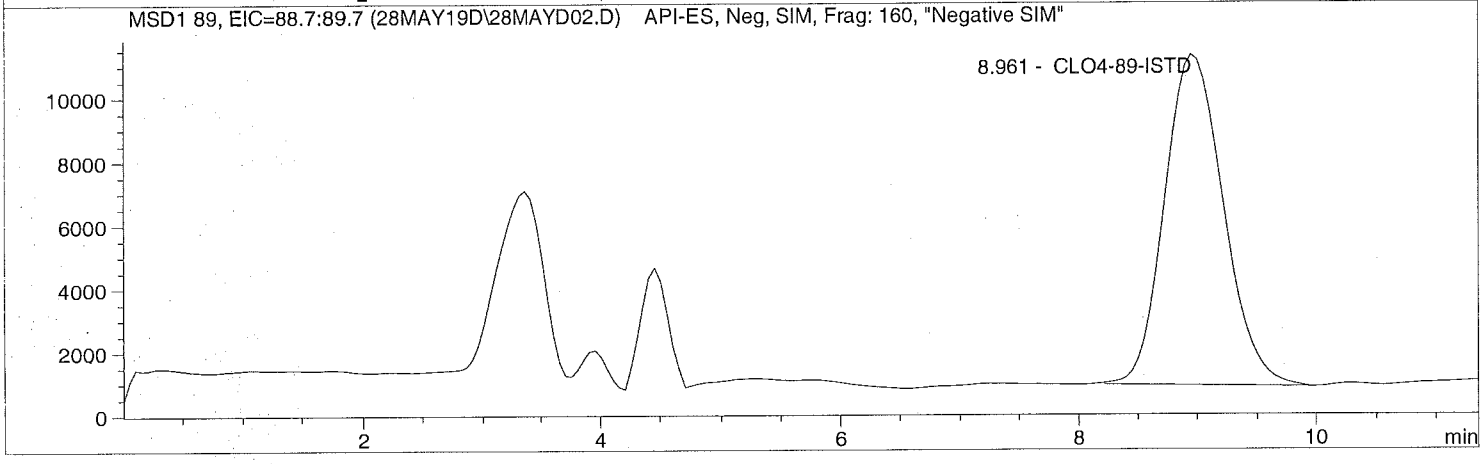
Injection Date:	5/28/2019 09:39:12	Seq Line:	2
Sample Name:	655030 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Injection Date:	5/28/2019 09:39:12	Seq Line:	2
Sample Name:	655030 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.943	PBA	451078.5	4.1960	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.967	BBA	145201.9	4.3977	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

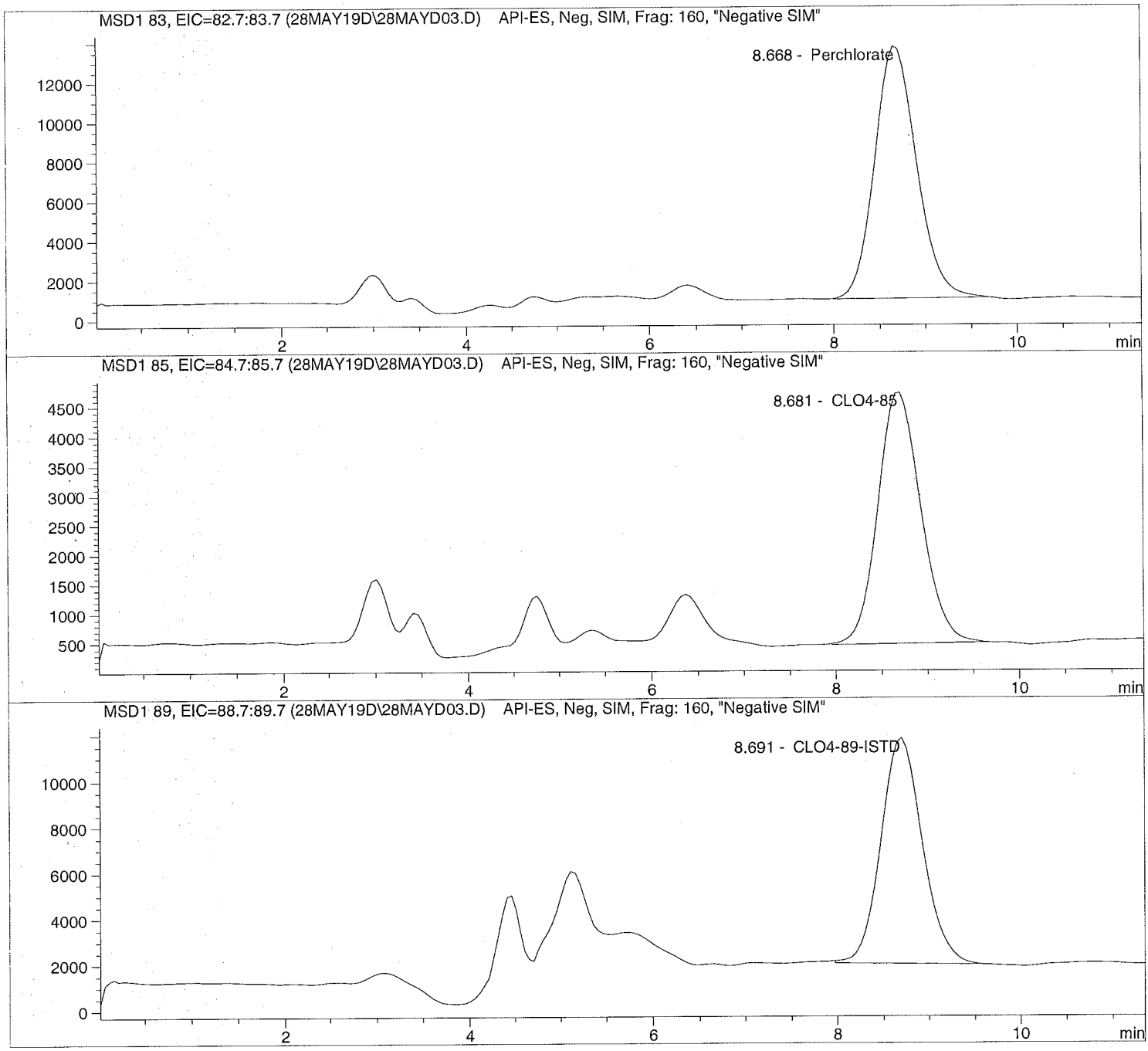
RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.961	BBA	353402.8	5.0000	CLO4-89-ISTD

*** End of Report ***

Injection Date:	5/28/2019 09:54:31	Seq Line:	3
Sample Name:	655028 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	5/28/2019 09:54:31	Seq Line:	3
Sample Name:	655028 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.668	PBA	402631.1	4.2796	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.681	BBA	138337.3	4.7885	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.691	BBA	308984.7	5.0000	CLO4-89-ISTD

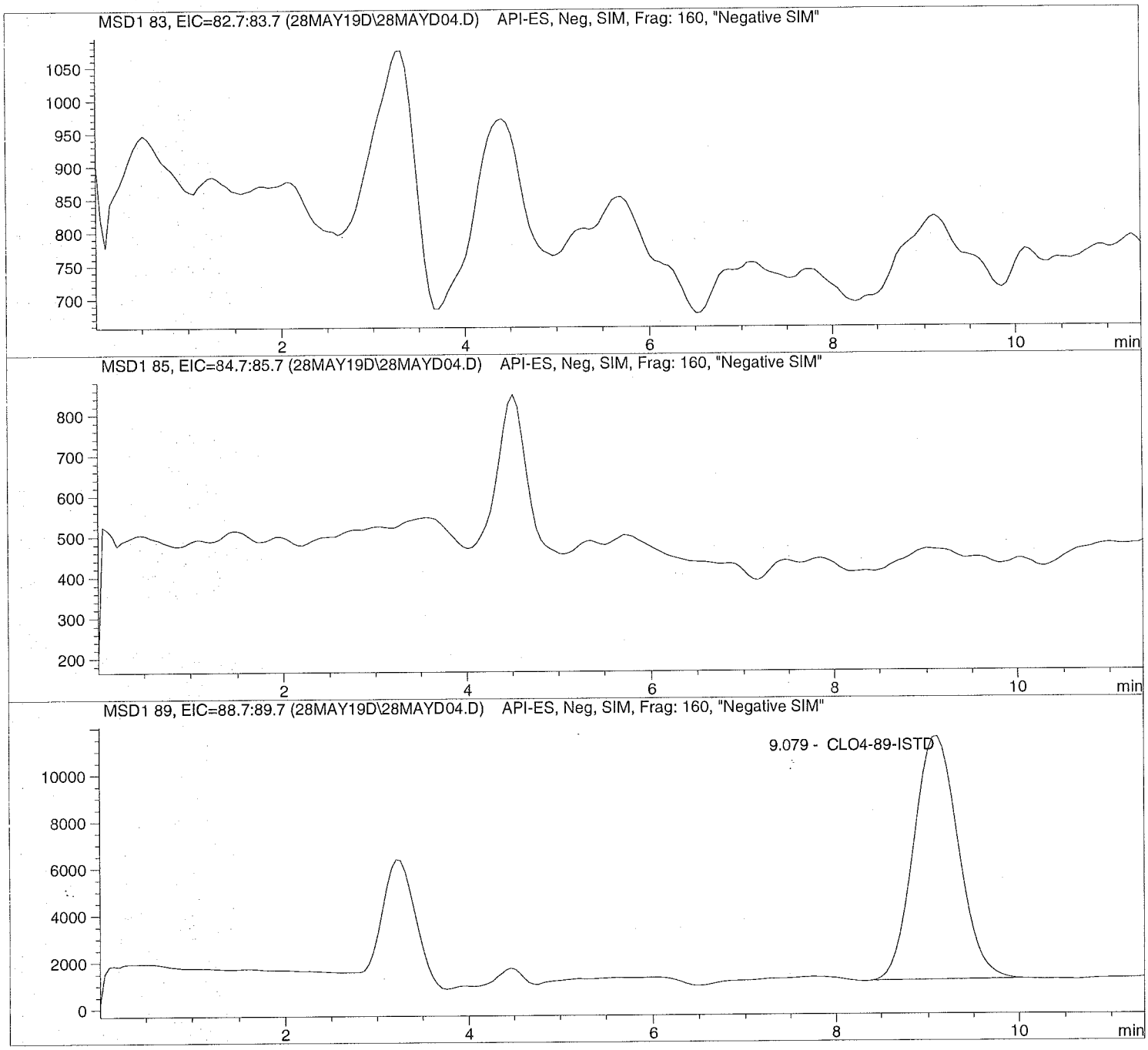
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD04.D Sample Name: 655029 LMB

Injection Date:	5/28/2019 10:08:00	Seq Line:	4
Sample Name:	655029 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD04.D Sample Name: 655029 LMB

Injection Date:	5/28/2019 10:08:00	Seq Line:	4
Sample Name:	655029 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.079	PBA	347474.2	5.0000	CLO4-89-ISTD

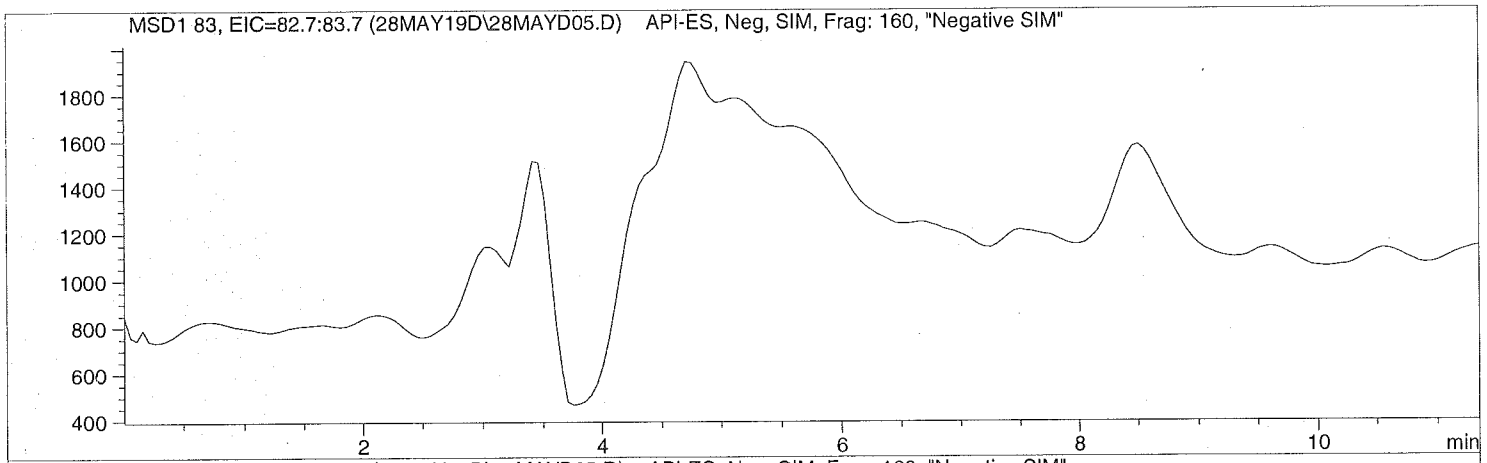
*** End of Report ***

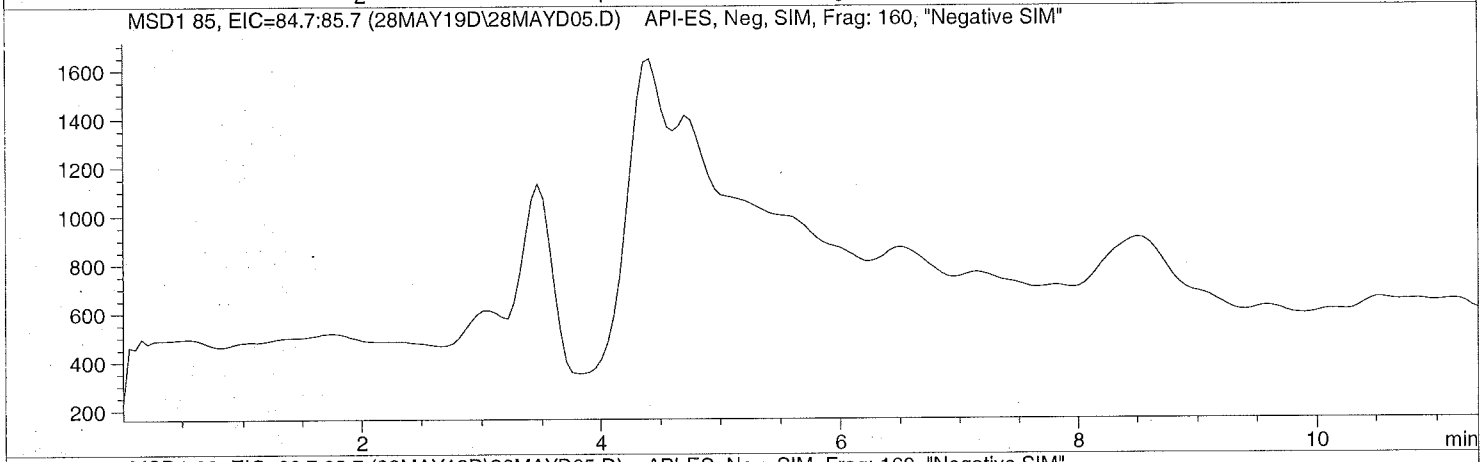
Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD05.D Sample Name: 1914602001

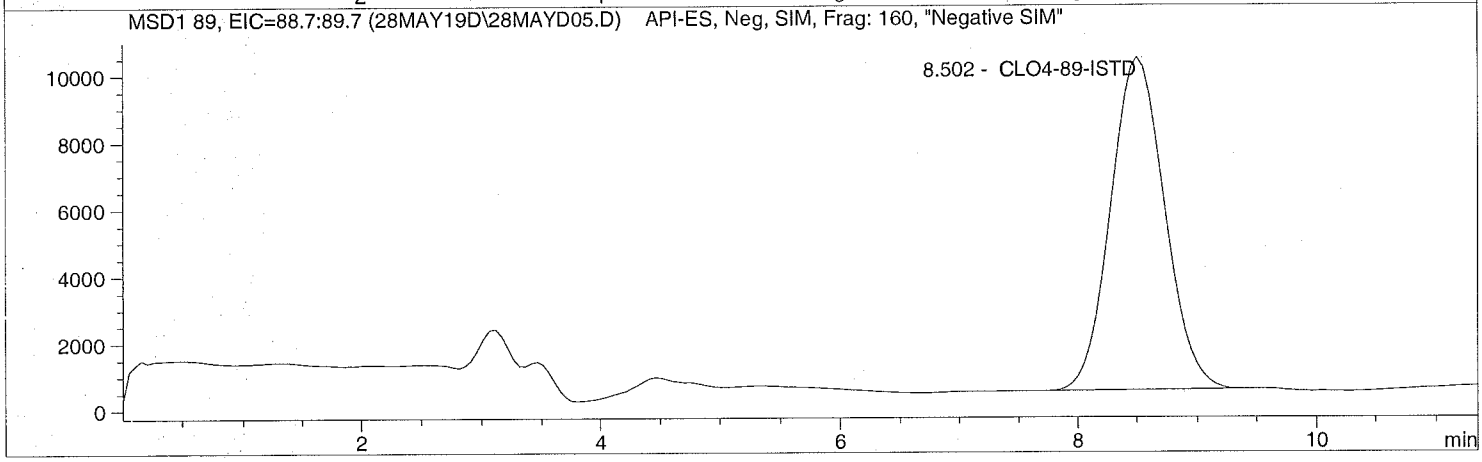
Injection Date:	5/28/2019 10:21:23	Seq Line:	5
Sample Name:	1914602001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD05.D Sample Name: 1914602001

Injection Date:	5/28/2019 10:21:23	Seq Line:	5
Sample Name:	1914602001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	PBA	309553.4	5.0000	CLO4-89-ISTD

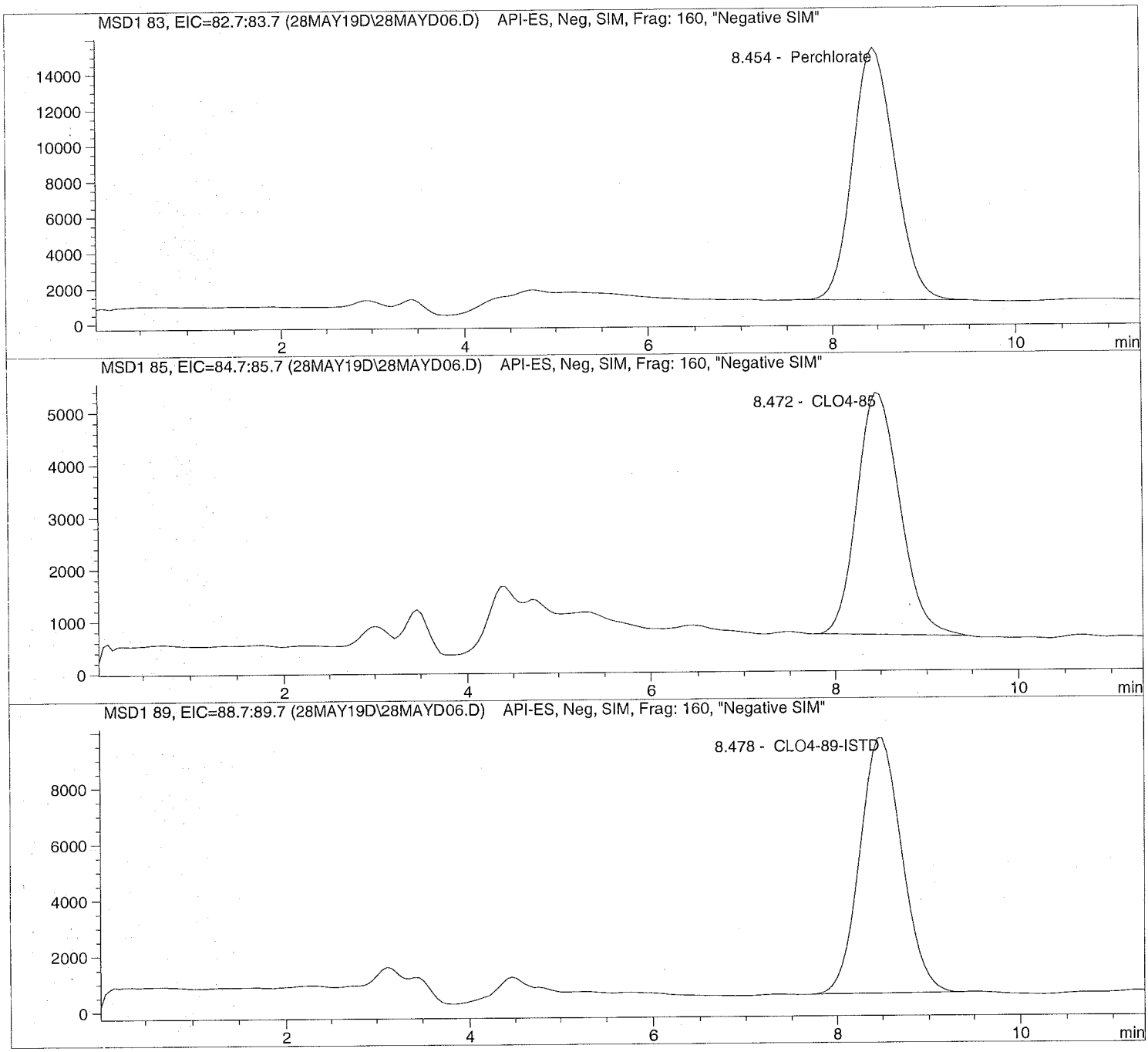
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD06.D Sample Name: 655031 146021S

Injection Date:	5/28/2019 10:34:49	Seq Line:	6
Sample Name:	655031 146021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	5/28/2019 10:34:49	Seq Line:	6
Sample Name:	655031 146021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.454	BBA	452005.2	5.0867	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	PBA	150468.2	5.5493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.478	PBA	289563.3	5.0000	CLO4-89-ISTD

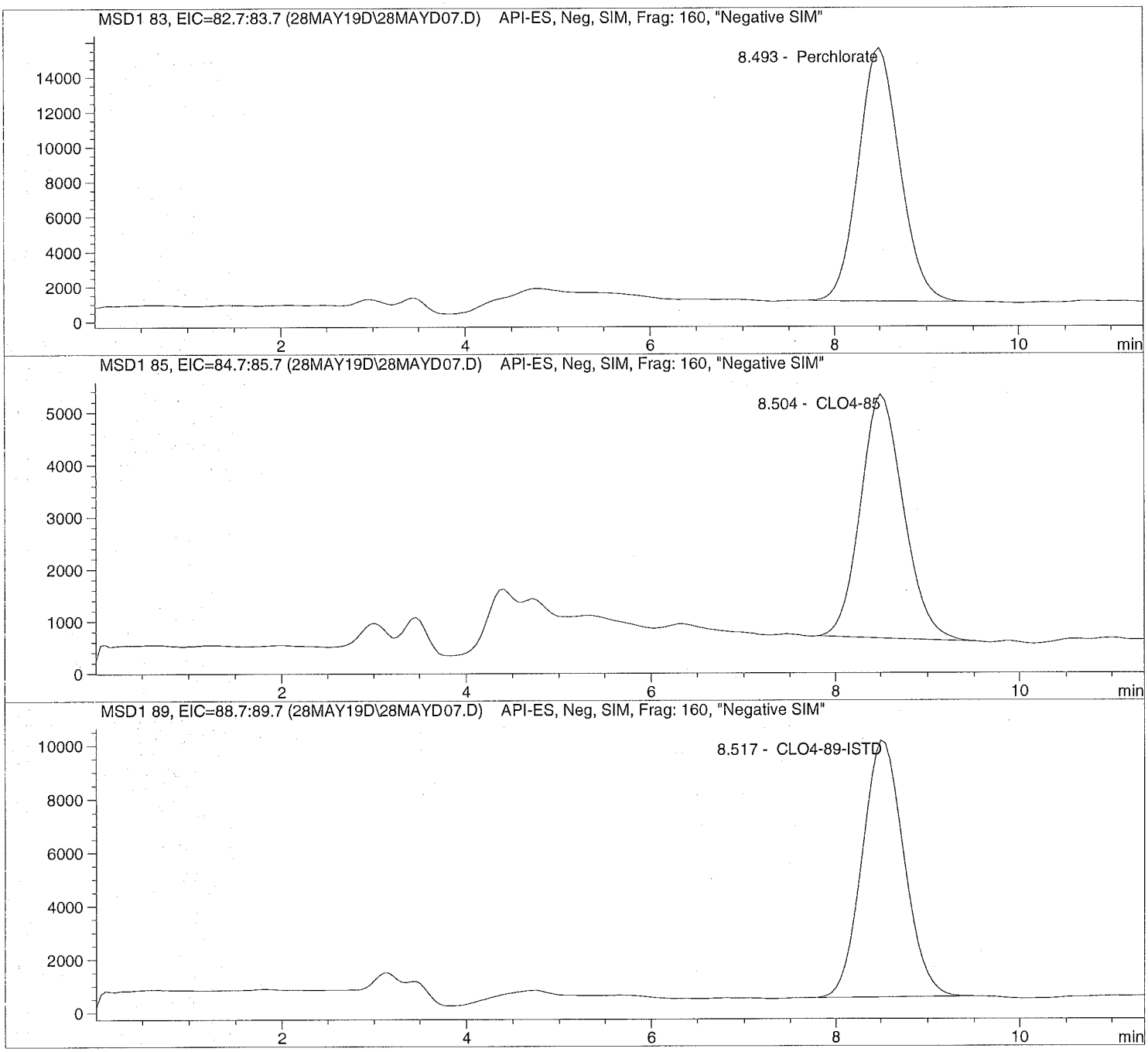
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD07.D Sample Name: 655032 146021D

Injection Date:	5/28/2019 10:48:16	Seq Line:	7
Sample Name:	655032 146021D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	5/28/2019 10:48:16	Seq Line:	7
Sample Name:	655032 146021D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.493	BBA	457024.3	4.8833	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.504	PBA	153322.9	5.3614	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.517	PBA	305513.7	5.0000	CLO4-89-ISTD

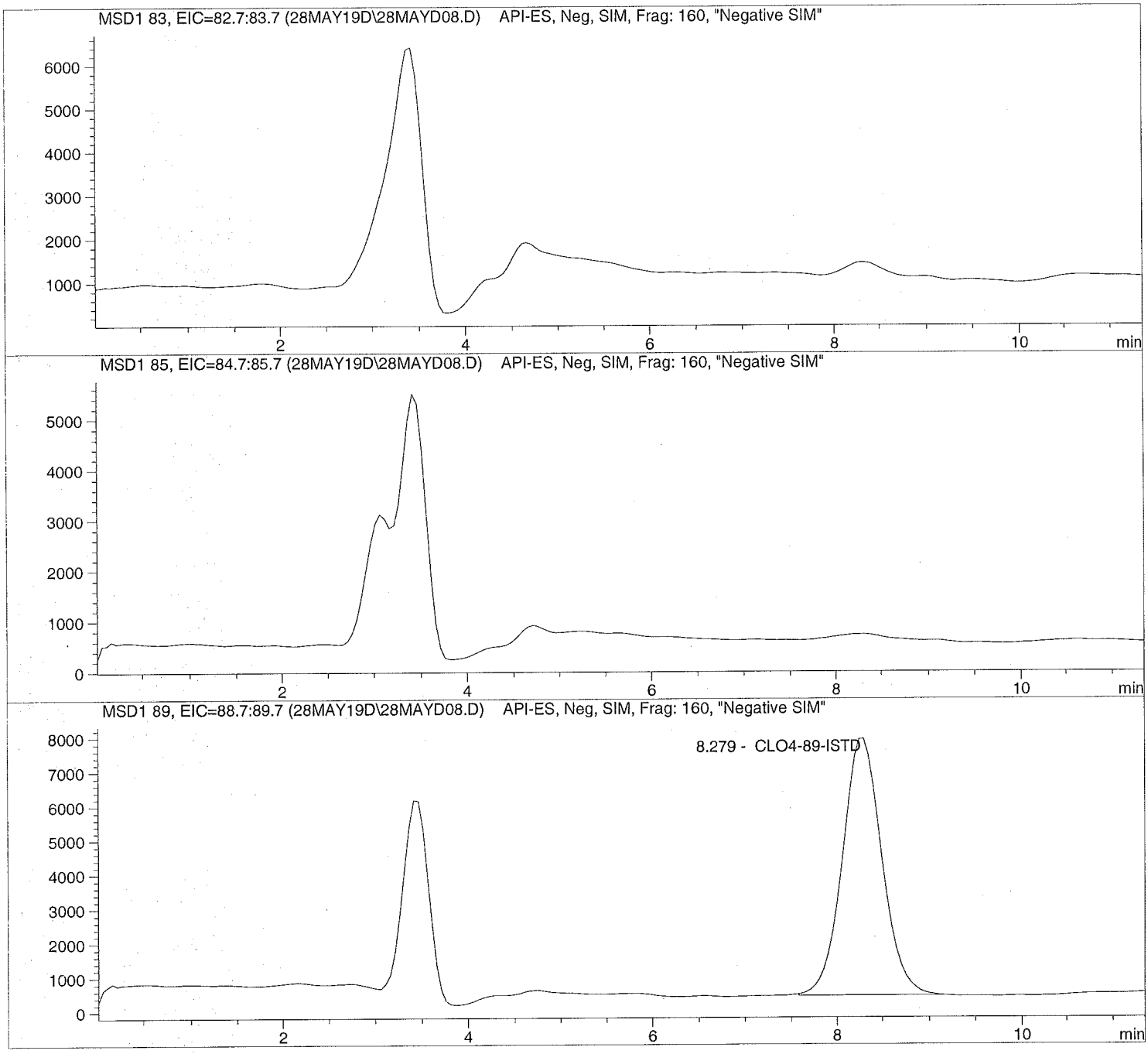
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD08.D Sample Name: 1914603001

Injection Date:	5/28/2019 11:01:42	Seq Line:	8
Sample Name:	1914603001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD08.D Sample Name: 1914603001

Injection Date:	5/28/2019 11:01:42	Seq Line:	8
Sample Name:	1914603001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.279	BBA	225288.9	5.0000	CLO4-89-ISTD

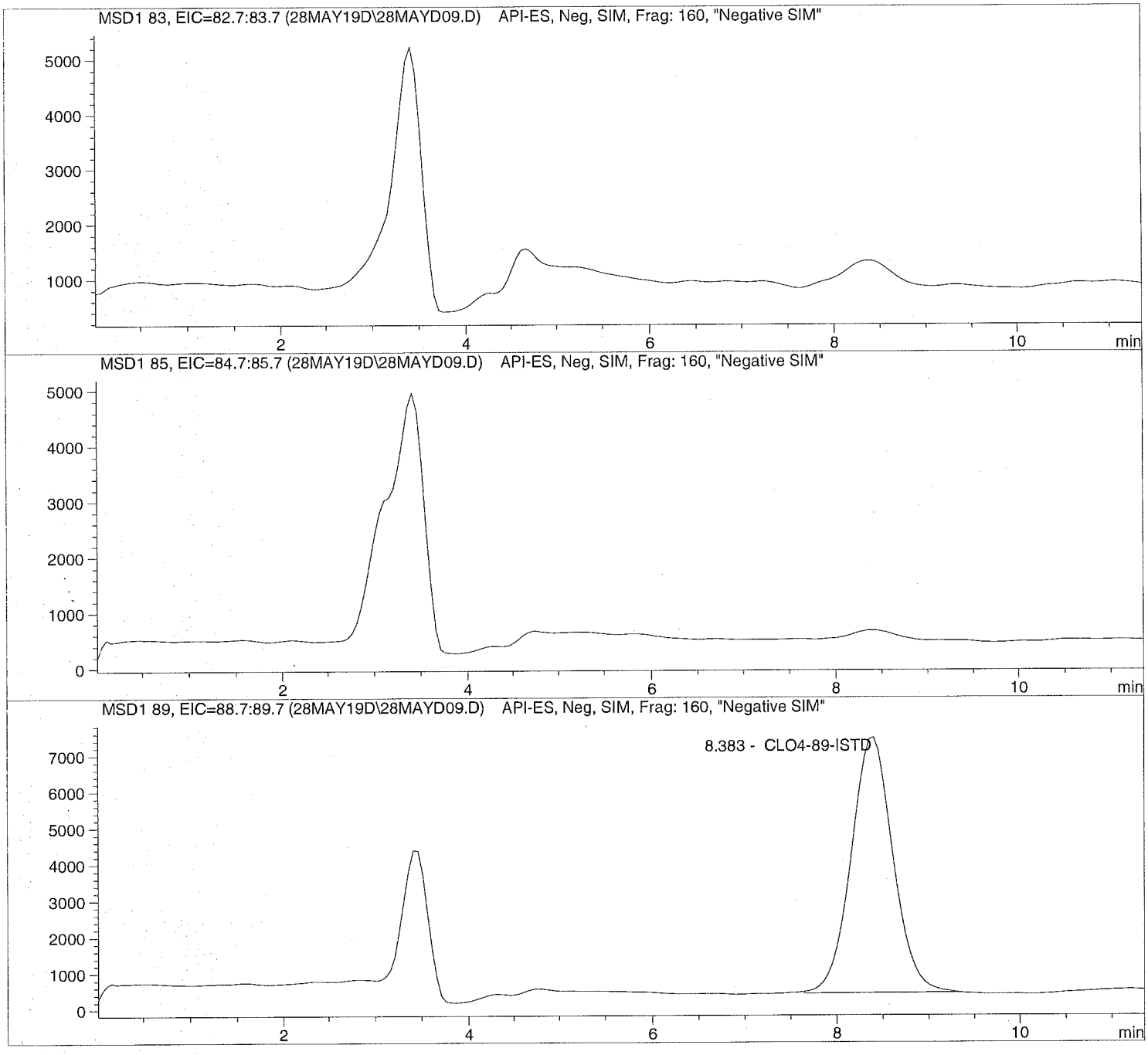
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD09.D Sample Name: 1914603002

Injection Date:	5/28/2019 11:15:07	Seq Line:	9
Sample Name:	1914603002	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD09.D Sample Name: 1914603002

Injection Date:	5/28/2019 11:15:07	Seq Line:	9
Sample Name:	1914603002	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.383	BBA	222696.7	5.0000	CLO4-89-ISTD

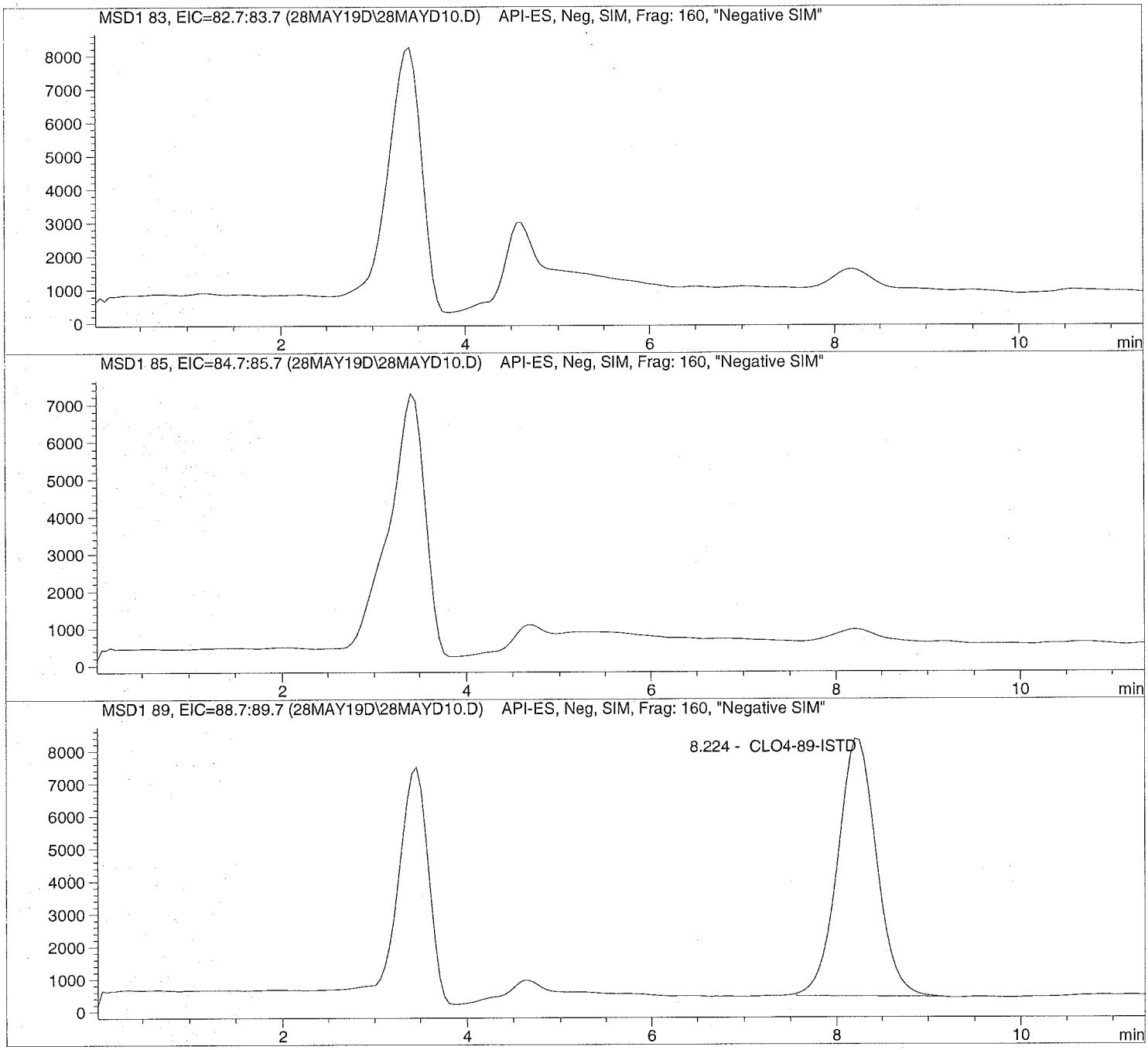
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD10.D Sample Name: 1914603003

Injection Date:	5/28/2019 11:28:30	Seq Line:	10
Sample Name:	1914603003	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD10.D Sample Name: 1914603003

Injection Date:	5/28/2019 11:28:30	Seq Line:	10
Sample Name:	1914603003	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.224	BBA	234372.9	5.0000	CLO4-89-ISTD

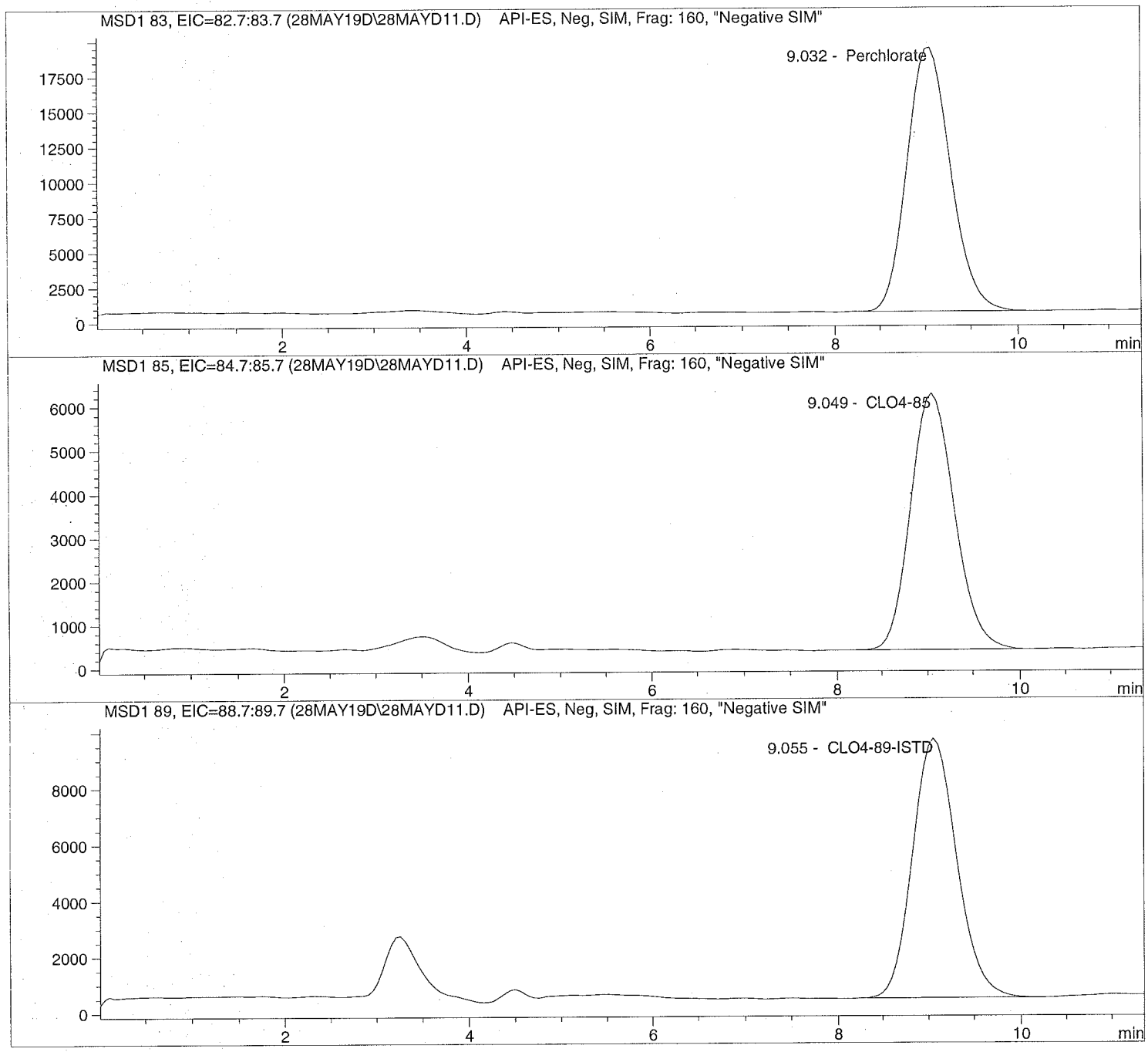
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD11.D Sample Name: 1914603004 10K

Injection Date:	5/28/2019 11:41:53	Seq Line:	11
Sample Name:	1914603004 10K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD11.D Sample Name: 1914603004 10K

Injection Date:	5/28/2019 11:41:53	Seq Line:	11
Sample Name:	1914603004 10K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.032	BBA	615140.4	64684.2479	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.049	BBA	194510.4	67529.1287	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.055	BBA	306844.5	50000.0000	CLO4-89-ISTD

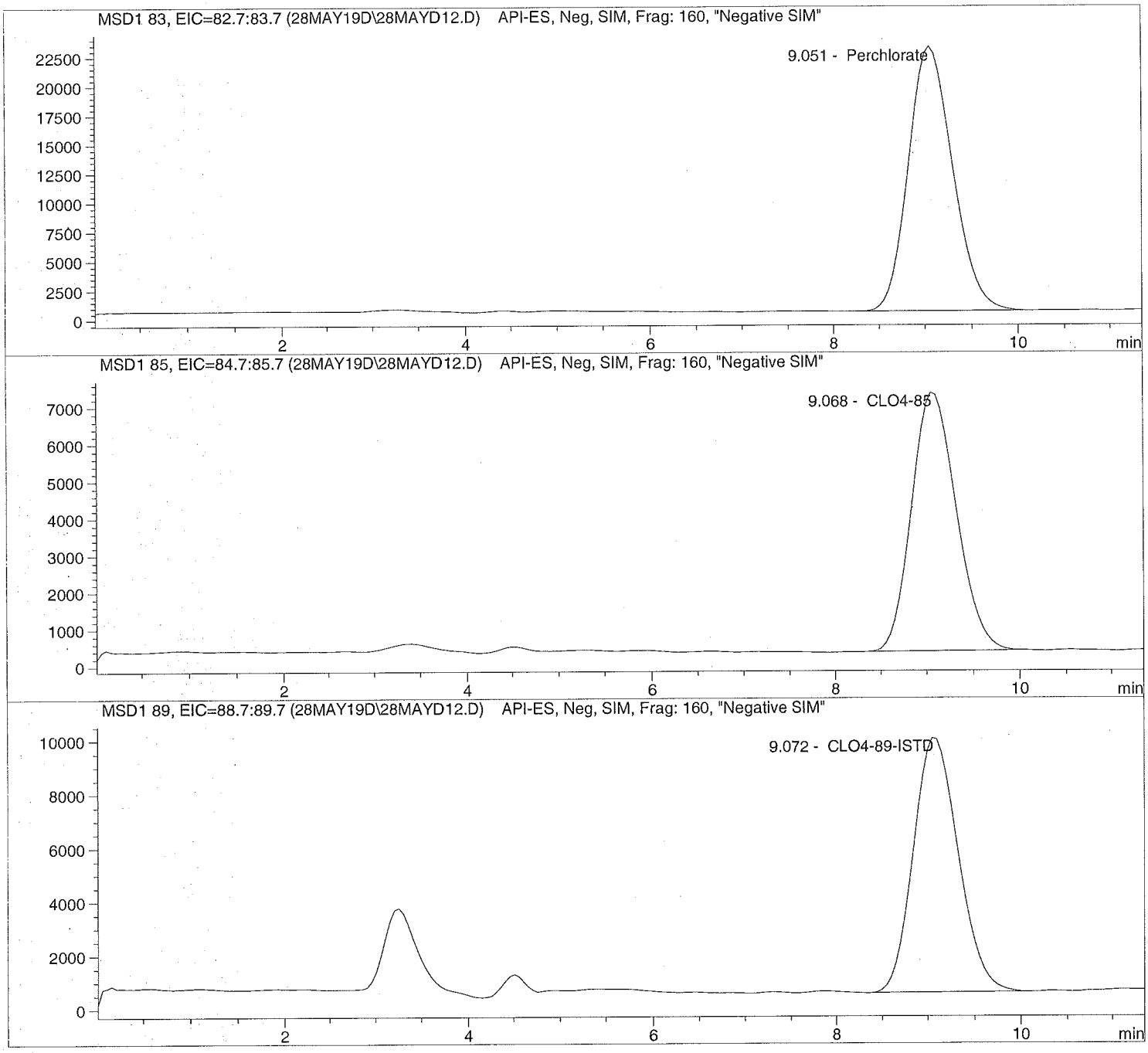
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD12.D Sample Name: 1914603005 10K 00938577

Injection Date:	5/28/2019 11:55:16	Seq Line:	12
Sample Name:	1914603005 10K	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD12.D Sample Name: 1914603005 10K

Injection Date:	5/28/2019 11:55:16	Seq Line:	12
Sample Name:	1914603005 10K	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.051	PBA	746250.2	75626.8976	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.068	BBA	232859.8	78210.3806	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.072	PBA	316467.9	50000.0000	CLO4-89-ISTD

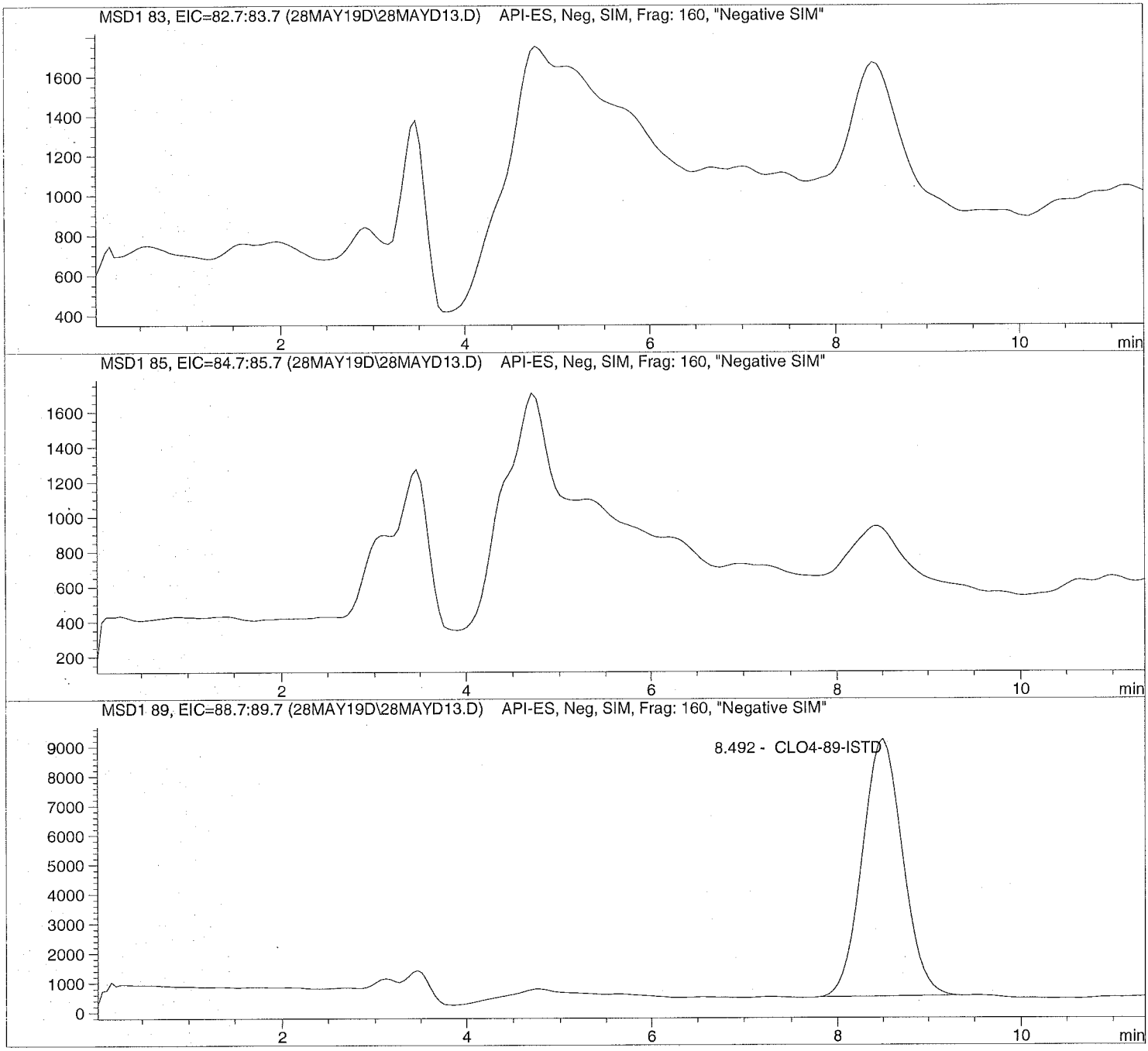
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD13.D Sample Name: 1914871001

Injection Date:	5/28/2019 12:08:42	Seq Line:	13
Sample Name:	1914871001	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD13.D Sample Name: 1914871001

Injection Date:	5/28/2019 12:08:42	Seq Line:	13
Sample Name:	1914871001	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.492	PBA	266978.1	5.0000	CLO4-89-ISTD

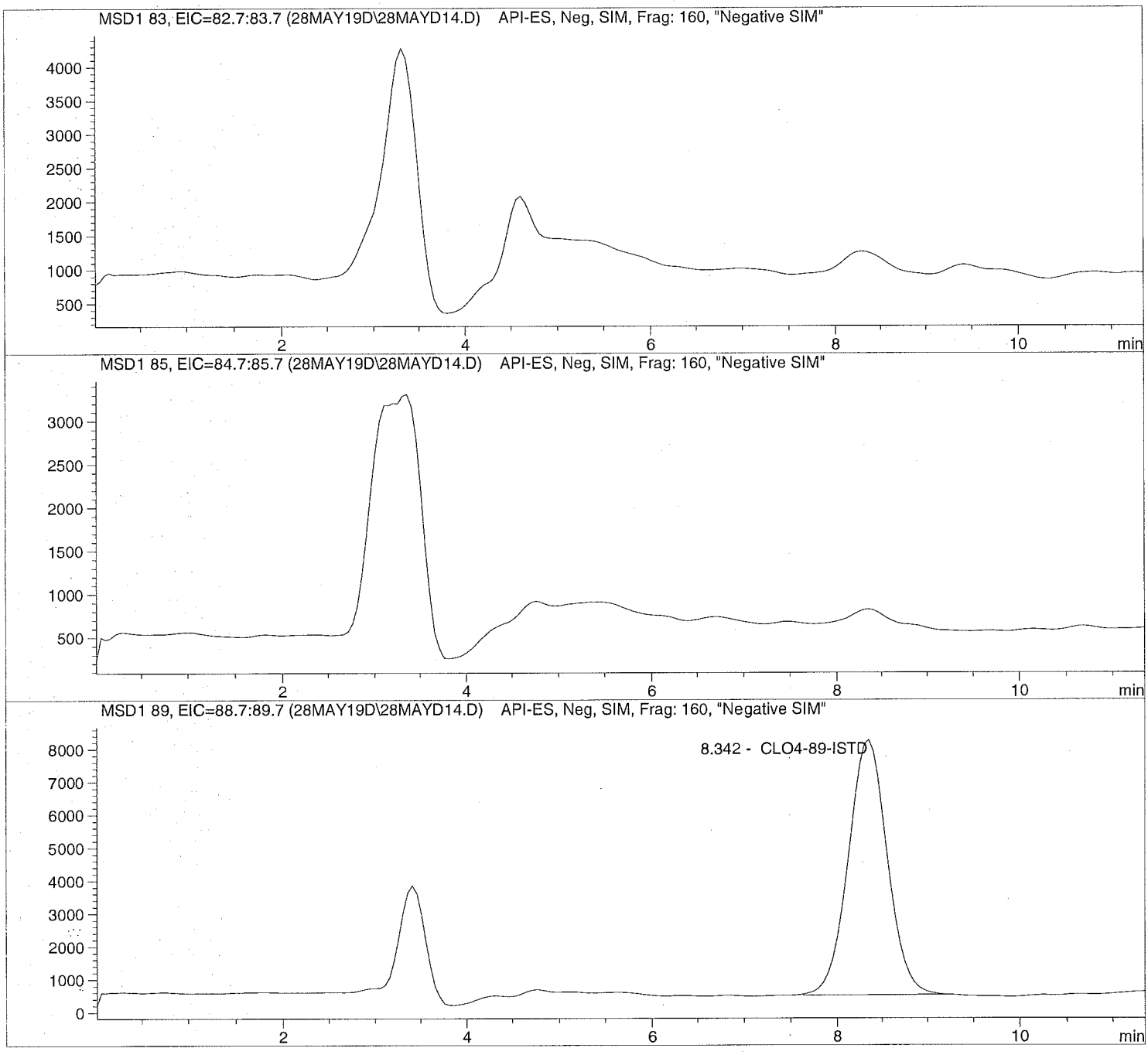
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD14.D Sample Name: 1915147001

Injection Date:	5/28/2019 12:22:08	Seq Line:	14
Sample Name:	1915147001	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD14.D Sample Name: 1915147001

Injection Date:	5/28/2019 12:22:08	Seq Line:	14
Sample Name:	1915147001	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.342	BBA	234476.0	5.0000	CLO4-89-ISTD

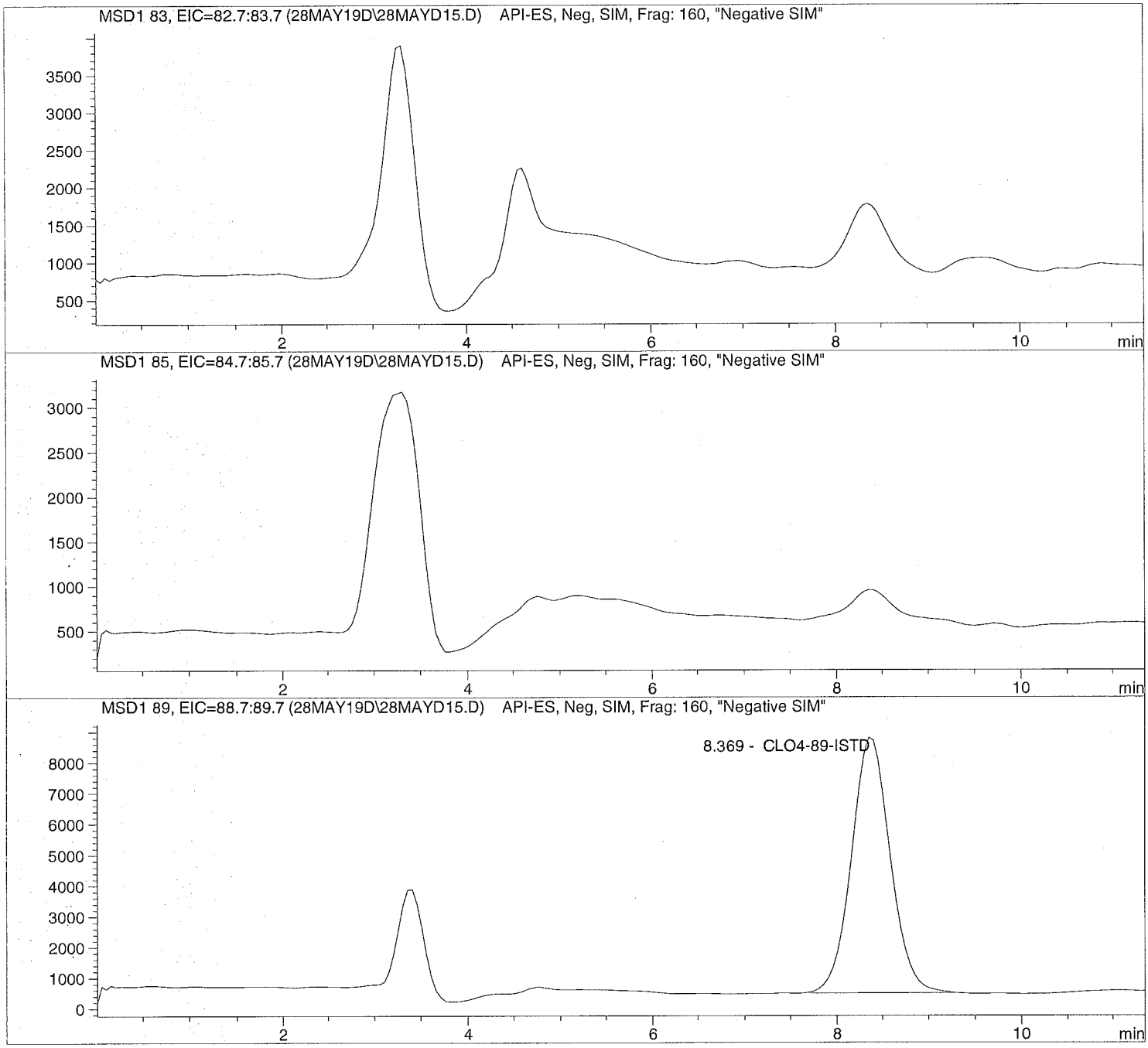
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD15.D Sample Name: 1915147002

Injection Date:	5/28/2019 12:35:29	Seq Line:	15
Sample Name:	1915147002	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD15.D Sample Name: 1915147002

Injection Date:	5/28/2019 12:35:29	Seq Line:	15
Sample Name:	1915147002	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.369	BBA	247415.5	5.0000	CLO4-89-ISTD

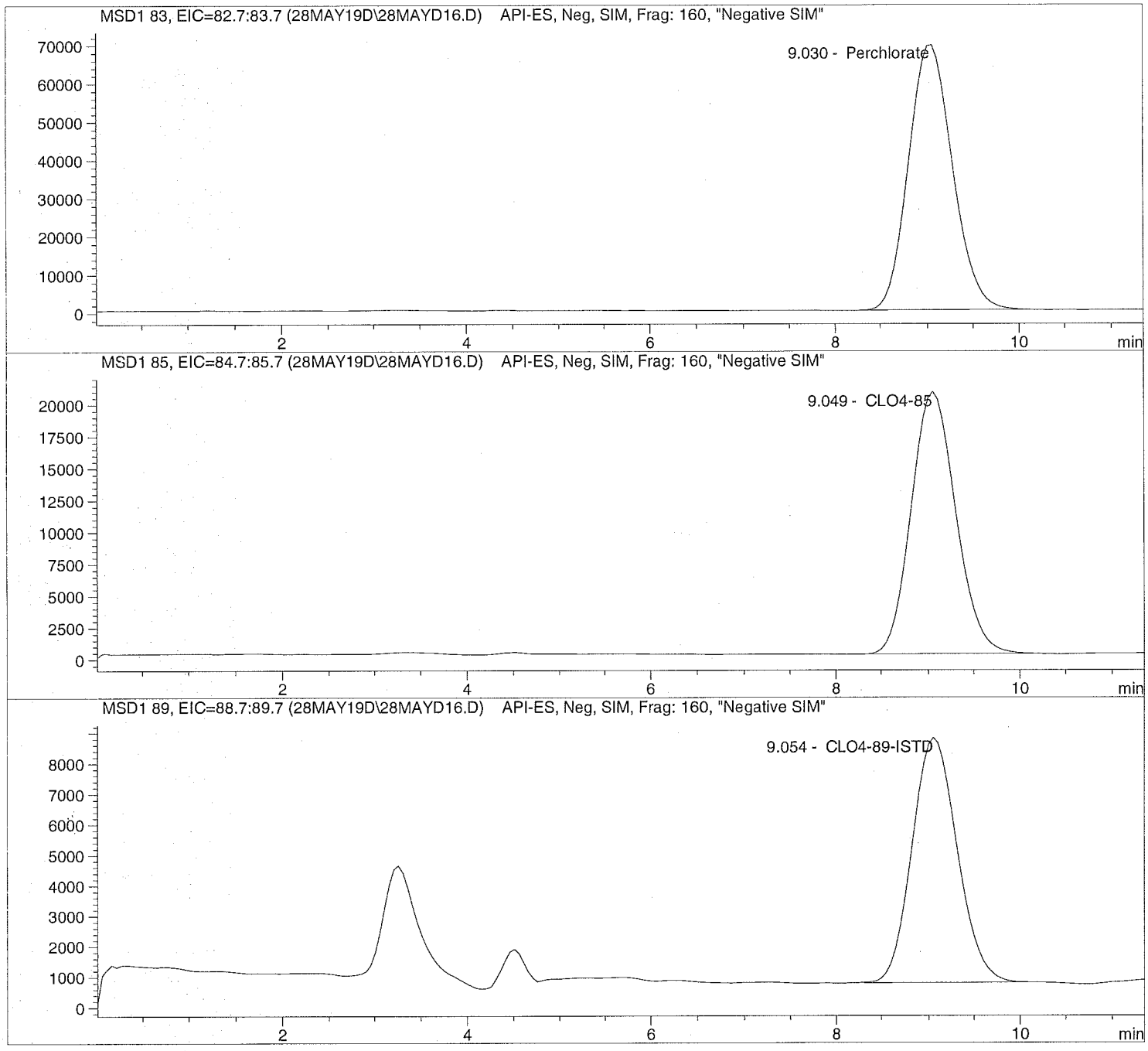
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\28MAY19D\28MAYD16.D Sample Name: 655033 CCV@25

Injection Date:	5/28/2019 13:28:26	Seq Line:	16
Sample Name:	655033 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	5/28/2019 13:28:26	Seq Line:	16
Sample Name:	655033 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.030	PBA	2263822.8	25.4454	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.049	PBA	682139.4	25.8138	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.054	BBA	270387.5	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

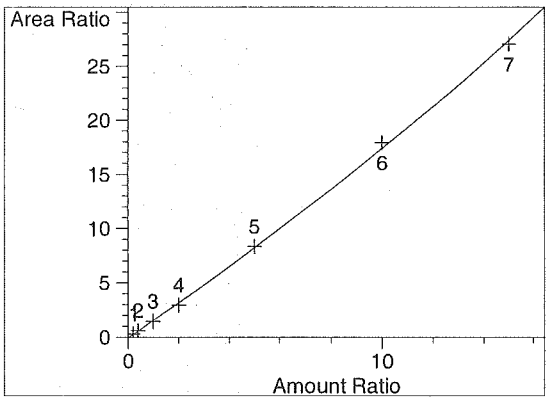
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

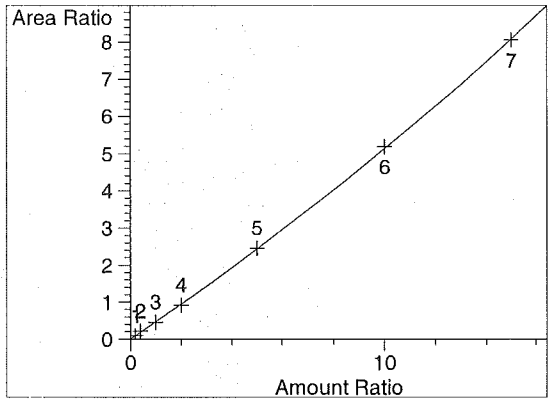
Peak Sum Table

No Entries in table

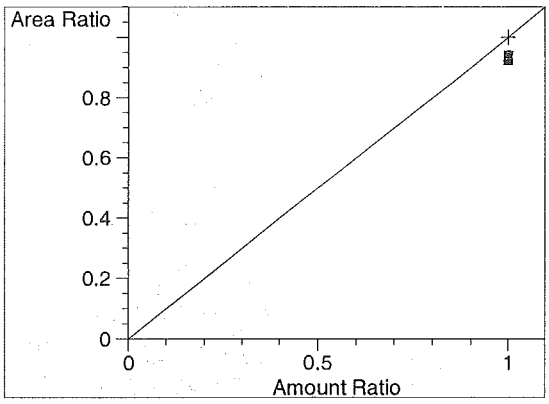
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

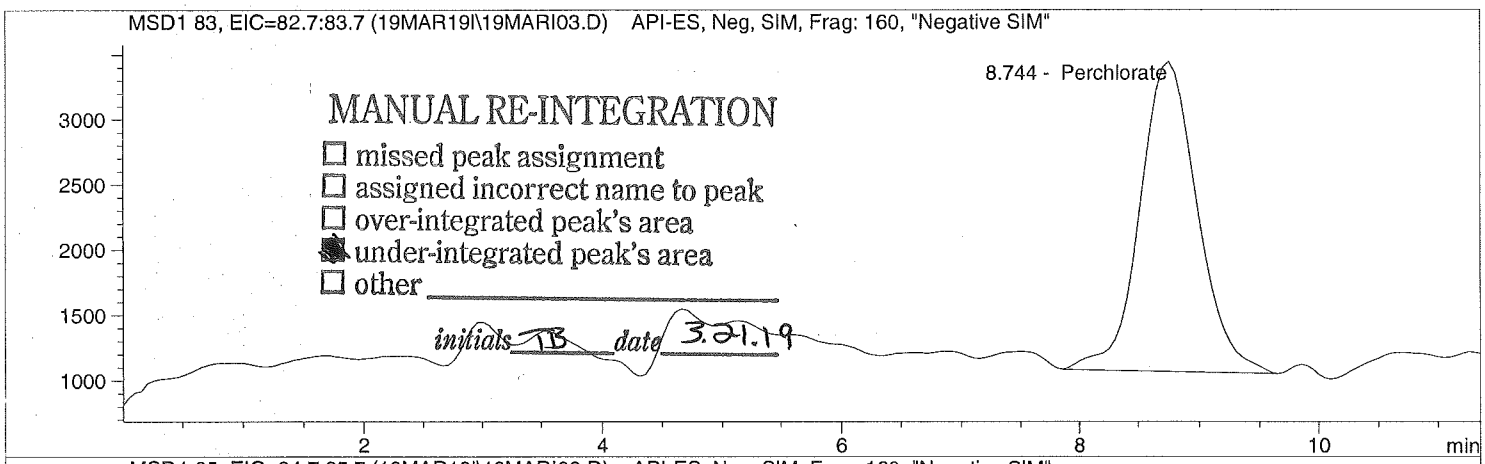
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

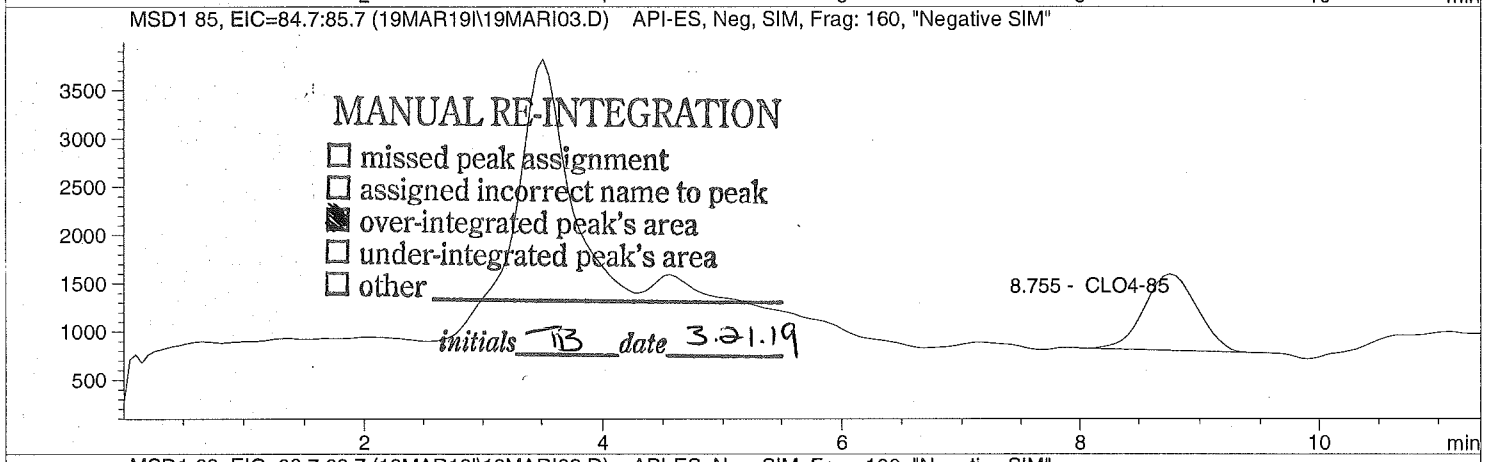
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

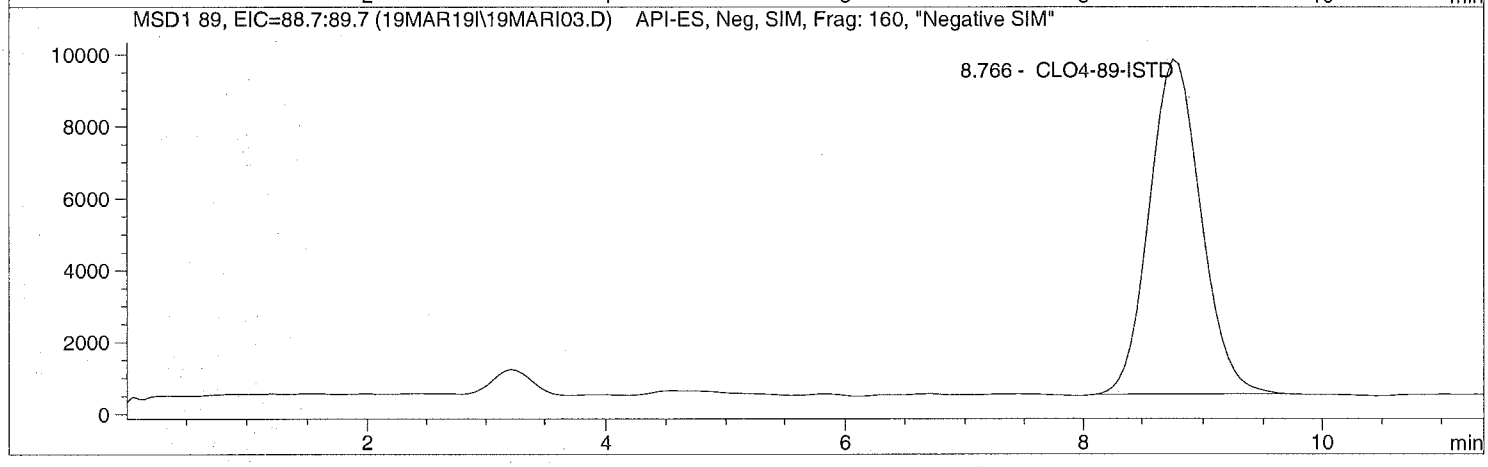
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

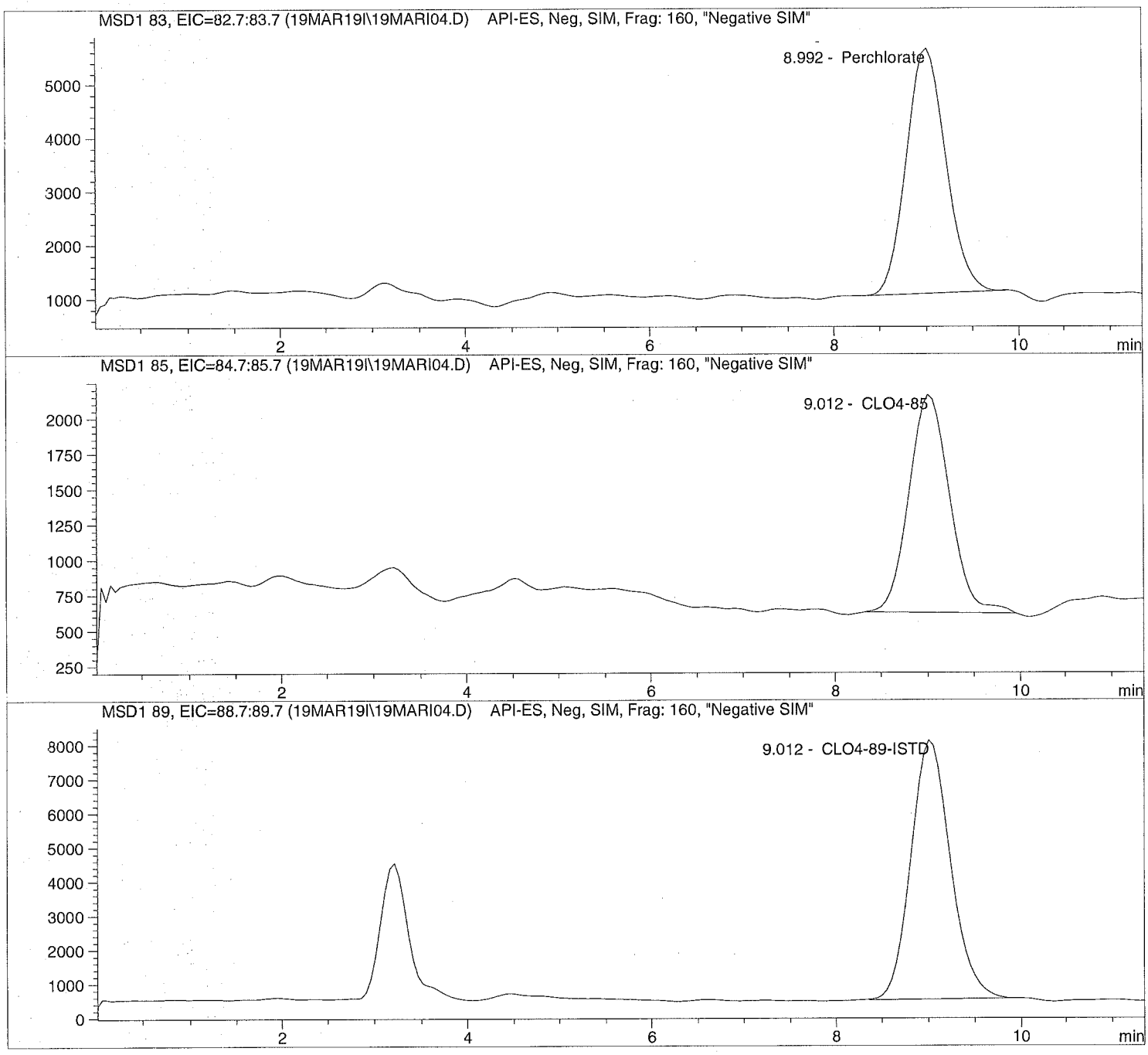
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

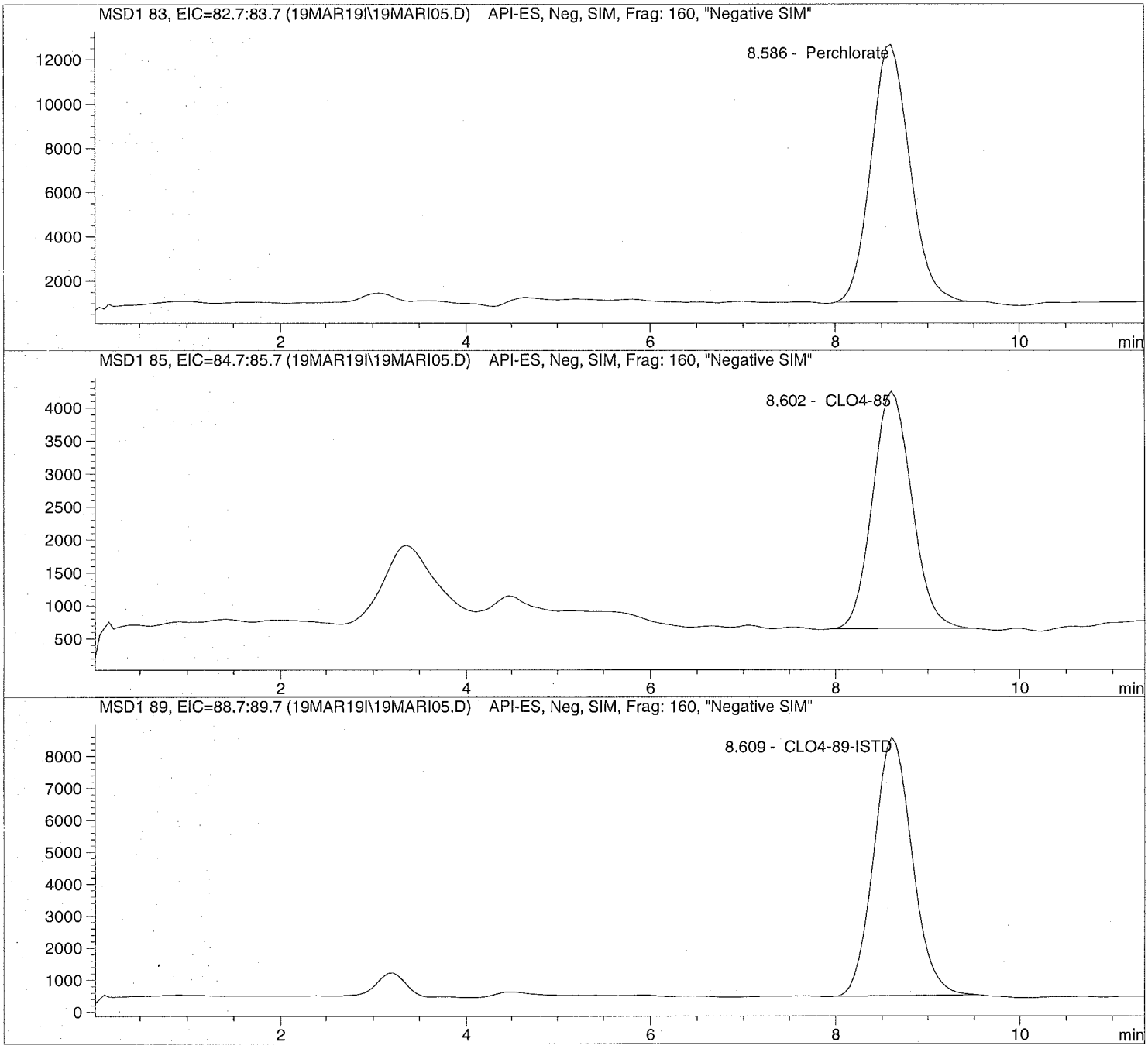
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

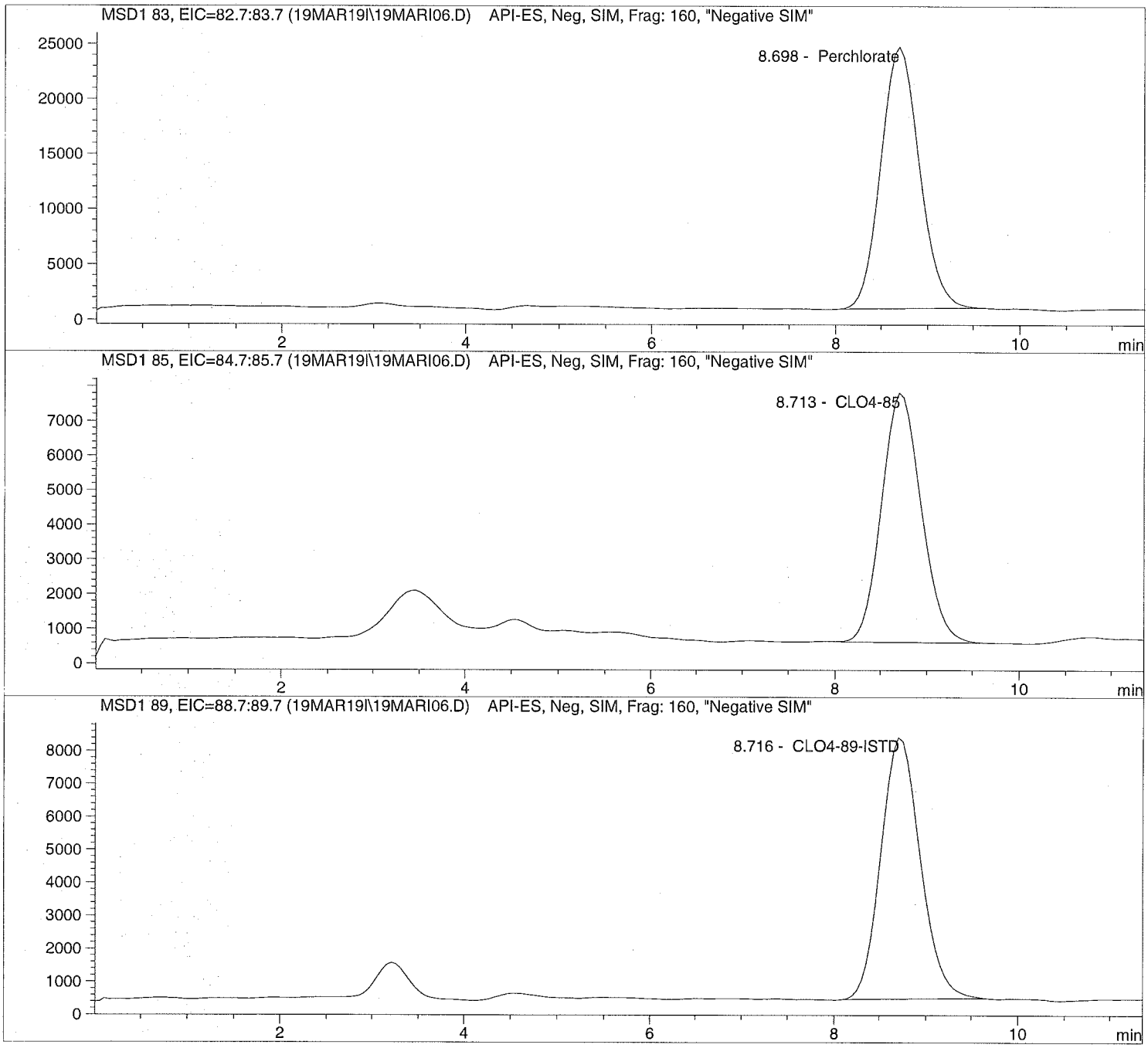
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

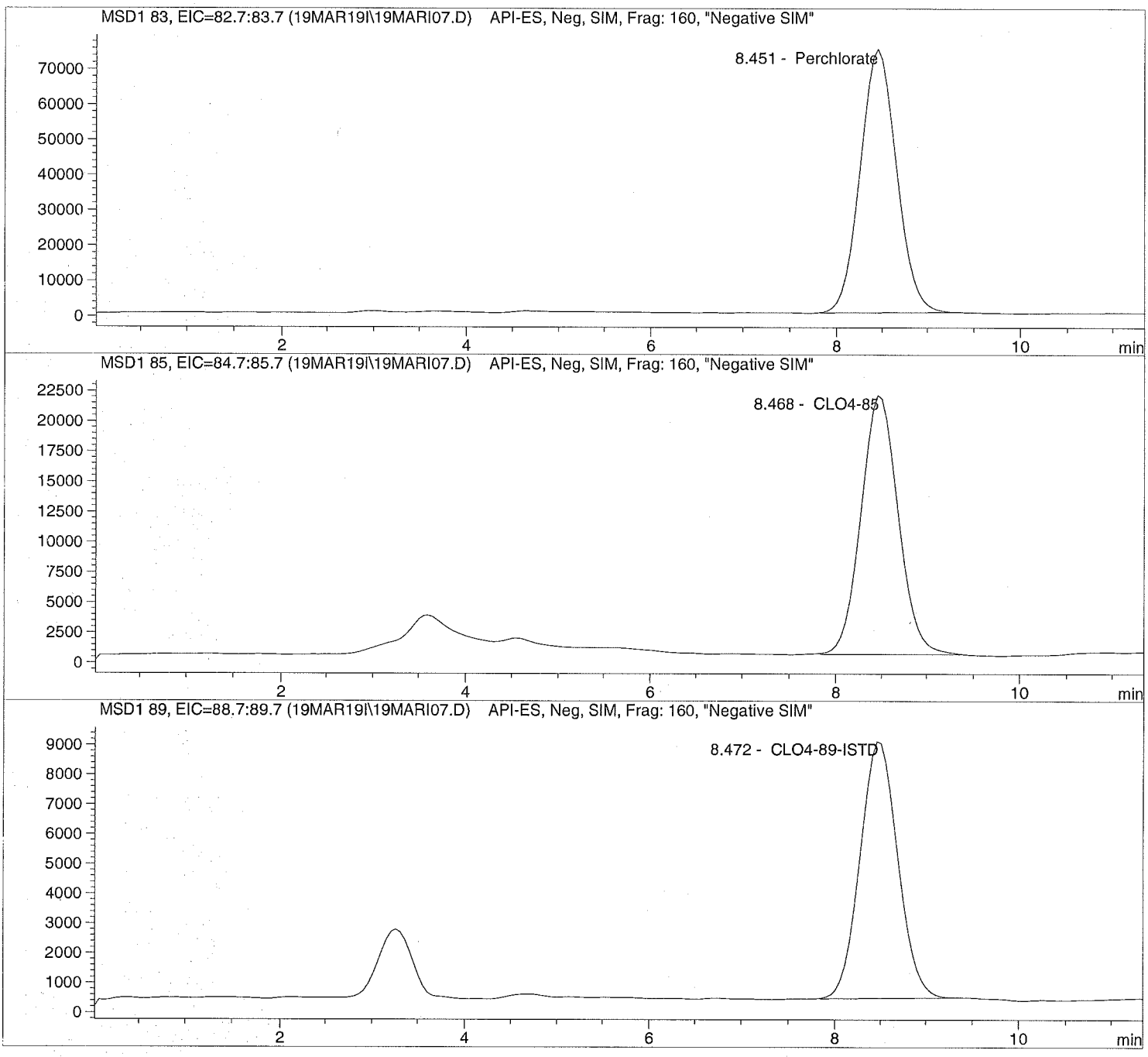
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

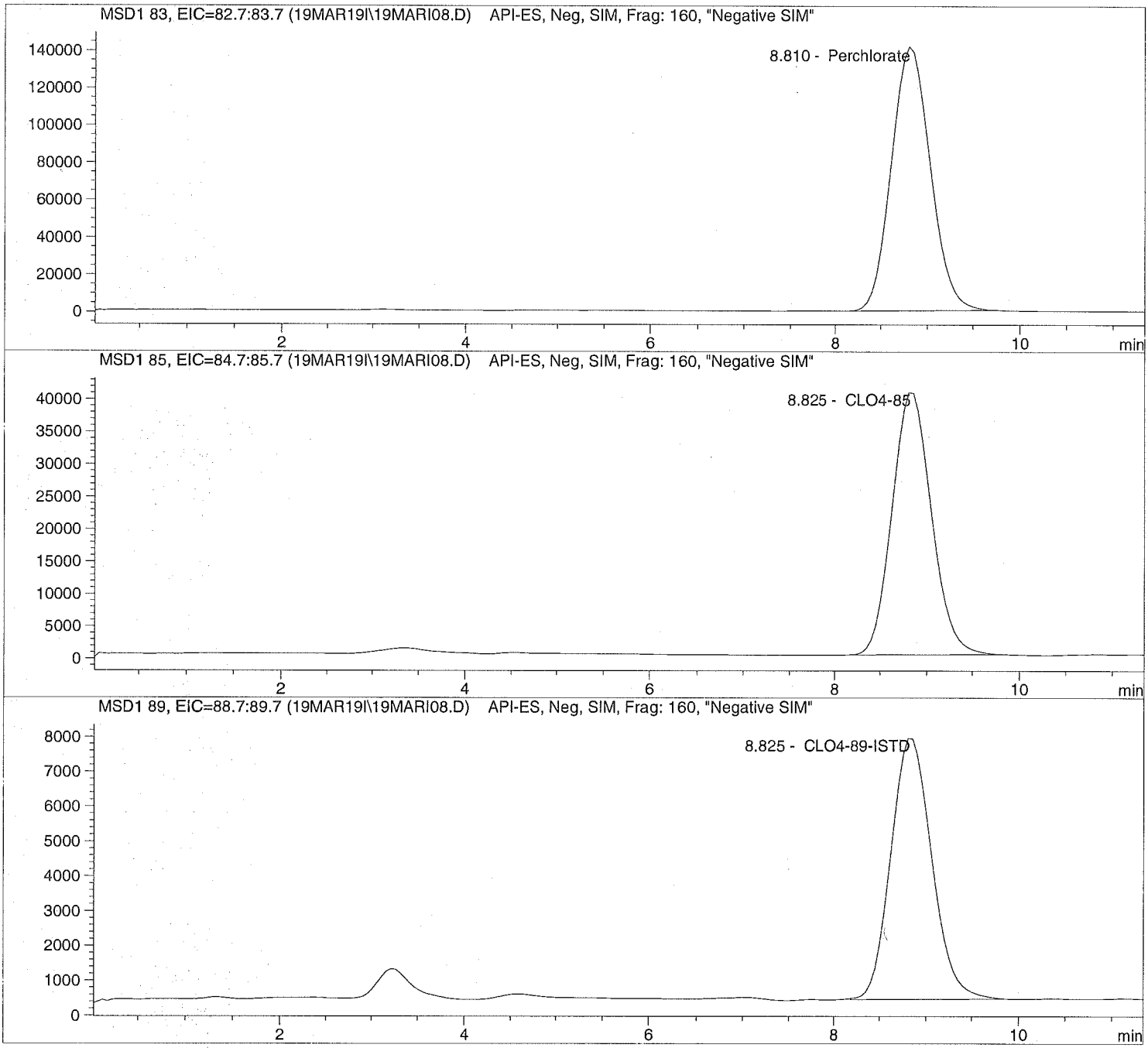
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

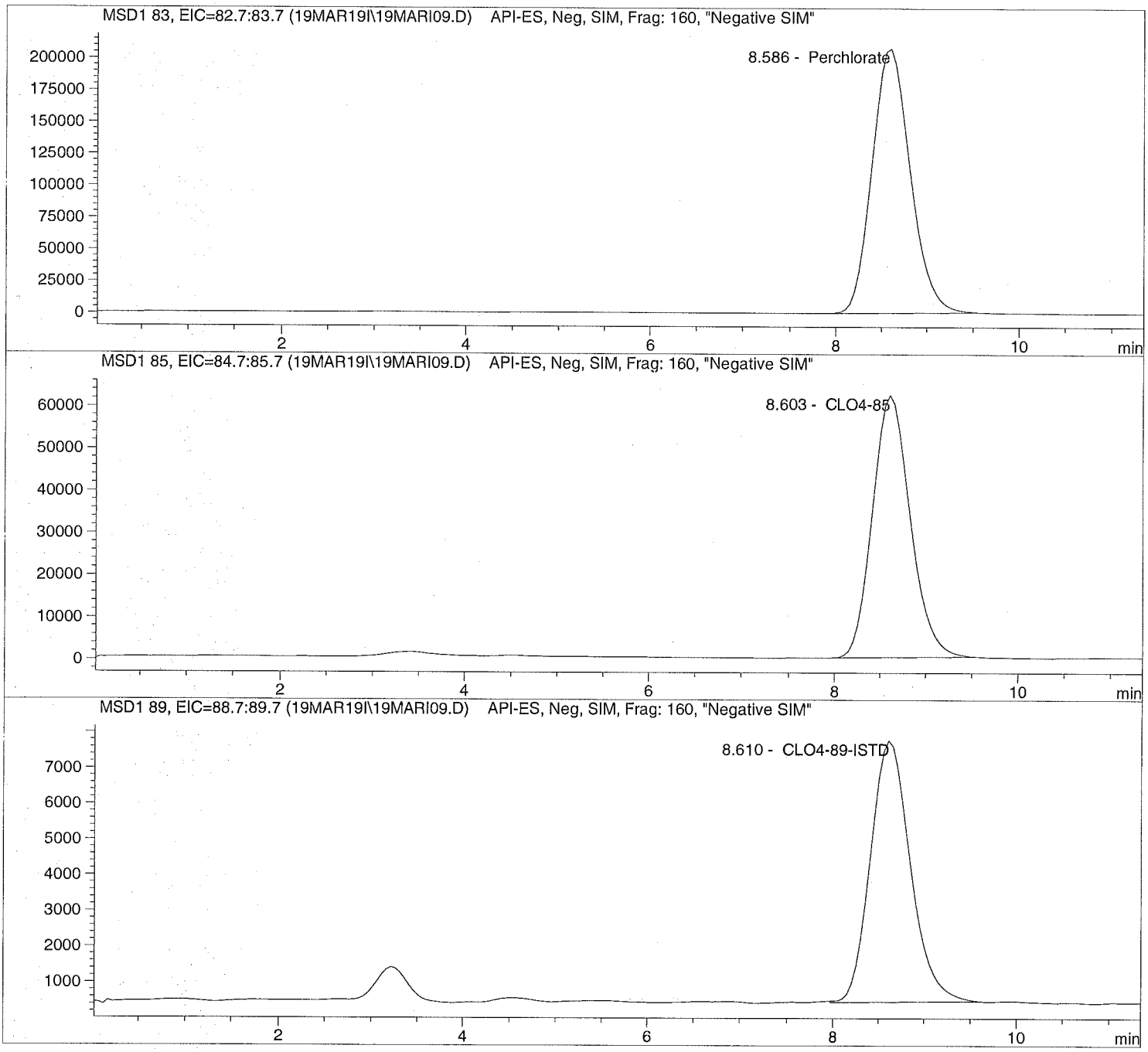
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

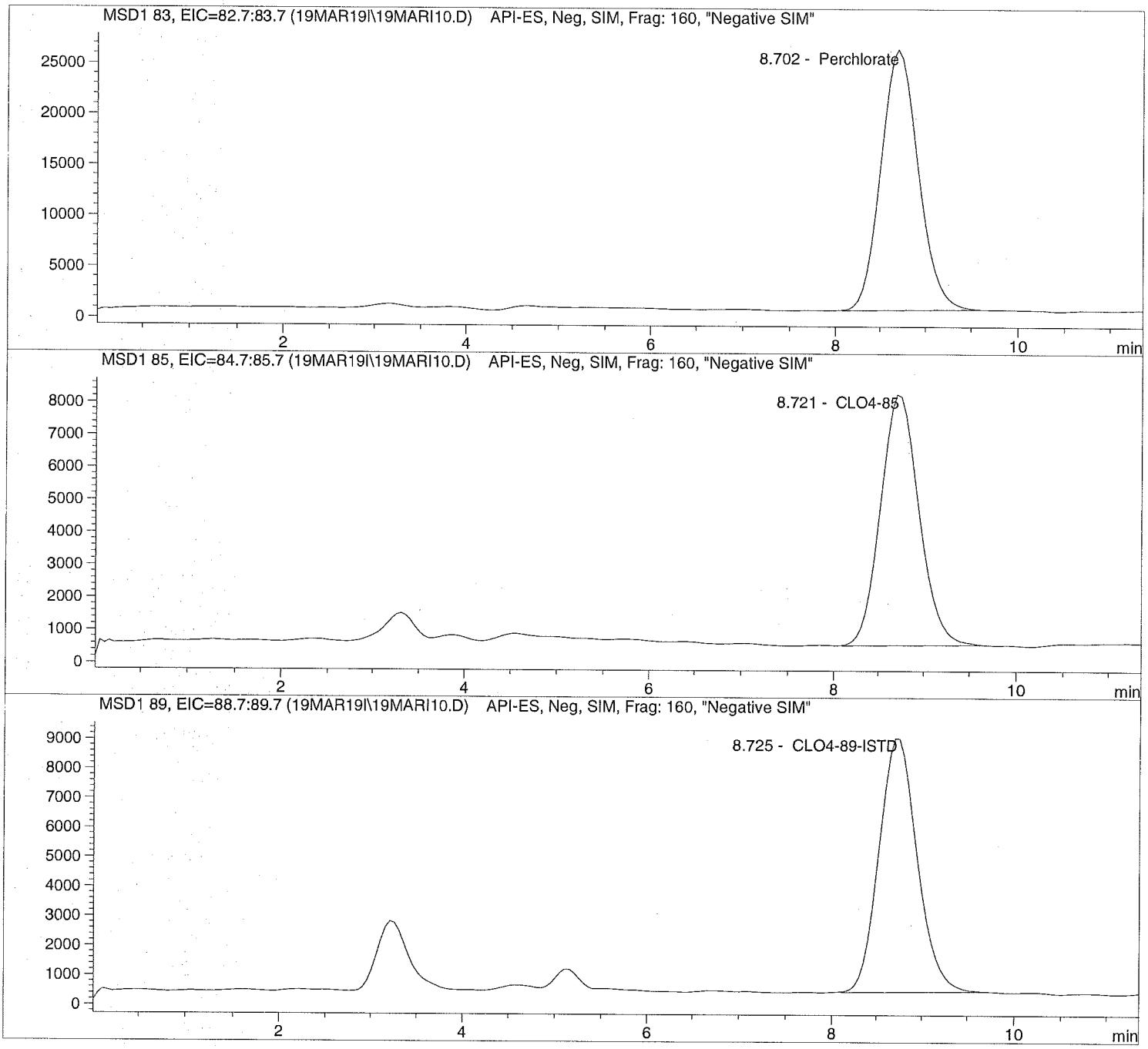
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

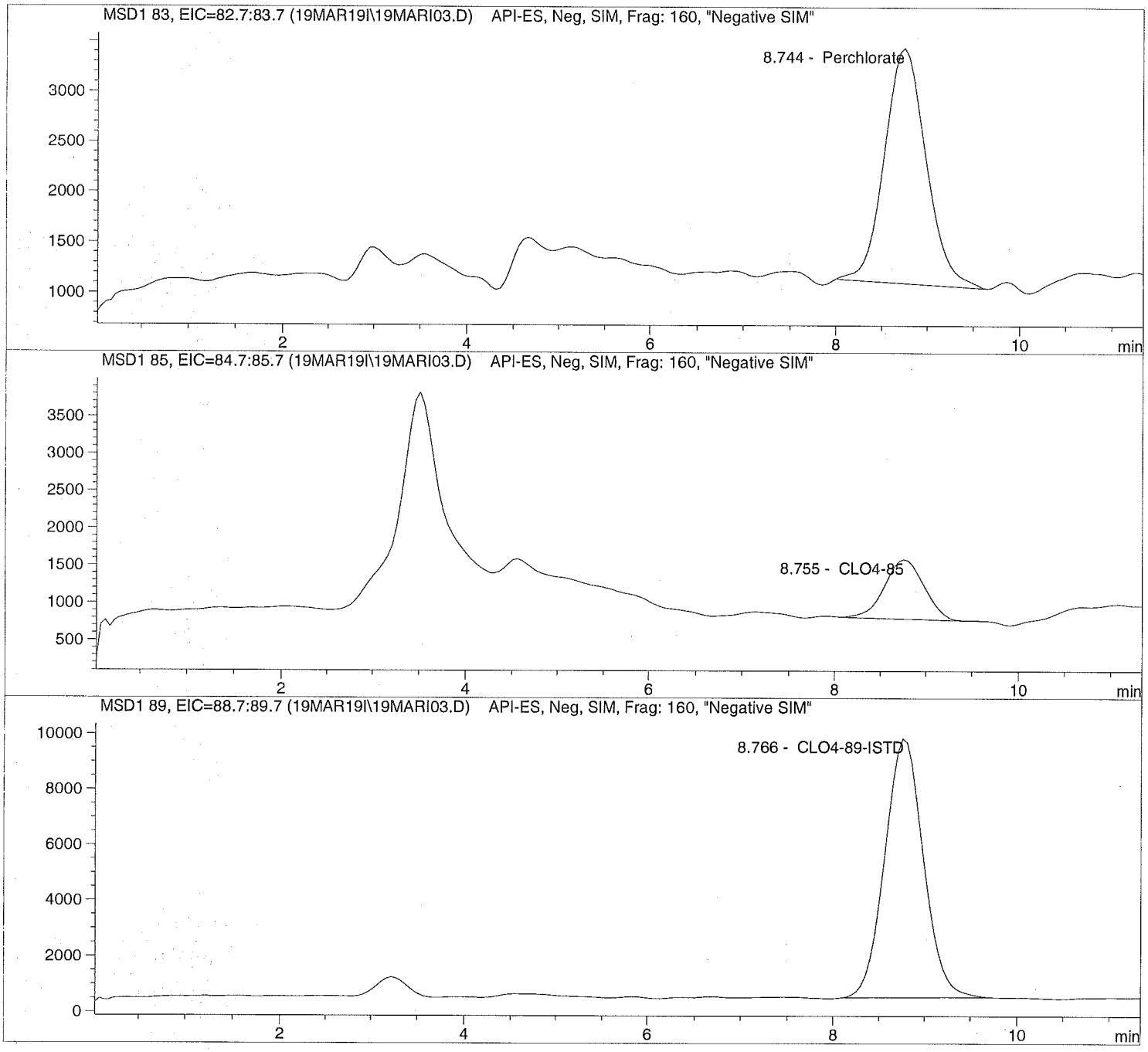
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

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May 24, 2019

Analytical Report for Service Request No: K1904503

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: 11324

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory May 17, 2019
For your reference, these analyses have been assigned our service request number **K1904503.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
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1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client: ALS Environmental - US
Project:
Sample Matrix: Water

Service Request: K1904503
Date Received: 05/17/2019

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 05/17/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 05/24/2019

Chain of Custody

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KP904503

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **11324**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19050886
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19050886-01**	**LH18/24-SP650_051419**	**Water**	**14 May 2019 14:00**
	TOC Analysis for DOD Level IV			23 May 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: JMALAWAL Date/Time: 5/16/19 18:00

Received By: KMorrow ALS Kelso Date/Time: 5/17/19 0950

Cooler ID(s): _____ Temperature(s): _____

00938621

PC Kelly

Cooler Receipt and Preservation Form

Client ALS - Houston Service Request *K19* 04503

Received: 5/17/19 Opened: 5/17/19 By: km Unloaded: 5/17/19 By: km

1. Samples were received via? *USPS* *Fed Ex* *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) *Cooler* *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA Y N If yes, how many and where? 2 Front

   If present, were custody seals intact? Y N If present, were they signed and dated? Y N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.4	0.4	3.1	3.1	0	380		480978338653	

4. Packing material: *Inserts* *Baggies* *Bubble Wrap* *Gel Packs* *Wet Ice* *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA Y N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA Y N

   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA Y N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA Y N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA Y N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA Y N
11. Were VOA vials received without headspace? *Indicate in the table below.* NA Y N
12. Was C12/Res negative? NA Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

RUSH

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
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www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1904503
Project:	11324	**Date Collected:**	05/14/19
Sample Matrix:	Water	**Date Received:**	05/17/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
HS19050886-01	K1904503-001	**1.64**	0.50	0.20	0.07	1	05/22/19 20:54	
Method Blank	K1904503-MB	ND U	0.50	0.20	0.07	1	05/22/19 20:10	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1904503
Project	11324	**Date Collected:**	05/14/19
Sample Matrix:	Water	**Date Received:**	05/17/19
		Date Analyzed:	05/22/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	HS19050886-01	**Units:**	mg/L
Lab Code:	K1904503-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K1904503-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	1.64	1.69	1.66	3	10

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1904503
Project:	11324	**Date Collected:**	05/14/19
Sample Matrix:	Water	**Date Received:**	05/17/19
		Date Analyzed:	05/22/19
		Date Extracted:	NA

Matrix Spike Summary
Carbon, Total Organic

Sample Name:	HS19050886-01	**Units:**	mg/L
Lab Code:	K1904503-001	**Basis:**	NA
Analysis Method:	SM 5310 C		
Prep Method:	None		

Matrix Spike
K1904503-001MS

Analyte Name	Sample Result	Result	Spike Amount	% Rec	% Rec Limits
Carbon, Total Organic	1.64	28.0	25.0	105	83-117

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1904503
Project:	11324	**Date Analyzed:**	05/22/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	636316

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1904503-LCS	25.7	25.0	103	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1904503
Project:

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	636316	KQ1906831-05	05/22/19 19:41	25.0	25.4	102	90-110
CCV2	636316	KQ1906831-06	05/22/19 23:44	25.0	25.0	100	90-110
CCV3	636316	KQ1906831-07	05/23/19 04:54	25.0	25.4	102	90-110
CCV4	636316	KQ1906831-08	05/23/19	25.0	24.7	99	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1904503
Project:

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	636316	KQ1906831-01	05/22/19 19:55	0.50	0.20	0.07	ND	U
CCB2	636316	KQ1906831-02	05/22/19 23:59	0.50	0.20	0.07	ND	U
CCB3	636316	KQ1906831-03	05/23/19 05:09	0.50	0.20	0.07	ND	U
CCB4	636316	KQ1906831-04	05/23/19	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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Work Request # Original ( ) KP104503, 4518, 4527, 4531, 4535, 4545, 4546, 4547, 4556, 4295, 4502, 4532, 4531

Tier: IV II III IV II II II II IV II I III IV

Date Analyzed: 5/22/19

Analyst: BCP

Analysis: TOC/DOC

TOC: 636316, 636320

Run # DOC: 636321

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	(yes)/no/NA
2.	Holding times met for all analyses and for all samples?	(yes)/no/NA
3.	Are calculations correct?	(yes)/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/(NA)
5.	All quality control criteria met?	(yes)/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	(yes)/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	(yes)/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	(yes)/no/NA
9.	Are results for methods blanks all ND?	(yes)/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/(no)/NA
11.	Are all exceptions explained?	(yes)/no/NA
12.	Have all applicable service requests been reviewed?	(yes)/no/NA
13.	Are all samples labeled correctly?	(yes)/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	(yes)/no/NA
15.	Are detection limits and units reported correctly?	(yes)/no/NA
16.	Is the unused space on the benchsheet crossed out?	(yes)/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/(no)/NA

COMMENTS: KP104545-5/5d report a high %RSD, but these samples are less than 5x the MRL.
KP104547-2/5d report a high %RSD due to suspected non-homogenous sample that is turbid.
KP104547-4/5d is over the calibration range, and has been sent for RA.

Final Approved by: [signature] Date: 05/24/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 636316 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1904503-001	Carbon, Total Organic	N/A		Water	1.64 mg/L	10 mL	1.64 mg/L	1	0.07	0.50			5/22/19 20:54:00	N	IV
K1904518-001	Carbon, Total Organic	N/A		Water	1.34 mg/L	10 mL	1.34 mg/L	1	0.07	0.50			5/22/19 21:52:00	N	II
K1904527-006	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/23/19 05:53:00	N	III
K1904531-001	Carbon, Total Organic	N/A		Surface Water	3.00 mg/L	10 mL	3.00 mg/L	1	0.07	0.50			5/23/19 07:17:00	N	IV
K1904535-001	Carbon, Total Organic	N/A		Water	1.63 mg/L	10 mL	1.63 mg/L	1	0.07	0.50			5/22/19 22:20:00	N	II
K1904535-002	Carbon, Total Organic	N/A		Water	1.88 mg/L	10 mL	1.88 mg/L	1	0.07	0.50			5/22/19 22:48:00	N	II
K1904545-001	Carbon, Total Organic	N/A		Water	0.89 mg/L	10 mL	0.89 mg/L	1	0.07	0.50			5/22/19 23:16:00	N	II
K1904545-002	Carbon, Total Organic	N/A		Water	2.41 mg/L	10 mL	2.41 mg/L	1	0.07	0.50			5/23/19 00:13:00	N	II
K1904545-003	Carbon, Total Organic	N/A		Water	15.03 mg/L	10 mL	15.0 mg/L	1	0.07	0.50			5/23/19 00:41:00	N	II
K1904545-004	Carbon, Total Organic	N/A		Water	16.19 mg/L	10 mL	16.2 mg/L	1	0.07	0.50			5/23/19 01:09:00	N	II
K1904545-005	Carbon, Total Organic	N/A		Water	0.93 mg/L	10 mL	0.93 mg/L	1	0.07	0.50			5/23/19 01:37:00	N	II
K1904545-006	Carbon, Total Organic	N/A		Water	0.60 mg/L	10 mL	0.60 mg/L	1	0.07	0.50			5/23/19 02:06:00	N	II
K1904545-007	Carbon, Total Organic	N/A		Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50			5/23/19 02:34:00	N	II
K1904546-001	Carbon, Total Organic	N/A		Water	2.48 mg/L	10 mL	2.48 mg/L	1	0.07	0.50			5/23/19 03:02:00	N	II
K1904546-002	Carbon, Total Organic	N/A		Water	2.53 mg/L	10 mL	2.53 mg/L	1	0.07	0.50			5/23/19 03:30:00	N	II
K1904547-001	Carbon, Total Organic	N/A		Water	99.95 mg/L	10 mL	1000 mg/L	10	0.7	5.0			5/23/19 03:58:00	N	II
K1904547-002	Carbon, Total Organic	N/A		Water	7.10 mg/L	10 mL	710 mg/L	100	7	50			5/23/19 04:26:00	N	II
K1904556-001	Carbon, Total Organic	N/A		Water	1.77 mg/L	10 mL	1.77 mg/L	1	0.07	0.50			5/23/19 06:21:00	N	IV
K1904556-002	Carbon, Total Organic	N/A		Water	1.71 mg/L	10 mL	1.71 mg/L	1	0.07	0.50			5/23/19 06:49:00	N	IV
KQ1906831-01	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/22/19 19:55:00	N	IV
KQ1906831-02	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/22/19 23:59:00	N	IV
KQ1906831-03	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/23/19 05:09:00	N	IV
KQ1906831-04	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/23/19	N	IV
KQ1906831-05	Carbon, Total Organic	CCV		Water	25.41 mg/L	10 mL	25.4 mg/L	1					5/22/19 19:41:00	N	IV
KQ1906831-06	Carbon, Total Organic	CCV		Water	25.05 mg/L	10 mL	25.0 mg/L	1					5/22/19 23:44:00	N	IV
KQ1906831-07	Carbon, Total Organic	CCV		Water	25.45 mg/L	10 mL	25.4 mg/L	1					5/23/19 04:54:00	N	IV
KQ1906831-08	Carbon, Total Organic	CCV		Water	24.67 mg/L	10 mL	24.7 mg/L	1					5/23/19	N	IV
KQ1906831-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/22/19 20:10:00	N	IV
KQ1906831-10	Carbon, Total Organic	LCS		Water	25.69 mg/L	10 mL	25.7 mg/L	1	0.07	0.50	103		5/22/19 20:25:00	N	IV
KQ1906831-11	Carbon, Total Organic	DUP	K1904503-001	Water	1.69 mg/L	10 mL	1.69 mg/L	1	0.07	0.50		3	5/22/19 20:54:00	N	IV
KQ1906831-12	Carbon, Total Organic	DUP	K1904518-001	Water	1.34 mg/L	10 mL	1.34 mg/L	1	0.07	0.50		<1	5/22/19 21:52:00	N	II
KQ1906831-13	Carbon, Total Organic	DUP	K1904535-001	Water	1.61 mg/L	10 mL	1.61 mg/L	1	0.07	0.50		1	5/22/19 22:20:00	N	II
KQ1906831-14	Carbon, Total Organic	DUP	K1904535-002	Water	1.83 mg/L	10 mL	1.83 mg/L	1	0.07	0.50		3	5/22/19 22:48:00	N	II
KQ1906831-15	Carbon, Total Organic	DUP	K1904545-001	Water	0.85 mg/L	10 mL	0.85 mg/L	1	0.07	0.50		4	5/22/19 23:16:00	N	II
KQ1906831-16	Carbon, Total Organic	DUP	K1904545-002	Water	2.42 mg/L	10 mL	2.42 mg/L	1	0.07	0.50		<1	5/23/19 00:13:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Printed 5/24/19 13:14

Results Summary

05/24/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 636316 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1906831-17	Carbon, Total Organic	DUP	K1904545-003	Water	15.44 mg/L	10 mL	15.4 mg/L	1	0.07	0.50		3	5/23/19 00:41:00	N	II
KQ1906831-18	Carbon, Total Organic	DUP	K1904545-004	Water	15.81 mg/L	10 mL	15.8 mg/L	1	0.07	0.50		2	5/23/19 01:09:00	N	II
KQ1906831-19	Carbon, Total Organic	DUP	K1904545-005	Water	0.62 mg/L	10 mL	0.62 mg/L	1	0.07	0.50		40*	5/23/19 01:37:00	N	II
KQ1906831-20	Carbon, Total Organic	DUP	K1904545-006	Water	0.60 mg/L	10 mL	0.60 mg/L	1	0.07	0.50		<1	5/23/19 02:06:00	N	II
KQ1906831-21	Carbon, Total Organic	DUP	K1904545-007	Water	0.50 mg/L	10 mL	0.50 mg/L	1	0.07	0.50		2	5/23/19 02:34:00	N	II
KQ1906831-22	Carbon, Total Organic	DUP	K1904546-001	Water	2.49 mg/L	10 mL	2.49 mg/L	1	0.07	0.50		<1	5/23/19 03:02:00	N	II
KQ1906831-23	Carbon, Total Organic	DUP	K1904546-002	Water	2.54 mg/L	10 mL	2.54 mg/L	1	0.07	0.50		<1	5/23/19 03:30:00	N	II
KQ1906831-24	Carbon, Total Organic	DUP	K1904547-001	Water	123.17 mg/L	10 mL	1230 mg/L	10	0.7	5.0		21*	5/23/19 03:58:00	N	II
KQ1906831-25	Carbon, Total Organic	DUP	K1904547-002	Water	5.06 mg/L	10 mL	506 mg/L	100	7	50		34*	5/23/19 04:26:00	N	II
KQ1906831-26	Carbon, Total Organic	DUP	K1904527-006	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	5/23/19 05:53:00	N	III
KQ1906831-27	Carbon, Total Organic	DUP	K1904556-001	Water	1.75 mg/L	10 mL	1.75 mg/L	1	0.07	0.50		<1	5/23/19 06:21:00	N	IV
KQ1906831-28	Carbon, Total Organic	DUP	K1904556-002	Water	1.68 mg/L	10 mL	1.68 mg/L	1	0.07	0.50		2	5/23/19 06:49:00	N	IV
KQ1906831-29	Carbon, Total Organic	DUP	K1904531-001	Surface Water	2.98 mg/L	10 mL	2.98 mg/L	1	0.07	0.50		<1	5/23/19 07:17:00	N	IV
KQ1906831-30	Carbon, Total Organic	MS	K1904503-001	Water	27.96 mg/L	10 mL	28.0 mg/L	1	0.07	0.50	105		5/22/19 21:22:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 636320 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1904295-004	Carbon, Total Organic	N/A		Water	5.68 mg/L	10 mL	568 mg/L	100	7	50			5/23/19 13:25:00	N	II
K1904295-005	Carbon, Total Organic	N/A		Water	6.05 mg/L	10 mL	605 mg/L	100	7	50			5/23/19 13:53:00	N	II
K1904502-001	Carbon, Total Organic	N/A		Water	1.48 mg/L	10 mL	1.48 mg/L	1	0.07	0.50			5/23/19 11:32:00	N	I
K1904502-002	Carbon, Total Organic	N/A		Water	16.84 mg/L	10 mL	16.8 mg/L	1	0.07	0.50			5/23/19 12:00:00	N	I
K1904502-003	Carbon, Total Organic	N/A		Water	2.54 mg/L	10 mL	2.54 mg/L	1	0.07	0.50			5/23/19 12:29:00	N	I
K1904502-004	Carbon, Total Organic	N/A		Water	1.03 mg/L	10 mL	1.03 mg/L	1	0.07	0.50			5/23/19 12:57:00	N	I
K1904532-001	Carbon, Total Organic	N/A		Surface Water	3.06 mg/L	10 mL	3.06 mg/L	1	0.07	0.50			5/23/19 07:45:00	N	III
K1904532-002	Carbon, Total Organic	N/A		Surface Water	10.94 mg/L	10 mL	10.9 mg/L	1	0.07	0.50			5/23/19 08:13:00	Y	III
K1904532-003	Carbon, Total Organic	N/A		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/23/19 09:40:00	N	III
K1904532-004	Carbon, Total Organic	N/A		Surface Water	2.89 mg/L	10 mL	2.89 mg/L	1	0.07	0.50			5/23/19 10:08:00	N	III
K1904532-005	Carbon, Total Organic	N/A		Surface Water	6.59 mg/L	10 mL	6.59 mg/L	1	0.07	0.50			5/23/19 10:36:00	N	III
K1904532-006	Carbon, Total Organic	N/A		Surface Water	6.69 mg/L	10 mL	6.69 mg/L	1	0.07	0.50			5/23/19 11:04:00	N	III
KQ1906832-01	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/23/19 05:09:00	N	III
KQ1906832-02	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/23/19 09:25:00	N	III
KQ1906832-03	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/23/19 14:36:00	N	III
KQ1906832-04	Carbon, Total Organic	CCV		Surface Water	25.45 mg/L	10 mL	25.4 mg/L	1					5/23/19 04:54:00	N	III
KQ1906832-05	Carbon, Total Organic	CCV		Surface Water	24.67 mg/L	10 mL	24.7 mg/L	1					5/23/19 09:10:00	N	III
KQ1906832-06	Carbon, Total Organic	CCV		Surface Water	24.70 mg/L	10 mL	24.7 mg/L	1					5/23/19 14:21:00	N	III
KQ1906832-07	Carbon, Total Organic	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/23/19 05:24:00	N	III
KQ1906832-08	Carbon, Total Organic	LCS		Surface Water	25.10 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		5/23/19 05:38:00	N	III
KQ1906832-09	Carbon, Total Organic	MS	K1904532-002	Surface Water	35.57 mg/L	10 mL	35.6 mg/L	1	0.07	0.50	99		5/23/19 08:41:00	N	III
KQ1906832-10	Carbon, Total Organic	DUP	K1904532-001	Surface Water	3.06 mg/L	10 mL	3.06 mg/L	1	0.07	0.50		<1	5/23/19 07:45:00	N	III
KQ1906832-11	Carbon, Total Organic	DUP	K1904532-002	Surface Water	10.84 mg/L	10 mL	10.8 mg/L	1	0.07	0.50		<1	5/23/19 08:13:00	N	III
KQ1906832-12	Carbon, Total Organic	DUP	K1904532-003	Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	5/23/19 09:40:00	N	III
KQ1906832-13	Carbon, Total Organic	DUP	K1904532-004	Surface Water	3.05 mg/L	10 mL	3.05 mg/L	1	0.07	0.50		5	5/23/19 10:08:00	N	III

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

05/24/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 636320 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1906832-14	Carbon, Total Organic	DUP	K1904532-005	Surface Water	6.50 mg/L	10 mL	6.50 mg/L	1	0.07	0.50		1	5/23/19 10:36:00	N	III
KQ1906832-15	Carbon, Total Organic	DUP	K1904532-006	Surface Water	6.62 mg/L	10 mL	6.62 mg/L	1	0.07	0.50		1	5/23/19 11:04:00	N	III
KQ1906832-16	Carbon, Total Organic	DUP	K1904502-001	Water	1.46 mg/L	10 mL	1.46 mg/L	1	0.07	0.50		2	5/23/19 11:32:00	N	I
KQ1906832-17	Carbon, Total Organic	DUP	K1904502-002	Water	16.64 mg/L	10 mL	16.6 mg/L	1	0.07	0.50		1	5/23/19 12:00:00	N	I
KQ1906832-18	Carbon, Total Organic	DUP	K1904502-003	Water	2.43 mg/L	10 mL	2.43 mg/L	1	0.07	0.50		4	5/23/19 12:29:00	N	I
KQ1906832-19	Carbon, Total Organic	DUP	K1904502-004	Water	1.03 mg/L	10 mL	1.03 mg/L	1	0.07	0.50		<1	5/23/19 12:57:00	N	I
KQ1906832-20	Carbon, Total Organic	DUP	K1904295-004	Water	5.77 mg/L	10 mL	577 mg/L	100	7	50		2	5/23/19 13:25:00	N	II
KQ1906832-21	Carbon, Total Organic	DUP	K1904295-005	Water	6.06 mg/L	10 mL	606 mg/L	100	7	50		<1	5/23/19 13:53:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 636321 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1904531-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	9.08 mg/L	10 mL	9.08 mg/L	1	0.07	0.50			5/23/19 15:20:00	N	IV
K1904532-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	7.95 mg/L	10 mL	7.95 mg/L	1	0.07	0.50			5/23/19 15:48:00	N	III
K1904532-002	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	15.48 mg/L	10 mL	15.5 mg/L	1	0.07	0.50			5/23/19 16:16:00	Y	III
K1904532-003	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	4.13 mg/L	10 mL	4.13 mg/L	1	0.07	0.50			5/23/19 17:13:00	N	III
K1904532-004	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	6.96 mg/L	10 mL	6.96 mg/L	1	0.07	0.50			5/23/19 17:41:00	N	III
K1904532-005	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	11.10 mg/L	10 mL	11.1 mg/L	1	0.07	0.50			5/23/19 18:09:00	N	III
K1904532-006	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	8.31 mg/L	10 mL	8.31 mg/L	1	0.07	0.50			5/23/19 19:07:00	N	III
KQ1906833-01	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/23/19 14:36:00	N	IV
KQ1906833-02	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/23/19 18:52:00	N	IV
KQ1906833-03	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/23/19 19:50:00	N	IV
KQ1906833-04	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.70 mg/L	10 mL	24.7 mg/L	1					5/23/19 14:21:00	N	IV
KQ1906833-05	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.39 mg/L	10 mL	24.4 mg/L	1					5/23/19 18:37:00	N	IV
KQ1906833-06	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	25.08 mg/L	10 mL	25.1 mg/L	1					5/23/19 19:07:00	N	IV
KQ1906833-07	Carbon, Dissolved Organic (DOC)	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/23/19 14:50:00	N	IV
KQ1906833-08	Carbon, Dissolved Organic (DOC)	LCS		Surface Water	24.93 mg/L	10 mL	24.9 mg/L	1	0.07	0.50	100		5/23/19 15:05:00	N	IV
KQ1906833-09	Carbon, Dissolved Organic (DOC)	DUP	K1904531-001	Surface Water	9.06 mg/L	10 mL	9.06 mg/L	1	0.07	0.50		<1	5/23/19 15:20:00	N	IV
KQ1906833-10	Carbon, Dissolved Organic (DOC)	DUP	K1904532-001	Surface Water	7.90 mg/L	10 mL	7.90 mg/L	1	0.07	0.50		<1	5/23/19 15:48:00	N	III
KQ1906833-11	Carbon, Dissolved Organic (DOC)	DUP	K1904532-002	Surface Water	15.17 mg/L	10 mL	15.2 mg/L	1	0.07	0.50		2	5/23/19 16:16:00	N	III
KQ1906833-12	Carbon, Dissolved Organic (DOC)	DUP	K1904532-003	Surface Water	4.13 mg/L	10 mL	4.13 mg/L	1	0.07	0.50		<1	5/23/19 17:13:00	N	III
KQ1906833-13	Carbon, Dissolved Organic (DOC)	DUP	K1904532-004	Surface Water	6.98 mg/L	10 mL	6.98 mg/L	1	0.07	0.50		<1	5/23/19 17:41:00	N	III
KQ1906833-14	Carbon, Dissolved Organic (DOC)	DUP	K1904532-005	Surface Water	10.92 mg/L	10 mL	10.9 mg/L	1	0.07	0.50		2	5/23/19 18:09:00	N	III
KQ1906833-15	Carbon, Dissolved Organic (DOC)	DUP	K1904532-006	Surface Water	8.31 mg/L	10 mL	8.31 mg/L	1	0.07	0.50		<1	5/23/19 19:07:00	N	III
KQ1906833-16	Carbon, Dissolved Organic (DOC)	MS	K1904532-002	Surface Water	39.49 mg/L	10 mL	39.5 mg/L	1	0.07	0.50	96		5/23/19 16:44:00	N	III

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

05/24/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	25.405	0.0000	25.4053	25.4053	25.4	5/22/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/22/2019
4	MB1	1	0.000	0.0000	0.0000	0	<0.5	5/22/2019
5	[TOC] LCS [24ppm]	1	25.687	0.0000	25.6874	25.6874	25.7	5/22/2019
6	K1904503-001	1	1.639	0.0000	1.6387	1.6387	1.64	5/22/2019
7	K1904503-001d	1	1.687	0.0000	1.6866	1.6866	1.7	5/22/2019
8	K1904503-001ms	1	27.957	0.0000	27.9572	27.9572	28	5/22/2019
9	K1904518-001	1	1.340	0.0000	1.3404	1.3404	1.34	5/22/2019
10	K1904518-001d	1	1.337	0.0000	1.3370	1.337	1.34	5/22/2019
11	K1904535-001	1	1.634	0.0000	1.6342	1.6342	1.6	5/22/2019
12	K1904535-001d	1	1.613	0.0000	1.6128	1.6128	1.61	5/22/2019
13	K1904535-002	1	1.881	0.0000	1.8814	1.8814	1.88	5/22/2019
14	K1904535-002d	1	1.834	0.0000	1.8342	1.8342	1.83	5/22/2019
15	K1904545-001	1	0.885	0.0000	0.8852	0.8852	0.9	5/22/2019
16	K1904545-001d	1	0.849	0.0000	0.8485	0.8485	0.8	5/22/2019
17	C] CCV 25 ppm [25 p	1	25.049	0.0000	25.0489	25.0489	25.05	5/22/2019
18	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/22/2019
19	K1904545-002	1	2.407	0.0000	2.4073	2.4073	2.4	5/23/2019
20	K1904545-002d	1	2.420	0.0000	2.4203	2.4203	2.42	5/23/2019
21	K1904545-003	1	15.025	0.0000	15.0250	15.025	15.03	5/23/2019
22	K1904545-003d	1	15.443	0.0000	15.4434	15.4434	15.4	5/23/2019
23	K1904545-004	1	16.186	0.0000	16.1857	16.1857	16.2	5/23/2019
24	K1904545-004d	1	15.815	0.0000	15.8145	15.8145	15.81	5/23/2019
25	K1904545-005	1	0.933	0.0000	0.9325	0.9325	0.93	5/23/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date time
Analyzed By: RP	Date Analyzed	5/22/19
Reviewed By:	Date Reviewed	05/24/19

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1904545-005d	1	0.621	0.0000	0.6206	0.6206	0.62	5/23/2019
27	K1904545-006	1	0.596	0.0000	0.5957	0.5957	0.60	5/23/2019
28	K1904545-006d	1	0.595	0.0000	0.5951	0.5951	0.6	5/23/2019
29	K1904545-007	1	0.512	0.0000	0.5122	0.5122	0.5	5/23/2019
30	K1904545-007d	1	0.500	0.0000	0.5002	0.5002	0.5	5/23/2019
31	K1904546-001	1	2.478	0.0000	2.4782	2.4782	2.5	5/23/2019
32	K1904546-001d	1	2.487	0.0000	2.4873	2.4873	2.5	5/23/2019
33	K1904546-002	1	2.531	0.0000	2.5306	2.5306	2.5	5/23/2019
34	K1904546-002d	1	2.536	0.0000	2.5359	2.5359	2.5	5/23/2019
35	K1904547-001	10	99.953	0.0000	99.9529	999.529	999.5	5/23/2019
36	K1904547-001d	10	123.172	0.0000	123.1718	1231.718	1231.7	5/23/2019
37	K1904547-002	100	7.105	0.0000	7.1048	710.48	710.5	5/23/2019
38	K1904547-002d	100	5.062	0.0000	5.0623	506.23	506.2	5/23/2019
39	C] CCV 25 ppm [25 p	1	25.449	0.0000	25.4492	25.4492	25.4	5/23/2019
40	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/23/2019
41	K1904527-006	1	0.000	0.0000	0.0000	0	<0.5	5/23/2019
42	K1904527-006d	1	0.000	0.0000	0.0000	0	<0.5	5/23/2019
43	K1904556-001	1	1.766	0.0000	1.7656	1.7656	1.8	5/23/2019
44	K1904556-001d	1	1.749	0.0000	1.7485	1.7485	1.7	5/23/2019
45	K1904556-002	1	1.711	0.0000	1.7111	1.7111	1.7	5/23/2019
46	K1904556-002d	1	1.679	0.0000	1.6792	1.6792	1.7	5/23/2019
47	K1904531-001	1	2.997	0.0000	2.9966	2.9966	3.0	5/23/2019
48	K1904531-001d	1	2.977	0.0000	2.9770	2.977	3.0	5/23/2019
49	C] CCV 25 ppm [25 p	1	24.666	0.0000	24.6660	24.666	24.7	5/23/2019
50	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/23/2019

Analyzed By: BCP	Date Analyzed 5/22/19
Reviewed By: [signature]	Date Reviewed 05/24/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	25.449	0.0000	25.4492	25.4492	25.4	5/23/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/23/2019
4	MB2	1	0.000	0.0000	0.0000	0	<0.5	5/23/2019
5	[TOC] LCS [24ppm]	1	25.102	0.0000	25.1021	25.1021	25.1	5/23/2019
6	K1904532-001	1	3.056	0.0000	3.0557	3.0557	3.06	5/23/2019
7	K1904532-001d	1	3.065	0.0000	3.0645	3.0645	3.1	5/23/2019
8	K1904532-002	1	10.942	0.0000	10.9420	10.942	11	5/23/2019
9	K1904532-002d	1	10.841	0.0000	10.8411	10.8411	10.84	5/23/2019
10	K1904532-002ms	1	35.568	0.0000	35.5676	35.5676	35.57	5/23/2019
11	C] CCV 25 ppm [25 p	1	24.666	0.0000	24.6660	24.666	24.7	5/23/2019
12	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/23/2019
13	K1904532-003	1	0.000	0.0000	0.0000	0	<0.5	5/23/2019
14	K1904532-003d	1	0.000	0.0000	0.0000	0	<0.5	5/23/2019
15	K1904532-004	1	2.893	0.0000	2.8926	2.8926	2.9	5/23/2019
16	K1904532-004d	1	3.047	0.0000	3.0468	3.0468	3.0	5/23/2019
17	K1904532-005	1	6.595	0.0000	6.5946	6.5946	6.59	5/23/2019
18	K1904532-005d	1	6.497	0.0000	6.4971	6.4971	6.5	5/23/2019
19	K1904532-006	1	6.691	0.0000	6.6914	6.6914	6.7	5/23/2019
20	K1904532-006d	1	6.618	0.0000	6.6184	6.6184	6.62	5/23/2019
21	K1904502-001	1	1.482	0.0000	1.4815	1.4815	1.48	5/23/2019
22	K1904502-001d	1	1.459	0.0000	1.4594	1.4594	1.5	5/23/2019
23	K1904502-002	1	16.839	0.0000	16.8392	16.8392	16.8	5/23/2019
24	K1904502-002d	1	16.644	0.0000	16.6437	16.6437	16.64	5/23/2019
25	K1904502-003	1	2.543	0.0000	2.5428	2.5428	2.54	5/23/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date time
Analyzed By: BCV	Date Analyzed	5/22/19
Reviewed By:	Date Reviewed	05/24/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1904502-003d	1	2.432	0.0000	2.4319	2.4319	2.43	5/23/2019
27	K1904502-004	1	1.029	0.0000	1.0290	1.029	1.03	5/23/2019
28	K1904502-004d	1	1.033	0.0000	1.0330	1.033	1.0	5/23/2019
29	K1904295-004	100	5.682	0.0000	5.6822	568.22	568.2	5/23/2019
30	K1904295-004d	100	5.771	0.0000	5.7712	577.12	577.1	5/23/2019
31	K1904295-005	100	6.048	0.0000	6.0477	604.77	604.8	5/23/2019
32	K1904295-005d	100	6.064	0.0000	6.0635	606.35	606.4	5/23/2019
33	C] CCV 25 ppm [25 p	1	24.696	0.0000	24.6961	24.6961	24.7	5/23/2019
34	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/23/2019
35		1		0.0000	0.0000	0	<0.5	
36		1		0.0000	0.0000	0	<0.5	
37		1		0.0000	0.0000	0	<0.5	
38		1		0.0000	0.0000	0	<0.5	
39		1		0.0000	0.0000	0	<0.5	
40		1		0.0000	0.0000	0	<0.5	
41		1		0.0000	0.0000	0	<0.5	
42		1		0.0000	0.0000	0	<0.5	
43		1		0.0000	0.0000	0	<0.5	
44		1		0.0000	0.0000	0	<0.5	
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By:	BCP	Date Analyzed	5/23/19
Reviewed By:	[signature]	Date Reviewed	05/29/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	24.696	0.0000	24.6961	24.6961	24.7	5/23/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/23/2019
4	MB3	1	0.000	0.0000	0.0000	0	<0.5	5/23/2019
5	[TOC] LCS [25ppm]	1	24.928	0.0000	24.9281	24.9281	24.9	5/23/2019
6	K1904531-001	1	9.077	0.0000	9.0769	9.0769	9.08	5/23/2019
7	K1904531-001d	1	9.063	0.0000	9.0631	9.0631	9.1	5/23/2019
8	K1904532-001	1	7.947	0.0000	7.9470	7.947	8	5/23/2019
9	K1904532-001d	1	7.897	0.0000	7.8969	7.8969	7.90	5/23/2019
10	K1904532-002	1	15.482	0.0000	15.4821	15.4821	15.48	5/23/2019
11	K1904532-002d	1	15.170	0.0000	15.1704	15.1704	15.2	5/23/2019
12	K1904532-002ms	1	39.489	0.0000	39.4894	39.4894	39.49	5/23/2019
13	K1904532-003	1	4.135	0.0000	4.1349	4.1349	4.13	5/23/2019
14	K1904532-003d	1	4.130	0.0000	4.1295	4.1295	4.13	5/23/2019
15	K1904532-004	1	6.957	0.0000	6.9573	6.9573	7.0	5/23/2019
16	K1904532-004d	1	6.978	0.0000	6.9782	6.9782	7.0	5/23/2019
17	K1904532-005	1	11.097	0.0000	11.0968	11.0968	11.10	5/23/2019
18	K1904532-005d	1	10.922	0.0000	10.9223	10.9223	10.9	5/23/2019
19	C] CCV 25 ppm [25 p	1	24.389	0.0000	24.3888	24.3888	24.4	5/23/2019
20	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/23/2019
21	K1904532-006	1	8.308	0.0000	8.3078	8.3078	8.31	5/23/2019
22	K1904532-006d	1	8.308	0.0000	8.3078	8.3078	8.3	5/23/2019
23	C] CCV 25 ppm [25 p	1	25.080	0.0000	25.0803	25.0803	25.1	5/23/2019
24	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/23/2019
25	~~———~~	~~1~~		~~0.0000~~	~~0.0000~~	~~0~~	~~<0.5~~	

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: BD		Date Analyzed 5/24/19	
Reviewed By:		Date Reviewed 05/24/19	

TOC: 636316, 636320
DOC: 636321

Schedule: 05222019b

Version: 2
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/05/22 17:40 - Wednesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1904503-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1904503-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1904518-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1904535-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1904535-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1904545-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1904545-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1904545-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1904545-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1904545-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1904545-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1904545-007.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1904546-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1904546-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1904547-001.01 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1904547-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1904527-006.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1904556-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1904556-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1904531-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1904532-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1904532-002.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1904532-002.03 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
28	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1904532-003.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1904532-004.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1904532-005.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K1904532-006.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K1904502-001.05	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1904502-002.05	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1904502-003.05	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1904502-004.05	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1904295-004.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1904295-005.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

05/24/19

Schedule: 05222019b

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K1904531-001.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1904532-001.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1904532-002.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1904532-002.04 doc ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
44	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
45	Sample	K1904532-003.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1904532-004.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1904532-005.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	K1904532-006.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

00938644

Fusion Report - 05222019b
Wednesday, May 22, 2019 05:40 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/05/24 09:05 - Friday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	05222019b	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2)		
Comment:			

Report Results

05/24/19 Hamphrey

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/05/22 17:40

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.53	16.35	3.82	49.70	05:24
2	TC Clean	4.18	7.21	3.03	50.02	04:06
3	TC Clean	2.02	5.20	3.18	50.03	03:55
4	TC Clean	1.84	4.97	3.13	50.02	03:55

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/05/22 18:02

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.60	3.65	3.04	49.77	05:24
2	TC Clean	3.44	6.54	3.10	50.03	04:01
3	TC Clean	1.68	4.80	3.13	50.05	03:49
4	TC Clean	2.02	5.12	3.10	50.05	03:46

00938645

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/05/22 18:24

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.82	3.91	3.09	49.64	05:12
2	TC Clean	3.47	6.70	3.23	50.01	04:02
3	TC Clean	2.01	5.19	3.18	50.02	03:45
4	TC Clean	1.98	5.14	3.16	50.05	03:48

Sample Type: Blank (Creating v1259) — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(blank)		Reagent/Acid Blank	2019/05/22 18:46

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.58	3.87	3.29	49.62	05:23
2	TC Clean	3.81	7.05	3.24	50.02	04:05
3	TC Clean	2.21	5.29	3.08	50.02	03:49
4	TC Clean	2.16	5.32	3.16	49.76	07:04
5	Reagent Blank	8.27	11.25	2.98	49.73	08:11
6	Acid Blank	2.31	5.24	2.94	49.80	05:32

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	D	TOC	RB	0.9130 ppm	0.0000 ppm	0.0000%	2019/05/22 19:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9130	9.1303	15.26	18.27	3.01	49.88	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.4053 ppm (PASS)	0.0000 ppm	0%	2019/05/22 19:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.4053	254.0528	181.91	185.03	3.12	49.85	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/22 19:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.53	11.63	3.10	49.82	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/22 20:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.45	10.53	3.08	49.82	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.6874 ppm (PASS)	0.0000 ppm	0%	2019/05/22 20:25

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

	Type									
C	TOC	25.0 ppm	1	25.6874	256.8739	183.83	186.81	2.98	49.80	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.1031 ppm	0.0000 ppm	0.0000%	2019/05/22 20:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1031	1.0307	9.77	12.80	3.04	49.80	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K1904503-001.01	1.6627 ppm	0.0339 ppm	2.0400%	2019/05/22 20:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6387	16.3873	20.19	23.17	2.98	49.83	10:30
2	TOC	1.6866	16.8661	20.52	23.54	3.03	49.83	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1904503-001.01 ms	27.9572 ppm	0.0000 ppm	0.0000%	2019/05/22 21:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.9572	279.5717	198.84	201.87	3.03	49.80	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/22 21:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.43	11.43	3.00	49.84	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1904518-001.01	1.3387 ppm	0.0024 ppm	0.1800%	2019/05/22 21:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3404	13.4041	18.17	21.36	3.20	49.84	10:26
2	TOC	1.3370	13.3702	18.14	21.30	3.15	49.85	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1904535-001.01	1.6235 ppm	0.0151 ppm	0.9300%	2019/05/22 22:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6342	16.3417	20.16	23.19	3.03	49.86	10:29
2	TOC	1.6128	16.1281	20.02	23.03	3.01	49.86	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1904535-002.01	1.8578 ppm	0.0333 ppm	1.7900%	2019/05/22 22:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8814	18.8137	21.84	24.69	2.85	49.88	10:27
2	TOC	1.8342	18.3423	21.52	24.56	3.04	49.88	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1904545-001.01	0.8668 ppm	0.0259 ppm	2.9900%	2019/05/22 23:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8852	8.8519	15.08	18.06	2.99	49.88	10:28
2	TOC	0.8485	8.4851	14.83	17.85	3.02	49.90	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.0489 ppm	0.0000 ppm	0%	2019/05/22 23:44

							(PASS)				

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.0489	250.4891	179.49	182.49	3.00	49.89	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/22 23:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.71	10.53	2.83	49.92	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K1904545-002.01	2.4138 ppm	0.0092 ppm	0.3800%	2019/05/23 00:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4073	24.0730	25.41	28.32	2.91	49.91	10:26
2	TOC	2.4203	24.2027	25.50	28.49	2.99	49.92	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K1904545-003.01	15.2342 ppm	0.2958 ppm	1.9400%	2019/05/23 00:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.0250	150.2497	111.06	114.00	2.94	49.93	10:25
2	TOC	15.4434	154.4336	113.90	117.17	3.27	49.94	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis	Sample ID	Result (ppmC)	Std. Dev.	RSD	Start Time

00938650

		Type			(ppmC)		
◈	12	TOC	K1904545-004.01	16.0001 ppm	0.2625 ppm	1.6400%	2019/05/23 01:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	16.1857	161.8571	118.94	122.05	3.12	49.93	10:29
2	TOC	15.8145	158.1446	116.42	119.61	3.20	49.93	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1904545-005.01	0.7765 ppm	0.2205 ppm	28.4000%	2019/05/23 01:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9325	9.3248	15.40	18.57	3.17	49.96	10:29
2	TOC	0.6206	6.2060	13.28	16.43	3.15	49.98	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1904545-006.01	0.5954 ppm	0.0004 ppm	0.0700%	2019/05/23 02:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5957	5.9571	13.11	16.06	2.95	49.96	10:31
2	TOC	0.5951	5.9512	13.11	16.17	3.06	49.96	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1904545-007.01	0.5062 ppm	0.0084 ppm	1.6700%	2019/05/23 02:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5122	5.1218	12.54	15.62	3.07	49.97	10:29
2	TOC	0.5002	5.0024	12.46	15.48	3.02	49.97	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1904546-001.01	2.4827 ppm	0.0065 ppm	0.2600%	2019/05/23 03:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4782	24.7816	25.89	28.77	2.88	49.99	10:28
2	TOC	2.4873	24.8730	25.95	28.95	3.00	49.96	10:28

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1904546-002.01	2.5333 ppm	0.0038 ppm	0.1500%	2019/05/23 03:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5306	25.3061	26.24	29.38	3.14	49.98	10:30
2	TOC	2.5359	25.3591	26.28	29.15	2.87	49.98	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K1904547-001.01 10x	111.5624 ppm	16.4182 ppm	14.7200%	2019/05/23 03:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	99.9529	999.5294	687.54	690.54	3.00	50.01	10:27
2	TOC	123.1718	1231.7176	845.15	849.34	4.19	50.01	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K1904547-002.01 100x	6.0835 ppm	1.4442 ppm	23.7400%	2019/05/23 04:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.1048	71.0475	57.29	61.22	3.93	50.01	10:28
2	TOC	5.0623	50.6231	43.43	46.70	3.27	50.01	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm

From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.4492 ppm (PASS)	0.0000 ppm	0%	2019/05/23 04:54

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.4492	254.4918	182.21	185.27	3.06	50.01	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria	Do Nothing	CAS_salt_010711	CAS_salt_010711	50 ppmC

met.	(v4)	(v30)

Sample Type: Check Standard --> CCB — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/23 05:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	9.07	12.16	3.08	50.02	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/23 05:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.57	10.65	3.08	50.02	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.1021 ppm (PASS)	0.0000 ppm	0%	2019/05/23 05:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.1021	251.0209	179.85	182.82	2.97	50.03	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◈	21	TOC	K1904527-006.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/23 05:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.67	11.98	3.31	50.02	10:28
2	TOC	0.0000	0.0000	8.52	11.71	3.19	50.06	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1904556-001.01	1.7570 ppm	0.0121 ppm	0.6900%	2019/05/23 06:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7656	17.6558	21.05	24.08	3.03	50.03	10:28
2	TOC	1.7485	17.4849	20.94	23.92	2.98	50.03	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1904556-002.01	1.6952 ppm	0.0225 ppm	1.3300%	2019/05/23 06:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7111	17.1107	20.68	23.81	3.13	50.04	10:29
2	TOC	1.6792	16.7925	20.47	23.53	3.06	50.04	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1904531-001.03	2.9868 ppm	0.0139 ppm	0.4600%	2019/05/23 07:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9966	29.9658	29.41	32.42	3.01	50.06	10:28
2	TOC	2.9770	29.7699	29.28	32.32	3.05	50.01	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1904532-001.03	3.0601 ppm	0.0063 ppm	0.2000%	2019/05/23 07:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0557	30.5566	29.81	32.83	3.02	50.01	10:26
2	TOC	3.0645	30.6450	29.87	32.88	3.01	50.00	10:27

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Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1904532-002.03	10.8915 ppm	0.0714 ppm	0.6600%	2019/05/23 08:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.9420	109.4200	83.34	86.34	3.00	49.97	10:26
2	TOC	10.8411	108.4108	82.66	85.63	2.97	50.00	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1904532-002.03 ms	35.5676 ppm	0.0000 ppm	0.0000%	2019/05/23 08:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	35.5676	355.6758	250.50	253.54	3.05	49.98	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	RB	0.3261 ppm	0.0000 ppm	0.0000%	2019/05/23 08:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3261	3.2611	11.28	14.34	3.06	49.97	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6660 ppm (PASS)	0.0000 ppm	0%	2019/05/23 09:10

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6660	246.6602	176.89	180.11	3.21	49.96	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

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Sample Type: Check Standard --> CCB From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/23 09:25

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.32	10.59	3.28	49.95	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1904532-003.03	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/23 09:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.10	10.01	2.90	49.94	10:24
2	TOC	0.0000	0.0000	7.07	10.05	2.97	49.99	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K1904532-004.03	2.9697 ppm	0.1091 ppm	3.6700%	2019/05/23 10:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8926	28.9257	28.70	31.68	2.98	49.92	10:26
2	TOC	3.0468	30.4682	29.75	32.68	2.93	49.91	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K1904532-005.03	6.5458 ppm	0.0690 ppm	1.0500%	2019/05/23 10:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.5946	65.9458	53.83	56.90	3.07	49.89	10:26
2	TOC	6.4971	64.9706	53.17	56.33	3.16	49.90	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

		Analysis			Std. Dev.		

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◈	32	TOC	K1904532-006.03	6.6549 ppm	0.0516 ppm	0.7700%	2019/05/23 11:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.6914	66.9137	54.49	57.46	2.97	49.88	10:27
2	TOC	6.6184	66.1845	53.99	57.04	3.04	49.87	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K1904502-001.05	1.4705 ppm	0.0156 ppm	1.0600%	2019/05/23 11:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4815	14.8154	19.12	22.14	3.01	50.00	10:28
2	TOC	1.4594	14.5945	18.97	21.98	3.01	49.93	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1904502-002.05	16.7415 ppm	0.1382 ppm	0.8300%	2019/05/23 12:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	16.8392	168.3922	123.37	126.36	2.99	50.00	10:31
2	TOC	16.6437	166.4373	122.04	125.11	3.06	49.89	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1904502-003.05	2.4874 ppm	0.0784 ppm	3.1500%	2019/05/23 12:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5428	25.4284	26.33	29.17	2.84	50.00	10:30
2	TOC	2.4319	24.3190	25.58	28.51	2.94	49.88	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	36	TOC	K1904502-004.05	1.0310 ppm	0.0028 ppm	0.2700%	2019/05/23 12:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0290	10.2898	16.05	19.13	3.07	49.96	10:28
2	TOC	1.0330	10.3295	16.08	19.07	2.99	49.99	10:25

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	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K1904295-004.01 100x	5.7267 ppm	0.0629 ppm	1.1000%	2019/05/23 13:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.6822	56.8223	47.64	50.52	2.88	49.93	10:25
2	TOC	5.7712	57.7121	48.24	51.09	2.84	49.98	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	K1904295-005.01 100x	6.0556 ppm	0.0111 ppm	0.1800%	2019/05/23 13:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.0477	60.4773	50.12	53.14	3.02	50.03	10:28
2	TOC	6.0635	60.6349	50.23	53.26	3.04	49.94	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6961 ppm (PASS)	0.0000 ppm	0%	2019/05/23 14:21

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6961	246.9608	177.10	180.04	2.95	49.95	10:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/23 14:36

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

	Type									
D	TOC	0 ppm	1	0.0000	0.0000	7.09	10.13	3.05	49.99	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/23 14:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.15	9.20	3.06	49.96	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.9281 ppm (PASS)	0.0000 ppm	0%	2019/05/23 15:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.9281	249.2811	178.67	181.70	3.02	49.98	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	40	TOC	K1904531-001.04 doc	9.0700 ppm	0.0098 ppm	0.1100%	2019/05/23 15:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0769	90.7692	70.68	73.87	3.19	49.98	10:28
2	TOC	9.0631	90.6308	70.59	73.57	2.98	49.96	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◈	41	TOC	K1904532-001.04 doc	7.9219 ppm	0.0354 ppm	0.4500%	2019/05/23 15:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.9470	79.4698	63.01	66.00	2.98	49.99	10:24
2	TOC	7.8969	78.9689	62.67	65.64	2.96	49.98	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	42	TOC	K1904532-002.04 doc	15.3262 ppm	0.2204 ppm	1.4400%	2019/05/23 16:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.4821	154.8211	114.16	117.27	3.11	49.95	10:32
2	TOC	15.1704	151.7038	112.04	115.15	3.10	50.02	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	K1904532-002.04 doc ms	39.4894 ppm	0.0000 ppm	0.0000%	2019/05/23 16:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	39.4894	394.8939	277.12	280.20	3.08	49.98	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/23 16:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.52	11.70	3.18	49.99	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	K1904532-003.04 doc	4.1322 ppm	0.0039 ppm	0.0900%	2019/05/23 17:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.1349	41.3493	37.14	40.16	3.03	50.03	10:30
2	TOC	4.1295	41.2947	37.10	40.19	3.09	50.02	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC)	CAS_salt_010711	CAS_salt_010711

(v1259) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1904532-004.04 doc	6.9677 ppm	0.0148 ppm	0.2100%	2019/05/23 17:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.9573	69.5728	56.29	59.33	3.04	50.03	10:31
2	TOC	6.9782	69.7820	56.44	59.41	2.98	50.04	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	K1904532-005.04 doc	11.0095 ppm	0.1234 ppm	1.1200%	2019/05/23 18:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.0968	110.9683	84.39	87.53	3.14	50.01	10:29
2	TOC	10.9223	109.2226	83.21	86.34	3.13	50.02	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.3888 ppm (PASS)	0.0000 ppm	0%	2019/05/23 18:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3888	243.8877	175.01	178.09	3.08	49.99	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/23 18:52

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.94	10.11	3.17	49.93	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	48	TOC	K1904532-006.04 doc	8.3078 ppm	0.0000 ppm	0.0000%	2019/05/23 19:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.3078	83.0777	65.46	68.48	3.02	49.88	10:29
2	TOC	8.3078	83.0777	65.46	68.52	3.06	49.85	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 9.0674 (IC) (v1259)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.0803 ppm (PASS)	0.0000 ppm	0%	2019/05/23 19:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.0803	250.8029	179.71	182.76	3.06	49.82	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/23 19:50

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.97	9.89	2.93	49.79	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

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Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1258	5.1363	1.2620	0.0000	0.0000	0.0000	2019/05/22 12:47	Fusion1 (Fusion1)
v1259	2.7557	2.3080	0.0000	0.0000	0.0000	2019/05/22 19:26	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v30
Ver Creation: 2019/03/05 17:42
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC
Calibration curve formula: TOC: y = 6.788x + 9.463
r^2 value: TOC: r^2 = 0.99963

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4
Ver Creation: 2019/02/21 17:57
Comment:
Operator: Fusion1 (Fusion1)

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7

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DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/05/23 20:06

ALS Environmental

StarLIMS Run: 636316, 636320, 636321

Analysis: TOC

Method: 415.1, SM 5310 C, 9060, 9060A

CCV: 11-GEN-05-77K 50 ppm LCS: 11-GEN-05-77D 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-78B

21 % H3PO4: 11-GEN-05-78C

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: NA

Prepped 05/21/2019

Analyzed By: RCD	Date Analyzed: 5/22/2019
Reviewed By:	Date Reviewed: 05/24/19

ALS Houston, US Date: 23-may-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
Work Order: HS19050401

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19050401-01	LH18/24-SP140_050719	Water		07-May-2019 14:00	08-May-2019 09:30	☐

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
Work Order:

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Metals by Method SW6020

Batch ID: 140779

Sample ID: HS19050692-02MS

• MS/MSD and DUPS are for an unrelated sample

WetChemistry by Method SW7196

Batch ID: R338200

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 GW Treatment Plant Monthly Influent Samples WorkOrder:HS19050401

Sample ID: LH18/24-SP140_050719 Lab ID:HS19050401-01

Collection Date: 07-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	13-May-2019 23:54
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	13-May-2019 23:54
HEXAVALENT CHROMIUM BY SW7196A		**Method:SW7196**						Analyst: MZD
Chromium, Hexavalent	0.0100	U	0.00600	0.0100	0.0100	mg/L	1	08-May-2019 13:18
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-May-2019 14:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19050401

Batch ID: 140779 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19050401-01	1	10	10 (mL)	1

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19050401

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 140779	**Test Name :** METALS BY ICPMS BY SW6020A			**Matrix:** Water		
HS19050401-01	LH18/24-SP140_050719	07 May 2019 14:00		13 May 2019 12:00	13 May 2019 23:54	1
Batch ID R338200	**Test Name :** HEXAVALENT CHROMIUM BY SW7196A			**Matrix:** Water		
HS19050401-01	LH18/24-SP140_050719	07 May 2019 14:00			08 May 2019 13:18	1
Batch ID R339032	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19050401-01	LH18/24-SP140_050719	07 May 2019 14:00			23 May 2019 14:50	1

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19050401

QC BATCH REPORT

Batch ID: 140779 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-140779** Units: **mg/L** Analysis Date: **14-May-2019 15:15**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074406** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U

LCS Sample ID: **LCS-140779** Units: **mg/L** Analysis Date: **13-May-2019 23:51**
Client ID: Run ID: **ICPMS06_338296** SeqNo: **5073389** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.05418	0.00200	0.05	0	108	80 - 120				
Silver	0.05124	0.00200	0.05	0	102	80 - 120				

MS Sample ID: **HS19050692-02MS** Units: **mg/L** Analysis Date: **14-May-2019 15:20**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074409** PrepDate: **13-May-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	2.219	0.0100	0.05	2.123	192	80 - 120				SO
Silver	0.05437	0.0100	0.05	-0.000021	109	80 - 120				

MSD Sample ID: **HS19050692-02MSD** Units: **mg/L** Analysis Date: **14-May-2019 15:21**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074410** PrepDate: **13-May-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	2.198	0.0100	0.05	2.123	150	80 - 120	2.186	0.575	20	SO
Silver	0.05424	0.0100	0.05	-0.000021	109	80 - 120	0.04161	26.3	20	R

PDS Sample ID: **HS19050692-02PDS** Units: **mg/L** Analysis Date: **14-May-2019 15:23**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074411** PrepDate: **13-May-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	2.683	0.0100	0.5	2.123	112	75 - 125				O
Silver	0.5511	0.0100	0.5	0	110	75 - 125				

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19050401

QC BATCH REPORT

Batch ID: 140779 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

SD Sample ID: **HS19050692-02SD** Units: **mg/L** Analysis Date: **14-May-2019 15:18**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074408** PrepDate: **13-May-2019** DF: **25**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Selenium	2.145	0.0500					2.123	1.02	10	
Silver	0.0125	0.0500					-0.000021	0	10	U

The following samples were analyzed in this batch: HS19050401-01

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19050401

QC BATCH REPORT

Batch ID: R338200 (0) **Instrument: UV-2450** **Method: HEXAVALENT CHROMIUM BY SW7196A**

MBLK Sample ID: **MBLK-338200** Units: **mg/L** Analysis Date: **08-May-2019 13:18**
Client ID: Run ID: **UV-2450_338200** SeqNo: **5070046** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.0100	0.0100								U

LCS Sample ID: **LCS-338200** Units: **mg/L** Analysis Date: **08-May-2019 13:18**
Client ID: Run ID: **UV-2450_338200** SeqNo: **5070047** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.247	0.0100	0.25	0	98.8	90 - 111				

MS Sample ID: **HS19050410-01MS** Units: **mg/L** Analysis Date: **08-May-2019 13:18**
Client ID: Run ID: **UV-2450_338200** SeqNo: **5070049** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.249	0.0100	0.25	0.001	99.2	90 - 111				

MSD Sample ID: **HS19050410-01MSD** Units: **mg/L** Analysis Date: **08-May-2019 13:18**
Client ID: Run ID: **UV-2450_338200** SeqNo: **5070050** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.235	0.0100	0.25	0.001	93.6	90 - 111	0.249	5.79	20	

The following samples were analyzed in this batch: HS19050401-01

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: **HS19050401**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 23-may-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
Work Order: HS19050401

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19050401-01	LH18/24-SP140_050719	Login	08/05/2019 11:51:51	NDR	WET270
HS19050401-01	LH18/24-SP140_050719	Login	08/05/2019 11:51:51	NDR	WET270
HS19050401-01	LH18/24-SP140_050719	Login	08/05/2019 11:51:51	NDR	MET071

ALS Houston, US Date: 23-May-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19050401
Date/Time Received: **08-May-2019 09:30**
Received by: **JRM**

Checklist completed by: *Nilesh D. Ranchod* eSignature 8-May-2019 Date
Reviewed by: *RJ Modashia* eSignature 8-May-2019 Date

Matrices: **water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.6c uc/c	IR 11
Cooler(s)/Kit(s):	44882	
Date/Time sample(s) sent to storage:	05/08/2019 12:15pm	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes: Sample times donot match , SX LH18/27-SP140_050719
COC= Date : 04/07/19 /1400
Label = Date : 05/07/19 / 1400

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: RJ Modshia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. NWO1312.0150.0 16.0001

Job:
GROUNDWATER TREATMENT PLANT MONTHLY INFLUENT SAMPLES

Prepared By: Scott Beesinger

P.O. Number

HS19050401
Bhate Environmental Associates, Inc.
18/24 GW Treatment Plant Monthly Influent Samples

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: SILVER & SELENIUM	Analyses: HEXAVALENT CHROMIUM	Analyses: PERCHLORATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP140_050719	Water	04/07/19 / 14:00		1	X			HNO3	
LH18/24-SP140_050519	Water	05/07/19 / 14:00		2		X	X	NONE	

Additional Remarks: **STANDARD TURN AROUND TIME**

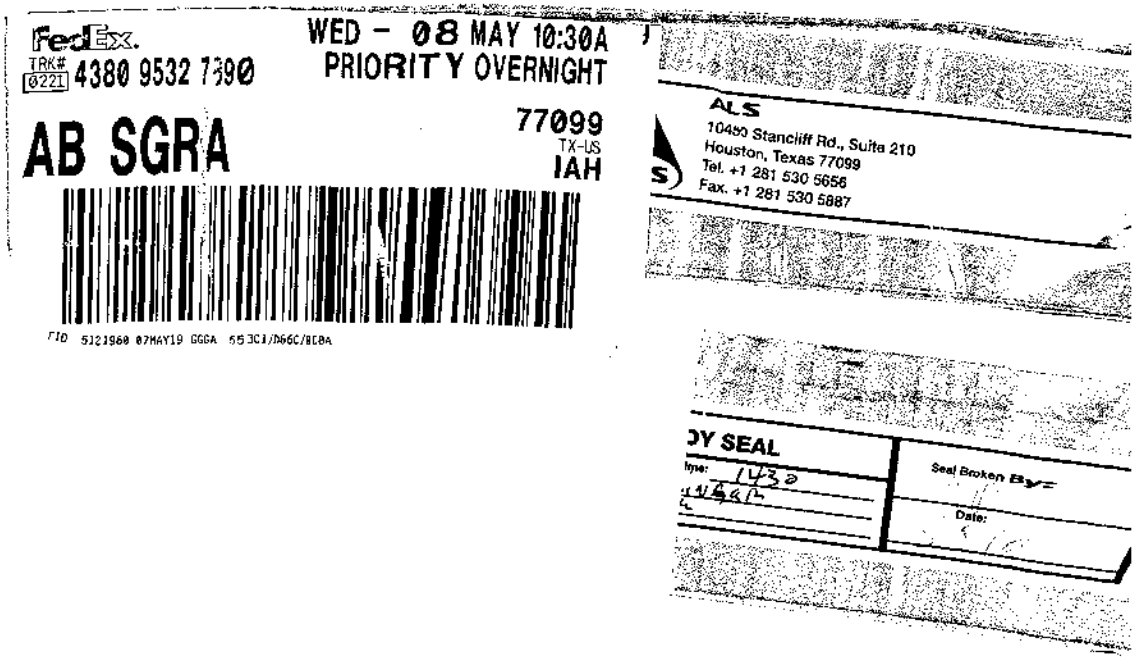
Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	05/07/19	14:30									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Mauricio	5/8/19	09:30							

Remarks: Cooler - 44882 IR11
Temp 1.6 0F0.0

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly


FedEx.
TRK# 0221 4380 9532 7390
WED - 08 MAY 10:30A
PRIORITY OVERNIGHT
AB SGRA
77099
TX-US
IAH
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
Seal Broken By:
Date:

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1913332, 1913338, 1913342, 1913345

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2253(239553)

General Set Information: There were ten field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1913338001 was analyzed and reported from a 1:100 dilution. Field sample 1913342004 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 653683) was less than 1/2 the CRDL. The recovery for the LCS (653684) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 1913342006/007. 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 653681) is reported from the analysis of the Laboratory Control Sample (LCS – 653684) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Stephen Brose	May 22, 2019
Analyst	Date

ANALYTICAL REPORT

Report Date: May 22, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1913338**
Project ID: HS19050401
Purchase Order: HS19050401
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP140_050719	1913338001	05/07/19	05/09/19	

ANALYTICAL REPORT

Workorder: 34-1913338
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP140_050719** | Sampling Site: NA | Collected: 05/07/2019
Lab ID: 1913338001 | Media: 125 mL Nalgene | Received: 05/09/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2253 (HBN: 239553) | **Percent Solid:** NA
Analyzed: 05/21/2019 08:56 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**4200**	100	200	400	100	

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 239553)**

Field sample 1913338001 was analyzed and reported from a 1:100 dilution. Field sample 1913342004 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Stephen Brose 05/22/2019 06:38	/S/ Thomas Bosch 05/22/2019 11:11

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1913338
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1913338

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2253 (HBN: 239553)
		Prepared By:	NA	**Analyzed By:**	Stephen Brose

Blank

LMB: 653683
Analyzed: 05/21/2019 08:29
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 653684
Analyzed: 05/21/2019 08:02
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.08	4.00	102	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1913342005	**MS:**	1913342006	**MSD:**	1913342007
Analyzed:	05/21/2019 10:03	**Analyzed:**	05/21/2019 10:17	**Analyzed:**	05/21/2019 10:30
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.78	4	94.4	78.8	123.8	3.72	93.0	1.51	0.0	20.0

Comments

Field sample 1913338001 was analyzed and reported from a 1:100 dilution. Field sample 1913342004 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Stephen Brose	/S/ Thomas Bosch
05/22/2019 06:38	05/22/2019 11:11

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

W 1913338

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

18698/#2

SAMPLING STATE: **Dept of Defense** **COC ID:** **11271**

SUBCONTRACT TO:

1913338

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19050401
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19050401-01**	**LH18/24-SP140_050719**	**Water**	**07 May 2019 14:00**
	SUB_Perch-6850			22 May 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Modashia Date/Time: 5/8/19 18:00

Received By: Lidia Vaccaro LACS Date/Time: 5/9/19 1018

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19050401	***Split:***	**Workorder ID:** 1913338	**Level:** ENV_LVL4	**Requested Analysis**
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly	
Comments:			**Preservatives**	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	COOL	EPA 6850, DoD QSM	
1	05/07/2019 14:00	LH18/24-SP140_050719	1913338001		Water	A	1		A	
2										
3										
4										
5										
6										
7										
8										
9										
23										

23 of 106

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Wrath, Julie	05/09/2019 10:18	ALS Sample Receiving	Sample Login
Julie Wrath 5/9/19 1408		14B	Storage
14B	5/20/19 1400	[signature]	Client Analysis

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00938686

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 1913338

Date/Time of Receipt: 5/9/19 1018

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 - 9390	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Lisa Worden (Signature) Julie Worden (Printed Name) 5/9/19 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

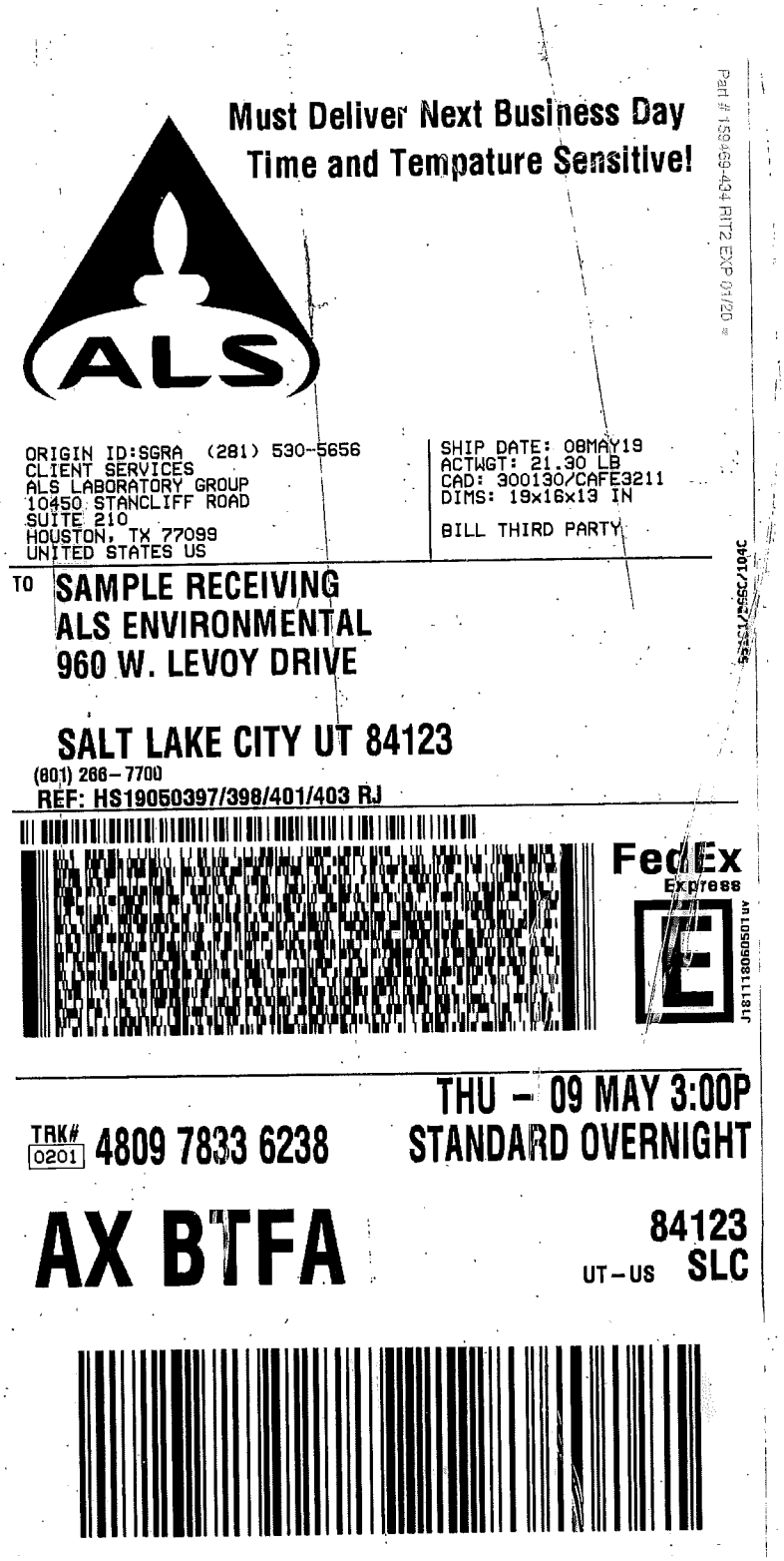
Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____



Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159469-494 RITZ EXP 01/20

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 08MAY19
ACTWGT: 21.30 LB
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19050397/398/401/403 RJ

FedEx Express

JS1113060501aw

THU - 09 MAY 3:00P
STANDARD OVERNIGHT

TRK# 0201 4809 7833 6238

AX BTFA

84123
UT-US SLC

Batch Worklist

Batch: ELMS/ 2253
Rule: EPA 6850, DoD QSM Water

Created: 5/20/2019 06:13
Analyst: S. Brose

Instrument:
Status: WP

HBN: 239553

Workorder: 1913332 [ENV_LVL4]
Workorder: 1913338 [ENV_LVL4]
Workorder: 1913342 [ENV_LVL4]
Workorder: 1913345 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	653680	CCV for HBN 239553 [ELMS/2253]				CCV	3		E685041C3Q	6214		5/22/2019	
2	653681	RLVS for HBN 239553 [ELMS/2253				RLVS	3		E685041C3Q	6214		5/22/2019	
3	653682	ICS for HBN 239553 [ELMS/2253]				ICS	3		E6850..D3Q	6214		5/22/2019	
4	653683	LMB for HBN 239553 [ELMS/2253]				LMB	3		E6850Q413Q	6214		5/22/2019	
5	653684	LCS for HBN 239553 [ELMS/2253]				LCS	3		E6850Q413Q	6214		5/22/2019	
6	1913332001	LH18/24-SP650_050719_BIX				SAMPLE	3	1913332001-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
7	1913338001	LH18/24-SP140_050719				SAMPLE	3	1913338001-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
8	1913342001	50WW10-190507				SAMPLE	3	1913342001-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
9	1913342002	50WW09-190507				SAMPLE	3	1913342002-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
10	1913342003	50WW09-190507-FD				FLDDUP	3	1913342003-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
11	1913342004	50WW08-190507				SAMPLE	3	1913342004-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
12	1913342005	50WW23-190507				SAMPLE	3	1913342005-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
13	1913342006	50WW23-190507MS				MS	3	1913342006-A	E6850Q413Q	5480		5/22/2019	
14	1913342007	50WW23-190507MSD				MSD	3	1913342007-A	E6850Q413Q	5480		5/22/2019	
15	1913342008	50WW24-190507				SAMPLE	3	1913342008-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
16	1913342009	50WW05-190507				SAMPLE	3	1913342009-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
17	1913345001	LH18-24-SP650_050719_BIX				SAMPLE	3	1913345001-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
18	653685	CCV for HBN 239553 [ELMS/2253]				CCV	3		E685041C3Q	6214		5/22/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1913332(001), 1913338(001), 1913342(001-009), 1913345(001)
ELMS Batch/HBN ID: 2253 (239553)
Prep Date: 05/21/2019 Analysis Date: 05/21/2019 Analyst: S. Brose
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\MAY\21MAY19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:
Water: Samples were prepared by SAB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 653684; Target = 4.0µg/L. ASTM type II water was used for LMB 653683.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1913342006/007 (Client ID: 50WW23-190507). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:
1) Results reported in µg/L. Field samples 1913338001 and 1913342004 required 1:100 and 1:10 dilutions respectively. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\MAY\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\239553-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 653681) is reported from the analysis of the Laboratory Control Sample (LCS – 653684) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, many of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS/2253 HBN: 238553 Sample Set IDs if Applicable: 191332/38/42/45	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	SB	TB
Standards traceability checked and meets criteria	SB	TB
Standard curve coefficients evaluated and meet criteria	SB	TB
ICVs analyzed and meet acceptance criteria	SB	TB
CCVs analyzed and meet acceptance criteria	SB	TB
Retention Time Windows checked	SB	TB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	SB	TB
Method Preparation Blanks analyzed and meet acceptance criteria	SB	TB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	SB	TB
RLVS analyzed	SB	TB
Preparation and analysis hold times met	SB	TB
Preparation deviations and re-preparations noted when performed	SB	TB
Analysis deviations and re-analyses noted when performed	SB	TB
Sample dilution factors noted on reports	SB	TB
Electronic records in HBN transcription accuracy and completeness checked	SB	TB
Preparation and analysis calculations checked	SB	TB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	SB	TB
Manual integrations checked	SB	TB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
			1000 ug/mL
1	14797-73-0	Perchlorate	

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ANAB ACCREDITED

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

AccuStandard

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Report: C:\HPCHEM\1\DATA\21MAY19D\21MAY19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	653680 CCV@25	Vial 71	1	Control	1	2.40704e6	8.594	23.99302
*	653684 QC@4.0	Vial 72	1	Control	2	3.96639e5	8.823	4.08274
*	653682 ICS@4.0	Vial 73	1	Control	3	3.14960e5	8.612	3.74421
*	653683 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1913332001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	1913338001 100	Vial 76	1	Sample	6	3.99368e6	8.959	4178.24239
*	1913342001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1913342002	Vial 78	1	Sample	8	6.18077e5	8.360	7.21259
*	1913342003	Vial 79	1	Sample	9	6.79913e5	8.381	7.76574
*	1913342004 10X	Vial 80	1	Sample	10	2.09294e6	8.642	226.56793
*	1913342005	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1913342006 MS	Vial 82	1	Sample	12	2.30072e5	8.281	3.77790
*	1913342007 SD	Vial 83	1	Sample	13	2.23456e5	8.296	3.72139
*	1913342008	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1913342009	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1913345001	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	653685 CCV@25	Vial 71	1	Control	17	1.93838e6	8.628	23.36594

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	653680 CCV@25	Vial 71	1	Control	1	7.14295e5	8.612	23.97986
*	653684 QC@4.0	Vial 72	1	Control	2	1.27284e5	8.838	4.26129
*	653682 ICS@4.0	Vial 73	1	Control	3	1.12778e5	8.627	4.34080
*	653683 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1913332001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	1913338001 100	Vial 76	1	Sample	6	1.20507e6	8.974	4254.41607
*	1913342001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1913342002	Vial 78	1	Sample	8	2.00267e5	8.373	7.73270
*	1913342003	Vial 79	1	Sample	9	2.18020e5	8.395	8.25365
*	1913342004 10X	Vial 80	1	Sample	10	6.29788e5	8.660	229.37195
*	1913342005	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1913342006 MS	Vial 82	1	Sample	12	8.05070e4	8.292	4.28262
*	1913342007 SD	Vial 83	1	Sample	13	7.84560e4	8.311	4.22992
*	1913342008	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1913342009	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1913345001	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	653685 CCV@25	Vial 71	1	Control	17	5.93941e5	8.647	24.07193

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	653680 CCV@25	Vial 71	1	Control	1	3.05962e5	8.618	5.00000
*	653684 QC@4.0	Vial 72	1	Control	2	3.19796e5	8.842	5.00000
*	653682 ICS@4.0	Vial 73	1	Control	3	2.78118e5	8.629	5.00000
*	653683 LMB	Vial 74	1	Control	4	3.07550e5	8.973	5.00000
*	1913332001	Vial 75	1	Sample	5	2.84011e5	8.455	5.00000
*	1913338001 100	Vial 76	1	Sample	6	2.80006e5	8.979	500.00000
*	1913342001	Vial 77	1	Sample	7	2.92233e5	8.419	5.00000
*	1913342002	Vial 78	1	Sample	8	2.75334e5	8.385	5.00000
*	1913342003	Vial 79	1	Sample	9	2.80514e5	8.402	5.00000
*	1913342004 10X	Vial 80	1	Sample	10	2.82646e5	8.663	50.00000
*	1913342005	Vial 81	1	Sample	11	2.06104e5	8.293	5.00000
*	1913342006 MS	Vial 82	1	Sample	12	2.01255e5	8.301	5.00000
*	1913342007 SD	Vial 83	1	Sample	13	1.98591e5	8.312	5.00000
*	1913342008	Vial 84	1	Sample	14	2.10825e5	8.375	5.00000

Batch Report: C:\HPCHEM\1\DATA\21MAY19D\21MAY19D.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	1913342009	Vial 85	1	Sample	15	2.18072e5	8.384	5.00000
*	1913345001	Vial 86	1	Sample	16	2.17961e5	8.508	5.00000
*	653685 CCV@25	Vial 71	1	Control	17	2.53387e5	8.650	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAY\21MAY19D.S

Sequence Table:

Method and Injection Info Part:

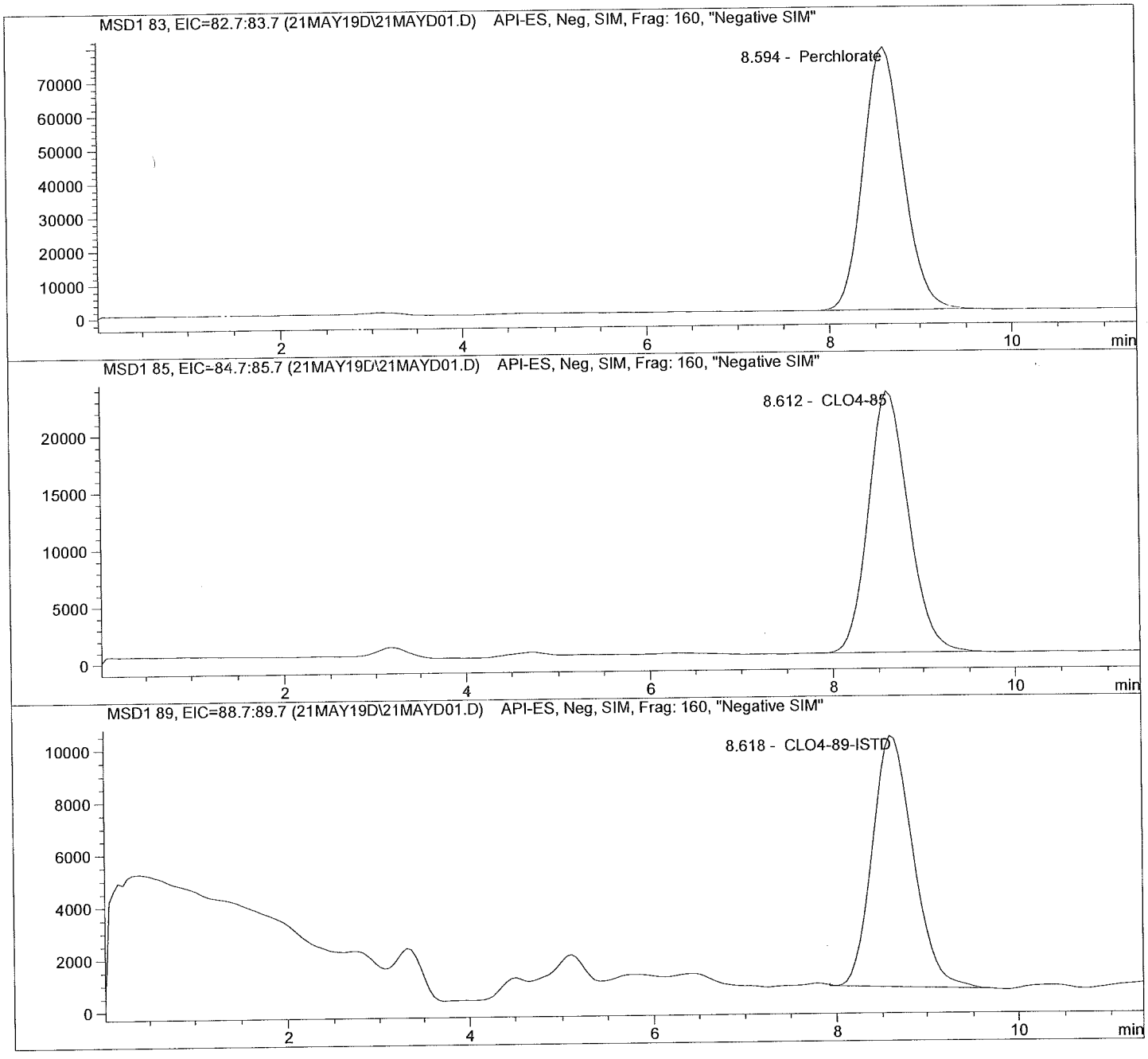
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	653680	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	653684	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	653682	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	653683	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1913332001		CLO4-AQN	1	Sample		
6	Vial 76	1913338001	100	CLO4-AQN	1	Sample		
7	Vial 77	1913342001		CLO4-AQN	1	Sample		
8	Vial 78	1913342002		CLO4-AQN	1	Sample		
9	Vial 79	1913342003		CLO4-AQN	1	Sample		
10	Vial 80	1913342004	10X	CLO4-AQN	1	Sample		
11	Vial 81	1913342005		CLO4-AQN	1	Sample		
12	Vial 82	1913342006	MS	CLO4-AQN	1	Sample		
13	Vial 83	1913342007	SD	CLO4-AQN	1	Sample		
14	Vial 84	1913342008		CLO4-AQN	1	Sample		
15	Vial 85	1913342009		CLO4-AQN	1	Sample		
16	Vial 86	1913345001		CLO4-AQN	1	Sample		
17	Vial 71	653685	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD01.D Sample Name: 653680 CCV@25

Injection Date:	5/21/2019 07:49:32	Seq Line:	1
Sample Name:	653680 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD01.D Sample Name: 653680 CCV@25

Injection Date:	5/21/2019 07:49:32	Seq Line:	1
Sample Name:	653680 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.594	PBA	2407042.7	23.9930	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.612	BBA	714295.0	23.9799	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.618	BBA	305961.9	5.0000	CLO4-89-ISTD

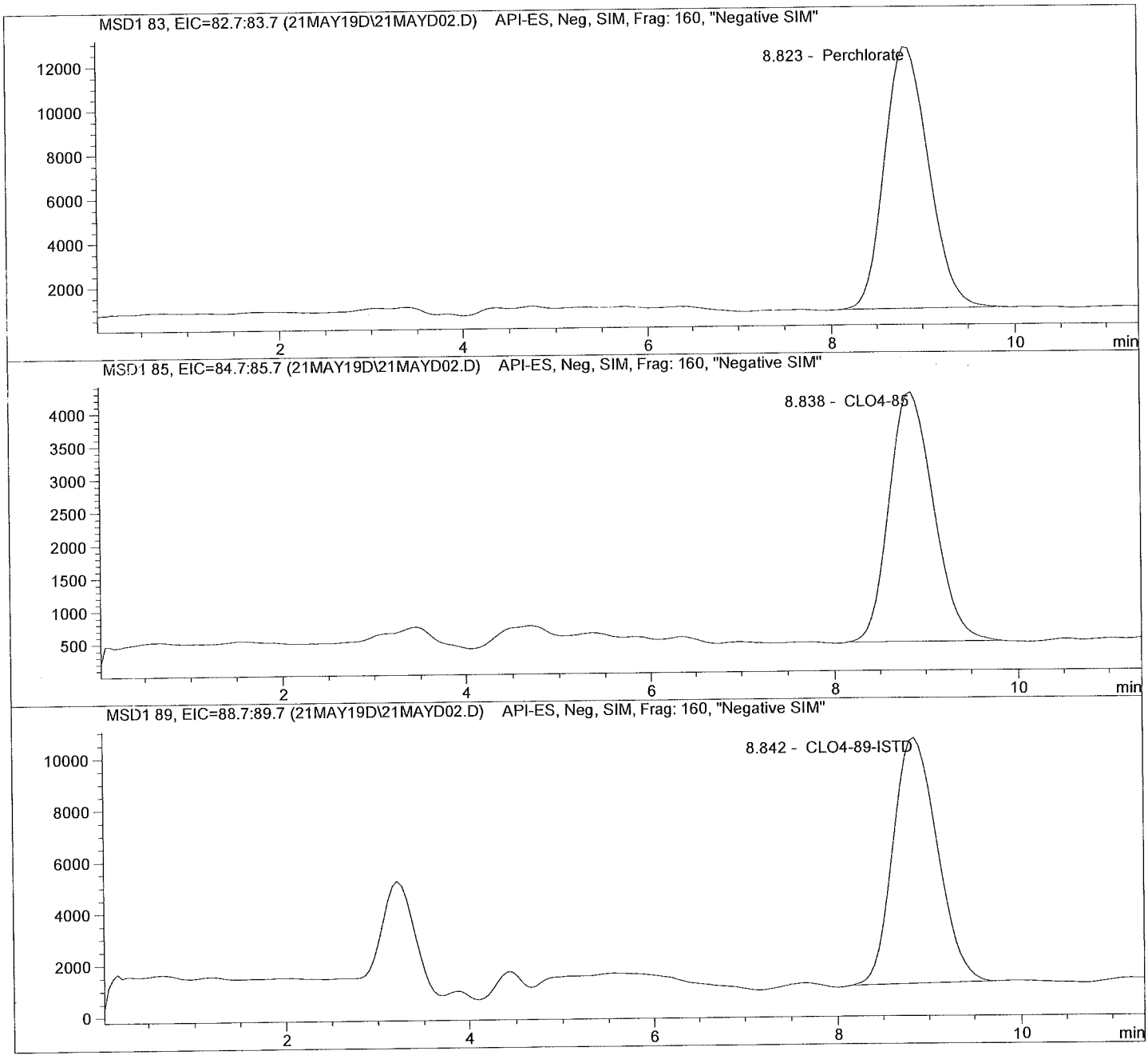
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD02.D Sample Name: 653684 QC@4.0

Injection Date:	5/21/2019 08:02:56	Seq Line:	2
Sample Name:	653684 QC@4.0	Location:	Vial 72
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD02.D Sample Name: 653684 QC@4.0

Injection Date:	5/21/2019 08:02:56	Seq Line:	2
Sample Name:	653684 QC@4.0	Location:	Vial 72
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.823	PBA	396638.7	4.0827	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.838	BBA	127284.0	4.2613	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.842	PBA	319795.5	5.0000	CLO4-89-ISTD

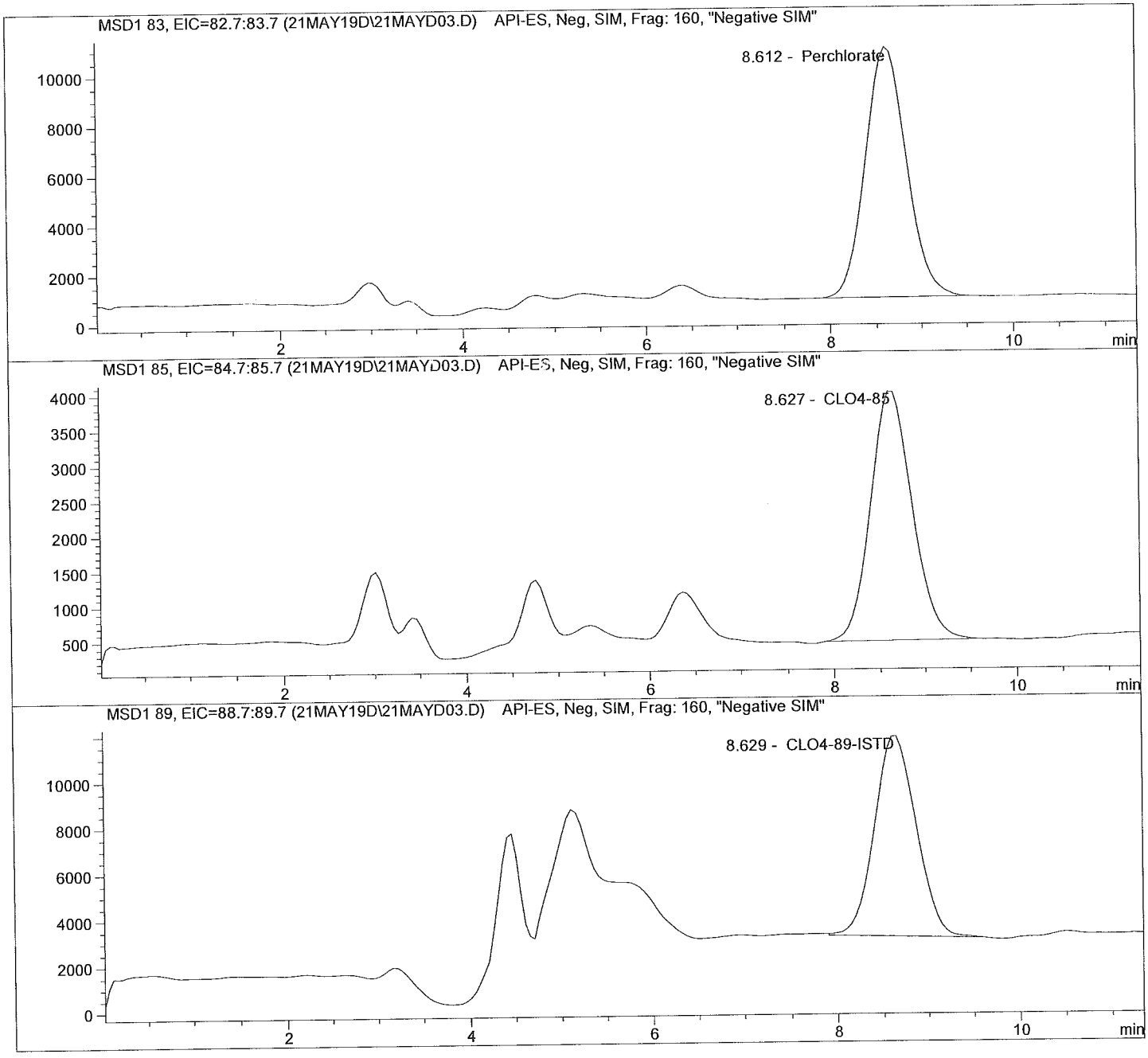
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD03.D Sample Name: 653682 ICS@4.0

Injection Date:	5/21/2019 08:16:19	Seq Line:	3
Sample Name:	653682 ICS@4.0	Location:	Vial 73
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD03.D Sample Name: 653682 ICS@4.0

Injection Date:	5/21/2019 08:16:19	Seq Line:	3
Sample Name:	653682 ICS@4.0	Location:	Vial 73
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.612	PBA	314959.5	3.7442	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.627	PBA	112778.0	4.3408	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.629	BBA	278118.1	5.0000	CLO4-89-ISTD

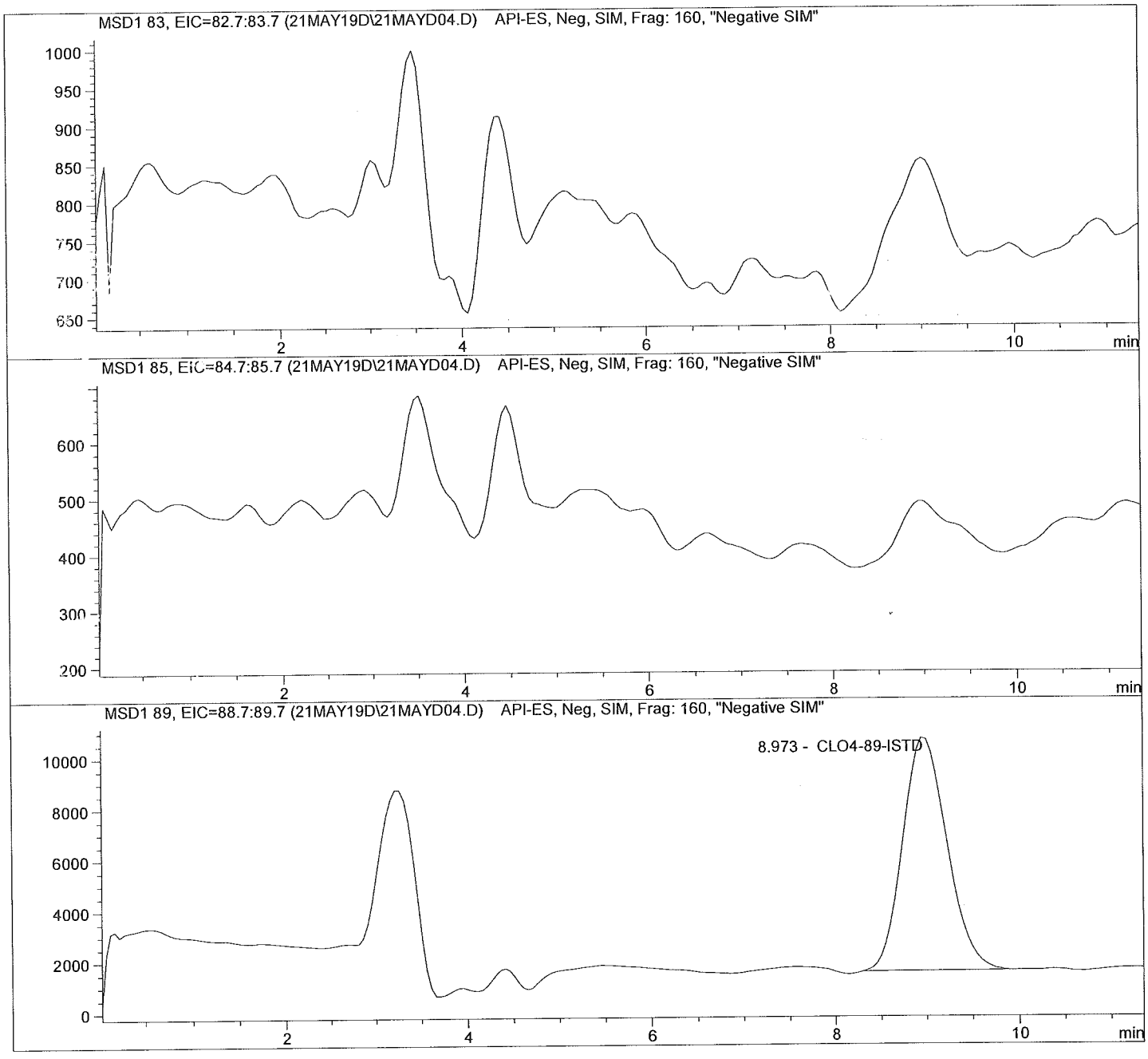
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD04.D Sample Name: 653683 LMB

Injection Date:	5/21/2019 08:29:45	Seq Line:	4
Sample Name:	653683 LMB	Location:	Vial 74
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD04.D Sample Name: 653683 LMB

Injection Date:	5/21/2019 08:29:45	Seq Line:	4
Sample Name:	653683 LMB	Location:	Vial 74
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.973	PBA	307549.9	5.0000	CLO4-89-ISTD

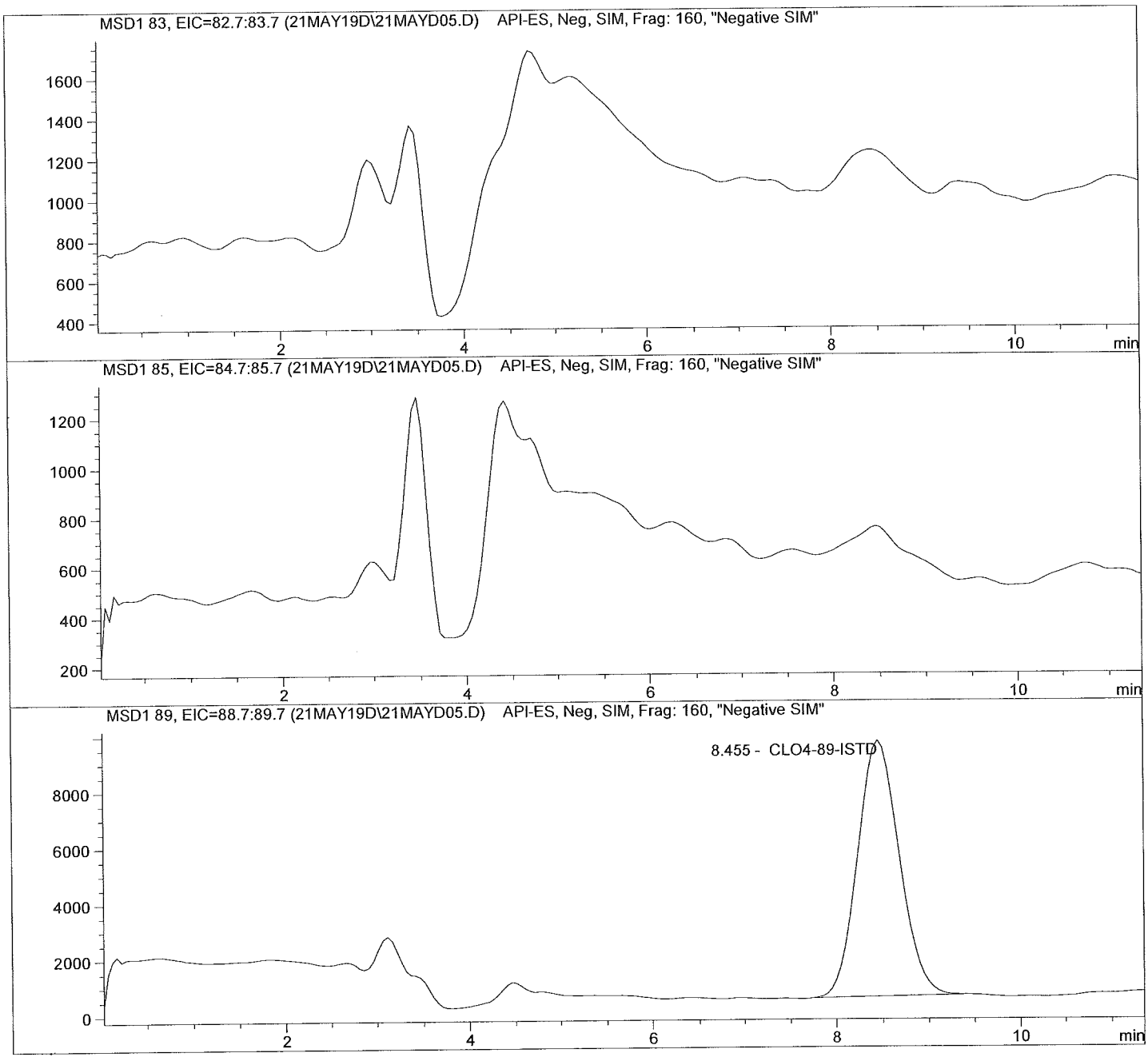
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD05.D Sample Name: 1913332001

Injection Date:	5/21/2019 08:43:07	Seq Line:	5
Sample Name:	1913332001	Location:	Vial 75
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD05.D Sample Name: 1913332001

Injection Date:	5/21/2019 08:43:07	Seq Line:	5
Sample Name:	1913332001	Location:	Vial 75
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.455	PBA	284011.2	5.0000	CLO4-89-ISTD

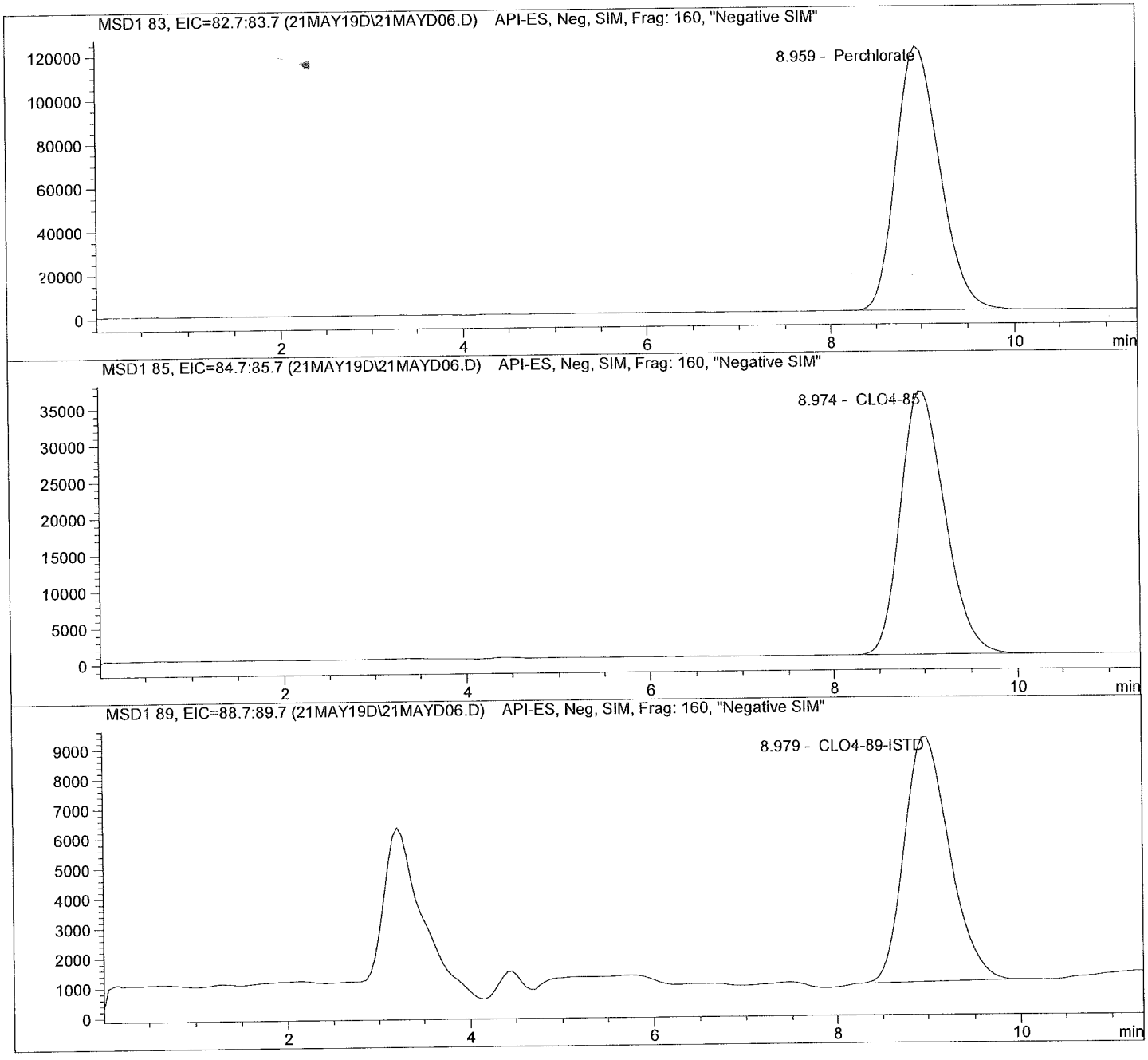
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD06.D Sample Name: 1913338001 100

Injection Date:	5/21/2019 08:56:30	Seq Line:	6
Sample Name:	1913338001 100	Location:	Vial 76
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD06.D Sample Name: 1913338001 100

Injection Date:	5/21/2019 08:56:30	Seq Line:	6
Sample Name:	1913338001 100	Location:	Vial 76
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.959	PBA	3993682.8	4178.2424	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.974	PBA	1205073.2	4254.4161	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.979	BBA	280005.7	500.0000	CLO4-89-ISTD

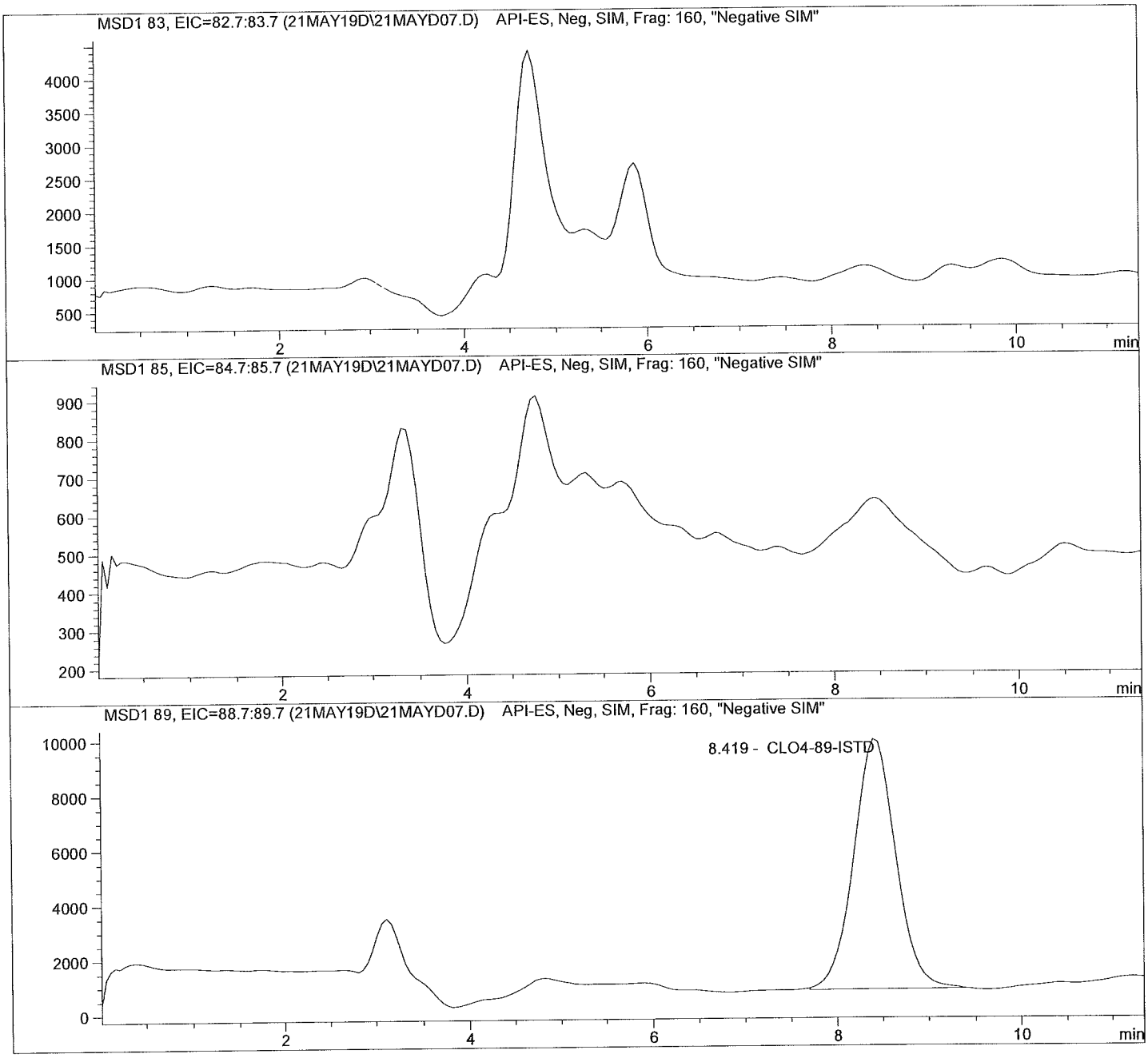
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD07.D Sample Name: 1913342001

Injection Date:	5/21/2019 09:10:03	Seq Line:	7
Sample Name:	1913342001	Location:	Vial 77
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD07.D Sample Name: 1913342001

Injection Date:	5/21/2019 09:10:03	Seq Line:	7
Sample Name:	1913342001	Location:	Vial 77
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.419	BBA	292233.0	5.0000	CLO4-89-ISTD

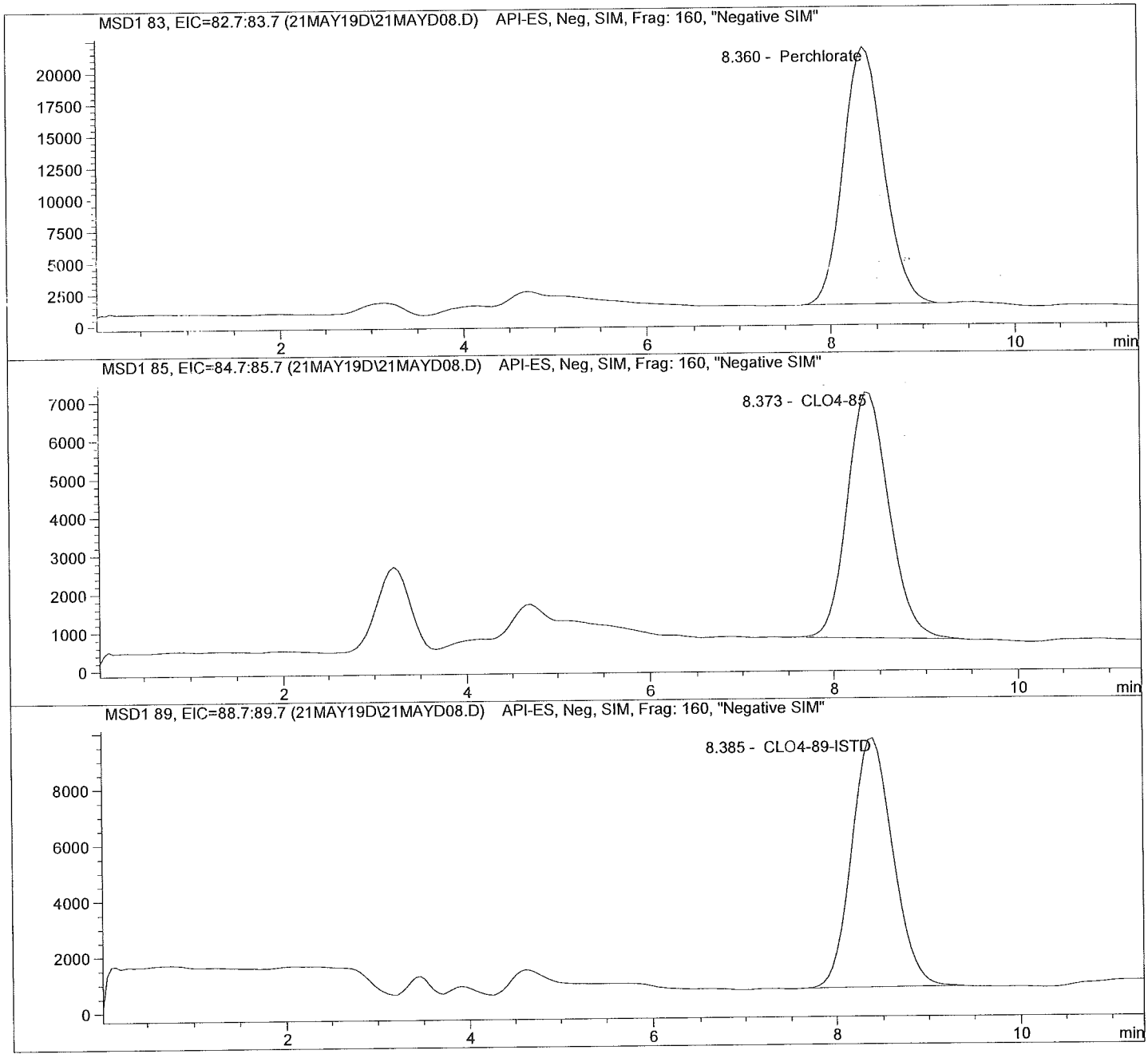
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD08.D Sample Name: 1913342002

Injection Date:	5/21/2019 09:23:25	Seq Line:	8
Sample Name:	1913342002	Location:	Vial 78
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD08.D Sample Name: 1913342002

Injection Date:	5/21/2019 09:23:25	Seq Line:	8
Sample Name:	1913342002	Location:	Vial 78
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.360	PBA	618077.5	7.2126	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.373	BBA	200267.3	7.7327	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.385	PBA	275333.5	5.0000	CLO4-89-ISTD

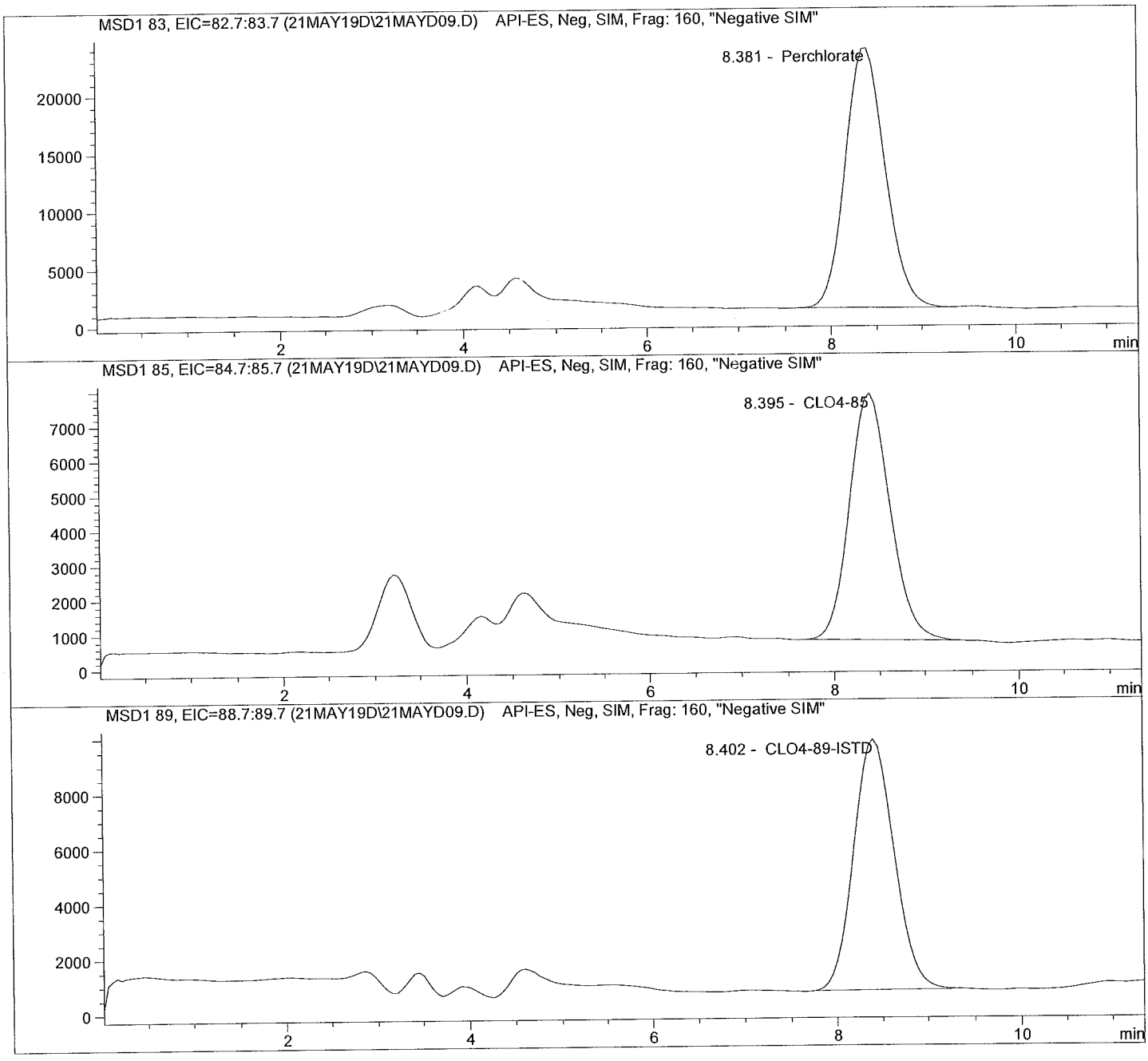
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD09.D Sample Name: 1913342003

Injection Date:	5/21/2019 09:36:53	Seq Line:	9
Sample Name:	1913342003	Location:	Vial 79
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD09.D Sample Name: 1913342003

Injection Date:	5/21/2019 09:36:53	Seq Line:	9
Sample Name:	1913342003	Location:	Vial 79
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.381	PBA	679913.4	7.7657	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.395	PBA	218019.8	8.2536	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.402	PBA	280514.3	5.0000	CLO4-89-ISTD

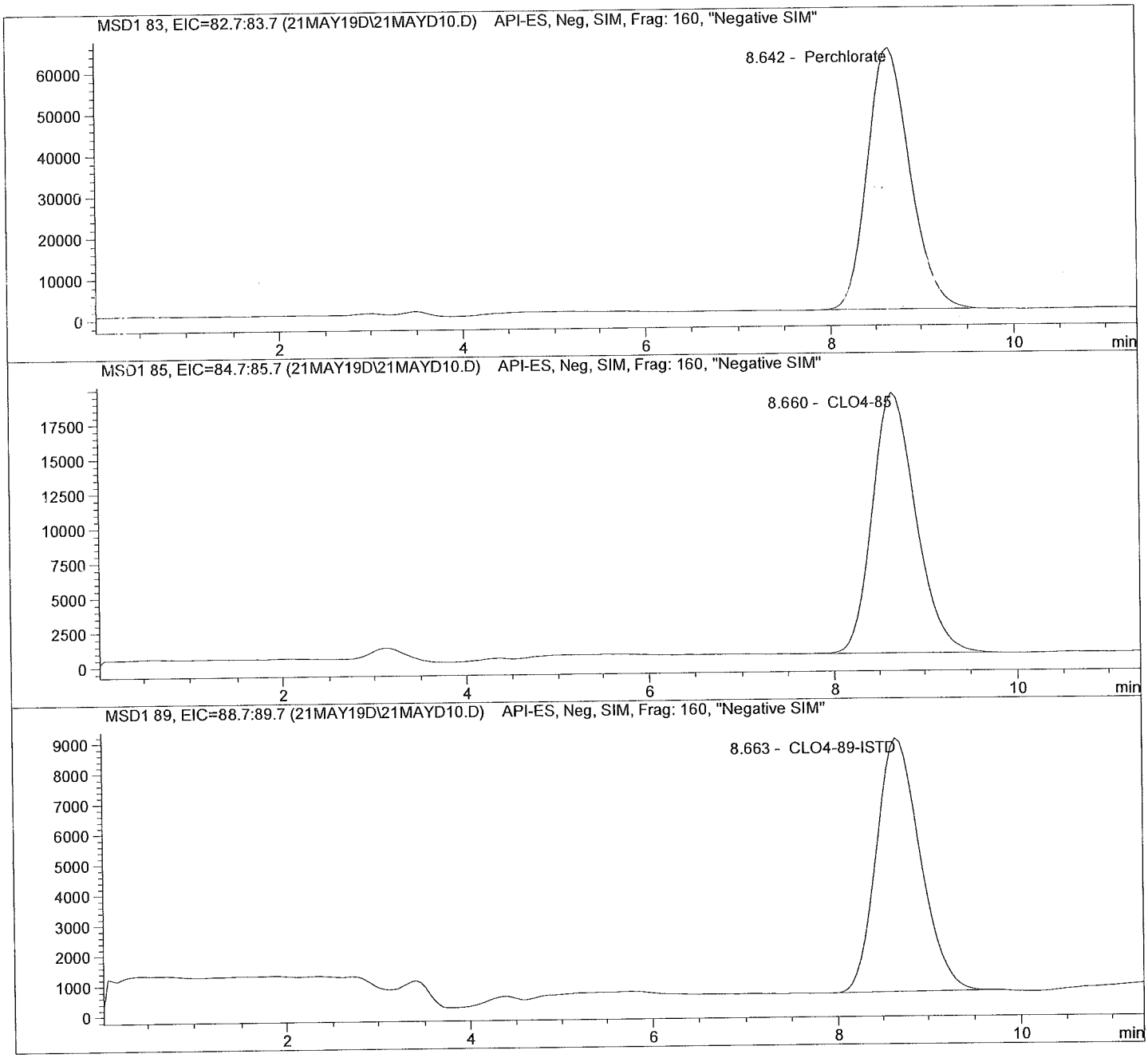
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD10.D Sample Name: 1913342004 10X

Injection Date:	5/21/2019 09:50:15	Seq Line:	10
Sample Name:	1913342004 10X	Location:	Vial 80
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD10.D Sample Name: 1913342004 10X

Injection Date:	5/21/2019 09:50:15	Seq Line:	10
Sample Name:	1913342004 10X	Location:	Vial 80
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.642	BBA	2092939.0	226.5679	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.660	BBA	629787.7	229.3720	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.663	PBA	282645.6	50.0000	CLO4-89-ISTD

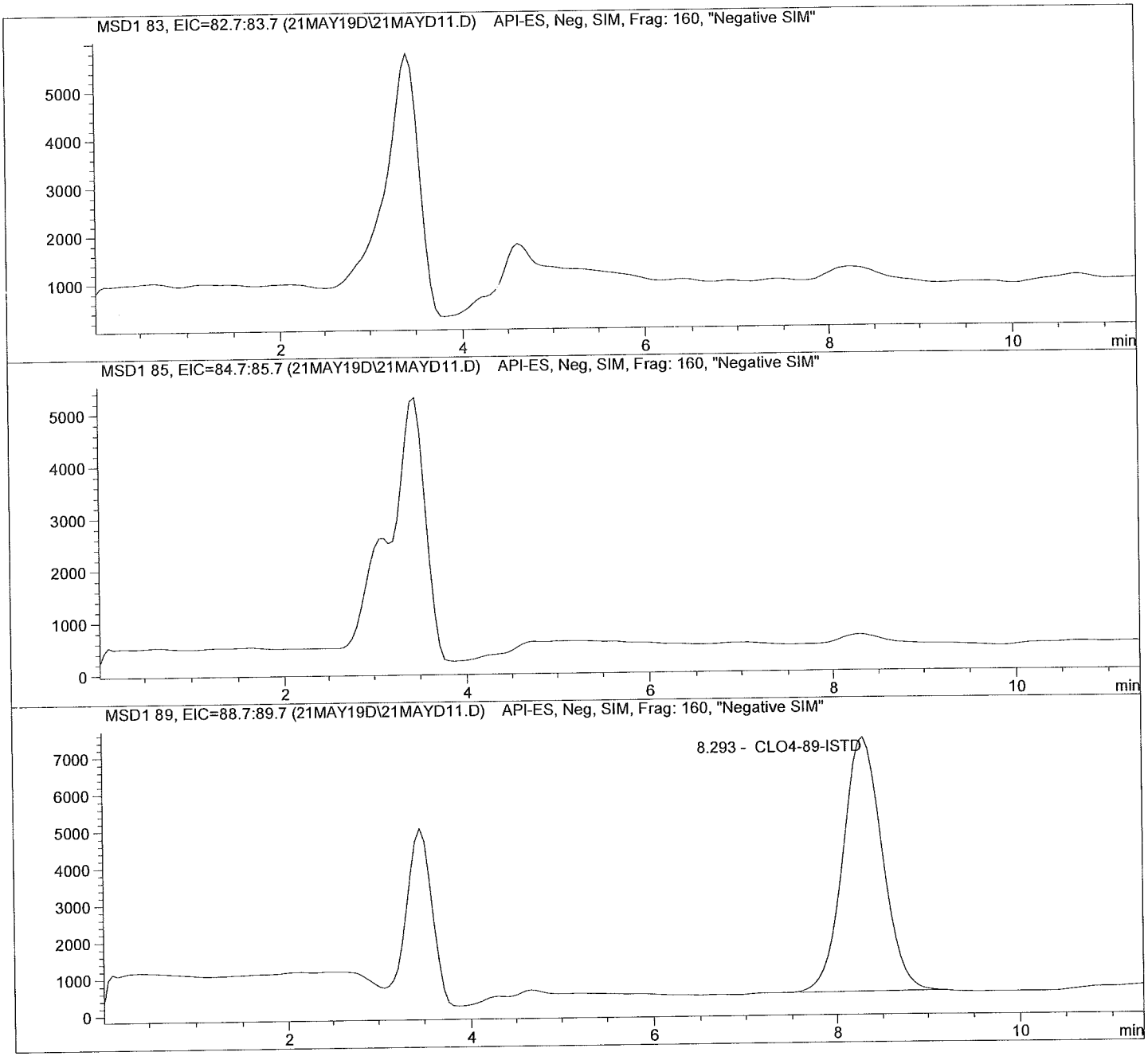
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD11.D Sample Name: 1913342005

Injection Date:	5/21/2019 10:03:44	Seq Line:	11
Sample Name:	1913342005	Location:	Vial 81
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD11.D Sample Name: 1913342005

Injection Date:	5/21/2019 10:03:44	Seq Line:	11
Sample Name:	1913342005	Location:	Vial 81
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.293	BBA	206103.9	5.0000	CLO4-89-ISTD

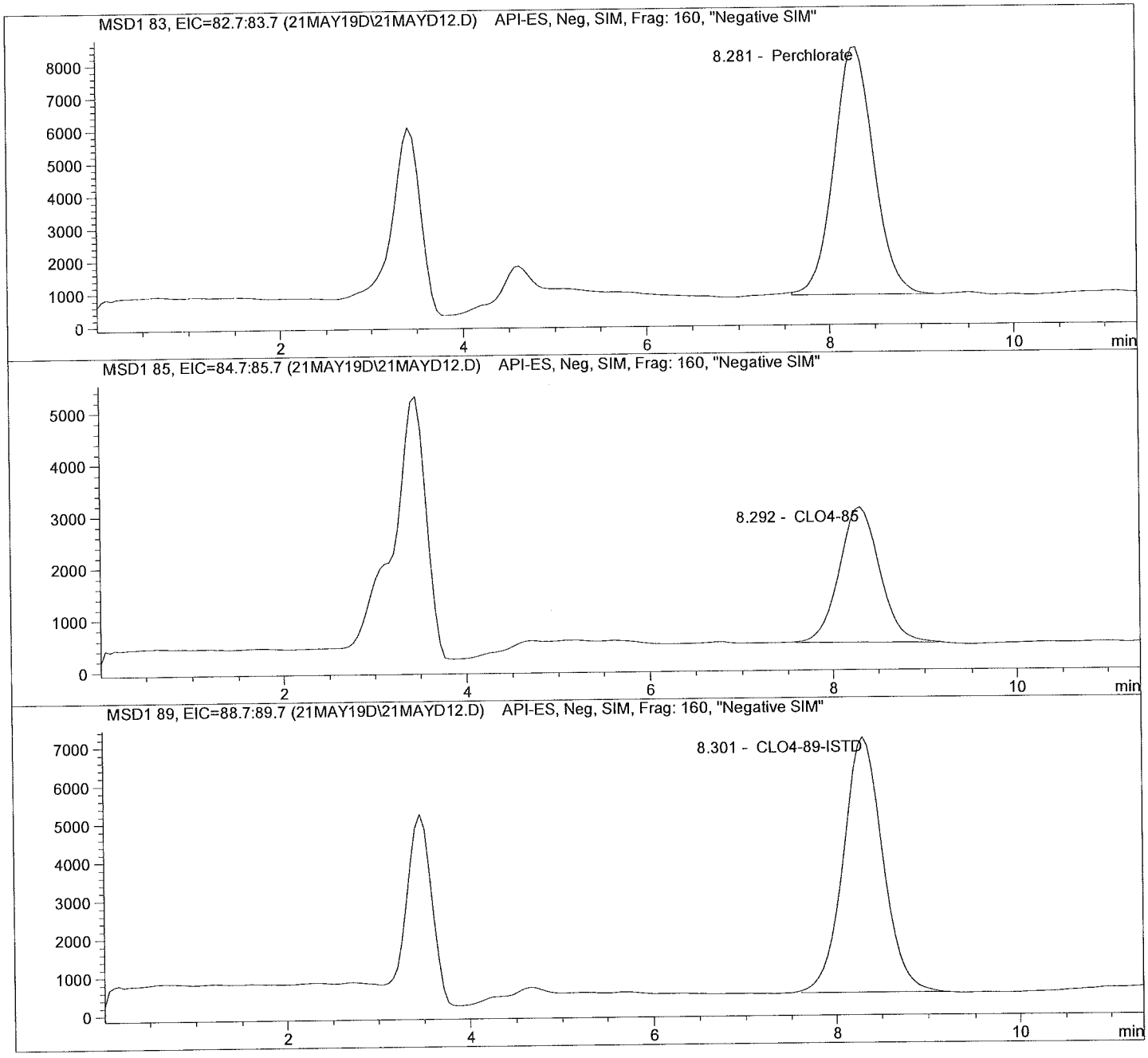
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD12.D Sample Name: 1913342006 MS

Injection Date:	5/21/2019 10:17:04	Seq Line:	12
Sample Name:	1913342006 MS	Location:	Vial 82
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD12.D Sample Name: 1913342006 MS

Injection Date:	5/21/2019 10:17:04	Seq Line:	12
Sample Name:	1913342006 MS	Location:	Vial 82
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.281	BBA	230072.2	3.7779	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.292	BBA	80507.0	4.2826	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.301	BBA	201254.7	5.0000	CLO4-89-ISTD

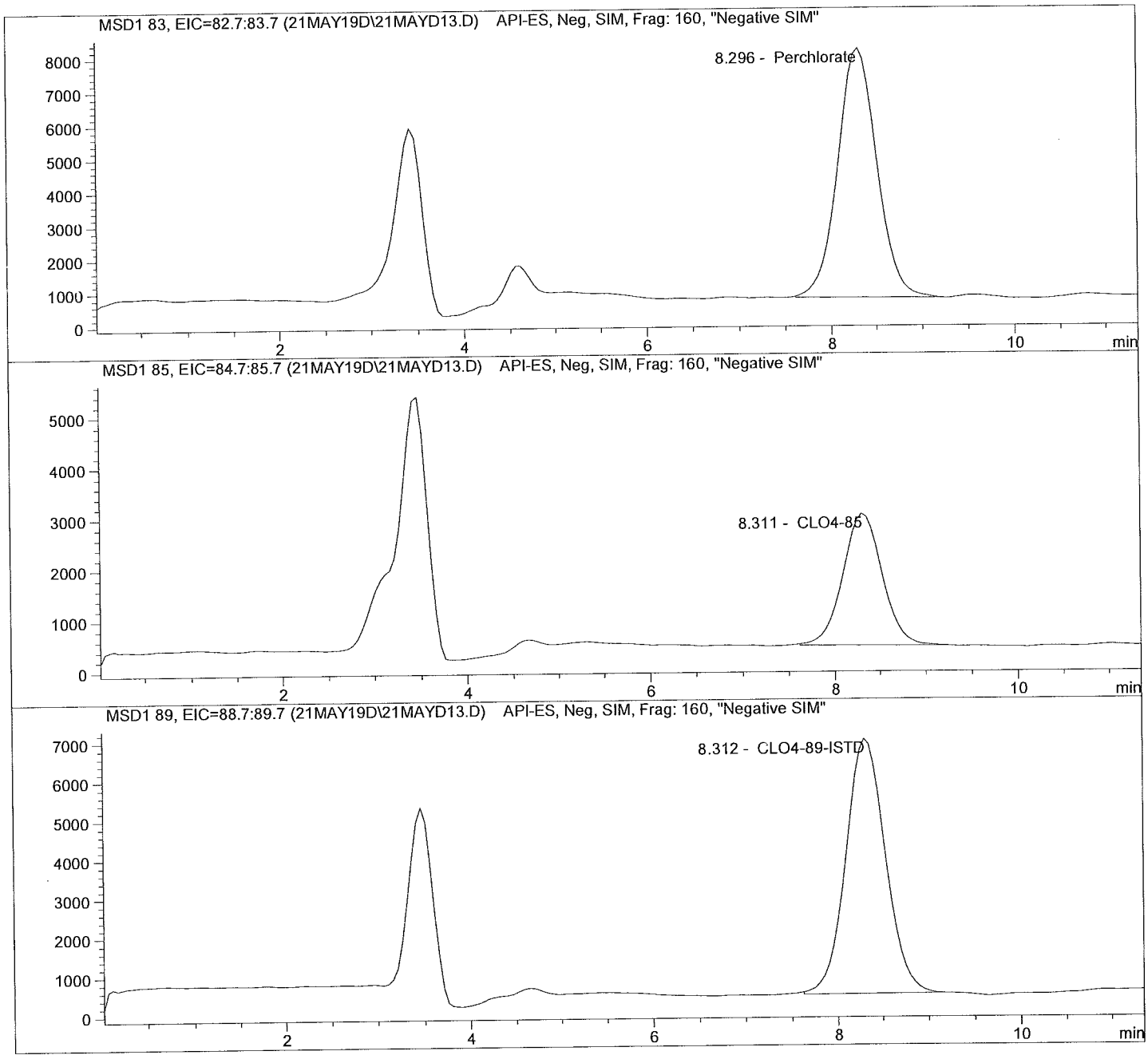
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD13.D Sample Name: 1913342007 SD

Injection Date:	5/21/2019 10:30:27	Seq Line:	13
Sample Name:	1913342007 SD	Location:	Vial 83
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD13.D Sample Name: 1913342007 SD

Injection Date:	5/21/2019 10:30:27	Seq Line:	13
Sample Name:	1913342007 SD	Location:	Vial 83
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.296	BBA	223455.8	3.7214	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.311	BBA	78456.0	4.2299	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.312	BBA	198591.3	5.0000	CLO4-89-ISTD

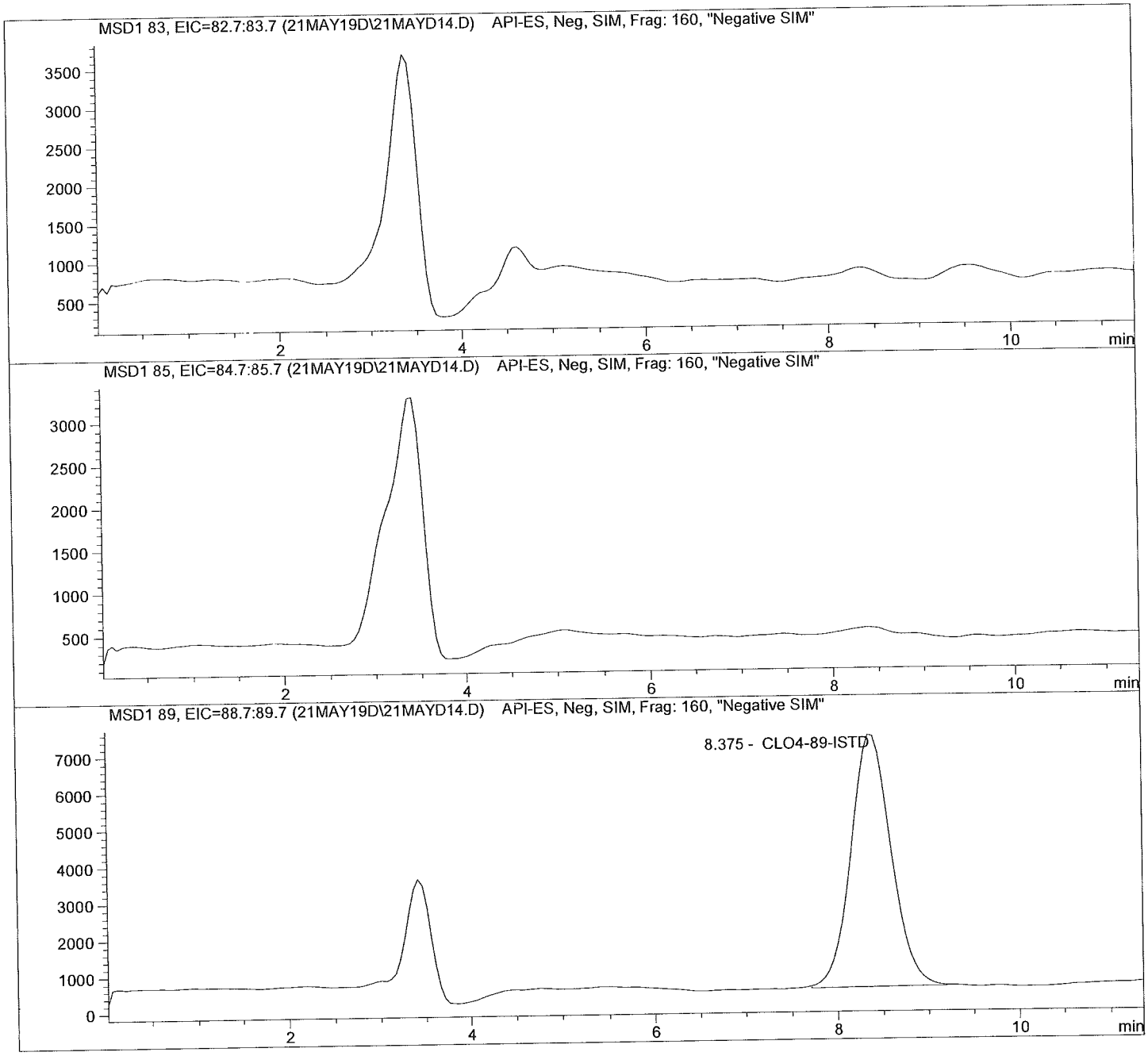
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD14.D Sample Name: 1913342008

Injection Date:	5/21/2019 10:43:48	Seq Line:	14
Sample Name:	1913342008	Location:	Vial 84
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD14.D Sample Name: 1913342008

Injection Date:	5/21/2019 10:43:48	Seq Line:	14
Sample Name:	1913342008	Location:	Vial 84
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.375	BBA	210825.1	5.0000	CLO4-89-ISTD

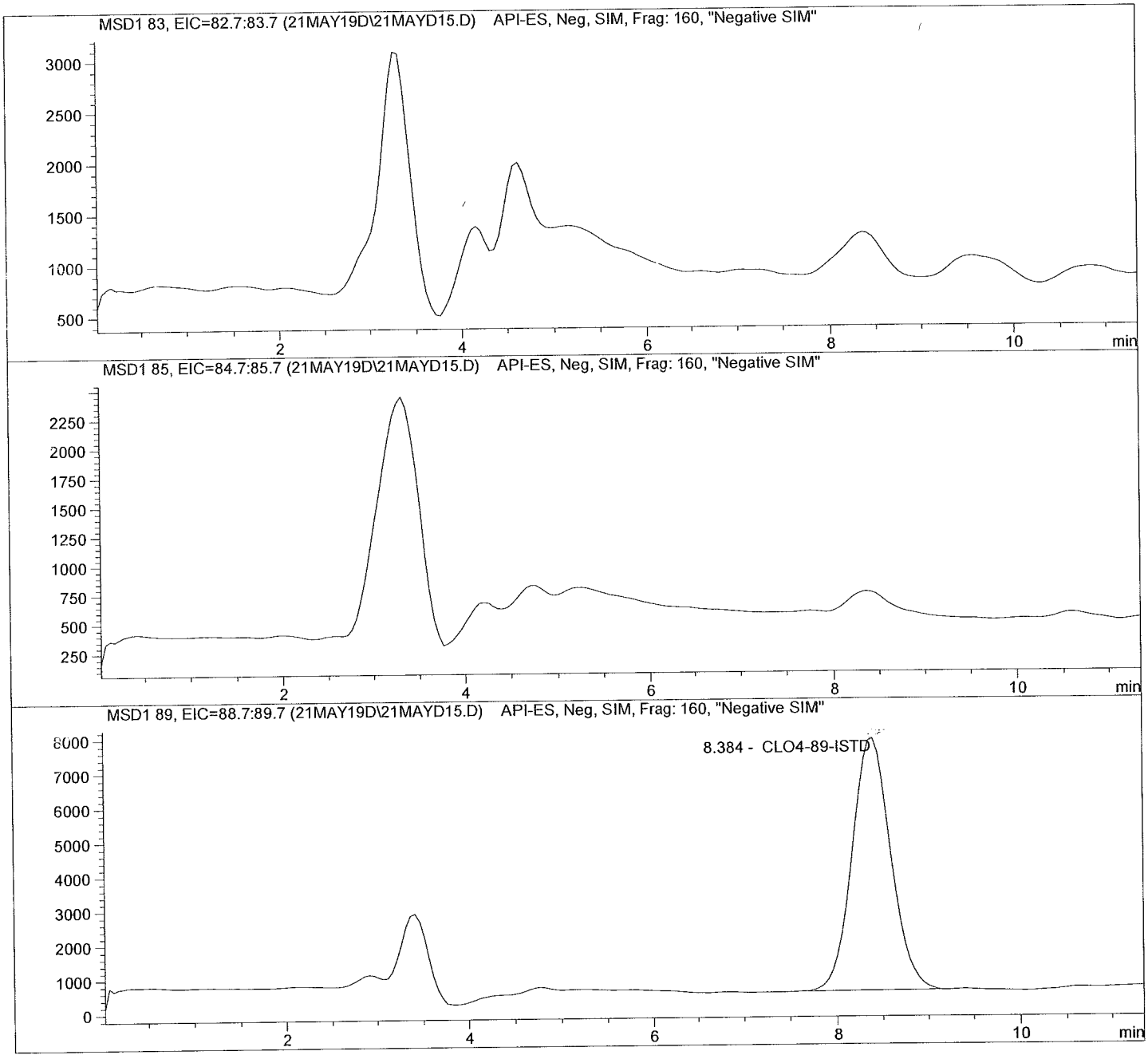
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD15.D Sample Name: 1913342009

Injection Date:	5/21/2019 10:57:10	Seq Line:	15
Sample Name:	1913342009	Location:	Vial 85
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD15.D Sample Name: 1913342009

Injection Date:	5/21/2019 10:57:10	Seq Line:	15
Sample Name:	1913342009	Location:	Vial 85
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.384	BBA	218072.4	5.0000	CLO4-89-ISTD

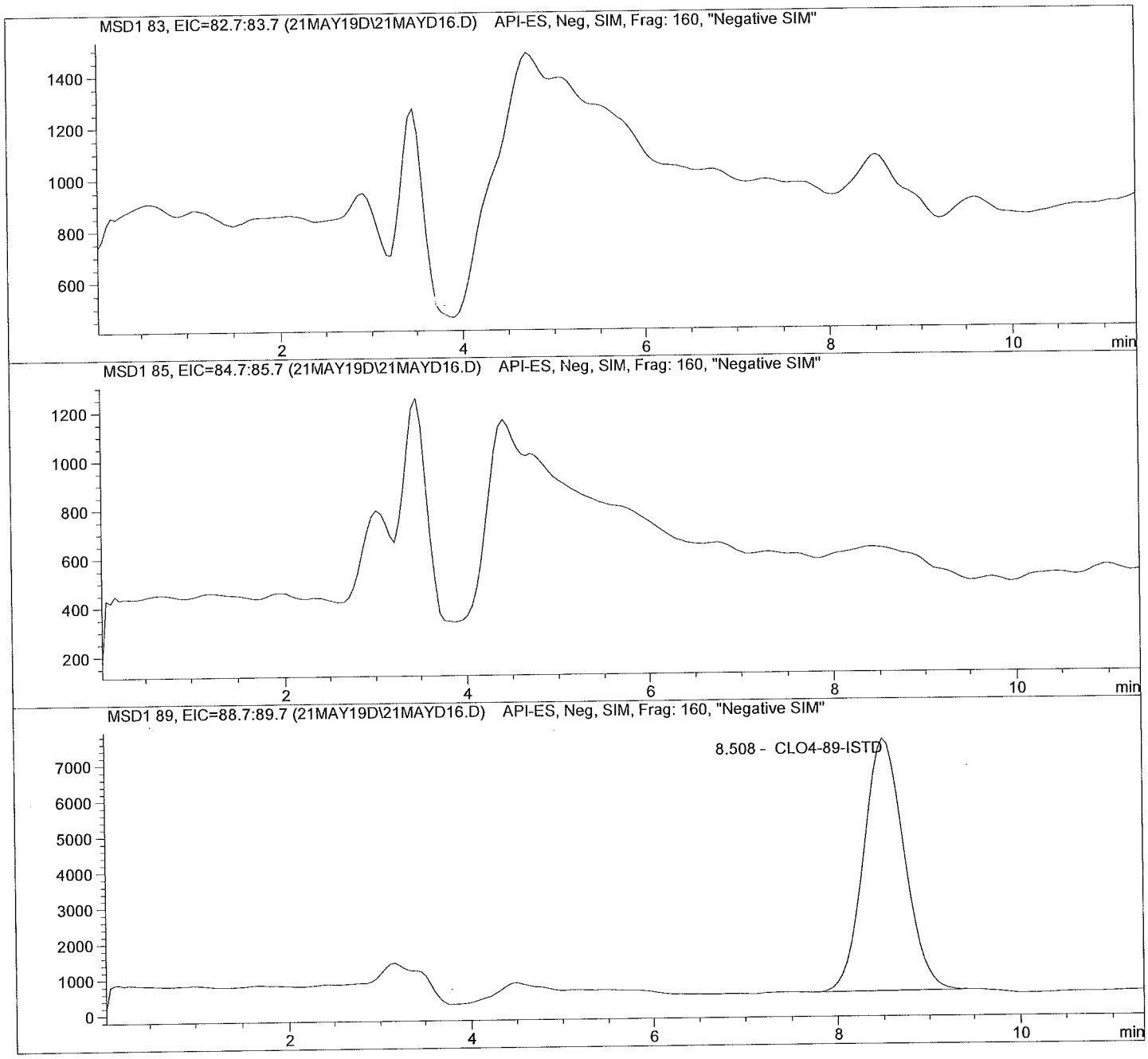
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD16.D Sample Name: 1913345001

Injection Date:	5/21/2019 11:10:33	Seq Line:	16
Sample Name:	1913345001	Location:	Vial 86
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD16.D Sample Name: 1913345001

Injection Date:	5/21/2019 11:10:33	Seq Line:	16
Sample Name:	1913345001	Location:	Vial 86
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.508	PBA	217961.0	5.0000	CLO4-89-ISTD

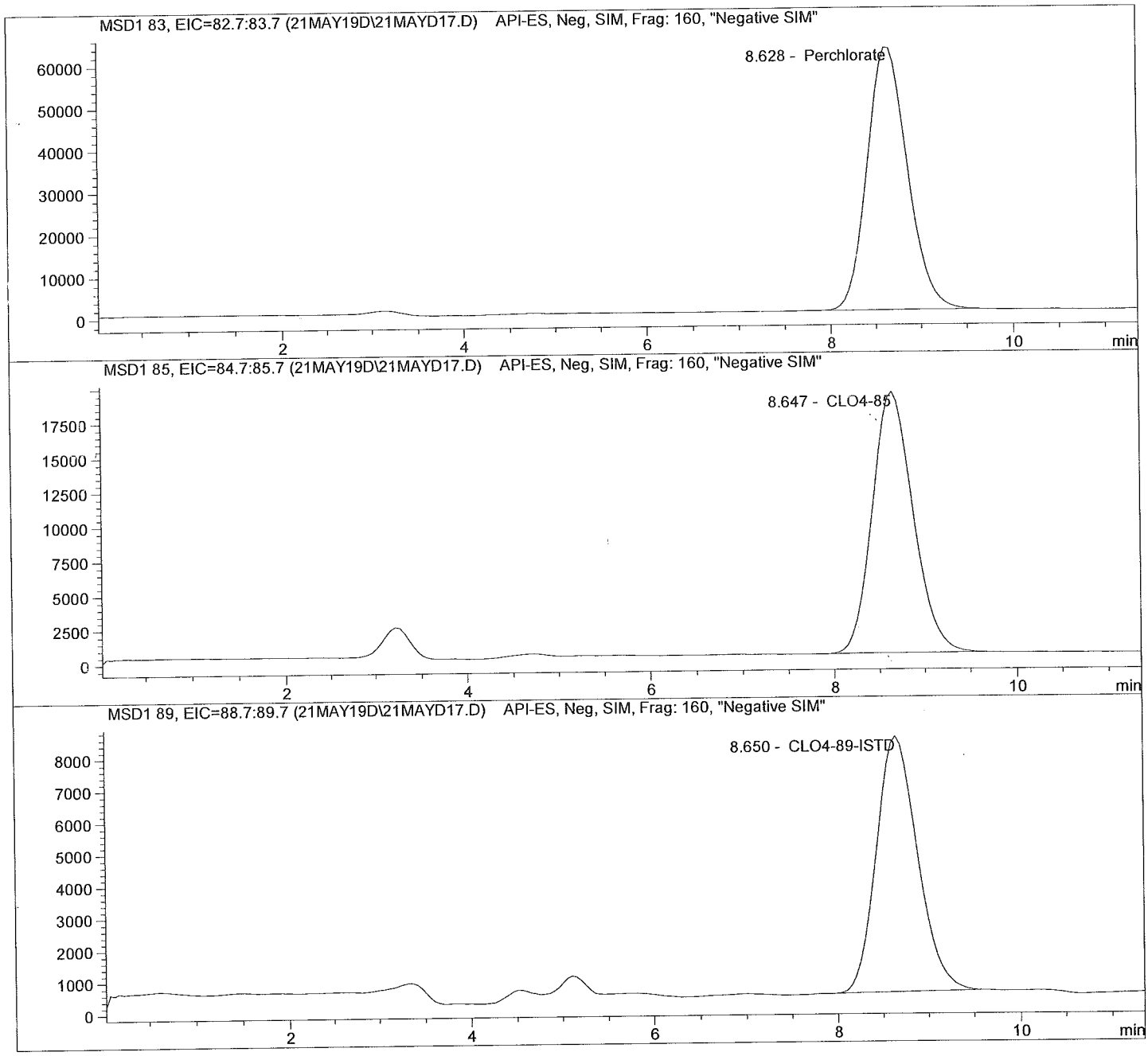
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD17.D Sample Name: 653685 CCV@25

Injection Date:	5/21/2019 11:23:56	Seq Line:	17
Sample Name:	653685 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD17.D Sample Name: 653685 CCV@25

Injection Date:	5/21/2019 11:23:56	Seq Line:	17
Sample Name:	653685 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.628	PBA	1938377.4	23.3659	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.647	PBA	593941.4	24.0719	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.650	PBA	253387.5	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

RetTime [min]	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
	7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

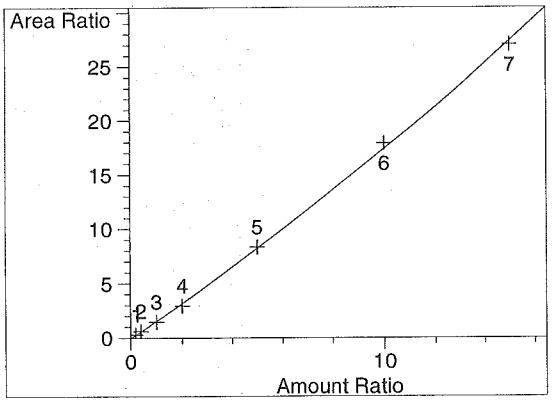
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

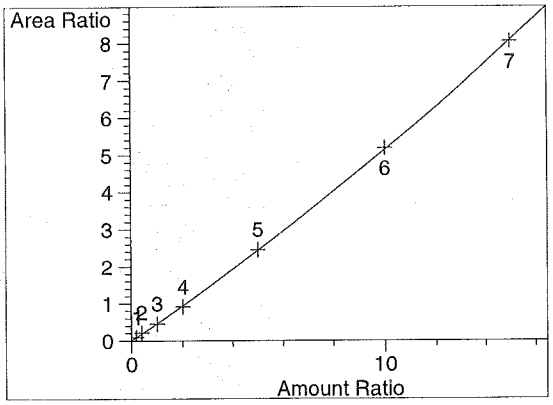
Peak Sum Table

No Entries in table

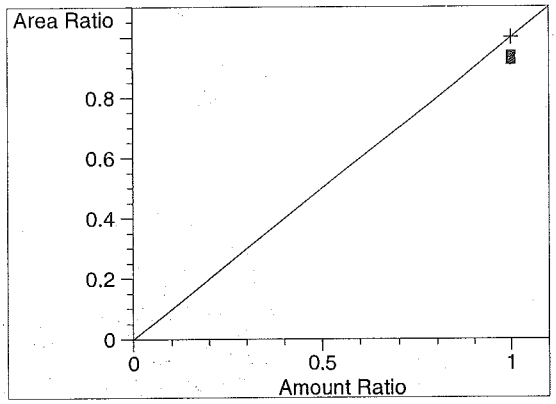
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Report: C:\HPCHEM\1\DATA\19MAR19I\19MAR19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

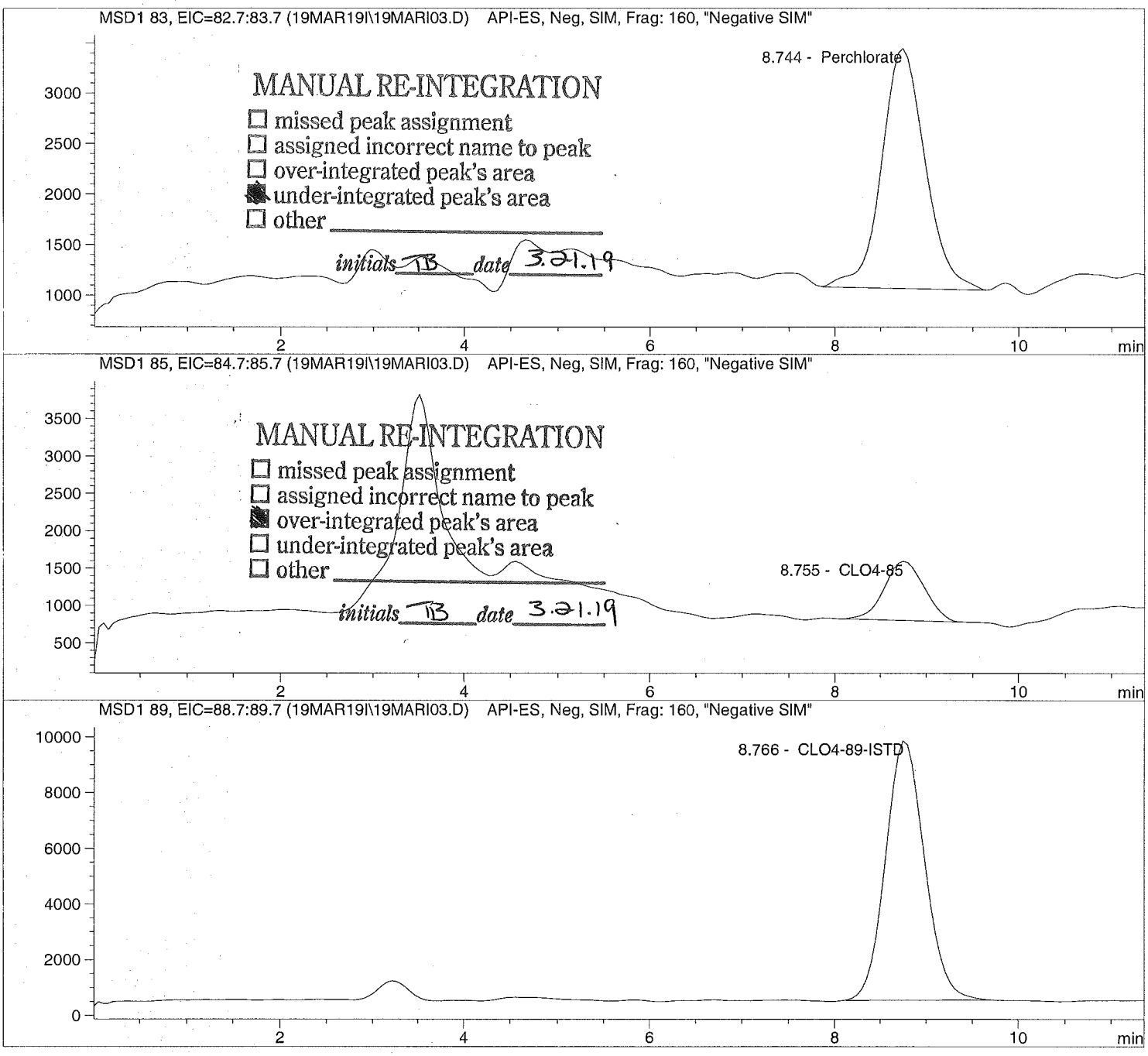
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

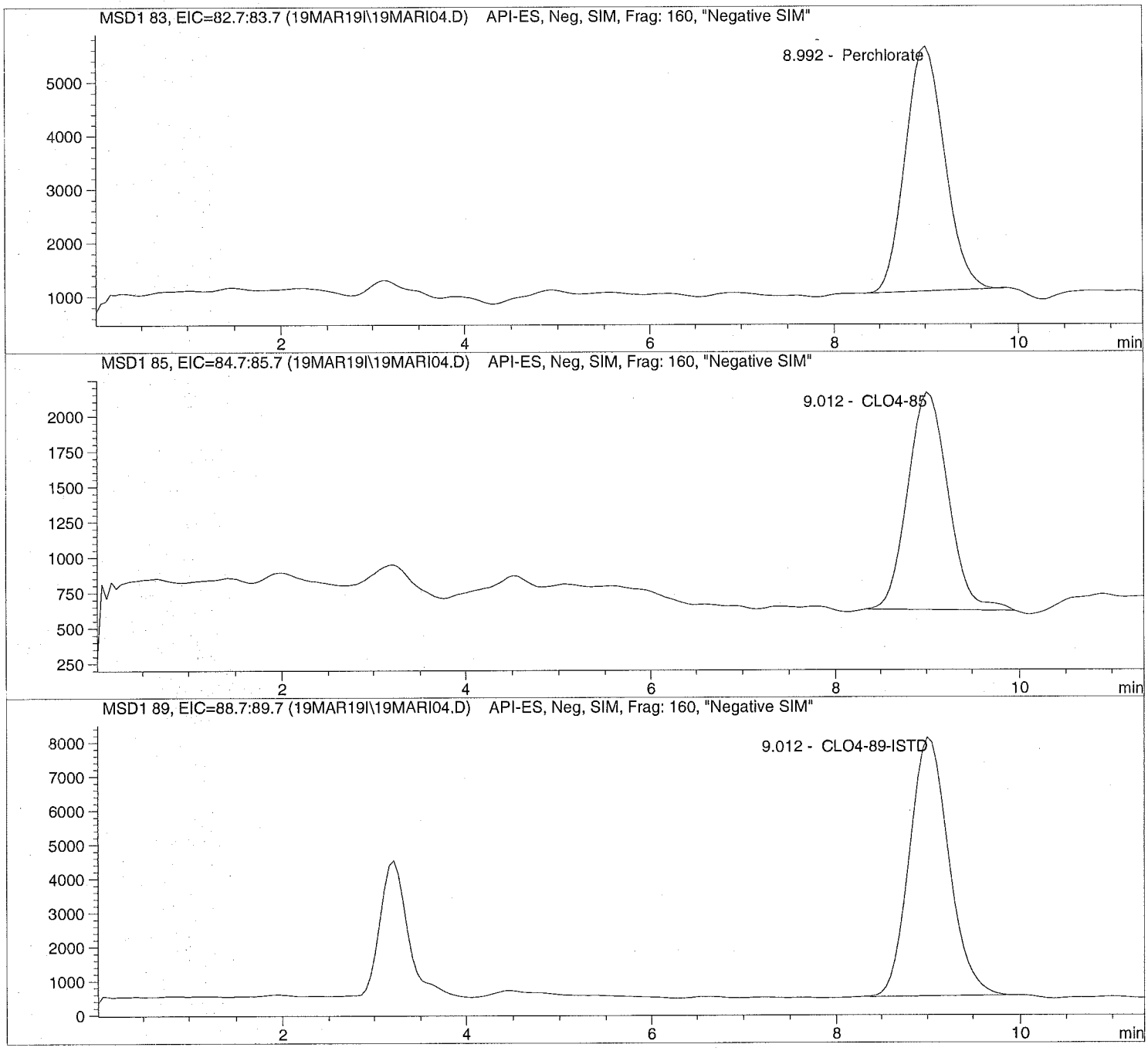
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

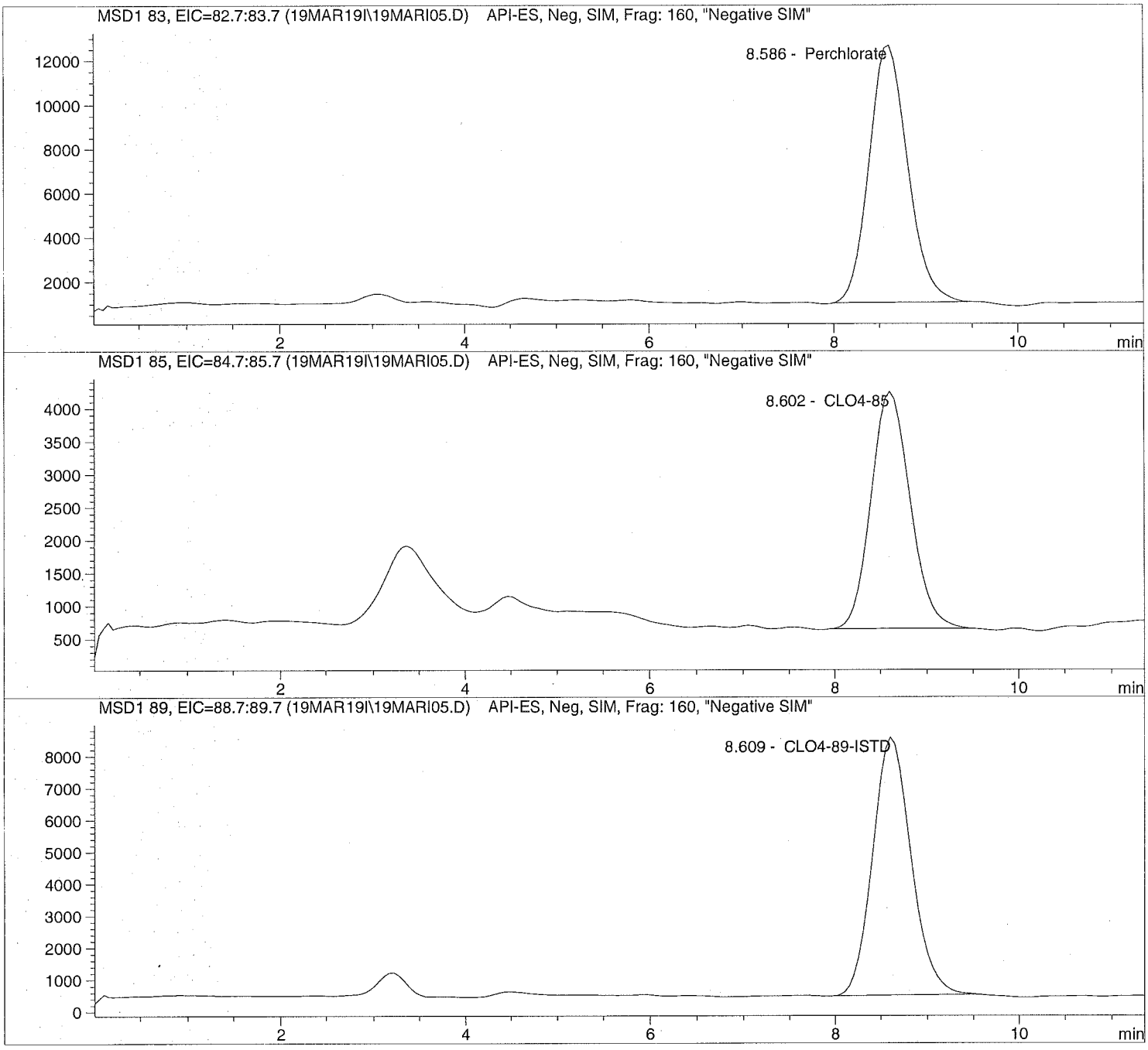
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

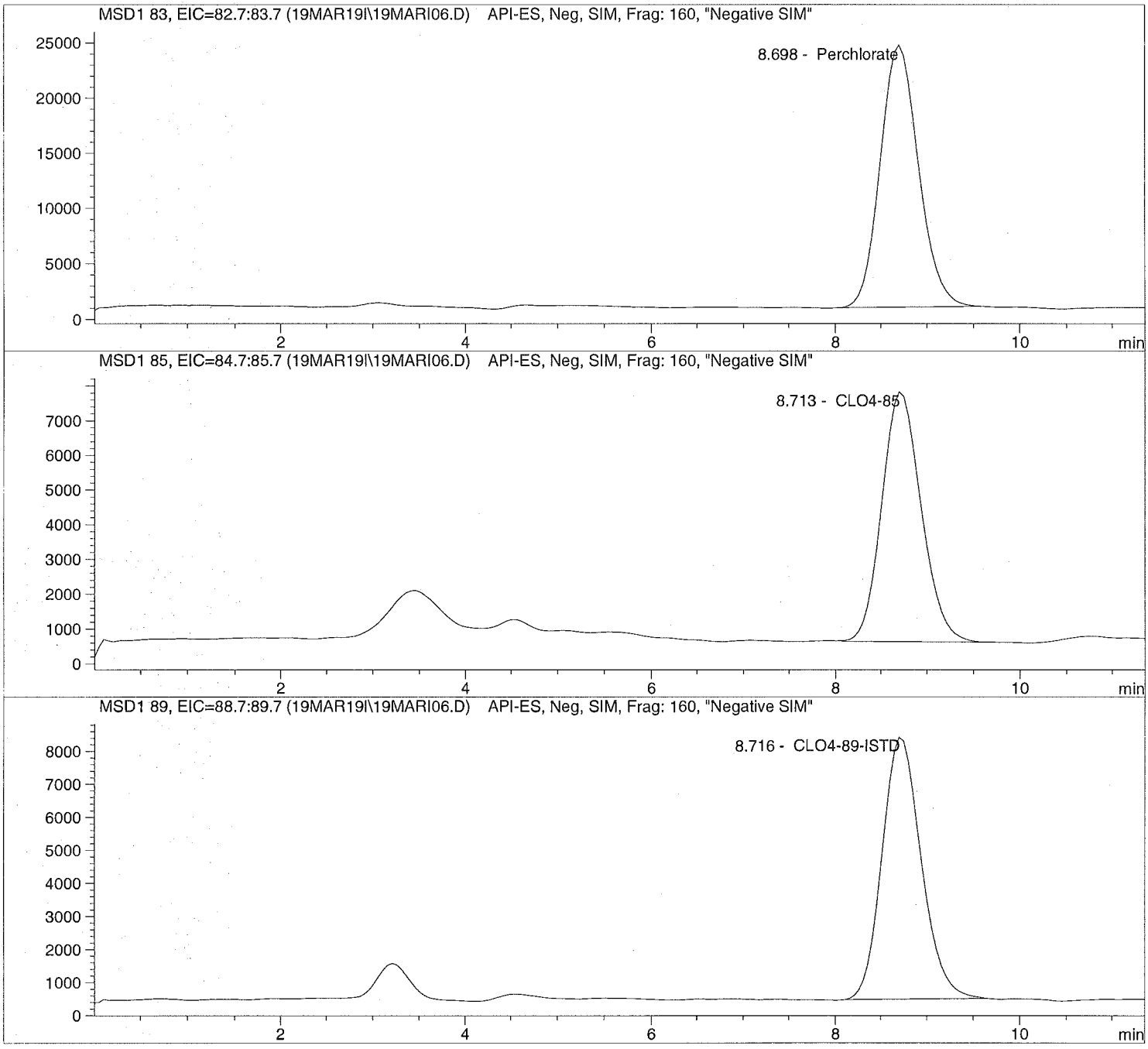
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

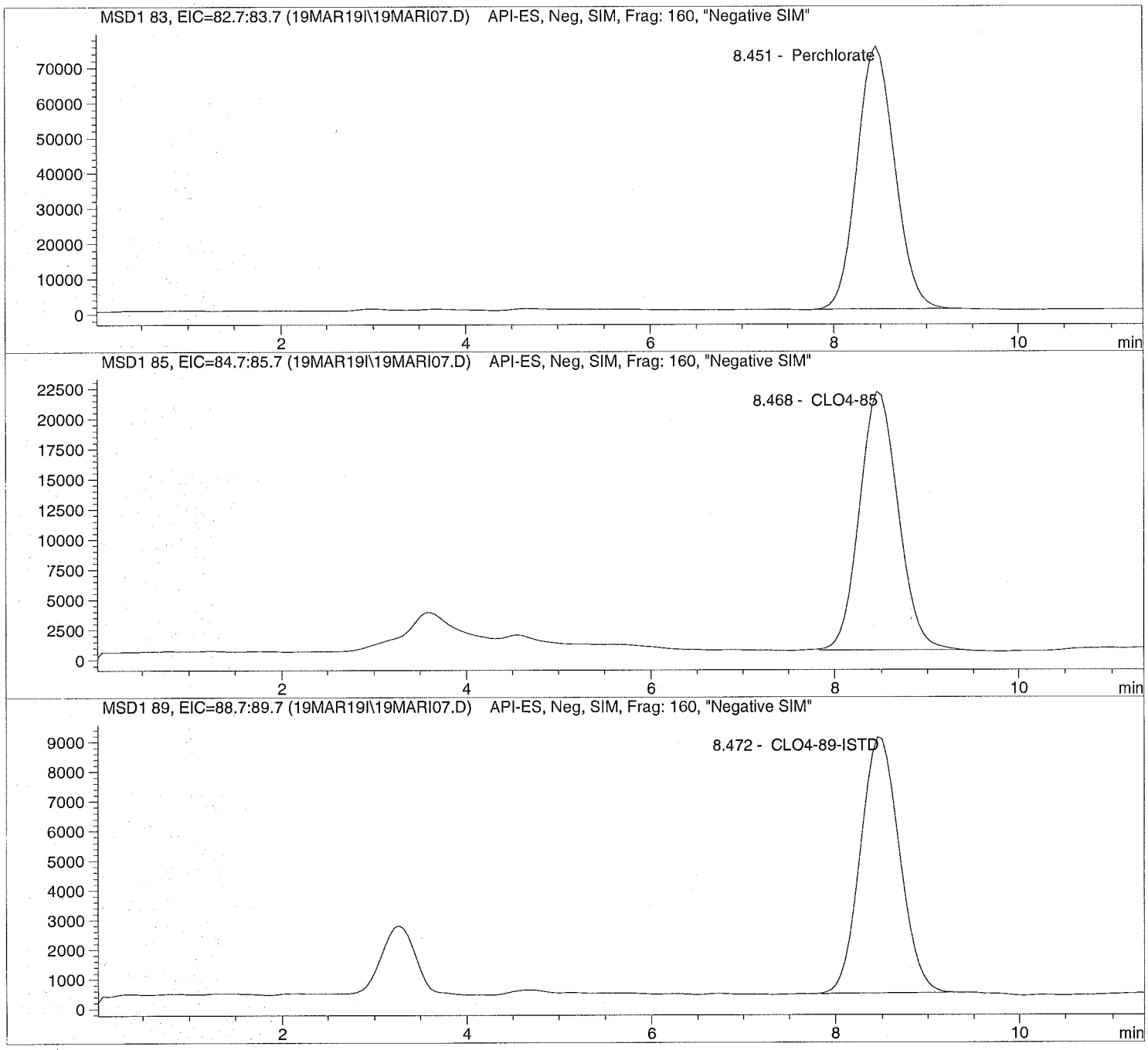
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

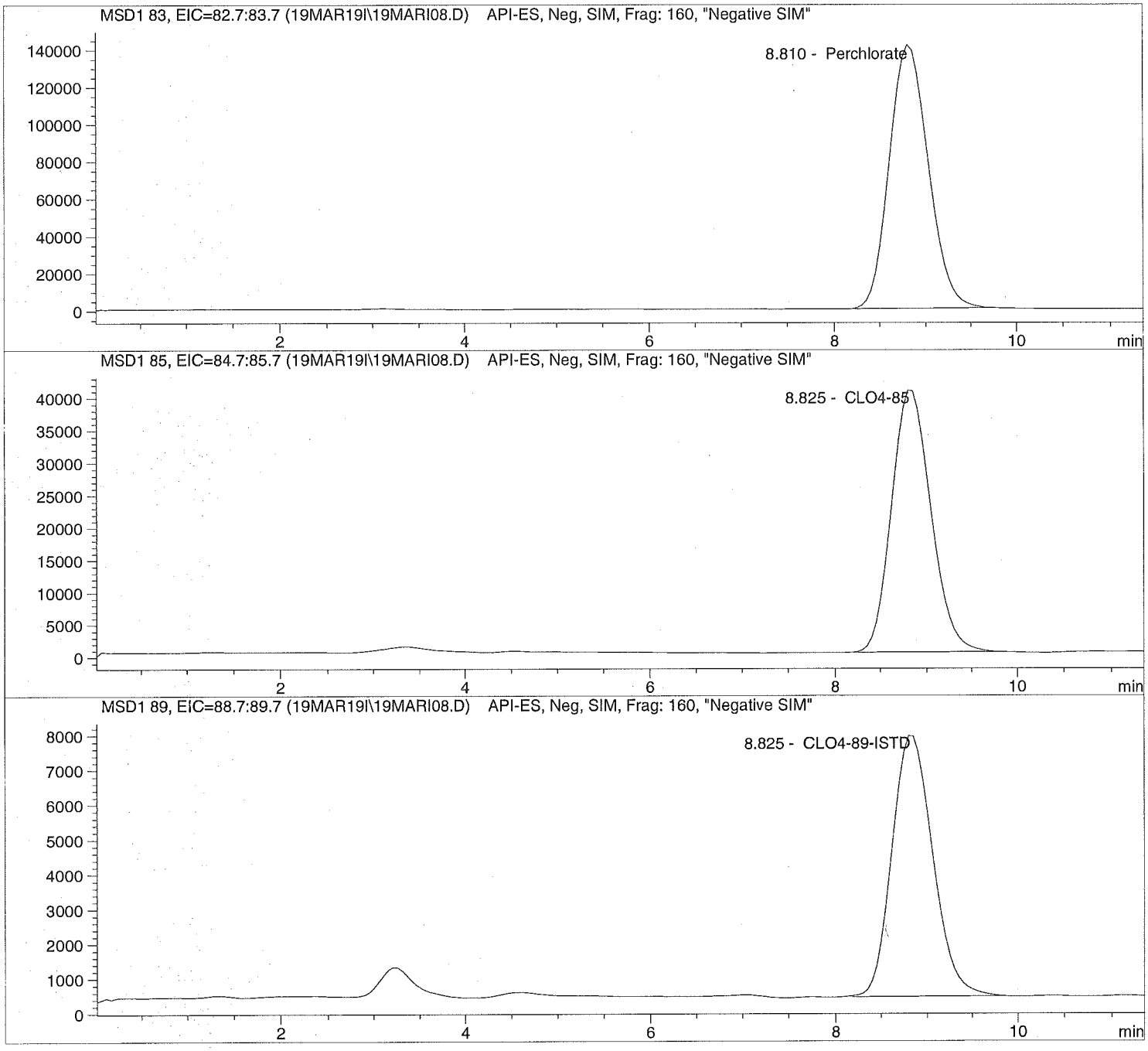
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

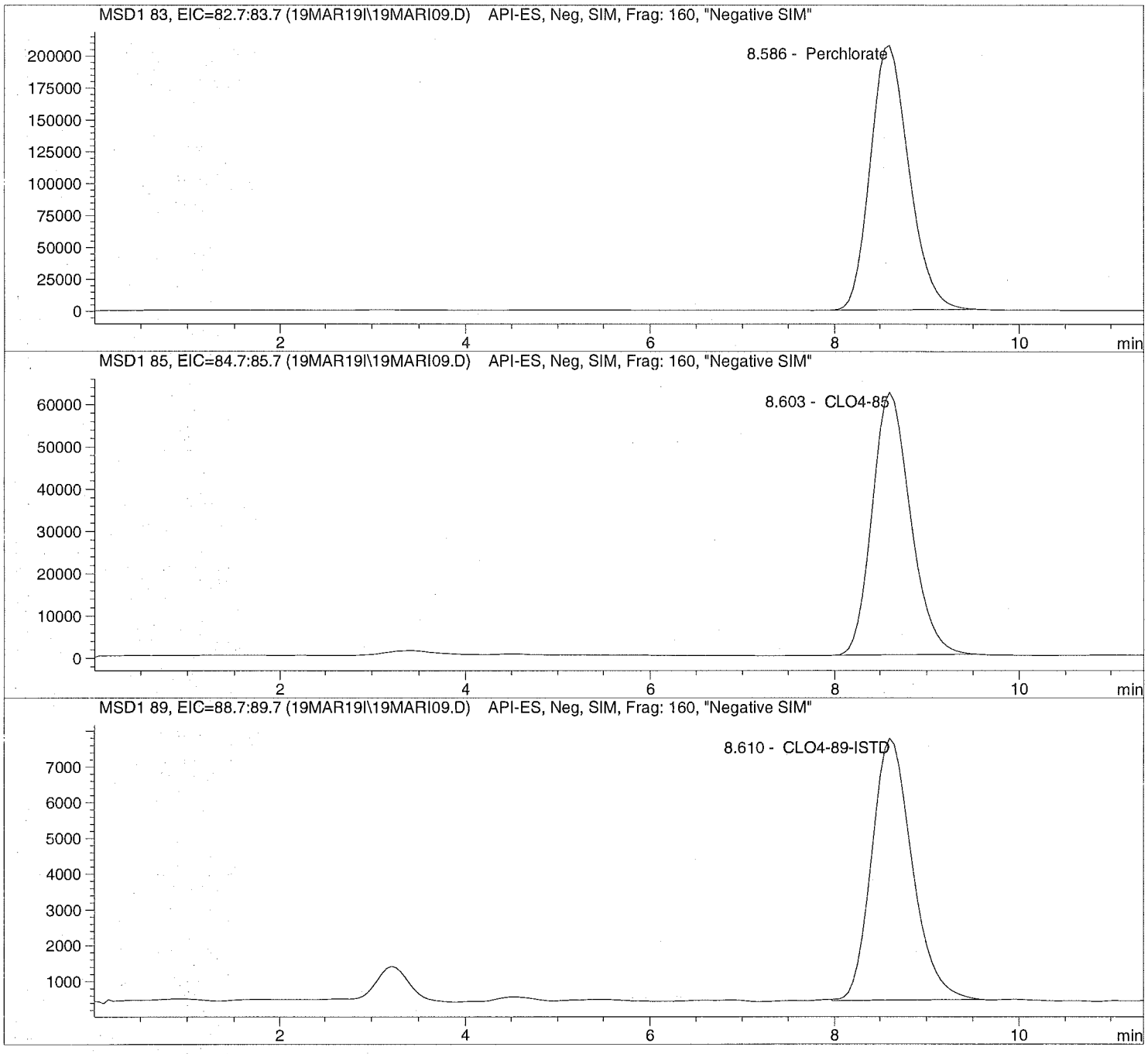
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

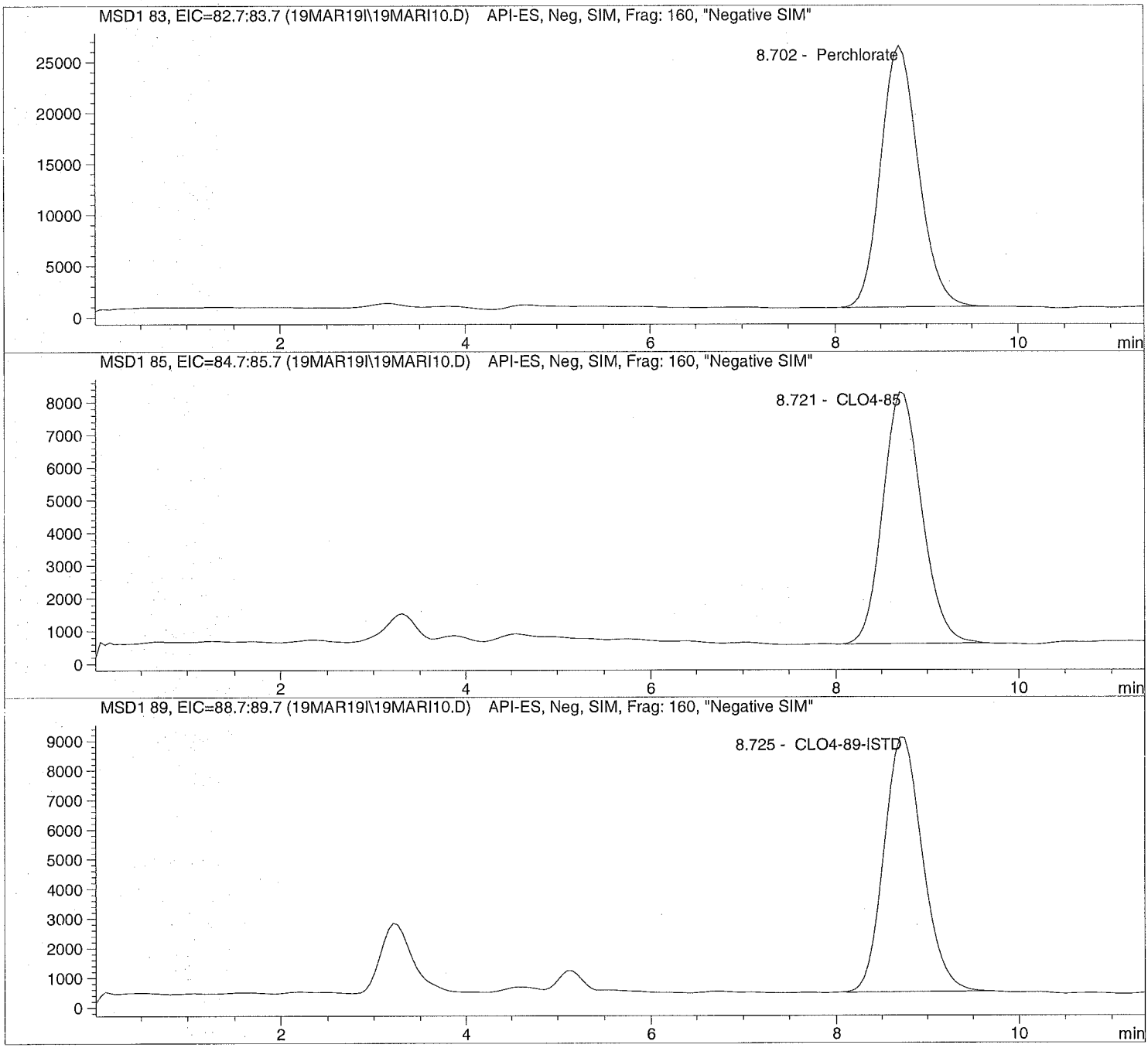
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

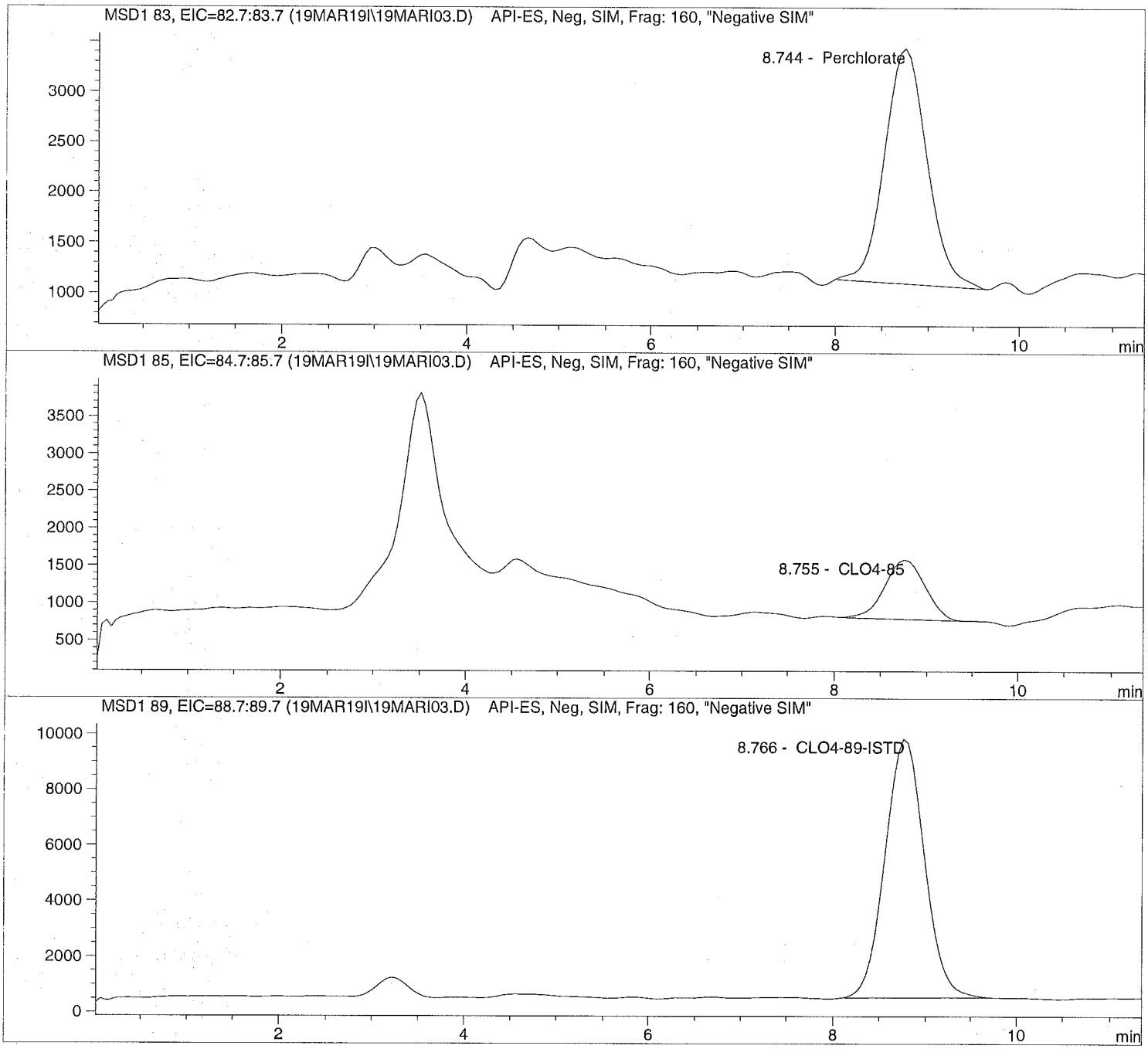
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Houston, US Date: 23-may-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS19050398

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19050398-01	LH18/24-SP650_050719	Water		07-May-2019 14:00	08-May-2019 09:30	☐
HS19050398-02	LH18/24-SP650_050719_BIX	Water		07-May-2019 14:00	08-May-2019 09:30	☐
HS19050398-03	Trip Blank	Water		07-May-2019 00:00	08-May-2019 09:30	☐

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order:

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 140715

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R338430

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 140779

Sample ID: HS19050692-02MS

• MS and MSD are for an unrelated sample

Sample ID: HS19050692-02PDS

• PDS is for an unrelated sample

WetChemistry by Method SW7196

Batch ID: R338198

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19050398

Sample ID: LH18/24-SP650_050719 Lab ID:HS19050398-01

Collection Date: 07-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 16:26
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:26
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 16:26
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 16:26
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 16:26
1,2-Dichloroethane	**0.51**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	14-May-2019 16:26
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 16:26
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:26
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:26
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	14-May-2019 16:26
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	14-May-2019 16:26
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:26
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	14-May-2019 16:26
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	14-May-2019 16:26
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:26
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:26
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:26
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	14-May-2019 16:26
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 16:26
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19050398

Sample ID: LH18/24-SP650_050719 Lab ID:HS19050398-01

Collection Date: 07-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26
cis-1,2-Dichloroethene	**1.9**		**0.20**	**0.50**	**1.0**	**UG/L**	1	14-May-2019 16:26
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	14-May-2019 16:26
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	14-May-2019 16:26
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	14-May-2019 16:26
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	14-May-2019 16:26
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:26
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26
Trichloroethene	**0.65**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	14-May-2019 16:26
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:26
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:26
Surr: 1,2-Dichloroethane-d4	*86.1*			**0**	*81-118*	*%REC*	*1*	*14-May-2019 16:26*
Surr: 4-Bromofluorobenzene	*100.0*			**0**	*85-114*	*%REC*	*1*	*14-May-2019 16:26*
Surr: Dibromofluoromethane	*87.5*			**0**	*80-119*	*%REC*	*1*	*14-May-2019 16:26*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*14-May-2019 16:26*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 10-May-2019		Analyst: LG
1,4-Dioxane	**21**		**1.0**	**1.0**	**1.0**	**ug/L**	100	14-May-2019 11:16
Surr: 2-Fluorobiphenyl	*136*			**0**	*40-140*	*%REC*	*100*	*14-May-2019 11:16*
Surr: 4-Terphenyl-d14	*112*			**0**	*40-140*	*%REC*	*100*	*14-May-2019 11:16*
Surr: Nitrobenzene-d5	*127*			**0**	*40-140*	*%REC*	*100*	*14-May-2019 11:16*
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 13-May-2019		Analyst: JHD
Barium	**0.136**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	13-May-2019 23:53
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	13-May-2019 23:53
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	13-May-2019 23:53
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	13-May-2019 23:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19050398

Sample ID: LH18/24-SP650_050719 Lab ID:HS19050398-01

Collection Date: 07-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
HEXAVALENT CHROMIUM BY SW7196A		**Method:SW7196**						Analyst: MZD
Chromium, Hexavalent	0.0100	U	0.00600	0.0100	0.0100	mg/L	1	08-May-2019 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 23-May-19

Client:	Bhate Environmental Associates, Inc.	**ANALYTICAL REPORT**
Project:	LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples	WorkOrder:HS19050398
Sample ID:	LH18/24-SP650_050719_BIX	Lab ID:HS19050398-02
Collection Date:	07-May-2019 14:00	Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-May-2019 14:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19050398

Sample ID: Trip Blank Lab ID:HS19050398-03

Collection Date: 07-May-2019 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 16:02
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:02
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 16:02
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 16:02
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 16:02
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 16:02
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:02
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:02
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	14-May-2019 16:02
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	14-May-2019 16:02
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:02
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	14-May-2019 16:02
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	14-May-2019 16:02
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:02
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:02
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:02
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	14-May-2019 16:02
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 16:02
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19050398

Sample ID: Trip Blank Lab ID:HS19050398-03

Collection Date: 07-May-2019 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	14-May-2019 16:02
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	14-May-2019 16:02
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	14-May-2019 16:02
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	14-May-2019 16:02
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 16:02
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 16:02
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 16:02
Surr: 1,2-Dichloroethane-d4	*88.9*			**0**	*81-118*	*%REC*	*1*	*14-May-2019 16:02*
Surr: 4-Bromofluorobenzene	*98.1*			**0**	*85-114*	*%REC*	*1*	*14-May-2019 16:02*
Surr: Dibromofluoromethane	*89.0*			**0**	*80-119*	*%REC*	*1*	*14-May-2019 16:02*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*14-May-2019 16:02*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19050398

Batch ID: 140715 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19050398-01	1	1000	1 (mL)	0.001

Batch ID: 140779 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19050398-01	1	10	10 (mL)	1

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19050398

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 140715	**Test Name :** SEMIVOLATILES SIM			**Matrix:** Water		
HS19050398-01	LH18/24-SP650_050719	07 May 2019 14:00		10 May 2019 12:14	14 May 2019 11:16	100
Batch ID 140779	**Test Name :** METALS BY ICPMS BY SW6020A			**Matrix:** Water		
HS19050398-01	LH18/24-SP650_050719	07 May 2019 14:00		13 May 2019 12:00	13 May 2019 23:53	1
Batch ID R338198	**Test Name :** HEXAVALENT CHROMIUM BY SW7196A			**Matrix:** Water		
HS19050398-01	LH18/24-SP650_050719	07 May 2019 14:00			08 May 2019 13:17	1
Batch ID R338430	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19050398-01	LH18/24-SP650_050719	07 May 2019 14:00			14 May 2019 16:26	1
HS19050398-03	Trip Blank	07 May 2019 00:00			14 May 2019 16:02	1
Batch ID R339032	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19050398-02	LH18/24-SP650_050719_BIX	07 May 2019 14:00			23 May 2019 14:50	1

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19050398

QC BATCH REPORT

Batch ID: 140779 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-140779** Units: **mg/L** Analysis Date: **14-May-2019 15:15**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074406** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.00250	0.00400								U
Lead	0.00100	0.00200								U
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U

LCS Sample ID: **LCS-140779** Units: **mg/L** Analysis Date: **13-May-2019 23:51**
Client ID: Run ID: **ICPMS06_338296** SeqNo: **5073389** PrepDate: **13-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.05371	0.00400	0.05	0	107	80 - 120				
Lead	0.05094	0.00200	0.05	0	102	80 - 120				
Selenium	0.05418	0.00200	0.05	0	108	80 - 120				
Silver	0.05124	0.00200	0.05	0	102	80 - 120				

MS Sample ID: **HS19050692-02MS** Units: **mg/L** Analysis Date: **14-May-2019 15:20**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074409** PrepDate: **13-May-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.0506	0.0200	0.05	0.002878	95.4	80 - 120				
Lead	2.378	0.0100	0.05	2.208	340	80 - 120				SO
Selenium	2.219	0.0100	0.05	2.123	192	80 - 120				SO
Silver	0.05437	0.0100	0.05	-0.000021	109	80 - 120				

MSD Sample ID: **HS19050692-02MSD** Units: **mg/L** Analysis Date: **14-May-2019 15:21**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074410** PrepDate: **13-May-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.05205	0.0200	0.05	0.002878	98.3	80 - 120	0.04962	4.77	20	
Lead	2.489	0.0100	0.05	2.208	562	80 - 120	2.328	6.7	20	SO
Selenium	2.198	0.0100	0.05	2.123	150	80 - 120	2.186	0.575	20	SO
Silver	0.05424	0.0100	0.05	-0.000021	109	80 - 120	0.04161	26.3	20	R

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19050398

QC BATCH REPORT

Batch ID: 140779 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19050692-02PDS** Units: **mg/L** Analysis Date: **14-May-2019 15:23**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074411** PrepDate: **13-May-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.4787	0.0200	0.5	0	95.7	75 - 125				
Lead	3.063	0.0100	0.5	2.208	171	75 - 125				SO
Selenium	2.683	0.0100	0.5	2.123	112	75 - 125				O
Silver	0.5511	0.0100	0.5	0	110	75 - 125				

SD Sample ID: **HS19050692-02SD** Units: **mg/L** Analysis Date: **14-May-2019 15:18**
Client ID: Run ID: **ICPMS06_338370** SeqNo: **5074408** PrepDate: **13-May-2019** DF: **25**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.0625	0.100					0.002878	0	10	U
Lead	2.24	0.0500					2.208	1.46	10	
Selenium	2.145	0.0500					2.123	1.02	10	
Silver	0.0125	0.0500					-0.000021	0	10	U

The following samples were analyzed in this batch: HS19050398-01

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19050398

QC BATCH REPORT

Batch ID: 140715 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-140715** Units: **ug/L** Analysis Date: **13-May-2019 16:06**
Client ID: Run ID: **SV-5_338421** SeqNo: **5074908** PrepDate: **10-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.07833*	*0*	*0.08*	*0*	*97.9*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.05817*	*0*	*0.08*	*0*	*72.7*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08156*	*0*	*0.08*	*0*	*102*	*40 - 140*				

LCS Sample ID: **LCS-140715** Units: **ug/L** Analysis Date: **13-May-2019 16:27**
Client ID: Run ID: **SV-5_338421** SeqNo: **5074909** PrepDate: **10-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08934	0.010	0.08	0	112	40 - 140				
Surr: 2-Fluorobiphenyl	*0.07161*	*0*	*0.08*	*0*	*89.5*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.06391*	*0*	*0.08*	*0*	*79.9*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07487*	*0*	*0.08*	*0*	*93.6*	*40 - 140*				

LCSD Sample ID: **LCSD-140715** Units: **ug/L** Analysis Date: **13-May-2019 16:48**
Client ID: Run ID: **SV-5_338421** SeqNo: **5074910** PrepDate: **10-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08741	0.010	0.08	0	109	40 - 140	0.08934	2.18	20	
Surr: 2-Fluorobiphenyl	*0.07183*	*0*	*0.08*	*0*	*89.8*	*40 - 140*	*0.07161*	*0.308*	*20*	
Surr: 4-Terphenyl-d14	*0.06602*	*0*	*0.08*	*0*	*82.5*	*40 - 140*	*0.06391*	*3.24*	*20*	
Surr: Nitrobenzene-d5	*0.08096*	*0*	*0.08*	*0*	*101*	*40 - 140*	*0.07487*	*7.83*	*20*	

The following samples were analyzed in this batch: HS19050398-01

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19050398

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190514** Units: **UG/L** Analysis Date: **14-May-2019 11:37**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075195** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19050398

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190514** Units: **UG/L** Analysis Date: **14-May-2019 11:37**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075195** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*42.59*	*1.0*	*50*	*0*	*85.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.97*	*1.0*	*50*	*0*	*97.9*	*85 - 114*				
Surr: Dibromofluoromethane	*43.89*	*1.0*	*50*	*0*	*87.8*	*80 - 119*				
Surr: Toluene-d8	*52.89*	*1.0*	*50*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19050398

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190514** Units: **UG/L** Analysis Date: **14-May-2019 10:49**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075194** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.65	1.0	20	0	98.3	78 - 124				
1,1,1-Trichloroethane	19.21	1.0	20	0	96.0	74 - 131				
1,1,2,2-Tetrachloroethane	19.94	1.0	20	0	99.7	71 - 121				
1,1,2-Trichloroethane	19.79	1.0	20	0	98.9	80 - 119				
1,1-Dichloroethane	19.1	1.0	20	0	95.5	77 - 125				
1,1-Dichloroethene	19.64	1.0	20	0	98.2	71 - 131				
1,1-Dichloropropene	19.1	1.0	20	0	95.5	78 - 125				
1,2,3-Trichlorobenzene	22.8	1.0	20	0	114	69 - 129				
1,2,3-Trichloropropane	19.99	1.0	20	0	99.9	73 - 122				
1,2,4-Trichlorobenzene	20.95	1.0	20	0	105	69 - 130				
1,2,4-Trimethylbenzene	19.27	1.0	20	0	96.3	76 - 124				
1,2-Dibromo-3-chloropropane	20.82	1.0	20	0	104	62 - 128				
1,2-Dibromoethane	19.76	1.0	20	0	98.8	77 - 121				
1,2-Dichlorobenzene	19.39	1.0	20	0	96.9	80 - 119				
1,2-Dichloroethane	19.2	1.0	20	0	96.0	73 - 128				
1,2-Dichloropropane	20.1	1.0	20	0	100	78 - 122				
1,3,5-Trimethylbenzene	19.23	1.0	20	0	96.2	75 - 124				
1,3-Dichlorobenzene	19.33	1.0	20	0	96.7	80 - 119				
1,3-Dichloropropane	19.66	1.0	20	0	98.3	80 - 119				
1,4-Dichlorobenzene	19.64	1.0	20	0	98.2	79 - 118				
2,2-Dichloropropane	19.71	1.0	20	0	98.6	60 - 139				
2-Butanone	41.52	2.0	40	0	104	56 - 143				
2-Chlorotoluene	18.51	1.0	20	0	92.5	79 - 122				
2-Hexanone	40.58	2.0	40	0	101	57 - 139				
4-Chlorotoluene	18.69	1.0	20	0	93.4	78 - 122				
4-Isopropyltoluene	18.93	1.0	20	0	94.6	77 - 127				
4-Methyl-2-pentanone	39.72	2.0	40	0	99.3	67 - 130				
Acetone	44.55	2.0	40	0	111	39 - 160				
Benzene	19.69	1.0	20	0	98.4	79 - 120				
Bromobenzene	19.68	1.0	20	0	98.4	80 - 120				
Bromochloromethane	19.96	1.0	20	0	99.8	78 - 123				
Bromodichloromethane	20.01	1.0	20	0	100	79 - 125				
Bromoform	21	1.0	20	0	105	66 - 130				
Bromomethane	22.76	1.0	20	0	114	53 - 141				

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19050398

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190514** Units: **UG/L** Analysis Date: **14-May-2019 10:49**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075194** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	39.51	2.0	40	0	98.8	64 - 133				
Carbon tetrachloride	18.82	1.0	20	0	94.1	72 - 136				
Chlorobenzene	19.91	1.0	20	0	99.5	82 - 118				
Chloroethane	18.27	1.0	20	0	91.3	60 - 138				
Chloroform	19.45	1.0	20	0	97.2	79 - 124				
Chloromethane	18.59	1.0	20	0	93.0	50 - 139				
cis-1,2-Dichloroethene	19.06	1.0	20	0	95.3	78 - 123				
cis-1,3-Dichloropropene	20.18	1.0	20	0	101	75 - 124				
Dibromochloromethane	19.83	1.0	20	0	99.2	74 - 126				
Dibromomethane	20.15	1.0	20	0	101	79 - 123				
Dichlorodifluoromethane	21.17	1.0	20	0	106	32 - 152				
Ethylbenzene	19.47	1.0	20	0	97.3	79 - 121				
Hexachlorobutadiene	20.77	1.0	20	0	104	66 - 134				
Isopropylbenzene	19.15	1.0	20	0	95.7	72 - 131				
m,p-Xylene	38.81	2.0	40	0	97.0	80 - 121				
Methylene chloride	20.12	2.0	20	0	101	74 - 124				
Naphthalene	20.78	1.0	20	0	104	61 - 128				
n-Butylbenzene	19.23	1.0	20	0	96.1	75 - 128				
n-Propylbenzene	18.85	1.0	20	0	94.2	76 - 126				
o-Xylene	19.46	1.0	20	0	97.3	78 - 122				
sec-Butylbenzene	18.62	1.0	20	0	93.1	77 - 126				
Styrene	20.18	1.0	20	0	101	78 - 123				
tert-Butylbenzene	18.7	1.0	20	0	93.5	78 - 124				
Tetrachloroethene	19.22	1.0	20	0	96.1	74 - 129				
Toluene	19.42	1.0	20	0	97.1	80 - 121				
trans-1,2-Dichloroethene	19.89	1.0	20	0	99.5	75 - 124				
trans-1,3-Dichloropropene	20.67	1.0	20	0	103	73 - 127				
Trichloroethene	19.92	1.0	20	0	99.6	79 - 123				
Trichlorofluoromethane	19.39	1.0	20	0	96.9	65 - 141				
Vinyl chloride	19.64	1.0	20	0	98.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.83*	*1.0*	*50*	*0*	*99.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.82*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*48.75*	*1.0*	*50*	*0*	*97.5*	*80 - 119*				
Surr: Toluene-d8	*48.69*	*1.0*	*50*	*0*	*97.4*	*89 - 112*				

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19050398

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19050304-05MS** Units: **UG/L** Analysis Date: **14-May-2019 14:26**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075202** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.96	1.0	20	0	89.8	78 - 124				
1,1,1-Trichloroethane	17.27	1.0	20	0	86.4	74 - 131				
1,1,2,2-Tetrachloroethane	19.07	1.0	20	0	95.4	71 - 121				
1,1,2-Trichloroethane	18.35	1.0	20	0	91.8	80 - 119				
1,1-Dichloroethane	16.46	1.0	20	0	82.3	77 - 125				
1,1-Dichloroethene	17.19	1.0	20	0	86.0	71 - 131				
1,1-Dichloropropene	18.19	1.0	20	0	91.0	78 - 125				
1,2,3-Trichlorobenzene	21.91	1.0	20	0	110	69 - 129				
1,2,3-Trichloropropane	18.51	1.0	20	0	92.6	73 - 122				
1,2,4-Trichlorobenzene	20.05	1.0	20	0	100	69 - 130				
1,2,4-Trimethylbenzene	17.85	1.0	20	0	89.3	76 - 124				
1,2-Dibromo-3-chloropropane	20.62	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	18.37	1.0	20	0	91.9	77 - 121				
1,2-Dichlorobenzene	18.43	1.0	20	0	92.2	80 - 119				
1,2-Dichloroethane	16.81	1.0	20	0	84.1	73 - 128				
1,2-Dichloropropane	17.63	1.0	20	0	88.2	78 - 122				
1,3,5-Trimethylbenzene	18.57	1.0	20	0	92.8	75 - 124				
1,3-Dichlorobenzene	18.44	1.0	20	0	92.2	80 - 119				
1,3-Dichloropropane	18.25	1.0	20	0	91.3	80 - 119				
1,4-Dichlorobenzene	18.41	1.0	20	0	92.1	79 - 118				
2,2-Dichloropropane	17.18	1.0	20	0	85.9	60 - 139				
2-Butanone	36.74	2.0	40	0	91.9	56 - 143				
2-Chlorotoluene	18.14	1.0	20	0	90.7	79 - 122				
2-Hexanone	36.41	2.0	40	0	91.0	57 - 139				
4-Chlorotoluene	18.02	1.0	20	0	90.1	78 - 122				
4-Isopropyltoluene	19.4	1.0	20	0	97.0	77 - 127				
4-Methyl-2-pentanone	37.53	2.0	40	0	93.8	67 - 130				
Acetone	41.3	2.0	40	5.033	90.7	39 - 160				
Benzene	17.22	1.0	20	0	86.1	79 - 120				
Bromobenzene	17.54	1.0	20	0	87.7	80 - 120				
Bromochloromethane	16.53	1.0	20	0	82.6	78 - 123				
Bromodichloromethane	17.16	1.0	20	0	85.8	79 - 125				
Bromoform	18.69	1.0	20	0	93.5	66 - 130				
Bromomethane	14.83	1.0	20	0	74.1	53 - 141				

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19050398

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19050304-05MS** Units: **UG/L** Analysis Date: **14-May-2019 14:26**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075202** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	34.64	2.0	40	0	86.6	64 - 133				
Carbon tetrachloride	17.45	1.0	20	0	87.2	72 - 136				
Chlorobenzene	18.68	1.0	20	0	93.4	82 - 118				
Chloroethane	16.04	1.0	20	0	80.2	60 - 138				
Chloroform	16.36	1.0	20	0	81.8	79 - 124				
Chloromethane	14.06	1.0	20	0	70.3	50 - 139				
cis-1,2-Dichloroethene	16.27	1.0	20	0	81.4	78 - 123				
cis-1,3-Dichloropropene	18.73	1.0	20	0	93.7	75 - 124				
Dibromochloromethane	18.41	1.0	20	0	92.0	74 - 126				
Dibromomethane	17.7	1.0	20	0	88.5	79 - 123				
Dichlorodifluoromethane	15.98	1.0	20	0	79.9	32 - 152				
Ethylbenzene	18.41	1.0	20	0	92.1	79 - 121				
Hexachlorobutadiene	21.25	1.0	20	0	106	66 - 134				
Isopropylbenzene	18.73	1.0	20	0	93.7	72 - 131				
m,p-Xylene	37.34	2.0	40	0	93.4	80 - 121				
Methylene chloride	16.74	2.0	20	0	83.7	74 - 124				
Naphthalene	20.25	1.0	20	0	101	61 - 128				
n-Butylbenzene	19.47	1.0	20	0	97.4	75 - 128				
n-Propylbenzene	19.15	1.0	20	0	95.8	76 - 126				
o-Xylene	19.15	1.0	20	0	95.7	78 - 122				
sec-Butylbenzene	19.76	1.0	20	0	98.8	77 - 126				
Styrene	18.13	1.0	20	0	90.7	78 - 123				
tert-Butylbenzene	19.35	1.0	20	0	96.8	78 - 124				
Tetrachloroethene	18.9	1.0	20	0	94.5	74 - 129				
Toluene	18.38	1.0	20	0	91.9	80 - 121				
trans-1,2-Dichloroethene	17.28	1.0	20	0	86.4	75 - 124				
trans-1,3-Dichloropropene	17.81	1.0	20	0	89.1	73 - 127				
Trichloroethene	18.37	1.0	20	0	91.9	79 - 123				
Trichlorofluoromethane	16.85	1.0	20	0	84.3	65 - 141				
Vinyl chloride	17.11	1.0	20	0	85.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*43.63*	*1.0*	*50*	*0*	*87.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.27*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*45.19*	*1.0*	*50*	*0*	*90.4*	*80 - 119*				
Surr: Toluene-d8	*52*	*1.0*	*50*	*0*	*104*	*89 - 112*				

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19050398

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19050304-05MSD** Units: **UG/L** Analysis Date: **14-May-2019 14:50**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075203** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.05	1.0	20	0	90.3	78 - 124	17.96	0.499	20	
1,1,1-Trichloroethane	16.75	1.0	20	0	83.7	74 - 131	17.27	3.11	20	
1,1,2,2-Tetrachloroethane	20.62	1.0	20	0	103	71 - 121	19.07	7.82	20	
1,1,2-Trichloroethane	18.77	1.0	20	0	93.9	80 - 119	18.35	2.27	20	
1,1-Dichloroethane	15.96	1.0	20	0	79.8	77 - 125	16.46	3.1	20	
1,1-Dichloroethene	16.38	1.0	20	0	81.9	71 - 131	17.19	4.84	20	
1,1-Dichloropropene	17.86	1.0	20	0	89.3	78 - 125	18.19	1.86	20	
1,2,3-Trichlorobenzene	24.61	1.0	20	0	123	69 - 129	21.91	11.6	20	
1,2,3-Trichloropropane	20.12	1.0	20	0	101	73 - 122	18.51	8.29	20	
1,2,4-Trichlorobenzene	21.58	1.0	20	0	108	69 - 130	20.05	7.37	20	
1,2,4-Trimethylbenzene	19.04	1.0	20	0	95.2	76 - 124	17.85	6.43	20	
1,2-Dibromo-3-chloropropane	23.37	1.0	20	0	117	62 - 128	20.62	12.5	20	
1,2-Dibromoethane	18.7	1.0	20	0	93.5	77 - 121	18.37	1.8	20	
1,2-Dichlorobenzene	20.02	1.0	20	0	100	80 - 119	18.43	8.27	20	
1,2-Dichloroethane	16.81	1.0	20	0	84.1	73 - 128	16.81	0.00614	20	
1,2-Dichloropropane	17.42	1.0	20	0	87.1	78 - 122	17.63	1.19	20	
1,3,5-Trimethylbenzene	19.67	1.0	20	0	98.3	75 - 124	18.57	5.76	20	
1,3-Dichlorobenzene	19.64	1.0	20	0	98.2	80 - 119	18.44	6.33	20	
1,3-Dichloropropane	18.61	1.0	20	0	93.0	80 - 119	18.25	1.94	20	
1,4-Dichlorobenzene	19.37	1.0	20	0	96.8	79 - 118	18.41	5.05	20	
2,2-Dichloropropane	16.54	1.0	20	0	82.7	60 - 139	17.18	3.8	20	
2-Butanone	36.99	2.0	40	0	92.5	56 - 143	36.74	0.672	20	
2-Chlorotoluene	19.27	1.0	20	0	96.3	79 - 122	18.14	6	20	
2-Hexanone	38.67	2.0	40	0	96.7	57 - 139	36.41	6.02	20	
4-Chlorotoluene	19.19	1.0	20	0	96.0	78 - 122	18.02	6.3	20	
4-Isopropyltoluene	20.54	1.0	20	0	103	77 - 127	19.4	5.71	20	
4-Methyl-2-pentanone	38.72	2.0	40	0	96.8	67 - 130	37.53	3.12	20	
Acetone	42.23	2.0	40	5.033	93.0	39 - 160	41.3	2.22	20	
Benzene	17.15	1.0	20	0	85.7	79 - 120	17.22	0.446	20	
Bromobenzene	18.86	1.0	20	0	94.3	80 - 120	17.54	7.22	20	
Bromochloromethane	15.89	1.0	20	0	79.5	78 - 123	16.53	3.91	20	
Bromodichloromethane	16.76	1.0	20	0	83.8	79 - 125	17.16	2.31	20	
Bromoform	19.5	1.0	20	0	97.5	66 - 130	18.69	4.22	20	
Bromomethane	14.44	1.0	20	0	72.2	53 - 141	14.83	2.67	20	

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19050398

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19050304-05MSD** Units: **UG/L** Analysis Date: **14-May-2019 14:50**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075203** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	33.71	2.0	40	0	84.3	64 - 133	34.64	2.72	20	
Carbon tetrachloride	17.32	1.0	20	0	86.6	72 - 136	17.45	0.729	20	
Chlorobenzene	18.86	1.0	20	0	94.3	82 - 118	18.68	0.95	20	
Chloroethane	15.18	1.0	20	0	75.9	60 - 138	16.04	5.54	20	
Chloroform	15.86	1.0	20	0	79.3	79 - 124	16.36	3.15	20	
Chloromethane	13.31	1.0	20	0	66.6	50 - 139	14.06	5.44	20	
cis-1,2-Dichloroethene	15.91	1.0	20	0	79.6	78 - 123	16.27	2.26	20	
cis-1,3-Dichloropropene	18.59	1.0	20	0	92.9	75 - 124	18.73	0.759	20	
Dibromochloromethane	18.51	1.0	20	0	92.5	74 - 126	18.41	0.558	20	
Dibromomethane	17.47	1.0	20	0	87.4	79 - 123	17.7	1.28	20	
Dichlorodifluoromethane	15.52	1.0	20	0	77.6	32 - 152	15.98	2.93	20	
Ethylbenzene	18.16	1.0	20	0	90.8	79 - 121	18.41	1.34	20	
Hexachlorobutadiene	21.15	1.0	20	0	106	66 - 134	21.25	0.477	20	
Isopropylbenzene	19.08	1.0	20	0	95.4	72 - 131	18.73	1.81	20	
m,p-Xylene	37.75	2.0	40	0	94.4	80 - 121	37.34	1.1	20	
Methylene chloride	16.03	2.0	20	0	80.1	74 - 124	16.74	4.31	20	
Naphthalene	22.61	1.0	20	0	113	61 - 128	20.25	11	20	
n-Butylbenzene	20.47	1.0	20	0	102	75 - 128	19.47	5.02	20	
n-Propylbenzene	20.31	1.0	20	0	102	76 - 126	19.15	5.87	20	
o-Xylene	19.03	1.0	20	0	95.1	78 - 122	19.15	0.637	20	
sec-Butylbenzene	20.71	1.0	20	0	104	77 - 126	19.76	4.7	20	
Styrene	17.96	1.0	20	0	89.8	78 - 123	18.13	0.935	20	
tert-Butylbenzene	20.46	1.0	20	0	102	78 - 124	19.35	5.56	20	
Tetrachloroethene	19.07	1.0	20	0	95.4	74 - 129	18.9	0.914	20	
Toluene	18.07	1.0	20	0	90.4	80 - 121	18.38	1.68	20	
trans-1,2-Dichloroethene	17.11	1.0	20	0	85.5	75 - 124	17.28	0.993	20	
trans-1,3-Dichloropropene	17.87	1.0	20	0	89.3	73 - 127	17.81	0.302	20	
Trichloroethene	17.81	1.0	20	0	89.1	79 - 123	18.37	3.1	20	
Trichlorofluoromethane	16.6	1.0	20	0	83.0	65 - 141	16.85	1.52	20	
Vinyl chloride	16.44	1.0	20	0	82.2	58 - 137	17.11	3.99	20	
Surr: 1,2-Dichloroethane-d4	*43.69*	*1.0*	*50*	*0*	*87.4*	*81 - 118*	*43.63*	*0.13*	*20*	
Surr: 4-Bromofluorobenzene	*49.42*	*1.0*	*50*	*0*	*98.8*	*85 - 114*	*50.27*	*1.71*	*20*	
Surr: Dibromofluoromethane	*44.57*	*1.0*	*50*	*0*	*89.1*	*80 - 119*	*45.19*	*1.39*	*20*	
Surr: Toluene-d8	*52.58*	*1.0*	*50*	*0*	*105*	*89 - 112*	*52*	*1.12*	*20*	

ALS Houston, US Date: 23-May-19

Client:	Bhate Environmental Associates, Inc.
Project:	LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder:	HS19050398

QC BATCH REPORT

Batch ID:	**R338430 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19050398-01 HS19050398-03

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19050398

QC BATCH REPORT

Batch ID: R338198 (0) **Instrument: UV-2450** **Method: HEXAVALENT CHROMIUM BY SW7196A**

MBLK Sample ID: **MBLK-338198** Units: **mg/L** Analysis Date: **08-May-2019 13:17**
Client ID: Run ID: **UV-2450_338198** SeqNo: **5070024** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.0100	0.0100								U

LCS Sample ID: **LCS-338198** Units: **mg/L** Analysis Date: **08-May-2019 13:17**
Client ID: Run ID: **UV-2450_338198** SeqNo: **5070025** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.247	0.0100	0.25	0	98.8	80 - 120				

MS Sample ID: **HS19050410-01MS** Units: **mg/L** Analysis Date: **08-May-2019 13:17**
Client ID: Run ID: **UV-2450_338198** SeqNo: **5070026** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.249	0.0100	0.25	0.001	99.2	75 - 125				

MSD Sample ID: **HS19050410-01MSD** Units: **mg/L** Analysis Date: **08-May-2019 13:17**
Client ID: Run ID: **UV-2450_338198** SeqNo: **5070027** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.235	0.0100	0.25	0.001	93.6	75 - 125	0.249	5.79	20	

The following samples were analyzed in this batch: HS19050398-01

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: **HS19050398**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 23-may-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS19050398

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19050398-01	LH18/24-SP650_050719	Login	08/05/2019 11:38:04	NDR	EXT024
HS19050398-01	LH18/24-SP650_050719	Login	08/05/2019 11:38:04	NDR	WET270
HS19050398-01	LH18/24-SP650_050719	Login	08/05/2019 11:38:04	NDR	MET071
HS19050398-01	LH18/24-SP650_050719	Login	08/05/2019 11:38:04	NDR	VOA137
HS19050398-02	LH18/24-SP650_050719_BIX	Login	08/05/2019 11:38:04	NDR	Sub
HS19050398-03	Trip Blank	Login	08/05/2019 11:38:04	NDR	VOA137

ALS Houston, US Date: 23-May-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19050398
Date/Time Received: **08-May-2019 09:30**
Received by: **JRM**

Checklist completed by: *Nilesh D. Ranchod* eSignature 8-May-2019 Date
Reviewed by: *RJ Modashia* eSignature 8-May-2019 Date

Matrices: **water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.6c uc/c	IR 11
Cooler(s)/Kit(s):	44882	
Date/Time sample(s) sent to storage:	05/08/2019 11:55am	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, TX 77099 (281) 530 – 5656 ATTN: RJ Modashia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No.
NWO1312.0150.0
16.0001

Job:
GROUNDWATER TREATMENT PLANT MONTHLY EFFLUENT SAMPLES

Prepared By:
Scott Beesinger

P.O. Number

HS19050398

Bhate Environmental Associates, Inc.
18/24 Longhorn GW Treatment Plant Monthly Effluer

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOLATILES	SILVER, SELENIUM, LEAD, BARIUM	HEXAVALENT CHROMIUM	1, 4 - DIOXANE	PERCHLORATE					Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_050719	Water	05/07/19 / 14:00		3	X									HCL	
LH18/24-SP650_050719	Water	05/07/19 / 14:00		2			X	X						NONE	
LH18/24-SP650_050719_BIX	Water	05/07/19 / 14:00		1					X					NONE	
LH18/24-SP650_050719	Water	05/07/19 / 14:00		1		X								HNO3	
Trip Blank	Water	05/07/19		2	X									HCL	

Additional Remarks: **STANDARD TURN AROUND TIME**

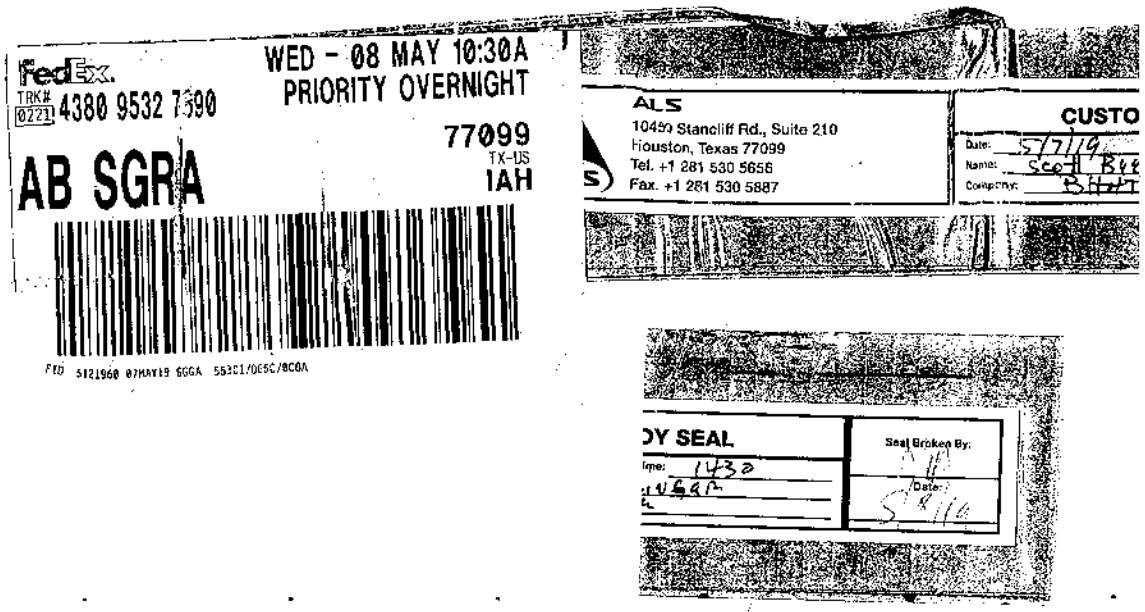
Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	05/07/19	14:30									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Mussumm	5/8/19	09:30							

Remarks: Cooler - 44882 IR#1
Temp 1.6 CF06

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly


FedEx.
TRK# 0221 4380 9532 7390
WED - 08 MAY 10:30A
PRIORITY OVERNIGHT
77099
TX-US
IAH
AB SGRA
FED 5121960 07MAY19 SGGA 553C1/0E5C/8C0A
ALS
10499 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTO
Date: 5/7/19
Name: Scott B
Company: BHP
OY SEAL
Time: 1430
Seal Broken By:
Date: 5/8/19

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1913332, 1913338, 1913342, 1913345

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2253(239553)

General Set Information: There were ten field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1913338001 was analyzed and reported from a 1:100 dilution. Field sample 1913342004 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 653683) was less than 1/2 the CRDL. The recovery for the LCS (653684) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 1913342006/007. 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 653681) is reported from the analysis of the Laboratory Control Sample (LCS – 653684) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Stephen Brose	May 22, 2019
Analyst	Date

ANALYTICAL REPORT

Report Date: May 22, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1913332**
Project ID: HS19050398
Purchase Order: HS19050398
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_050719_BIX	1913332001	05/07/19	05/09/19	

ANALYTICAL REPORT

Workorder: 34-1913332
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_050719_BIX** | Sampling Site: NA | Collected: 05/07/2019
Lab ID: 1913332001 | Media: 125 mL Nalgene | Received: 05/09/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2253 (HBN: 239553) | **Percent Solid:** NA
Analyzed: 05/21/2019 08:43 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 239553)**

Field sample 1913338001 was analyzed and reported from a 1:100 dilution. Field sample 1913342004 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Stephen Brose 05/22/2019 06:38	/S/ Thomas Bosch 05/22/2019 11:11

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1913332
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1913332

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2253 (HBN: 239553)
		Prepared By:	NA	**Analyzed By:**	Stephen Brose

Blank

LMB: 653683
Analyzed: 05/21/2019 08:29
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 653684
Analyzed: 05/21/2019 08:02
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.08	4.00	102	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1913342005	**MS:**	1913342006	**MSD:**	1913342007
Analyzed:	05/21/2019 10:03	**Analyzed:**	05/21/2019 10:17	**Analyzed:**	05/21/2019 10:30
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.78	4	94.4	78.8	123.8	3.72	93.0	1.51	0.0	20.0

Comments

Field sample 1913338001 was analyzed and reported from a 1:100 dilution. Field sample 1913342004 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Stephen Brose	/S/ Thomas Bosch
05/22/2019 06:38	05/22/2019 11:11

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

W 1913332

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

18698/#2

SAMPLING STATE: **Dept of Defense** **COC ID: 11269**

1913332

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19050398
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19050398-02**	**LH18/24-SP650_050719_BIX**	**Water**	**07 May 2019 14:00**
	SUB_Perch-6850			22 May 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Rodriguez Date/Time: 5/8/19 18:00

Received By: Lilia Valentin Date/Time: 5/9/19 1108

Cooler ID(s): Temperature(s):

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19050398	***Split:***	**Workorder ID:** 1913332	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives** COOL

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Count	Requested Analysis: EPA 6850, DoD QSM
1	05/07/2019 14:00	LH18/24-SP650_050719_BIX	1913332001		Water	A	1	A
2								
3								
4								
5								
6								
7								
8								
9								
10								

38 of 121

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	05/09/2019 10:18	ALS Sample Receiving	Sample Login
Lila Worton 5/9/19 1400		143	storage
143	5/10/19 14:00		Client/Analysis

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00938806

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 1913332

Date/Time of Receipt: 5/9/19 1018

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA	VOA Headspace Present?	Yes/No/NA
	Frozen/Melted/NA		

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19-9390	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Lisa Worthy (Signature) Julie Worthy (Printed Name) 5/9/19 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

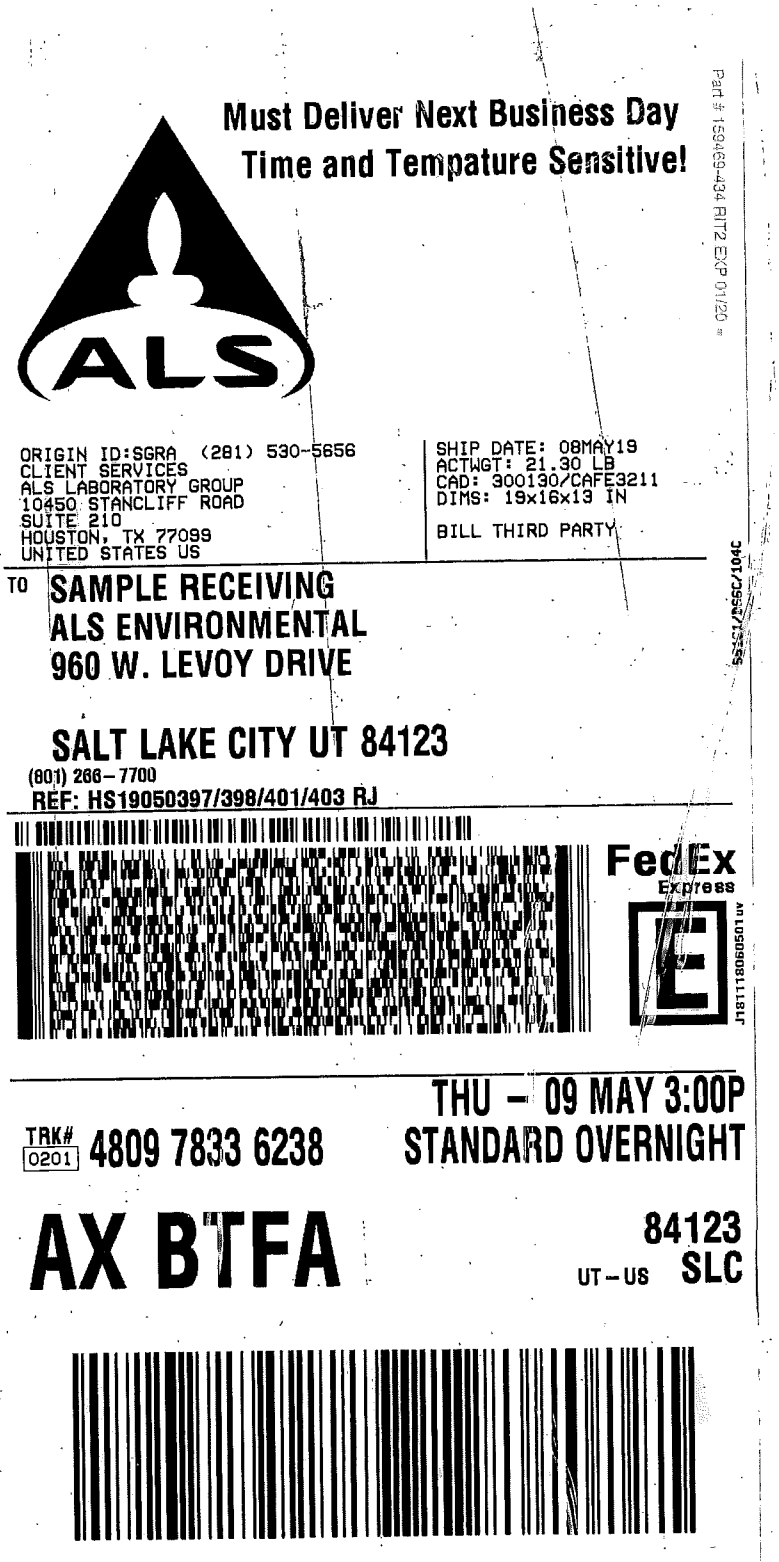
Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc Revised 01/01/2018



Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159469-494 RITZ EXP 01/20

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 08MAY19
ACTWGT: 21.30 LB
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19050397/398/401/403 RJ

FedEx Express

THU - 09 MAY 3:00P
STANDARD OVERNIGHT

TRK# 0201 4809 7833 6238

AX BTFA

84123
UT-US SLC

Batch Worklist

Batch: ELMS/ 2253 **Created:** 5/20/2019 06:13 **Instrument:** **HBN:** 239553

Rule: EPA 6850, DoD QSM Water **Analyst:** S. Brose **Status:** WP

Workorder: 1913332 [ENV_LVL4]
Workorder: 1913338 [ENV_LVL4]
Workorder: 1913342 [ENV_LVL4]
Workorder: 1913345 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	653680	CCV for HBN 239553 [ELMS/2253]				CCV	3		E685041C3Q	6214		5/22/2019	
2	653681	RLVS for HBN 239553 [ELMS/2253				RLVS	3		E685041C3Q	6214		5/22/2019	
3	653682	ICS for HBN 239553 [ELMS/2253]				ICS	3		E6850..D3Q	6214		5/22/2019	
4	653683	LMB for HBN 239553 [ELMS/2253]				LMB	3		E6850Q413Q	6214		5/22/2019	
5	653684	LCS for HBN 239553 [ELMS/2253]				LCS	3		E6850Q413Q	6214		5/22/2019	
6	1913332001	LH18/24-SP650_050719_BIX				SAMPLE	3	1913332001-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
7	1913338001	LH18/24-SP140_050719				SAMPLE	3	1913338001-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
8	1913342001	50WW10-190507				SAMPLE	3	1913342001-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
9	1913342002	50WW09-190507				SAMPLE	3	1913342002-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
10	1913342003	50WW09-190507-FD				FLDDUP	3	1913342003-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
11	1913342004	50WW08-190507				SAMPLE	3	1913342004-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
12	1913342005	50WW23-190507				SAMPLE	3	1913342005-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
13	1913342006	50WW23-190507MS				MS	3	1913342006-A	E6850Q413Q	5480		5/22/2019	
14	1913342007	50WW23-190507MSD				MSD	3	1913342007-A	E6850Q413Q	5480		5/22/2019	
15	1913342008	50WW24-190507				SAMPLE	3	1913342008-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
16	1913342009	50WW05-190507				SAMPLE	3	1913342009-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
17	1913345001	LH18-24-SP650_050719_BIX				SAMPLE	3	1913345001-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
18	653685	CCV for HBN 239553 [ELMS/2253]				CCV	3		E685041C3Q	6214		5/22/2019	

009388809

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1913332(001), 1913338(001), 1913342(001-009), 1913345(001)
ELMS Batch/HBN ID: 2253 (239553)
Prep Date: 05/21/2019 Analysis Date: 05/21/2019 Analyst: S. Brose
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\MAY\21MAY19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:
Water: Samples were prepared by SAB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 653684; Target = 4.0µg/L. ASTM type II water was used for LMB 653683.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1913342006/007 (Client ID: 50WW23-190507). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:
1) Results reported in µg/L. Field samples 1913338001 and 1913342004 required 1:100 and 1:10 dilutions respectively. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\MAY\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\239553-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 653681) is reported from the analysis of the Laboratory Control Sample (LCS – 653684) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, many of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS/2253 HBN: 238553 Sample Set IDs if Applicable: 191332/38/42/45	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	SB	TB
Standards traceability checked and meets criteria	SB	TB
Standard curve coefficients evaluated and meet criteria	SB	TB
ICVs analyzed and meet acceptance criteria	SB	TB
CCVs analyzed and meet acceptance criteria	SB	TB
Retention Time Windows checked	SB	TB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	SB	TB
Method Preparation Blanks analyzed and meet acceptance criteria	SB	TB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	SB	TB
RLVS analyzed	SB	TB
Preparation and analysis hold times met	SB	TB
Preparation deviations and re-preparations noted when performed	SB	TB
Analysis deviations and re-analyses noted when performed	SB	TB
Sample dilution factors noted on reports	SB	TB
Electronic records in HBN transcription accuracy and completeness checked	SB	TB
Preparation and analysis calculations checked	SB	TB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	SB	TB
Manual integrations checked	SB	TB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/18/2018 02:09PM	**Expires:** 09/18/2019
MFG Lot: TNB: 09/18/2018		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659	**Created By:** Thomas Bosch	**Amount:** 100 mL
MFG: AccuStandard	**Create Date:** 09/17/2018 09:09AM	**Expires:** 07/25/2020
MFG Lot: 218065075		**Usable:** No
Part ID: IC-PER-10X-1		**Lab Lot:** CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT		Description - 6850 Intermdt AccStd 10.ug/mL
Standard: 43701	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/18/2018 02:09PM	**Expires:** 09/18/2019
MFG Lot: TNB: 09/18/2018		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description - 6850 QC WKG STD 100ug/L

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		**Description - ASTM Type II Water**
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		**Description - 6850 QC Stock STD 1,000ug/mL**
Standard: 36748	Created By: Thomas Bosch	Amount: 100 mL
MFG: Ultra Scientific	Create Date: 05/11/2017 01:05PM	Expires: 03/31/2020
MFG Lot: CP-0860		Usable: Yes
Part ID: ICC-013		Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK		Description - Perchlorate ISTD Wrk 1,000ug/L
Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

AccuStandard

Page 1 of 1

For use in routine laboratory analysis.

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Report: C:\HPCHEM\1\DATA\21MAY19D\21MAY19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	653680 CCV@25	Vial 71	1	Control	1	2.40704e6	8.594	23.99302
*	653684 QC@4.0	Vial 72	1	Control	2	3.96639e5	8.823	4.08274
*	653682 ICS@4.0	Vial 73	1	Control	3	3.14960e5	8.612	3.74421
*	653683 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1913332001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	1913338001 100	Vial 76	1	Sample	6	3.99368e6	8.959	4178.24239
*	1913342001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1913342002	Vial 78	1	Sample	8	6.18077e5	8.360	7.21259
*	1913342003	Vial 79	1	Sample	9	6.79913e5	8.381	7.76574
*	1913342004 10X	Vial 80	1	Sample	10	2.09294e6	8.642	226.56793
*	1913342005	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1913342006 MS	Vial 82	1	Sample	12	2.30072e5	8.281	3.77790
*	1913342007 SD	Vial 83	1	Sample	13	2.23456e5	8.296	3.72139
*	1913342008	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1913342009	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1913345001	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	653685 CCV@25	Vial 71	1	Control	17	1.93838e6	8.628	23.36594

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	653680 CCV@25	Vial 71	1	Control	1	7.14295e5	8.612	23.97986
*	653684 QC@4.0	Vial 72	1	Control	2	1.27284e5	8.838	4.26129
*	653682 ICS@4.0	Vial 73	1	Control	3	1.12778e5	8.627	4.34080
*	653683 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1913332001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	1913338001 100	Vial 76	1	Sample	6	1.20507e6	8.974	4254.41607
*	1913342001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1913342002	Vial 78	1	Sample	8	2.00267e5	8.373	7.73270
*	1913342003	Vial 79	1	Sample	9	2.18020e5	8.395	8.25365
*	1913342004 10X	Vial 80	1	Sample	10	6.29788e5	8.660	229.37195
*	1913342005	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1913342006 MS	Vial 82	1	Sample	12	8.05070e4	8.292	4.28262
*	1913342007 SD	Vial 83	1	Sample	13	7.84560e4	8.311	4.22992
*	1913342008	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1913342009	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1913345001	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	653685 CCV@25	Vial 71	1	Control	17	5.93941e5	8.647	24.07193

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	653680 CCV@25	Vial 71	1	Control	1	3.05962e5	8.618	5.00000
*	653684 QC@4.0	Vial 72	1	Control	2	3.19796e5	8.842	5.00000
*	653682 ICS@4.0	Vial 73	1	Control	3	2.78118e5	8.629	5.00000
*	653683 LMB	Vial 74	1	Control	4	3.07550e5	8.973	5.00000
*	1913332001	Vial 75	1	Sample	5	2.84011e5	8.455	5.00000
*	1913338001 100	Vial 76	1	Sample	6	2.80006e5	8.979	500.00000
*	1913342001	Vial 77	1	Sample	7	2.92233e5	8.419	5.00000
*	1913342002	Vial 78	1	Sample	8	2.75334e5	8.385	5.00000
*	1913342003	Vial 79	1	Sample	9	2.80514e5	8.402	5.00000
*	1913342004 10X	Vial 80	1	Sample	10	2.82646e5	8.663	50.00000
*	1913342005	Vial 81	1	Sample	11	2.06104e5	8.293	5.00000
*	1913342006 MS	Vial 82	1	Sample	12	2.01255e5	8.301	5.00000
*	1913342007 SD	Vial 83	1	Sample	13	1.98591e5	8.312	5.00000
*	1913342008	Vial 84	1	Sample	14	2.10825e5	8.375	5.00000

Batch Report: C:\HPCHEM\1\DATA\21MAY19D\21MAY19D.B

#	*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
	*	1913342009	Vial 85	1	Sample	15	2.18072e5	8.384	5.00000
	*	1913345001	Vial 86	1	Sample	16	2.17961e5	8.508	5.00000
	*	653685 CCV@25	Vial 71	1	Control	17	2.53387e5	8.650	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAY\21MAY19D.S

Sequence Table:

Method and Injection Info Part:

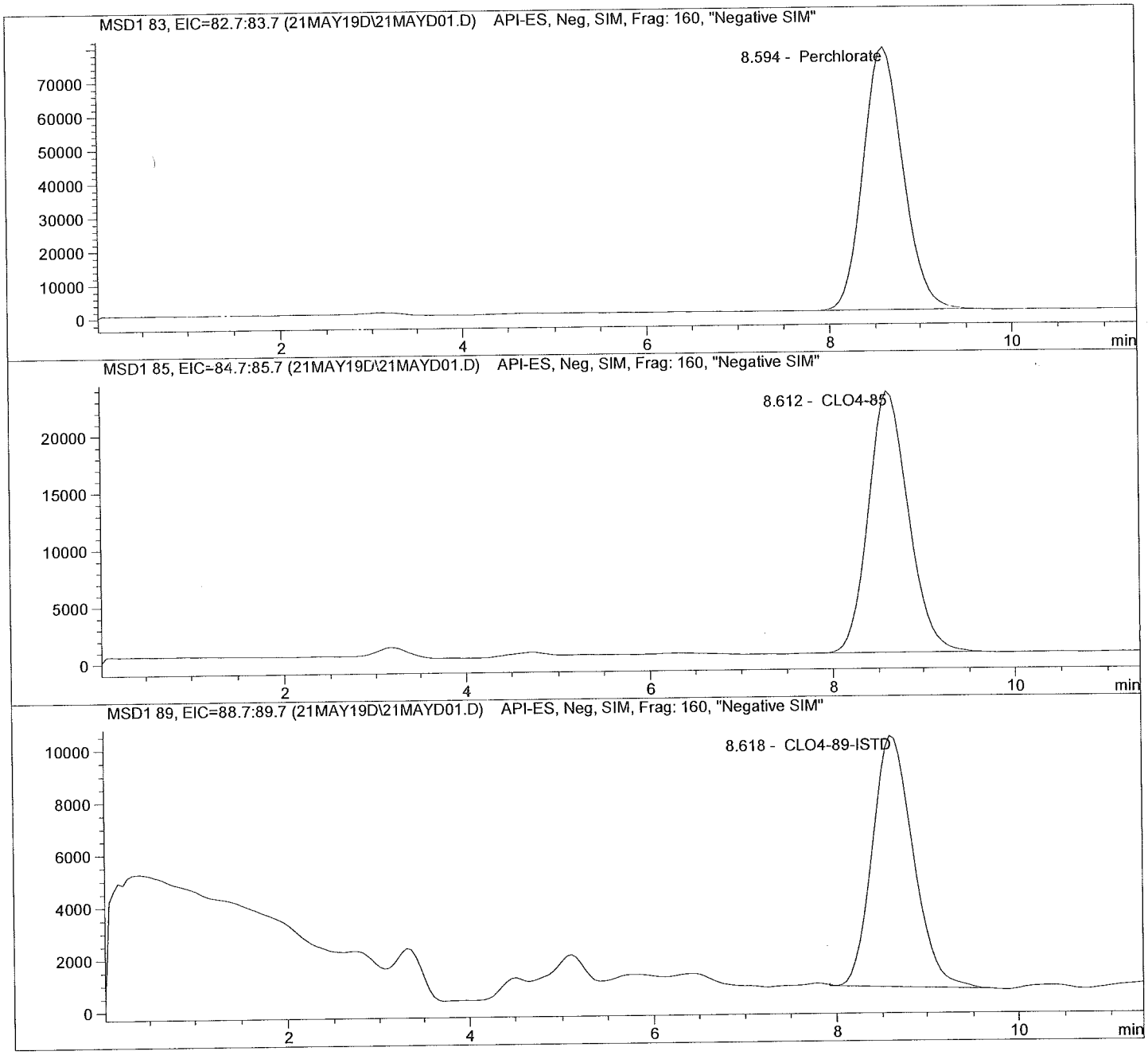
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	653680	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	653684	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	653682	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	653683	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1913332001		CLO4-AQN	1	Sample		
6	Vial 76	1913338001	100	CLO4-AQN	1	Sample		
7	Vial 77	1913342001		CLO4-AQN	1	Sample		
8	Vial 78	1913342002		CLO4-AQN	1	Sample		
9	Vial 79	1913342003		CLO4-AQN	1	Sample		
10	Vial 80	1913342004	10X	CLO4-AQN	1	Sample		
11	Vial 81	1913342005		CLO4-AQN	1	Sample		
12	Vial 82	1913342006	MS	CLO4-AQN	1	Sample		
13	Vial 83	1913342007	SD	CLO4-AQN	1	Sample		
14	Vial 84	1913342008		CLO4-AQN	1	Sample		
15	Vial 85	1913342009		CLO4-AQN	1	Sample		
16	Vial 86	1913345001		CLO4-AQN	1	Sample		
17	Vial 71	653685	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD01.D Sample Name: 653680 CCV@25

Injection Date:	5/21/2019 07:49:32	Seq Line:	1
Sample Name:	653680 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD01.D Sample Name: 653680 CCV@25

Injection Date:	5/21/2019 07:49:32	Seq Line:	1
Sample Name:	653680 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.594	PBA	2407042.7	23.9930	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.612	BBA	714295.0	23.9799	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.618	BBA	305961.9	5.0000	CLO4-89-ISTD

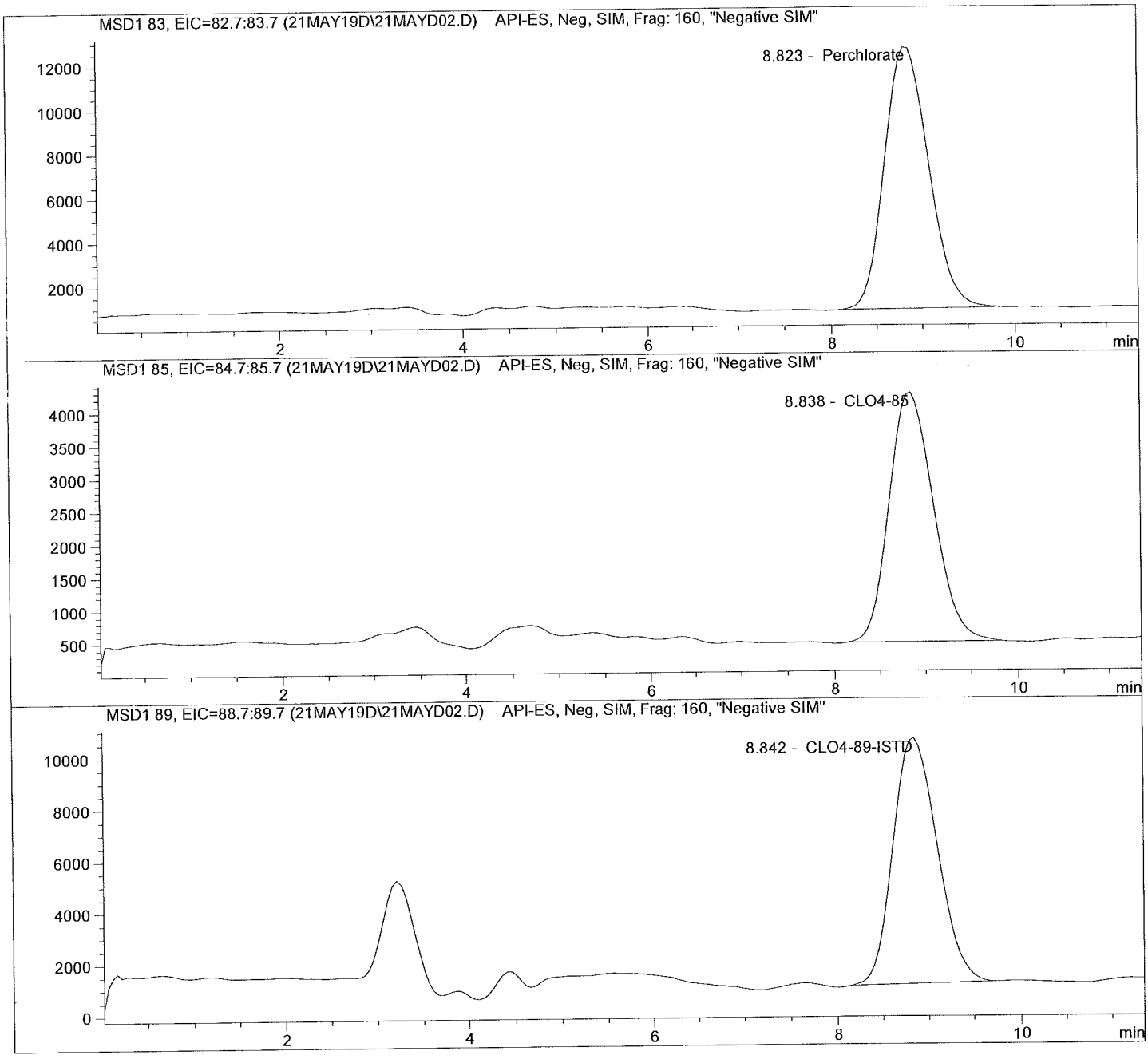
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD02.D Sample Name: 653684 QC@4.0

Injection Date:	5/21/2019 08:02:56	Seq Line:	2
Sample Name:	653684 QC@4.0	Location:	Vial 72
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD02.D Sample Name: 653684 QC@4.0

Injection Date:	5/21/2019 08:02:56	Seq Line:	2
Sample Name:	653684 QC@4.0	Location:	Vial 72
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.823	PBA	396638.7	4.0827	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.838	BBA	127284.0	4.2613	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.842	PBA	319795.5	5.0000	CLO4-89-ISTD

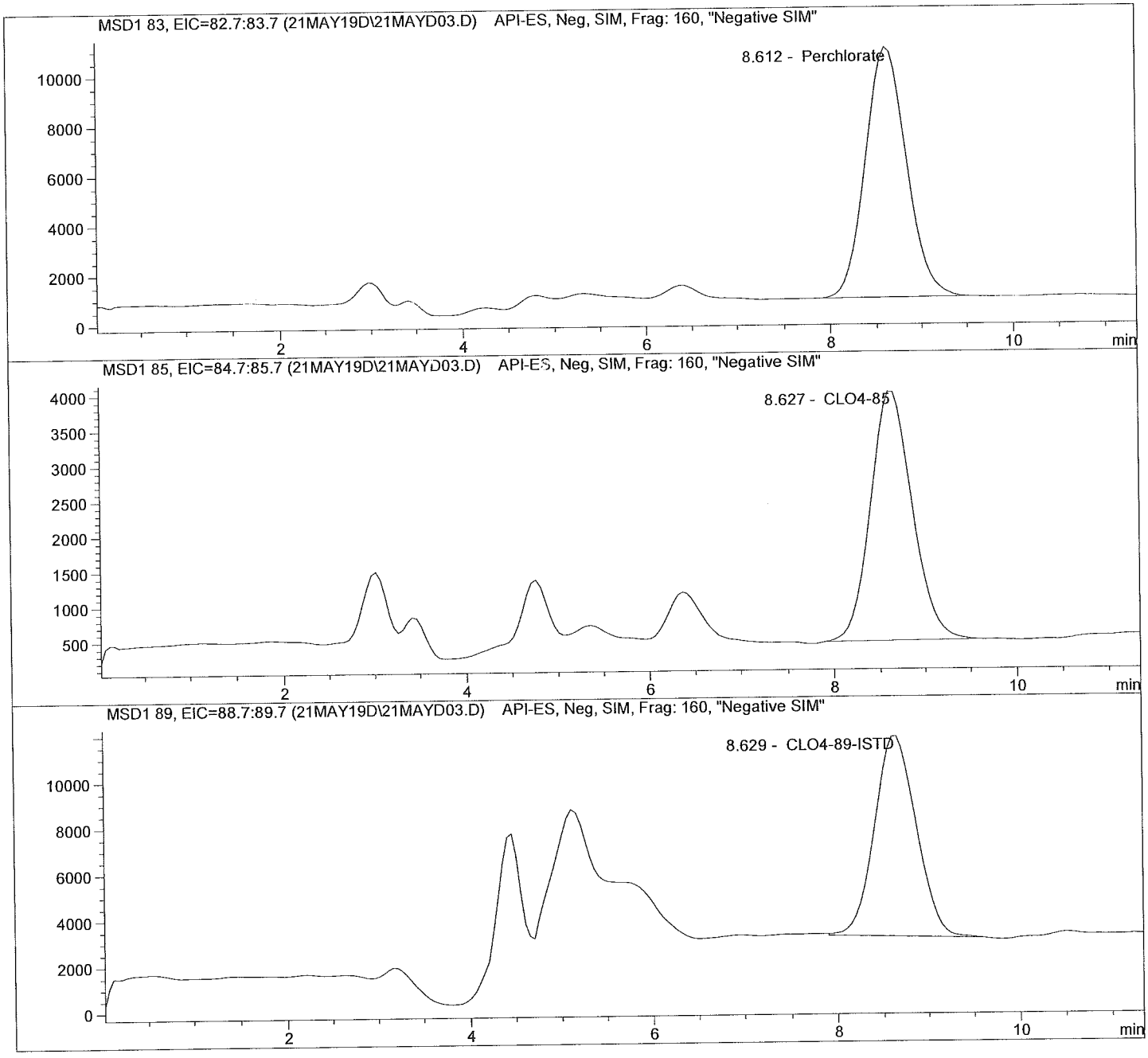
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD03.D Sample Name: 653682 ICS@4.0

Injection Date:	5/21/2019 08:16:19	Seq Line:	3
Sample Name:	653682 ICS@4.0	Location:	Vial 73
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD03.D Sample Name: 653682 ICS@4.0

Injection Date:	5/21/2019 08:16:19	Seq Line:	3
Sample Name:	653682 ICS@4.0	Location:	Vial 73
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.612	PBA	314959.5	3.7442	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.627	PBA	112778.0	4.3408	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.629	BBA	278118.1	5.0000	CLO4-89-ISTD

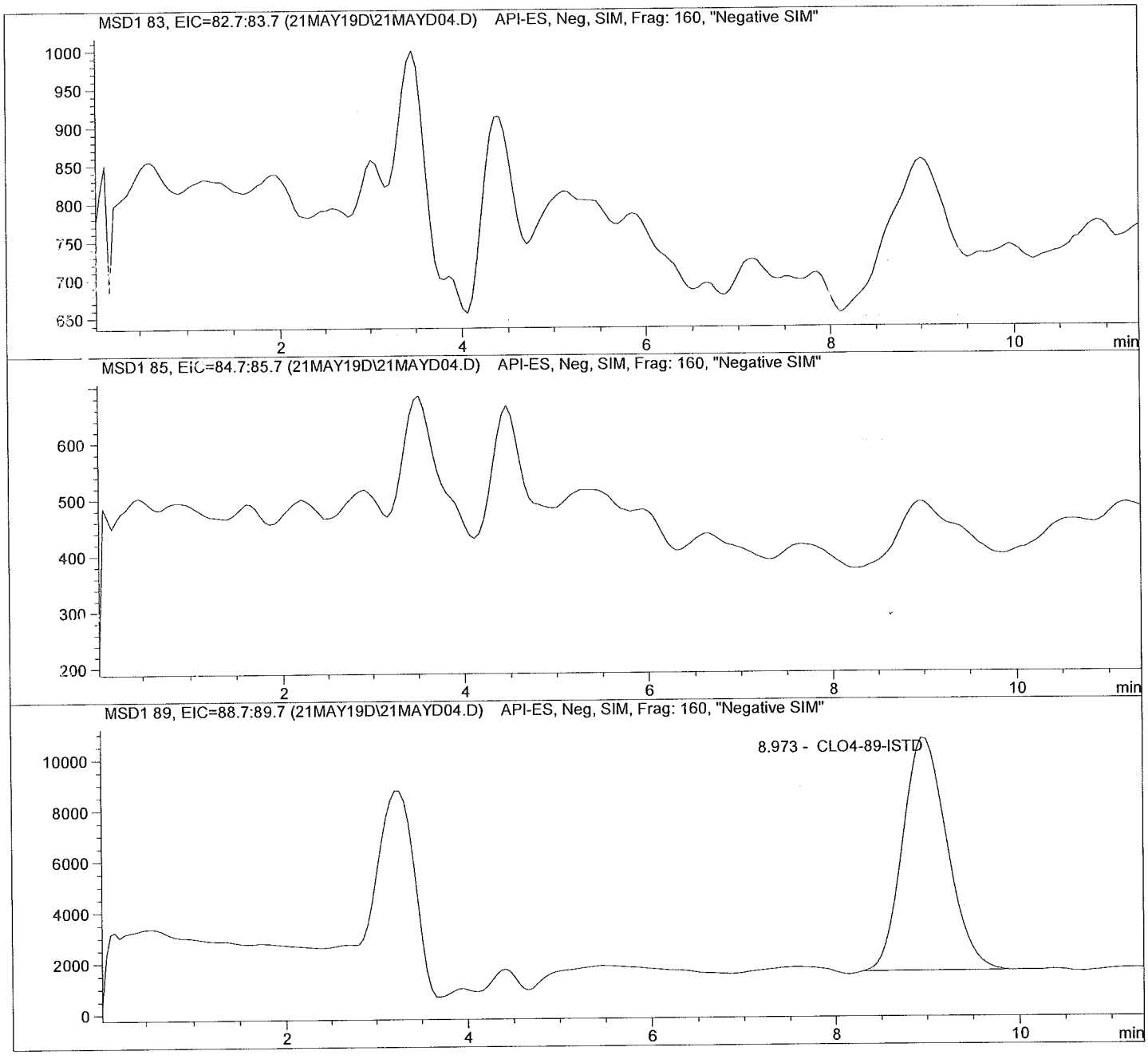
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD04.D Sample Name: 653683 LMB

Injection Date:	5/21/2019 08:29:45	Seq Line:	4
Sample Name:	653683 LMB	Location:	Vial 74
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD04.D Sample Name: 653683 LMB

Injection Date:	5/21/2019 08:29:45	Seq Line:	4
Sample Name:	653683 LMB	Location:	Vial 74
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.973	PBA	307549.9	5.0000	CLO4-89-ISTD

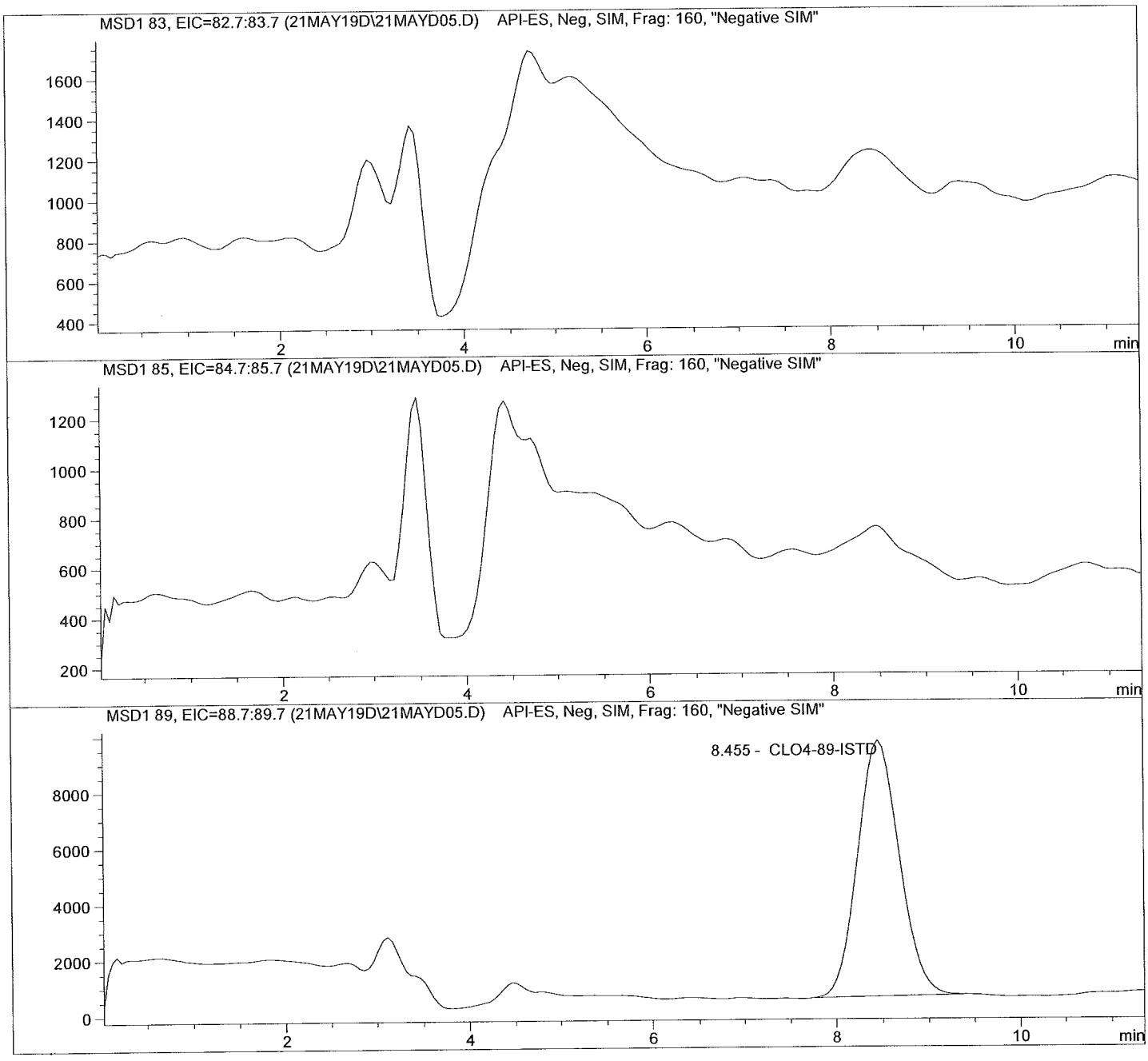
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD05.D Sample Name: 1913332001

Injection Date:	5/21/2019 08:43:07	Seq Line:	5
Sample Name:	1913332001	Location:	Vial 75
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD05.D Sample Name: 1913332001

Injection Date:	5/21/2019 08:43:07	Seq Line:	5
Sample Name:	1913332001	Location:	Vial 75
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.455	PBA	284011.2	5.0000	CLO4-89-ISTD

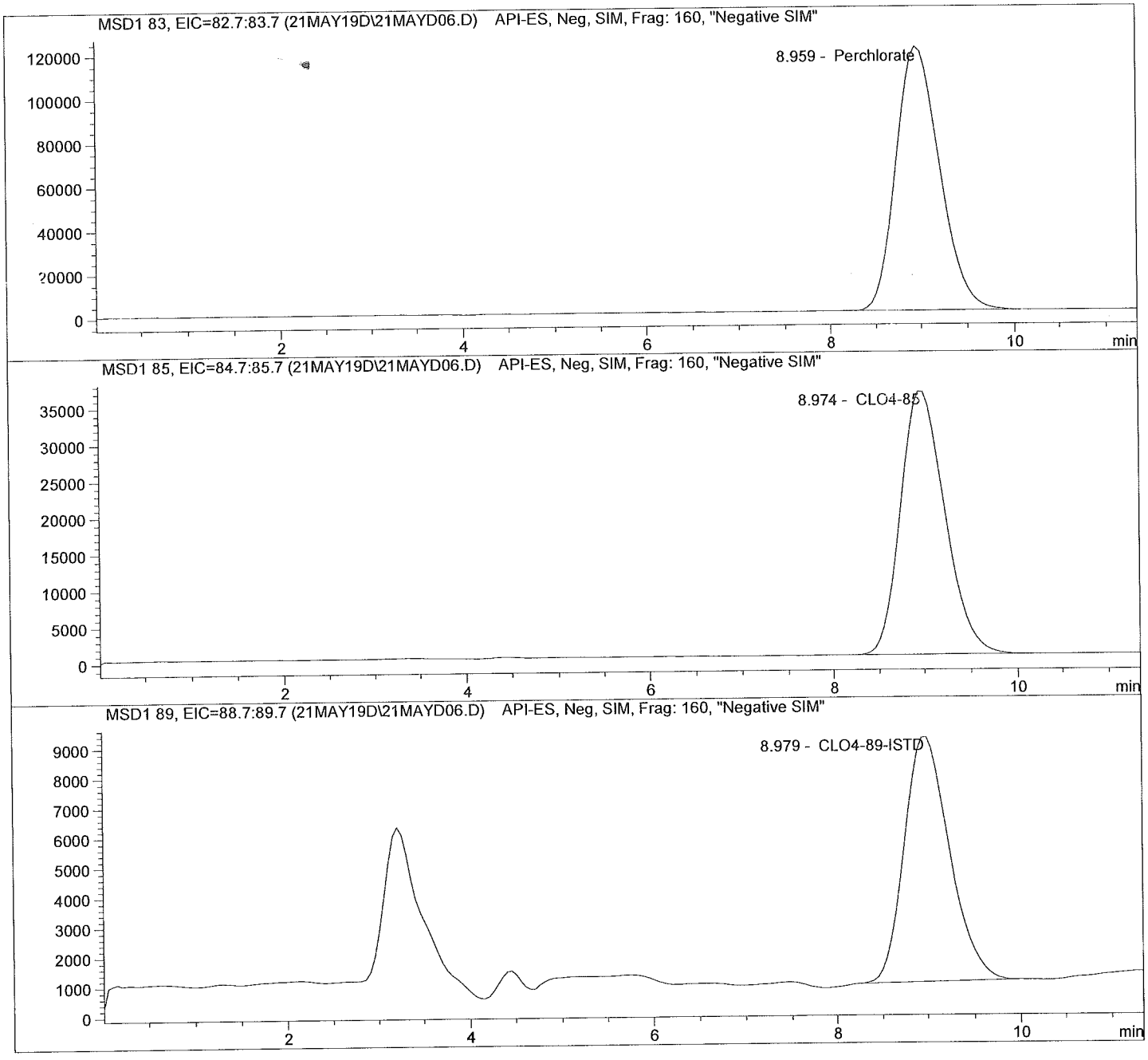
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD06.D Sample Name: 1913338001 100

Injection Date:	5/21/2019 08:56:30	Seq Line:	6
Sample Name:	1913338001 100	Location:	Vial 76
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD06.D Sample Name: 1913338001 100

Injection Date:	5/21/2019 08:56:30	Seq Line:	6
Sample Name:	1913338001 100	Location:	Vial 76
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.959	PBA	3993682.8	4178.2424	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.974	PBA	1205073.2	4254.4161	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.979	BBA	280005.7	500.0000	CLO4-89-ISTD

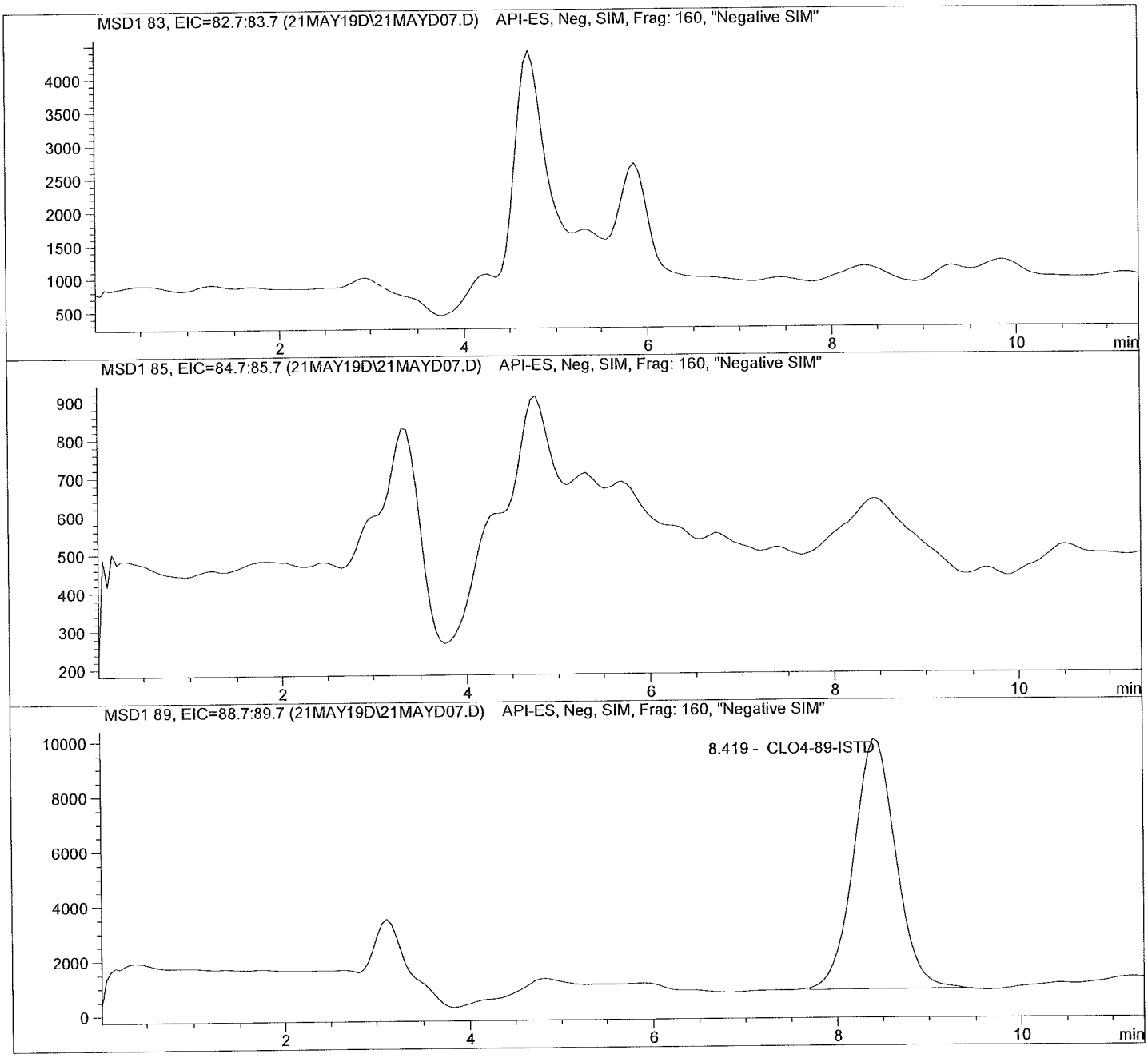
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD07.D Sample Name: 1913342001

Injection Date:	5/21/2019 09:10:03	Seq Line:	7
Sample Name:	1913342001	Location:	Vial 77
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD07.D Sample Name: 1913342001

Injection Date:	5/21/2019 09:10:03	Seq Line:	7
Sample Name:	1913342001	Location:	Vial 77
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.419	BBA	292233.0	5.0000	CLO4-89-ISTD

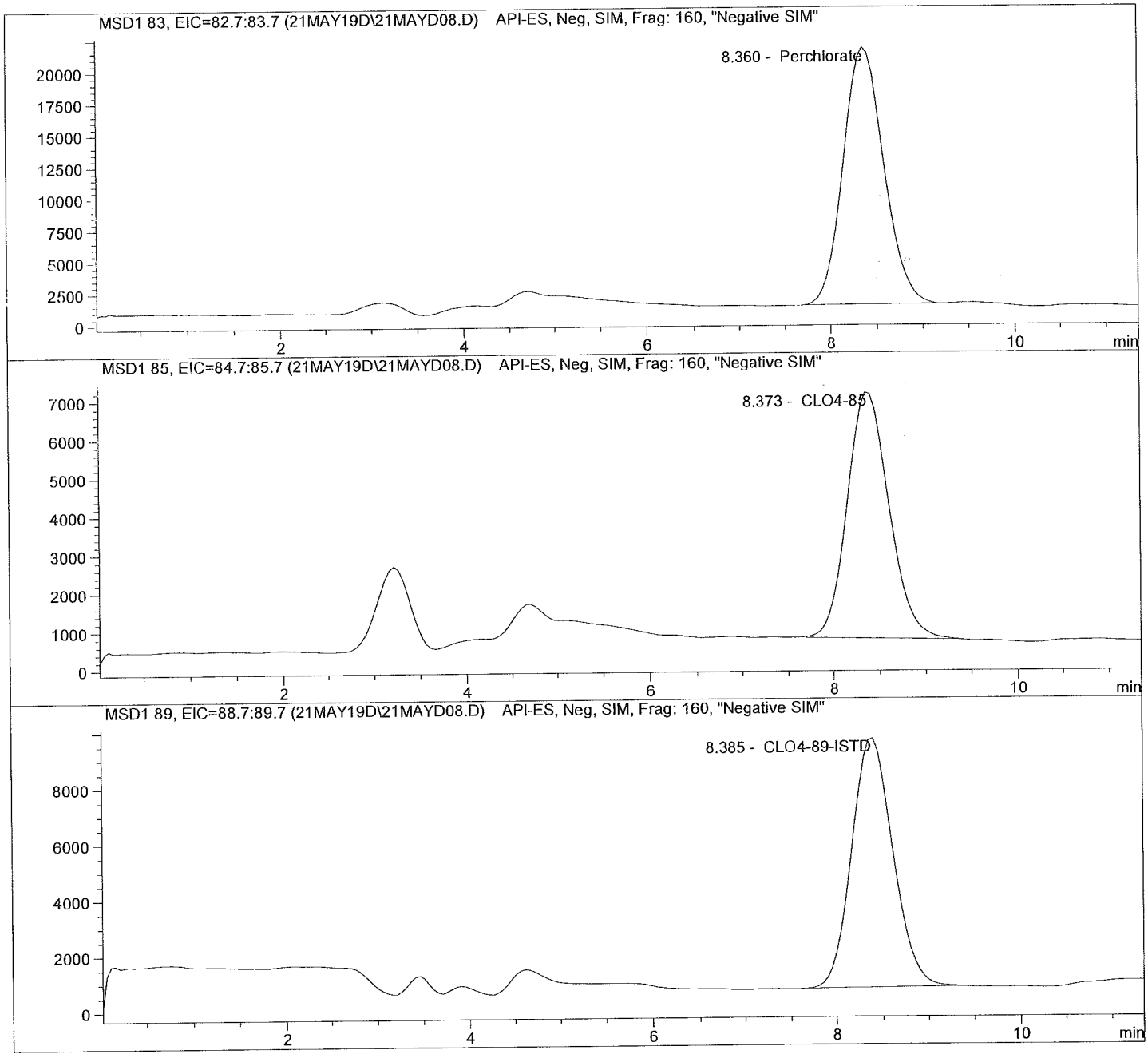
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD08.D Sample Name: 1913342002

Injection Date:	5/21/2019 09:23:25	Seq Line:	8
Sample Name:	1913342002	Location:	Vial 78
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD08.D Sample Name: 1913342002

Injection Date:	5/21/2019 09:23:25	Seq Line:	8
Sample Name:	1913342002	Location:	Vial 78
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.360	PBA	618077.5	7.2126	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.373	BBA	200267.3	7.7327	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.385	PBA	275333.5	5.0000	CLO4-89-ISTD

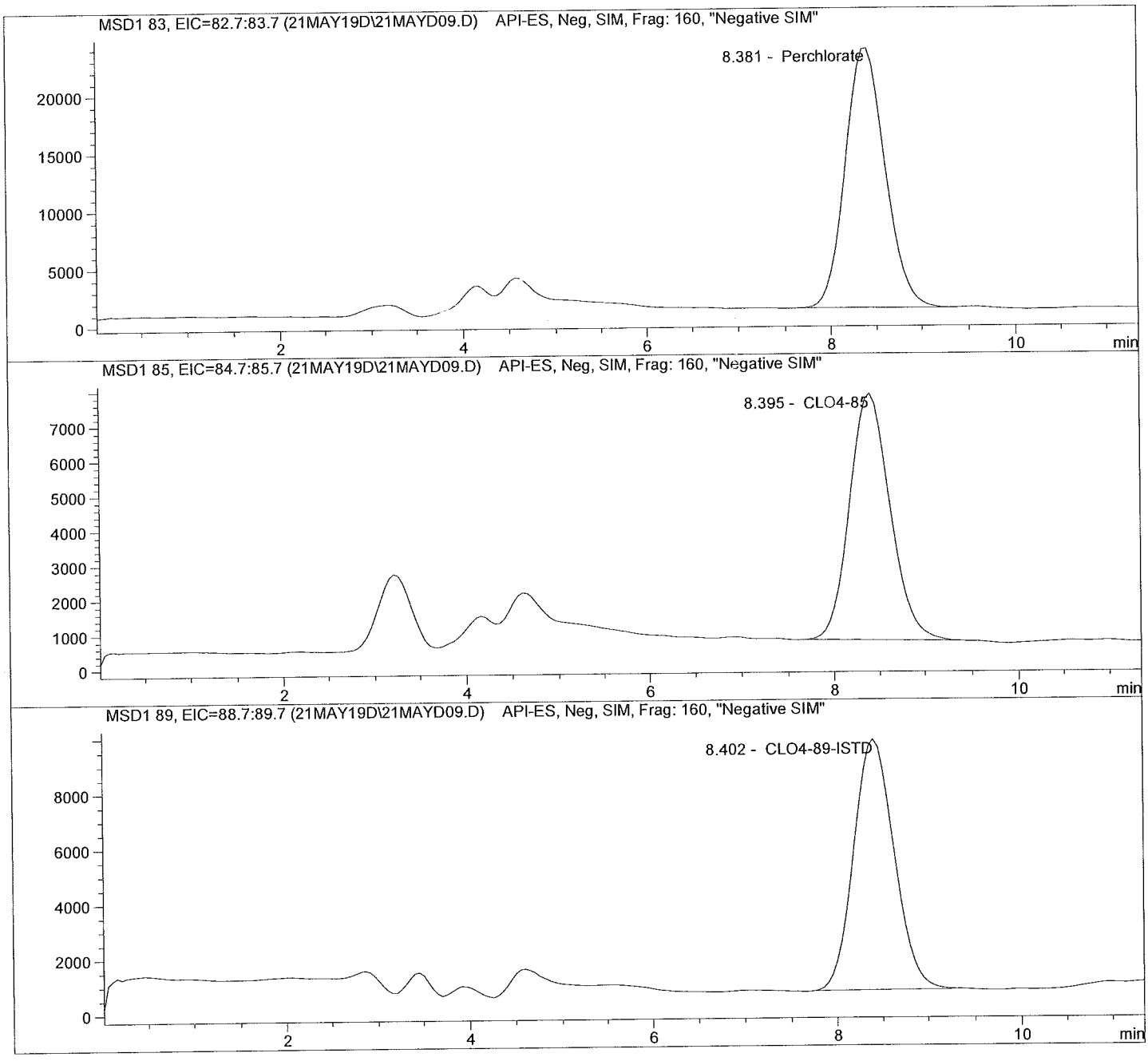
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD09.D Sample Name: 1913342003

Injection Date:	5/21/2019 09:36:53	Seq Line:	9
Sample Name:	1913342003	Location:	Vial 79
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD09.D Sample Name: 1913342003

Injection Date:	5/21/2019 09:36:53	Seq Line:	9
Sample Name:	1913342003	Location:	Vial 79
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.381	PBA	679913.4	7.7657	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.395	PBA	218019.8	8.2536	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.402	PBA	280514.3	5.0000	CLO4-89-ISTD

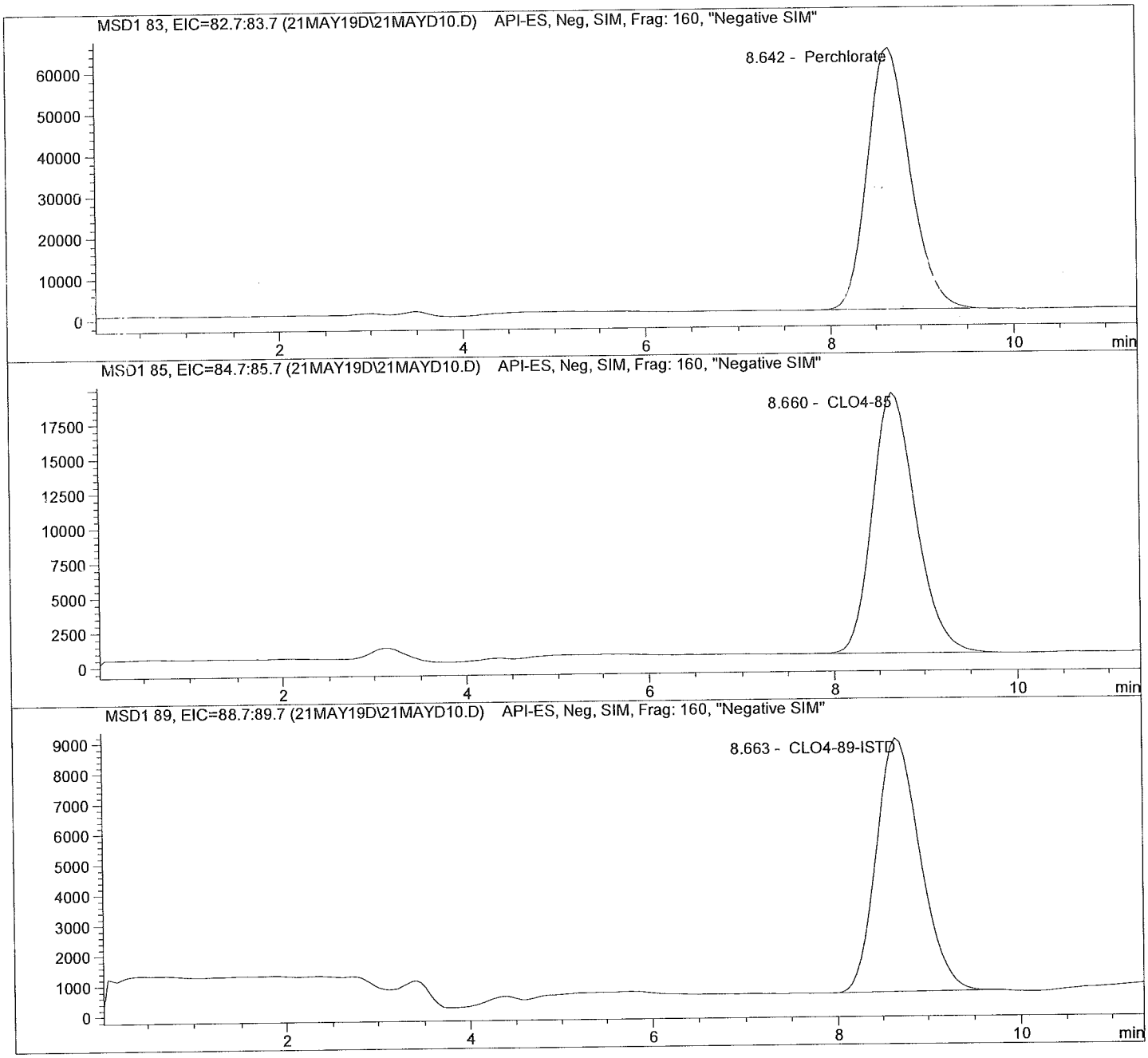
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD10.D Sample Name: 1913342004 10X

Injection Date:	5/21/2019 09:50:15	Seq Line:	10
Sample Name:	1913342004 10X	Location:	Vial 80
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD10.D Sample Name: 1913342004 10X

Injection Date: 5/21/2019 09:50:15
Sample Name: 1913342004 10X
Acq Operator: 6214

Seq Line: 10
Location: Vial 80
Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 10.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.642	BBA	2092939.0	226.5679	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.660	BBA	629787.7	229.3720	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.663	PBA	282645.6	50.0000	CLO4-89-ISTD

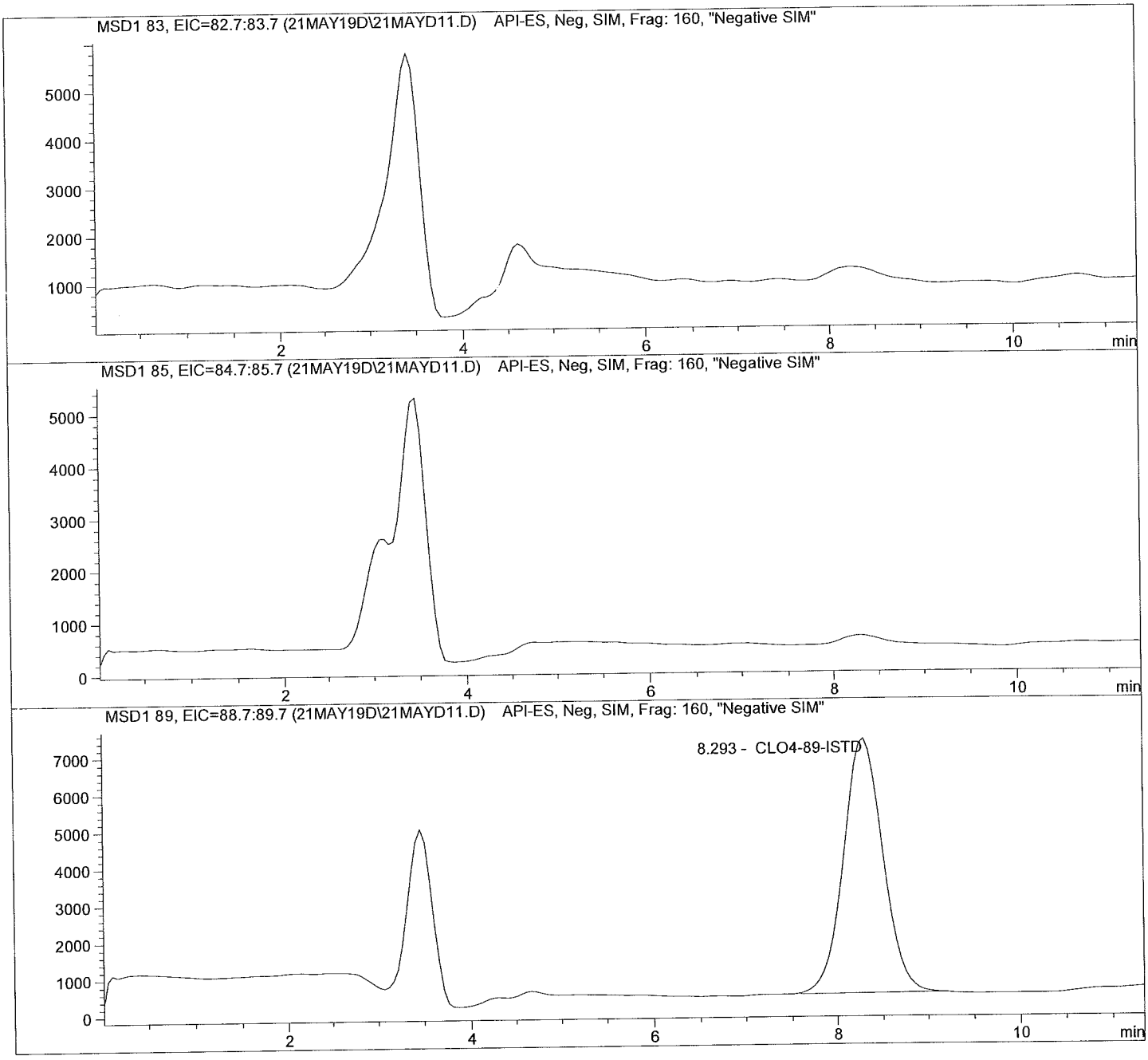
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD11.D Sample Name: 1913342005

Injection Date:	5/21/2019 10:03:44	Seq Line:	11
Sample Name:	1913342005	Location:	Vial 81
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD11.D Sample Name: 1913342005

Injection Date:	5/21/2019 10:03:44	Seq Line:	11
Sample Name:	1913342005	Location:	Vial 81
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.293	BBA	206103.9	5.0000	CLO4-89-ISTD

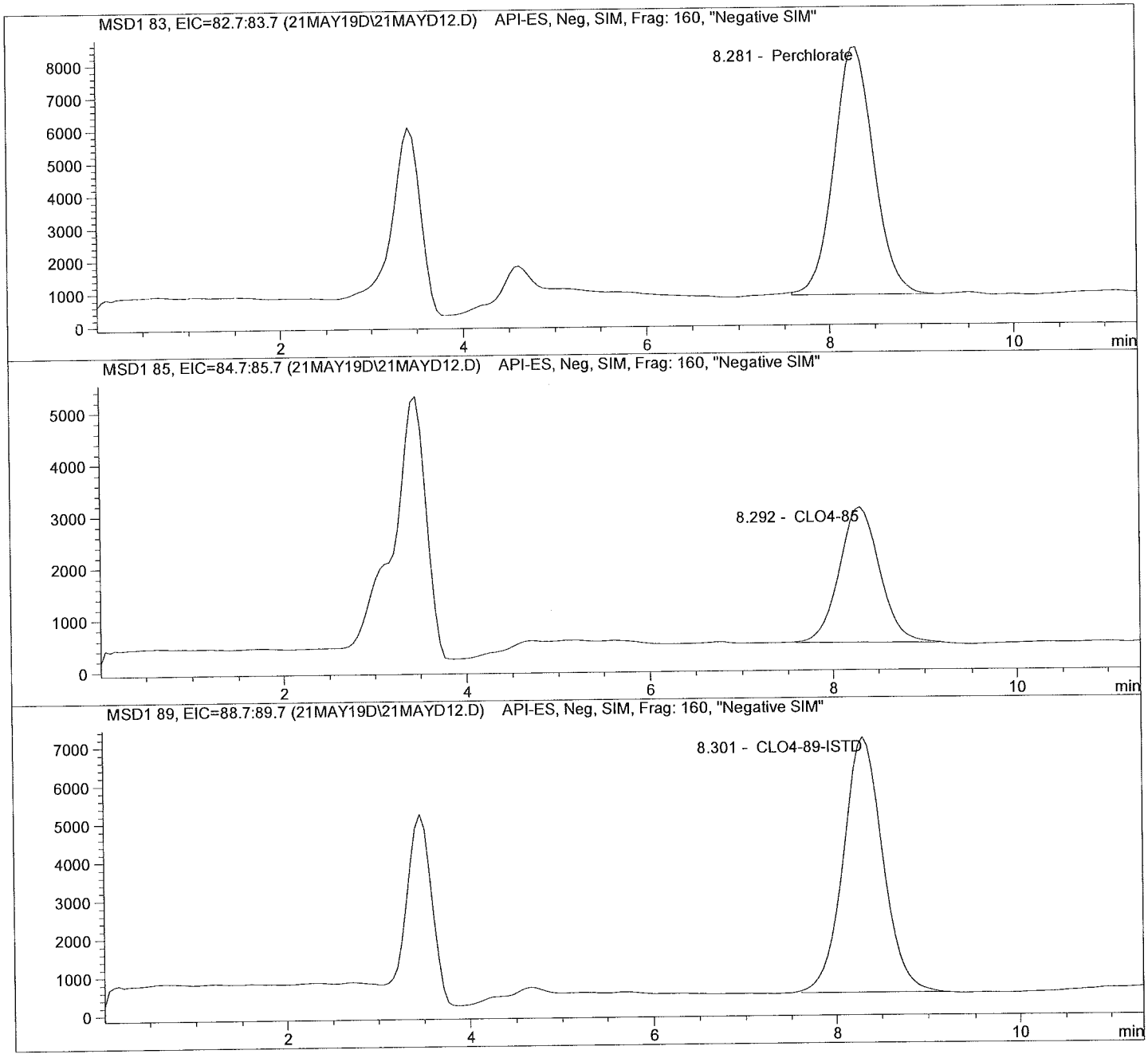
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD12.D Sample Name: 1913342006 MS

Injection Date:	5/21/2019 10:17:04	Seq Line:	12
Sample Name:	1913342006 MS	Location:	Vial 82
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD12.D Sample Name: 1913342006 MS

Injection Date:	5/21/2019 10:17:04	Seq Line:	12
Sample Name:	1913342006 MS	Location:	Vial 82
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.281	BBA	230072.2	3.7779	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.292	BBA	80507.0	4.2826	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.301	BBA	201254.7	5.0000	CLO4-89-ISTD

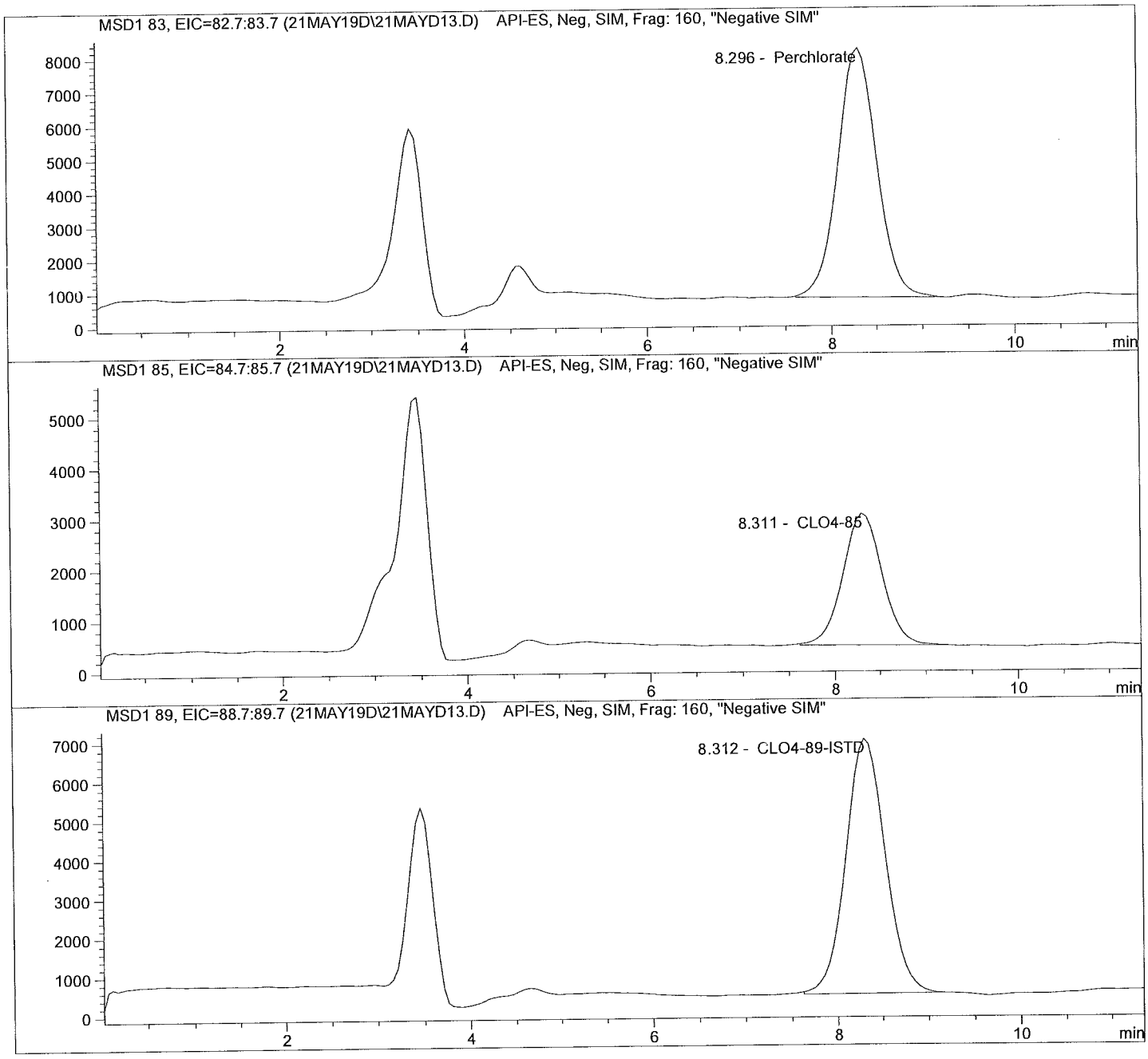
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD13.D Sample Name: 1913342007 SD

Injection Date:	5/21/2019 10:30:27	Seq Line:	13
Sample Name:	1913342007 SD	Location:	Vial 83
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD13.D Sample Name: 1913342007 SD

Injection Date:	5/21/2019 10:30:27	Seq Line:	13
Sample Name:	1913342007 SD	Location:	Vial 83
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.296	BBA	223455.8	3.7214	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.311	BBA	78456.0	4.2299	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.312	BBA	198591.3	5.0000	CLO4-89-ISTD

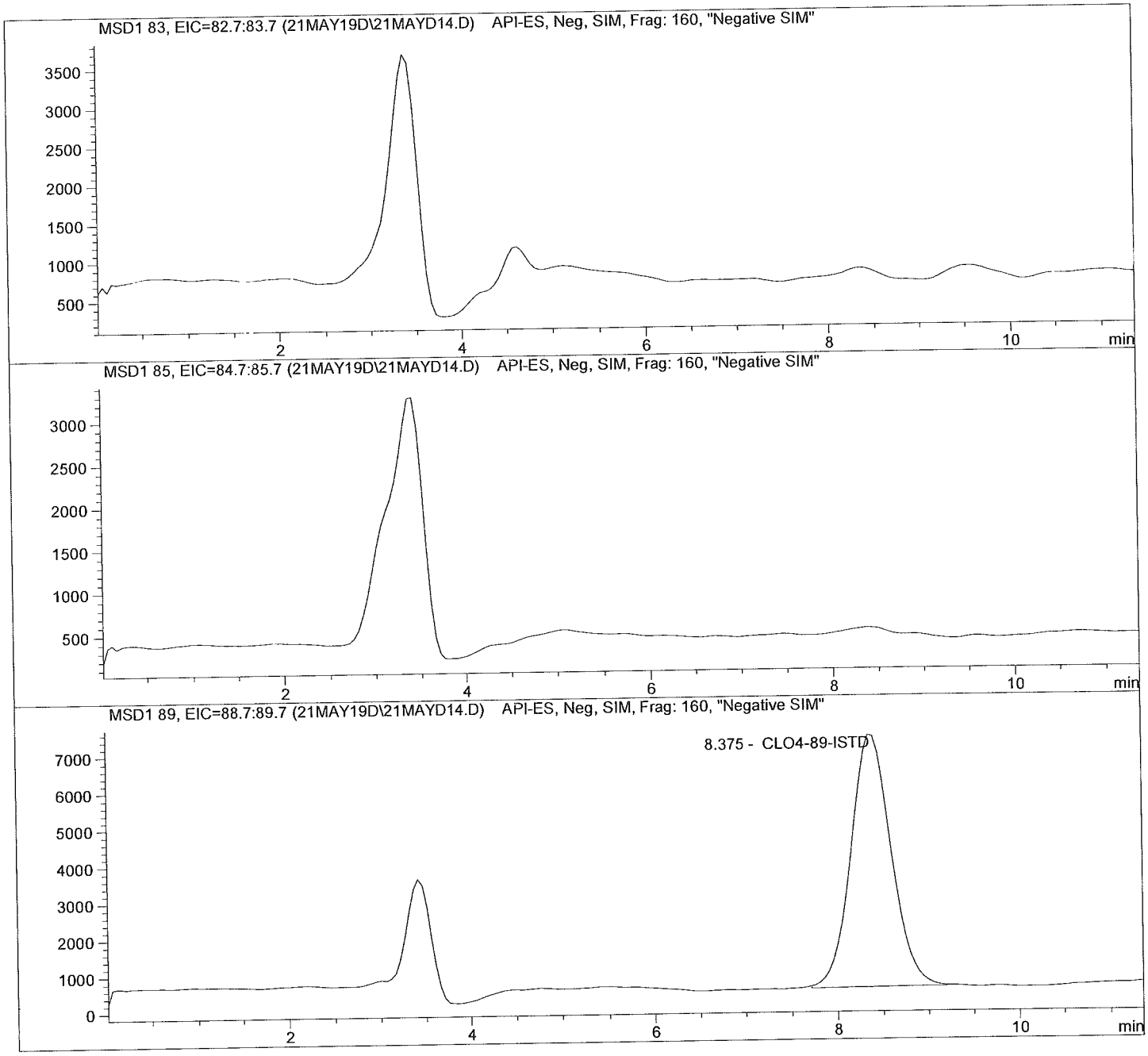
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD14.D Sample Name: 1913342008

Injection Date:	5/21/2019 10:43:48	Seq Line:	14
Sample Name:	1913342008	Location:	Vial 84
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD14.D Sample Name: 1913342008

Injection Date:	5/21/2019 10:43:48	Seq Line:	14
Sample Name:	1913342008	Location:	Vial 84
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.375	BBA	210825.1	5.0000	CLO4-89-ISTD

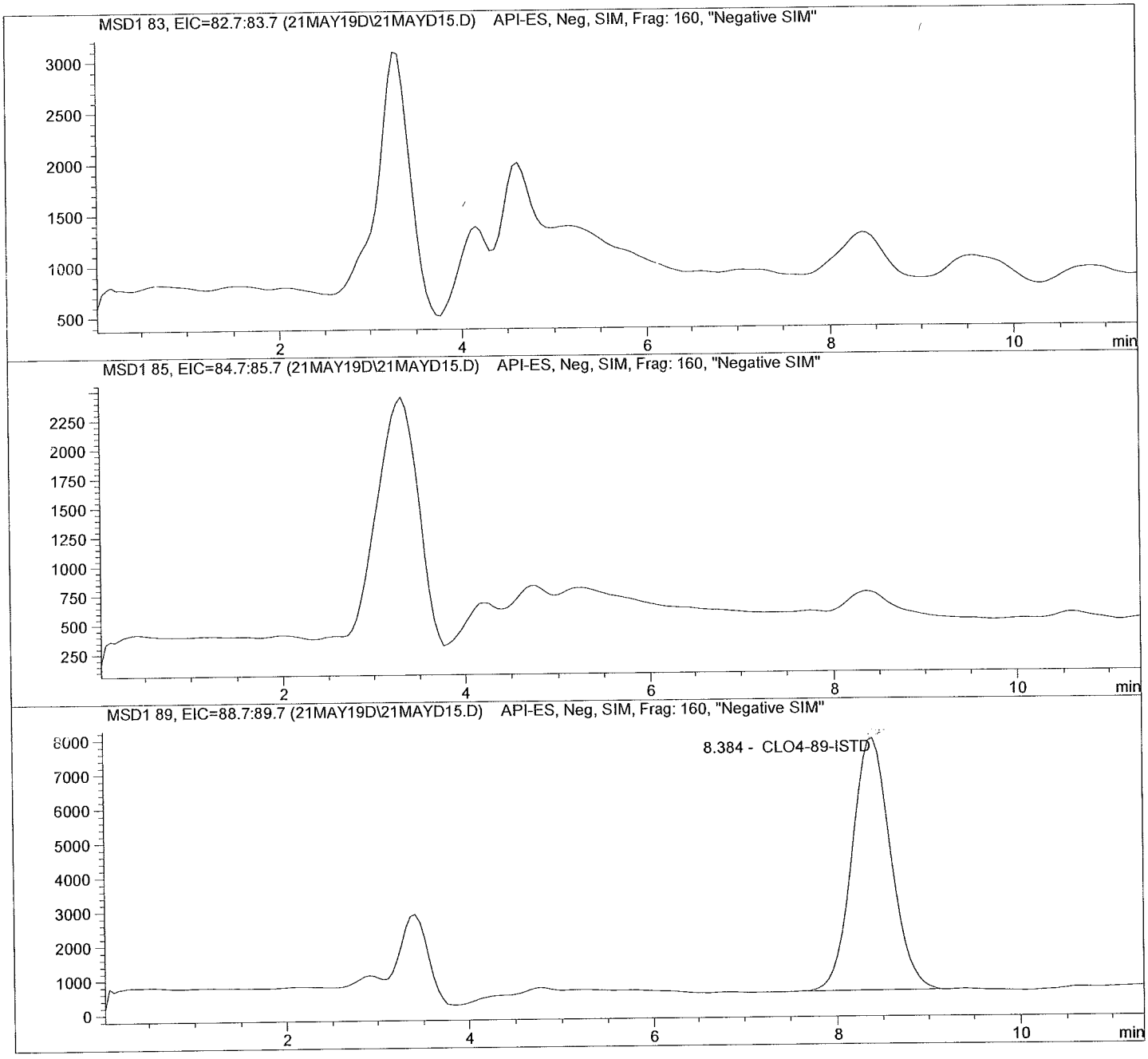
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD15.D Sample Name: 1913342009

Injection Date:	5/21/2019 10:57:10	Seq Line:	15
Sample Name:	1913342009	Location:	Vial 85
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD15.D Sample Name: 1913342009

Injection Date:	5/21/2019 10:57:10	Seq Line:	15
Sample Name:	1913342009	Location:	Vial 85
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.384	BBA	218072.4	5.0000	CLO4-89-ISTD

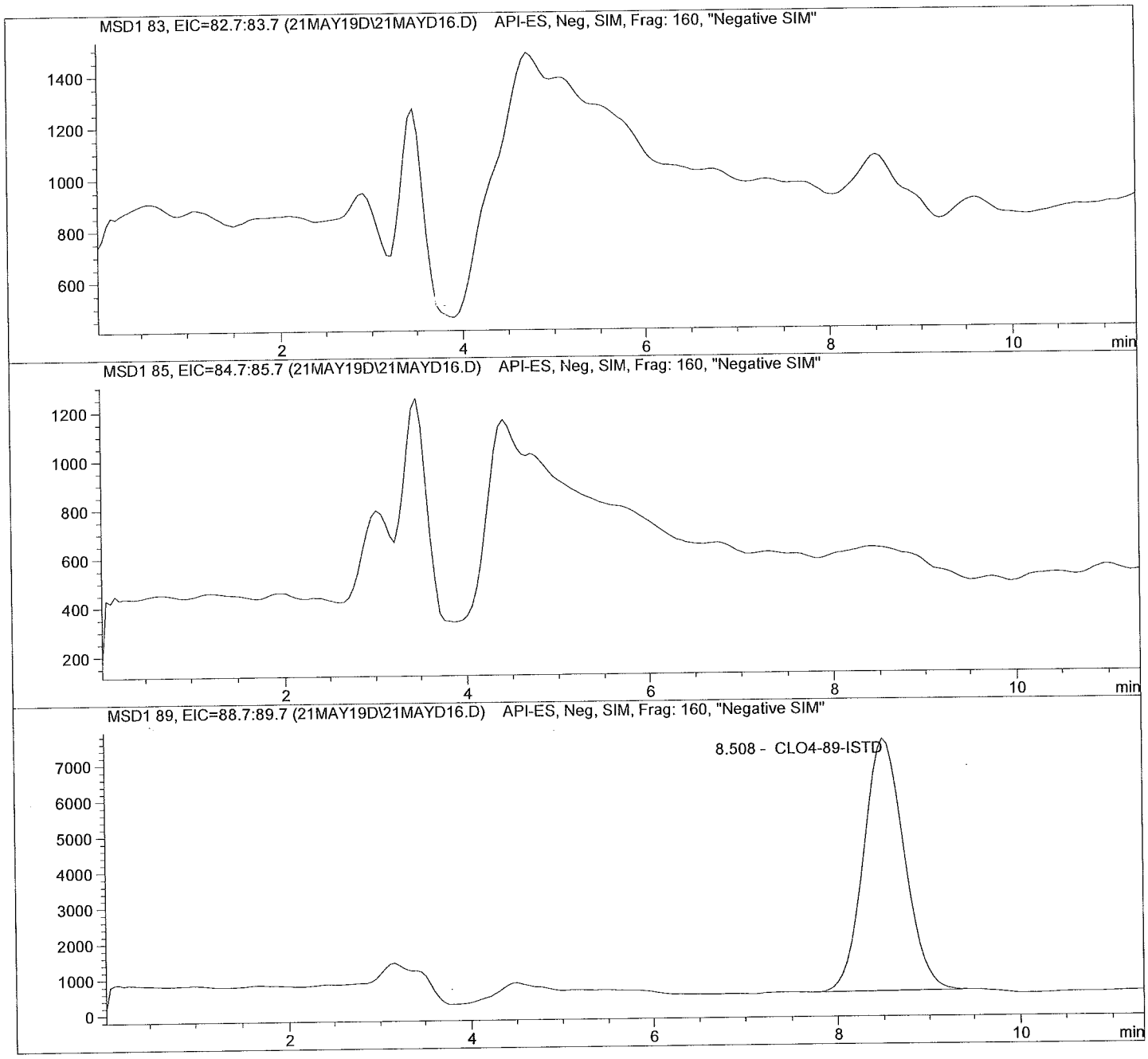
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD16.D Sample Name: 1913345001

Injection Date:	5/21/2019 11:10:33	Seq Line:	16
Sample Name:	1913345001	Location:	Vial 86
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD16.D Sample Name: 1913345001

Injection Date:	5/21/2019 11:10:33	Seq Line:	16
Sample Name:	1913345001	Location:	Vial 86
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.508	PBA	217961.0	5.0000	CLO4-89-ISTD

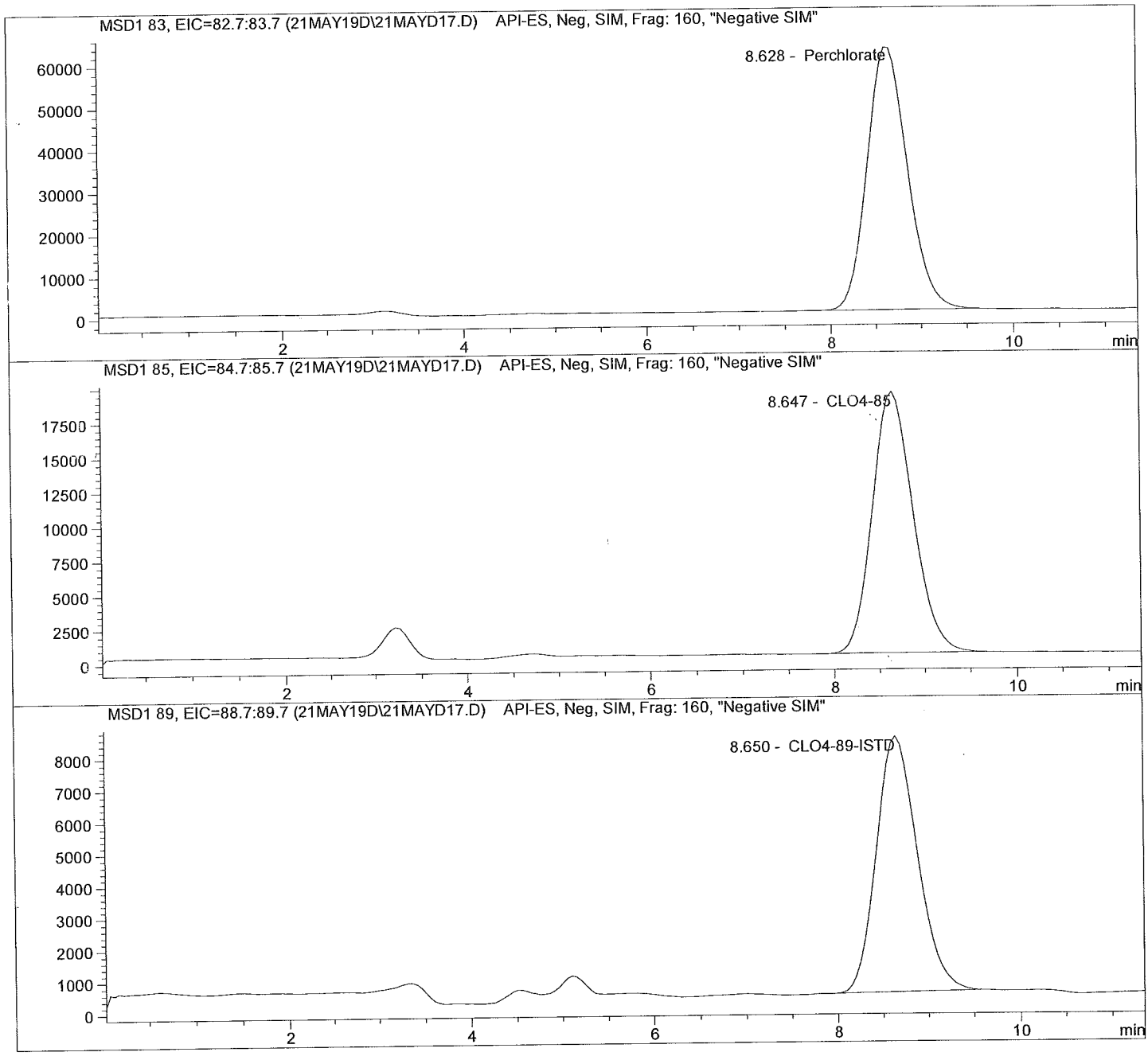
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD17.D Sample Name: 653685 CCV@25

Injection Date:	5/21/2019 11:23:56	Seq Line:	17
Sample Name:	653685 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD17.D Sample Name: 653685 CCV@25

Injection Date:	5/21/2019 11:23:56	Seq Line:	17
Sample Name:	653685 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.628	PBA	1938377.4	23.3659	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.647	PBA	593941.4	24.0719	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.650	PBA	253387.5	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

RetTime [min]	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
	7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

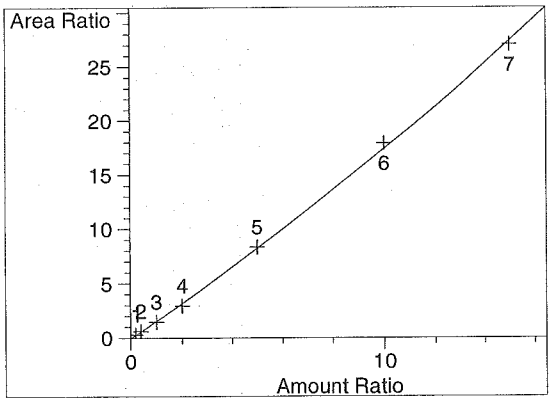
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

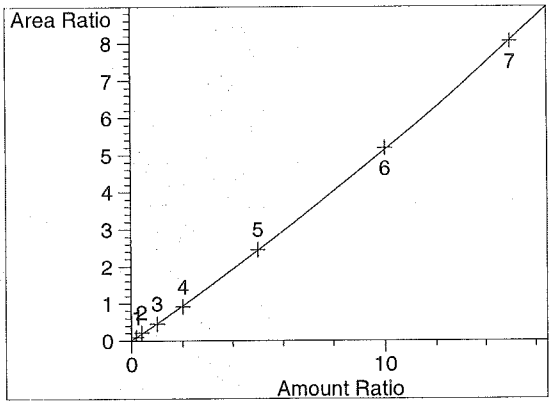
Peak Sum Table

No Entries in table

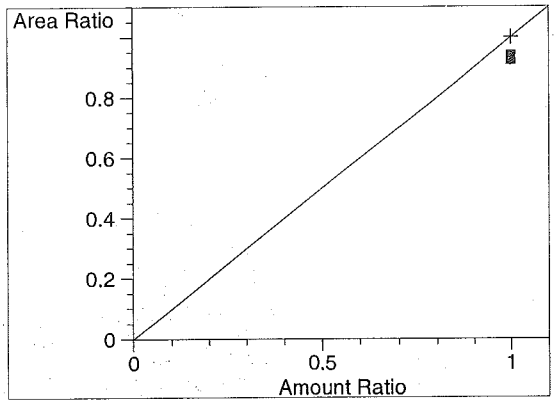
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

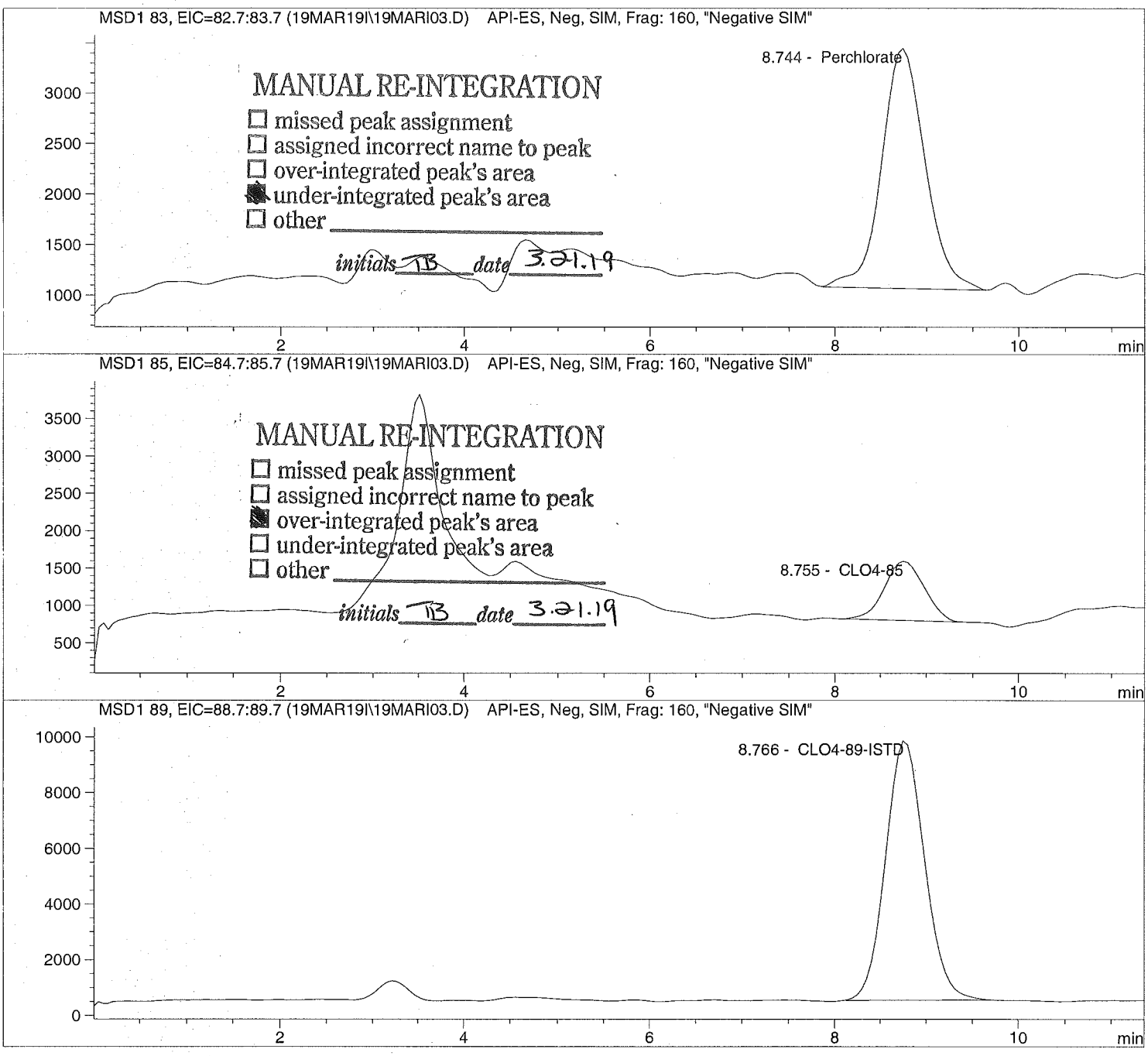
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

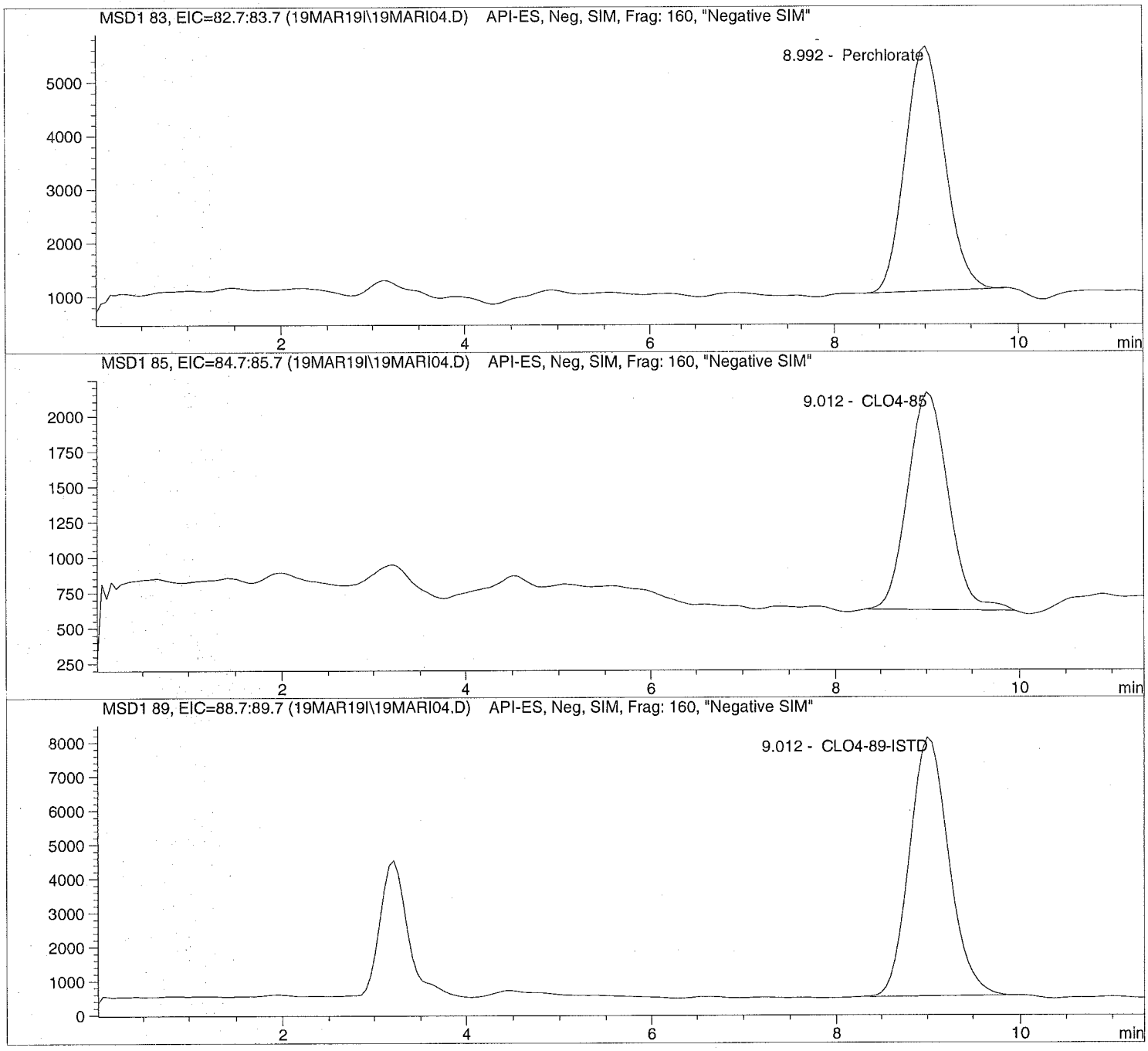
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

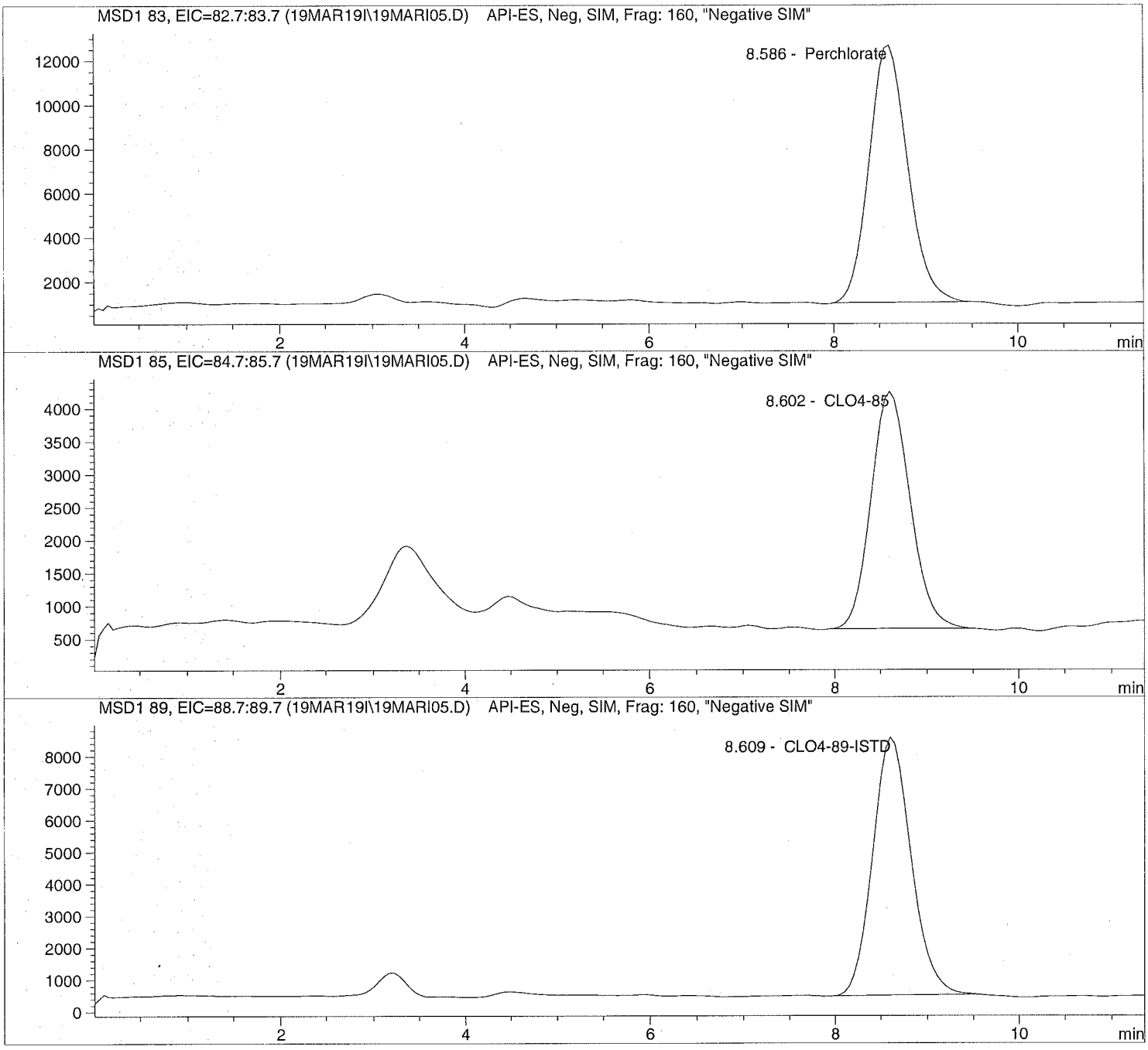
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

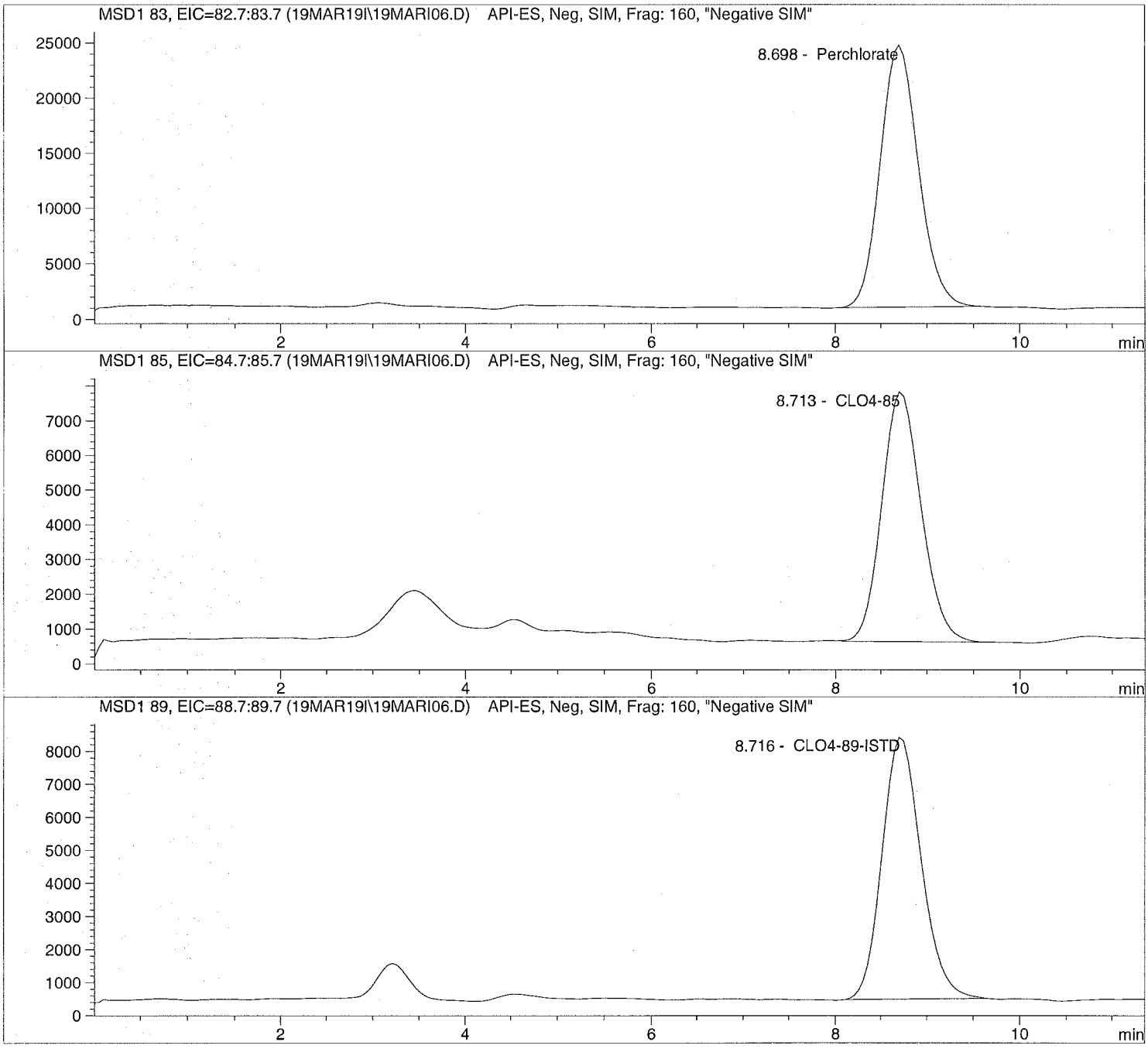
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

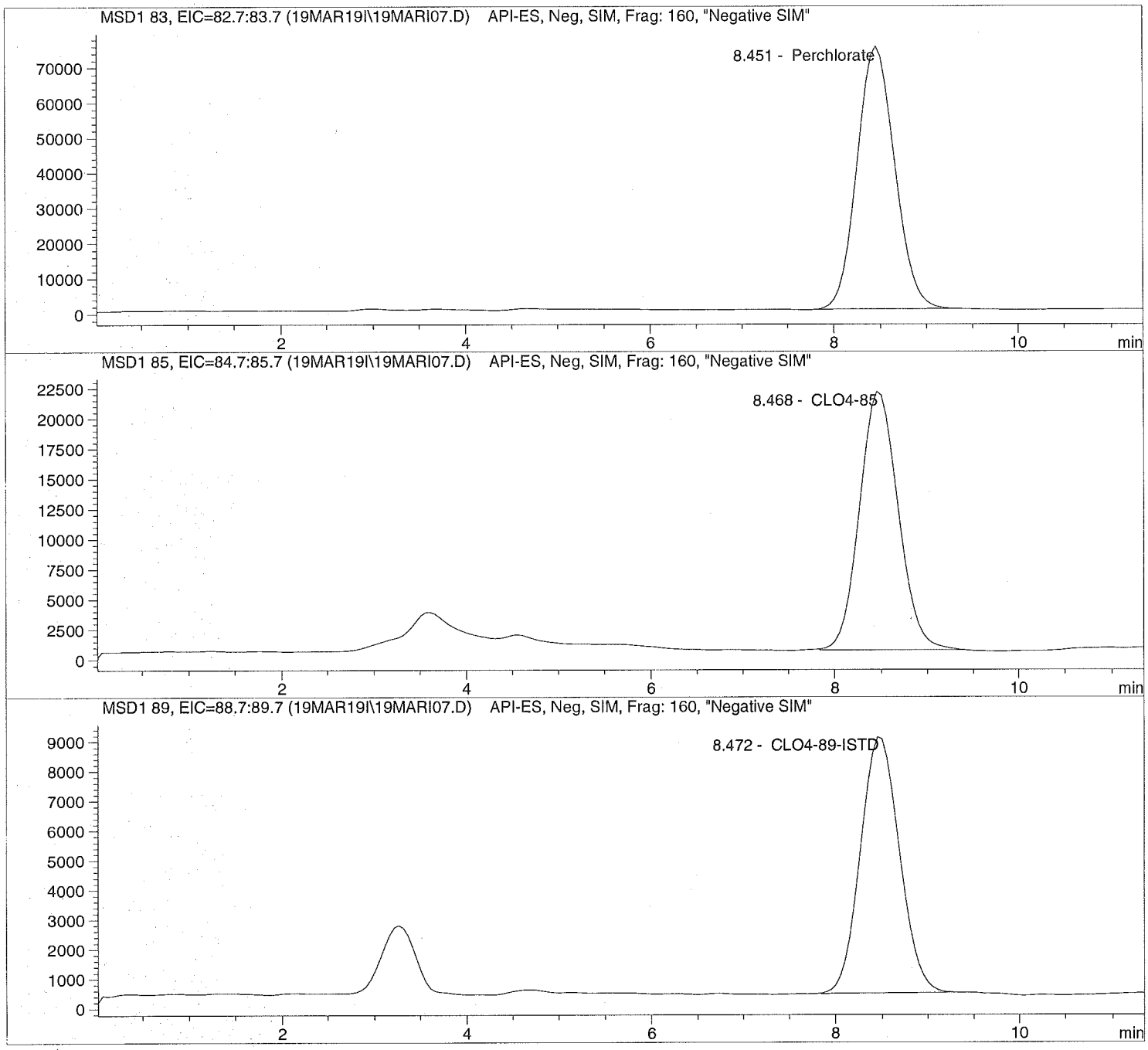
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

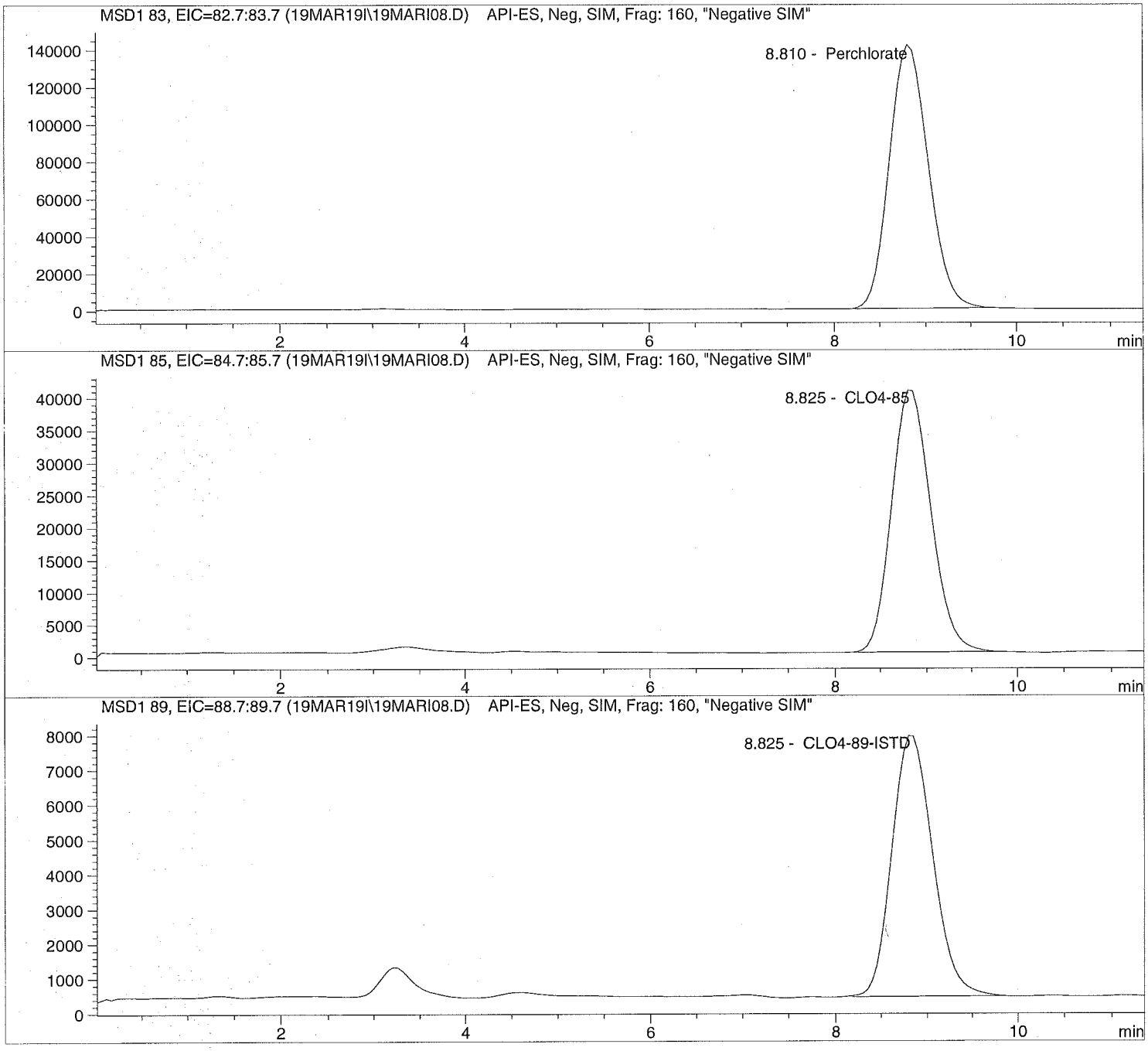
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

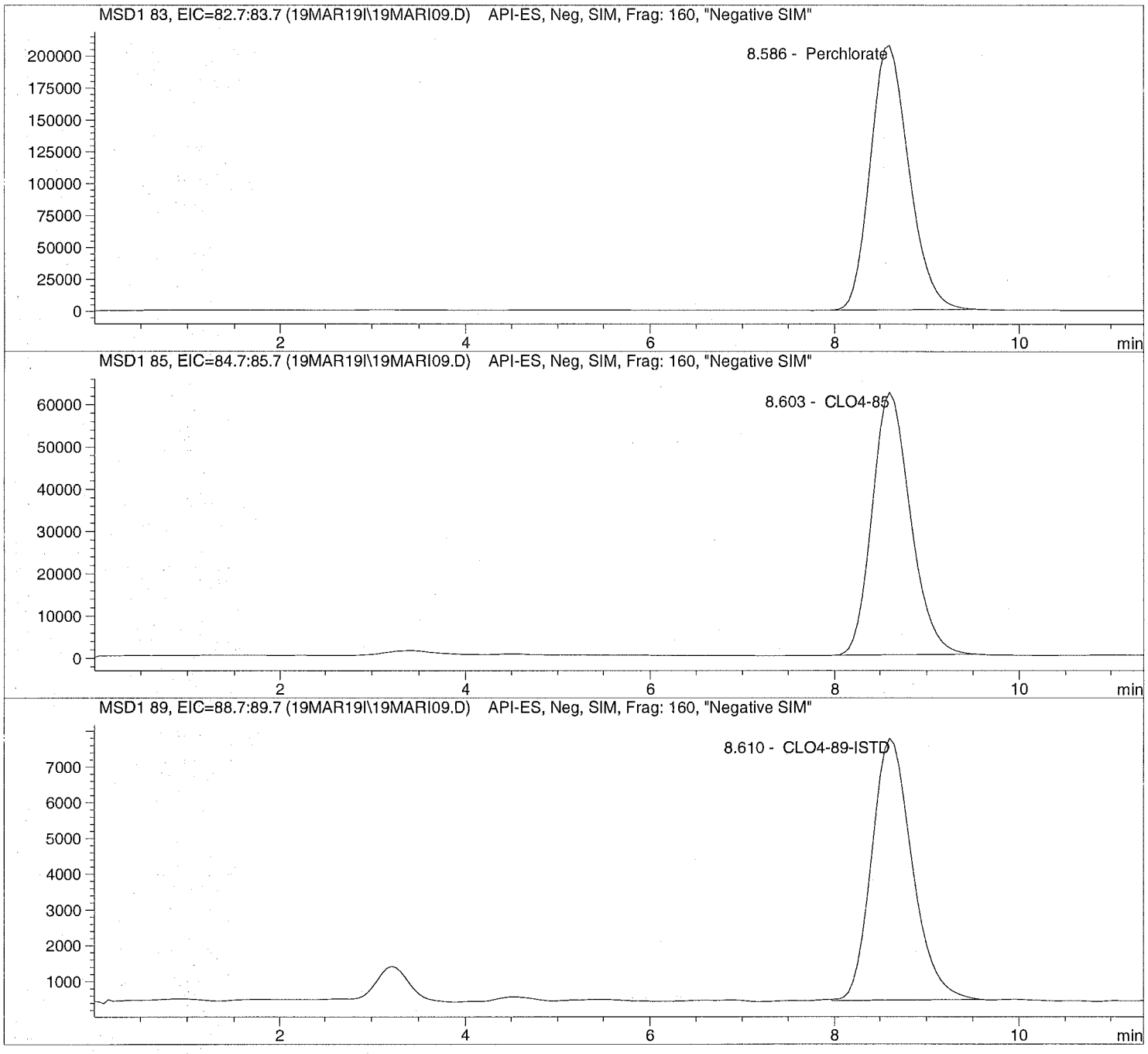
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

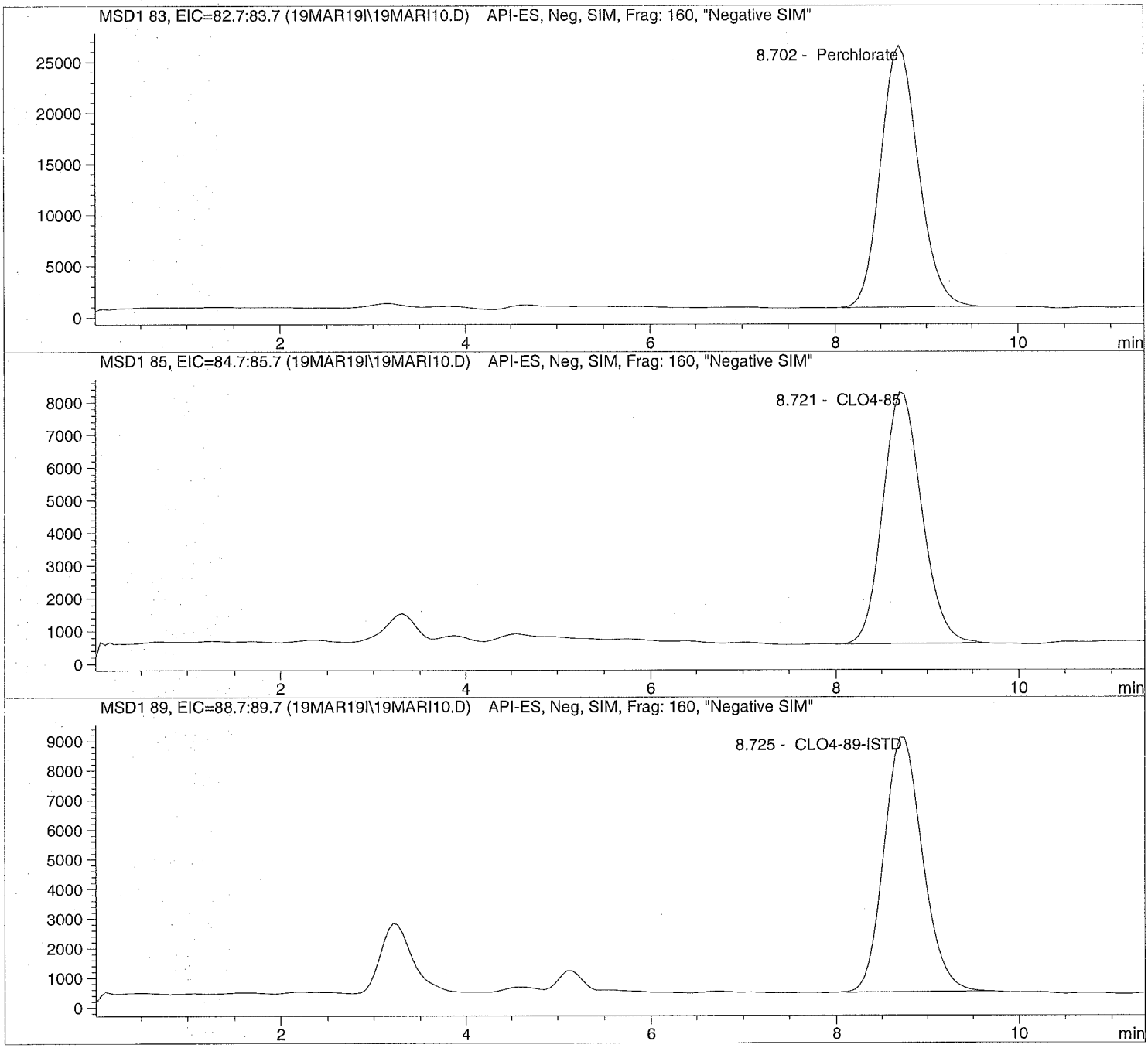
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

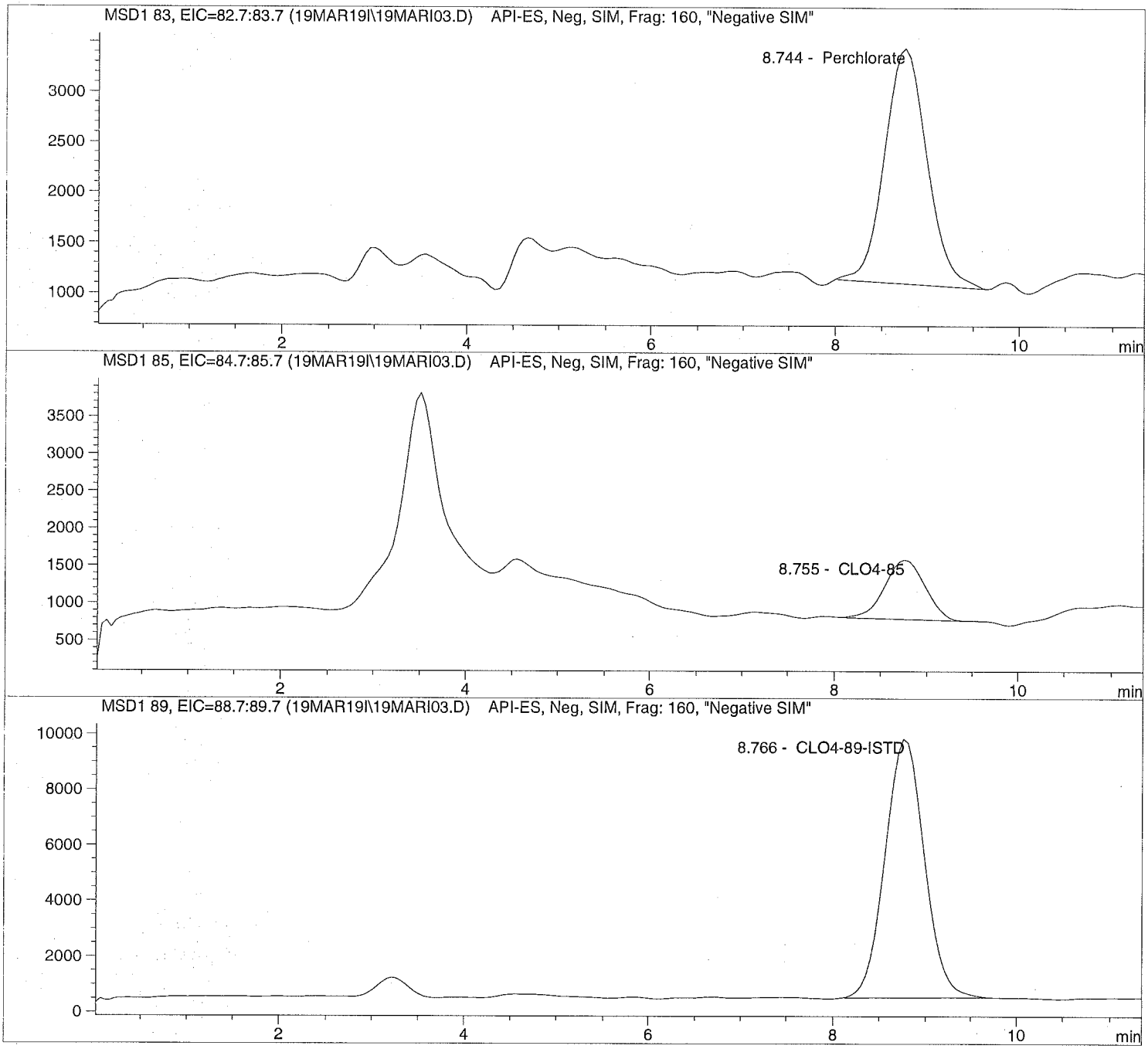
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Houston, US Date: 23-may-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19050397

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19050397-01	LH18/24-SP650_050719	Water		07-May-2019 14:00	08-May-2019 09:30	☐
HS19050397-02	LH18/24-SP650_050719_BIX	Water		07-May-2019 14:00	08-May-2019 09:30	☐

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order:

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

• The analysis for TOC was subcontracted to ALS Environmental in Fort Collins, CO. Final report attached.

WetChemistry by Method E350.3

Batch ID: R338485

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E365.3

Batch ID: R338359

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19050397

Sample ID: LH18/24-SP650_050719 Lab ID:HS19050397-01

Collection Date: 07-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: RG
Nitrogen, Ammonia (As N)	**21**		**0.20**	**0.10**	**0.20**	**mg/L**	1	14-May-2019 11:30
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: KVL
Phosphorus, Total Orthophosphate (As P)	**4.95**		**0.100**	**0.200**	**0.250**	**mg/L**	10	08-May-2019 18:15
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	16-May-2019 09:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19050397

Sample ID: LH18/24-SP650_050719_BIX Lab ID:HS19050397-02

Collection Date: 07-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	23-May-2019 14:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19050397

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R338359	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3			**Matrix:** Water		
HS19050397-01	LH18/24-SP650_050719	07 May 2019 14:00			08 May 2019 18:15	10
Batch ID R338485	**Test Name :** AMMONIA AS N BY E350.3(ISE)			**Matrix:** Water		
HS19050397-01	LH18/24-SP650_050719	07 May 2019 14:00			14 May 2019 11:30	1
Batch ID R338511	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS			**Matrix:** Water		
HS19050397-01	LH18/24-SP650_050719	07 May 2019 14:00			16 May 2019 09:25	1
Batch ID R339032	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19050397-02	LH18/24-SP650_050719_BIX	07 May 2019 14:00			23 May 2019 14:50	1

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19050397

QC BATCH REPORT

Batch ID: R338359 (0) **Instrument: UV-2450** **Method: ORTHO PHOSPHATE (PO4) AS P BY E365.3**

MBLK Sample ID: **MBLK-R338359** Units: **mg/L** Analysis Date: **08-May-2019 18:15**
Client ID: Run ID: **UV-2450_338359** SeqNo: **5073819** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0200	0.0250								U

LCS Sample ID: **LCS-R338359** Units: **mg/L** Analysis Date: **08-May-2019 18:15**
Client ID: Run ID: **UV-2450_338359** SeqNo: **5073801** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.232	0.0250	0.25	0	92.8	85 - 115				

MS Sample ID: **HS19050397-01MS** Units: **mg/L** Analysis Date: **08-May-2019 18:15**
Client ID: **LH18/24-SP650_050719** Run ID: **UV-2450_338359** SeqNo: **5073803** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	7.52	0.250	2.5	4.95	103	80 - 120				

MSD Sample ID: **HS19050397-01MSD** Units: **mg/L** Analysis Date: **08-May-2019 18:15**
Client ID: **LH18/24-SP650_050719** Run ID: **UV-2450_338359** SeqNo: **5073802** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	7.42	0.250	2.5	4.95	98.8	80 - 120	7.52	1.34	20	

The following samples were analyzed in this batch: HS19050397-01

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19050397

QC BATCH REPORT

Batch ID: R338485 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R338485** Units: **mg/L** Analysis Date: **14-May-2019 11:30**
Client ID: Run ID: **WetChem_HS_338485** SeqNo: **5076342** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R338485** Units: **mg/L** Analysis Date: **14-May-2019 11:30**
Client ID: Run ID: **WetChem_HS_338485** SeqNo: **5076341** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.79	0.20	10	0	108	80 - 120				

MS Sample ID: **HS19050506-06MS** Units: **mg/L** Analysis Date: **14-May-2019 11:30**
Client ID: Run ID: **WetChem_HS_338485** SeqNo: **5076344** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.12	0.20	10	1.346	87.7	80 - 120				

MSD Sample ID: **HS19050506-06MSD** Units: **mg/L** Analysis Date: **14-May-2019 11:30**
Client ID: Run ID: **WetChem_HS_338485** SeqNo: **5076343** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10	0.20	10	1.346	86.5	80 - 120	10.12	1.19	20	

The following samples were analyzed in this batch: HS19050397-01

ALS Houston, US Date: 23-May-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS19050397**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 23-may-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19050397

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19050397-01	LH18/24-SP650_050719	Login	08/05/2019 11:28:28	NDR	WET069
HS19050397-01	LH18/24-SP650_050719	Login	08/05/2019 11:28:28	NDR	WET069
HS19050397-01	LH18/24-SP650_050719	Login	08/05/2019 11:28:28	NDR	Sub
HS19050397-02	LH18/24-SP650_050719_BIX	Login	08/05/2019 11:28:28	NDR	Sub

ALS Houston, US Date: 23-May-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19050397
Date/Time Received: **08-May-2019 09:30**
Received by: **JRM**

Checklist completed by: *Nilesh D. Ranchod* eSignature 8-May-2019 Date
Reviewed by: *RJ Modashia* eSignature 8-May-2019 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.6C / 1.6c UC/C	IR11	
Cooler(s)/Kit(s):	44882		
Date/Time sample(s) sent to storage:	05/08/2019 11:45		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modshia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No.
NWO1312.0150.0
16.0001

Job:
GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

Prepared By:
Scott Beesinger

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_050719	Water	05/07/19 / 14:00		2	X	X			H2SO4	
LH18/24-SP650_050719	Water	05/07/19 / 14:00		1			X		NONE	
LH18/24-SP650_050719_BIX	Water	05/07/19 / 14:00		1				X	NONE	

HS19050397
Bhate Environmental Associates, Inc.
I18/24 Longhorn GW Treatment Plant Weekly Sampl

Additional Remarks: **Standard TAT on all parameters**

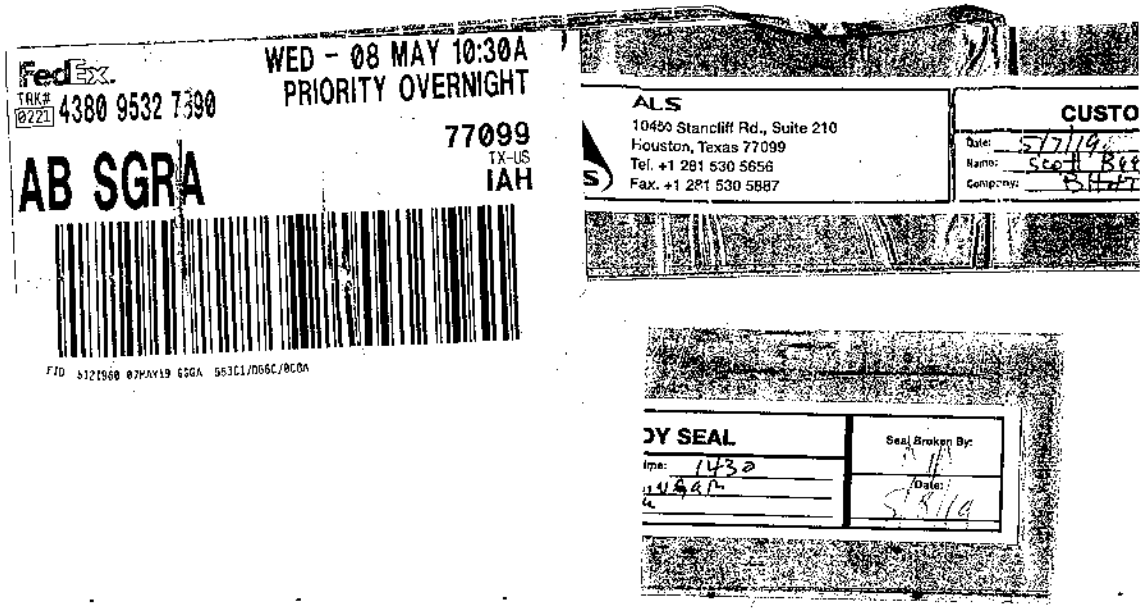
Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	05/07/19	14:30									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. MAUNN	5/8/19	09:30							

Remarks:
Cooler - 44882 IR11
Temp 1.6 0700

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly


FedEx.
TRK# 0221 4380 9532 7390
WED - 08 MAY 10:30A
PRIORITY OVERNIGHT
77099
TX-US
IAH
AB SGRA
ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887
CUSTO
Date: 5/7/14
Name: Scott Bee
Company: Bill
DY SEAL
Time: 1430
Seal Broken By:
Date: 5/8/14

ALS Environmental
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May 15, 2019

Analytical Report for Service Request No: K1904158

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS19050397

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory May 09, 2019
For your reference, these analyses have been assigned our service request number **K1904158.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

For Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
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1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client: ALS Environmental - US
Project: HS19050397
Sample Matrix: Water

Service Request: K1904158
Date Received: 05/09/2019

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 05/09/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by _____ Date 05/15/2019

Chain of Custody

ALS Environmental—Kelso Laboratory
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Phone (360)577- 7222 Fax (360)636-1 068
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K1904158

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Houston, TX 77099
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F: +1 281 530 5887
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Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **11268**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19050397
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19050397-01**	**LH18/24-SP650_050719**	**Water**	**07 May 2019 14:00**
	TOC Analysis for DOD Level IV			16 May 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

MAY 0 8 2019 | 8.

Relinquished By: _____ Date/Time: _____

Received By: Naomi Pedersen Date/Time: 5.9.19 1000

Cooler ID(s): _____ Temperature(s): _____

RIGHT SOLUTIONS | RIGHT PARTNER

00938912

PC KL

Cooler Receipt and Preservation Form

Client ALS Houston Service Request *K19* 04158

Received: 5·9·19 Opened: 5·9·19 By: NP Unloaded: 5·9·19 By: NP

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other*_____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.1	0.0	2.2	2.1	-0.1	377	11266	480978336227	
						11268		
						11277		

4. Packing material: *Inserts* (*Baggies*) (*Bubble Wrap*) *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

*Notes, Discrepancies, & Resolutions:*_____

RUSH

General Chemistry

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Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1904158
Project:	HS19050397	**Date Collected:**	05/7/19
Sample Matrix:	Water	**Date Received:**	05/9/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_050719	K1904158-001	**1.46**	0.50	0.20	0.07	1	05/10/19 03:25	
Method Blank	K1904158-MB	ND U	0.50	0.20	0.07	1	05/10/19 06:42	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1904158
Project	HS19050397	**Date Collected:**	05/07/19
Sample Matrix:	Water	**Date Received:**	05/09/19
		Date Analyzed:	05/10/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_050719	**Units:**	mg/L
Lab Code:	K1904158-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K1904158-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	1.46	1.42	1.44	3	10

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1904158
Project:	HS19050397	**Date Analyzed:**	05/10/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	635076

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1904158-LCS	25.3	25.0	101	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1904158
Project: HS19050397

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	635076	KQ1906237-05	05/09/19 19:10	25.0	24.9	100	90-110
CCV2	635076	KQ1906237-06	05/10/19 01:03	25.0	25.0	100	90-110
CCV3	635076	KQ1906237-07	05/10/19 06:13	25.0	24.7	99	90-110
CCV4	635076	KQ1906237-08	05/10/19 10:29	25.0	24.9	99	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1904158
Project: HS19050397

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	635076	KQ1906237-01	05/09/19 19:25	0.50	0.20	0.07	ND	U
CCB2	635076	KQ1906237-02	05/10/19 01:17	0.50	0.20	0.07	ND	U
CCB3	635076	KQ1906237-03	05/10/19 06:28	0.50	0.20	0.07	ND	U
CCB4	635076	KQ1906237-04	05/10/19 10:44	0.50	0.20	0.07	ND	U

Raw Data

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577-7222 Fax (360)636-1068
www.alsglobal.com

General Chemistry

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Work Request # Original ( ) K1903942, 4032, 4074, 4115, 4158, 4159, 4161, 4181, 4182, 4195, 4065, 4071, 4133, 4161, 4094, 4200, 4058

Tier: I II III I IV IV IV II II II II III II IV II

Date Analyzed: 5/9/19

Analyst: BCD

Analysis: TOC/DOC

Run # TOC: 635076, 635077, 635075

DOC: 635078

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	yes/no/NA
2.	Holding times met for all analyses and for all samples?	yes/no/NA
3.	Are calculations correct?	yes/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/NA
5.	All quality control criteria met?	yes/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	yes/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	yes/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	yes/no/NA
9.	Are results for methods blanks all ND?	yes/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/no/NA
11.	Are all exceptions explained?	yes/no/NA
12.	Have all applicable service requests been reviewed?	yes/no/NA
13.	Are all samples labeled correctly?	yes/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	yes/no/NA
15.	Are detection limits and units reported correctly?	yes/no/NA
16.	Is the unused space on the benchsheet crossed out?	yes/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/no/NA

COMMENTS: BCD 5/11/19
K1904032-2,2d, ~~and K190~~ reports a high %RSD, However, this sample is less than 5x the MRL.
K1904094 reports a high %RSD due to dirty/turbid non-homogenous sample.
K1904071-1 TOC sent for RA. Sample requires a dup.

Final Approved by: _____ Date: 05/13/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 635075 **Method/Testcode:** 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1903942-004	Carbon, Total Organic (TOC)	N/A		Water	7.20 mg/L	10 mL	28.8 mg/L	4		2.0			5/9/19 21:46:00	N	I
KQ1906235-01	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			5/9/19 19:25:00	N	I
KQ1906235-02	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			5/9/19 01:17:00	N	I
KQ1906235-03	Carbon, Total Organic (TOC)	CCV		Water	24.93 mg/L	10 mL	24.9 mg/L	1					5/9/19 19:10:00	N	I
KQ1906235-04	Carbon, Total Organic (TOC)	CCV		Water	25.03 mg/L	10 mL	25.0 mg/L	1					5/9/19 01:03:00	N	I
KQ1906235-05	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			5/9/19 19:40:00	N	I
KQ1906235-06	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			5/9/19 19:40:00	N	I
KQ1906235-07	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			5/9/19 19:40:00	N	I
KQ1906235-08	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			5/9/19 19:40:00	N	I
KQ1906235-09	Carbon, Total Organic (TOC)	LCS		Water	25.26 mg/L	10 mL	25.3 mg/L	1		0.50	101		5/9/19 20:35:00	N	I
KQ1906235-10	Carbon, Total Organic (TOC)	LCS		Water	25.26 mg/L	10 mL	25.3 mg/L	1		0.50	101		5/9/19 20:35:00	N	I
KQ1906235-11	Carbon, Total Organic (TOC)	LCS		Water	25.26 mg/L	10 mL	25.3 mg/L	1		0.50	101		5/9/19 20:35:00	N	I
KQ1906235-12	Carbon, Total Organic (TOC)	LCS		Water	25.26 mg/L	10 mL	25.3 mg/L	1		0.50	101		5/9/19 20:35:00	N	I
KQ1906235-13	Carbon, Total Organic (TOC)	DUP	K1903942-004	Water	7.22 mg/L	10 mL	28.9 mg/L	4		2.0		<1	5/9/19 21:46:00	N	I
KQ1906235-14	Carbon, Total Organic (TOC)	TRP	K1903942-004	Water	7.26 mg/L	10 mL	29.0 mg/L	4		2.0		<1	5/9/19 21:46:00	N	I
KQ1906235-15	Carbon, Total Organic (TOC)	QUAD	K1903942-004	Water	7.24 mg/L	10 mL	29.0 mg/L	4		2.0		<1	5/9/19 21:46:00	N	I

05/13/19

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 635076 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1904032-001	Carbon, Total Organic	N/A		Water	16.99 mg/L	10 mL	17.0 mg/L	1	0.07	0.50			5/10/19 09:04:00	N	II
K1904032-002	Carbon, Total Organic	N/A		Water	0.85 mg/L	10 mL	0.85 mg/L	1	0.07	0.50			5/10/19 09:32:00	N	II
K1904074-001	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 03:53:00	N	III
K1904115-001	Carbon, Total Organic	N/A		Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 04:21:00	N	I
K1904158-001	Carbon, Total Organic	N/A		Water	1.46 mg/L	10 mL	1.46 mg/L	1	0.07	0.50			5/10/19 03:25:00	N	IV
K1904159-001	Carbon, Total Organic	N/A		Ground Water	1.74 mg/L	10 mL	1.74 mg/L	1	0.07	0.50			5/10/19 00:07:00	N	IV
K1904159-002	Carbon, Total Organic	N/A		Ground Water	1.80 mg/L	10 mL	1.80 mg/L	1	0.07	0.50			5/10/19 00:35:00	N	IV
K1904159-003	Carbon, Total Organic	N/A		Ground Water	1.13 mg/L	10 mL	1.13 mg/L	1	0.07	0.50			5/10/19 01:32:00	N	IV
K1904159-004	Carbon, Total Organic	N/A		Ground Water	1.93 mg/L	10 mL	1.93 mg/L	1	0.07	0.50			5/10/19 02:00:00	N	IV
K1904159-005	Carbon, Total Organic	N/A		Ground Water	1.10 mg/L	10 mL	1.10 mg/L	1	0.07	0.50			5/10/19 02:28:00	N	IV
K1904159-006	Carbon, Total Organic	N/A		Ground Water	1.98 mg/L	10 mL	1.98 mg/L	1	0.07	0.50			5/10/19 02:56:00	N	IV
K1904161-001	Carbon, Total Organic	N/A		Ground Water	2.10 mg/L	10 mL	2.10 mg/L	1	0.07	0.50			5/9/19 22:41:00	N	IV
K1904161-002	Carbon, Total Organic	N/A		Ground Water	0.98 mg/L	10 mL	0.98 mg/L	1	0.07	0.50			5/9/19 23:09:00	Y	IV
K1904181-001	Carbon, Total Organic	N/A		Water	0.97 mg/L	10 mL	0.97 mg/L	1	0.07	0.50			5/10/19 04:49:00	N	II
K1904182-001	Carbon, Total Organic	N/A		Water	0.31 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 05:17:00	N	II
K1904195-001	Carbon, Total Organic	N/A		Water	2.14 mg/L	10 mL	2.14 mg/L	1	0.07	0.50			5/10/19 05:45:00	N	II
K1904195-002	Carbon, Total Organic	N/A		Water	3.34 mg/L	10 mL	3.34 mg/L	1	0.07	0.50			5/10/19 07:12:00	N	II
K1904195-003	Carbon, Total Organic	N/A		Water	1.36 mg/L	10 mL	1.36 mg/L	1	0.07	0.50			5/10/19 07:40:00	N	II
K1904195-004	Carbon, Total Organic	N/A		Water	1.56 mg/L	10 mL	1.56 mg/L	1	0.07	0.50			5/10/19 08:08:00	N	II
K1904195-005	Carbon, Total Organic	N/A		Water	1.57 mg/L	10 mL	1.57 mg/L	1	0.07	0.50			5/10/19 08:36:00	N	II
KQ1906237-01	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/9/19 19:25:00	N	IV
KQ1906237-02	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 01:17:00	N	IV
KQ1906237-03	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 06:28:00	N	IV
KQ1906237-04	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 10:44:00	N	IV
KQ1906237-05	Carbon, Total Organic	CCV		Ground Water	24.93 mg/L	10 mL	24.9 mg/L	1					5/9/19 19:10:00	N	IV
KQ1906237-06	Carbon, Total Organic	CCV		Ground Water	25.03 mg/L	10 mL	25.0 mg/L	1					5/10/19 01:03:00	N	IV
KQ1906237-07	Carbon, Total Organic	CCV		Ground Water	24.68 mg/L	10 mL	24.7 mg/L	1					5/10/19 06:13:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Printed 5/11/19 12:19

Results Summary

05/13/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 635076 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1906237-08	Carbon, Total Organic	CCV		Ground Water	24.85 mg/L	10 mL	24.9 mg/L	1					5/10/19 10:29:00	N	IV
KQ1906237-09	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 06:42:00	N	IV
KQ1906237-10	Carbon, Total Organic	LCS		Ground Water	25.28 mg/L	10 mL	25.3 mg/L	1	0.07	0.50	101		5/10/19 06:57:00	N	IV
KQ1906237-11	Carbon, Total Organic	MS	K1904161-002	Ground Water	24.54 mg/L	10 mL	24.5 mg/L	1	0.07	0.50	94		5/9/19 23:38:00	N	IV
KQ1906237-12	Carbon, Total Organic	DUP	K1904161-001	Ground Water	2.00 mg/L	10 mL	2.00 mg/L	1	0.07	0.50		5	5/9/19 22:41:00	N	IV
KQ1906237-13	Carbon, Total Organic	DUP	K1904161-002	Ground Water	1.05 mg/L	10 mL	1.05 mg/L	1	0.07	0.50		7	5/9/19 23:09:00	N	IV
KQ1906237-14	Carbon, Total Organic	DUP	K1904159-001	Ground Water	1.69 mg/L	10 mL	1.69 mg/L	1	0.07	0.50		3	5/10/19 00:07:00	N	IV
KQ1906237-15	Carbon, Total Organic	DUP	K1904159-002	Ground Water	1.87 mg/L	10 mL	1.87 mg/L	1	0.07	0.50		4	5/10/19 00:35:00	N	IV
KQ1906237-16	Carbon, Total Organic	DUP	K1904159-003	Ground Water	1.08 mg/L	10 mL	1.08 mg/L	1	0.07	0.50		5	5/10/19 01:32:00	N	IV
KQ1906237-17	Carbon, Total Organic	DUP	K1904159-004	Ground Water	1.78 mg/L	10 mL	1.78 mg/L	1	0.07	0.50		8	5/10/19 02:00:00	N	IV
KQ1906237-18	Carbon, Total Organic	DUP	K1904159-005	Ground Water	1.06 mg/L	10 mL	1.06 mg/L	1	0.07	0.50		4	5/10/19 02:28:00	N	IV
KQ1906237-19	Carbon, Total Organic	DUP	K1904159-006	Ground Water	2.05 mg/L	10 mL	2.05 mg/L	1	0.07	0.50		3	5/10/19 02:56:00	N	IV
KQ1906237-20	Carbon, Total Organic	DUP	K1904158-001	Water	1.42 mg/L	10 mL	1.42 mg/L	1	0.07	0.50		3	5/10/19 03:25:00	N	IV
KQ1906237-21	Carbon, Total Organic	DUP	K1904074-001	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	5/10/19 03:53:00	N	III
KQ1906237-22	Carbon, Total Organic	DUP	K1904115-001	Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	5/10/19 04:21:00	N	I
KQ1906237-23	Carbon, Total Organic	DUP	K1904181-001	Water	0.99 mg/L	10 mL	0.99 mg/L	1	0.07	0.50		2	5/10/19 04:49:00	N	II
KQ1906237-24	Carbon, Total Organic	DUP	K1904182-001	Water	0.35 mg/L	10 mL	0.35 mg/L J	1	0.07	0.50		NC	5/10/19 05:17:00	N	II
KQ1906237-25	Carbon, Total Organic	DUP	K1904195-001	Water	2.13 mg/L	10 mL	2.13 mg/L	1	0.07	0.50		<1	5/10/19 05:45:00	N	II
KQ1906237-26	Carbon, Total Organic	DUP	K1904195-002	Water	3.25 mg/L	10 mL	3.25 mg/L	1	0.07	0.50		3	5/10/19 07:12:00	N	II
KQ1906237-27	Carbon, Total Organic	DUP	K1904195-003	Water	1.30 mg/L	10 mL	1.30 mg/L	1	0.07	0.50		4	5/10/19 07:40:00	N	II
KQ1906237-28	Carbon, Total Organic	DUP	K1904195-004	Water	1.53 mg/L	10 mL	1.53 mg/L	1	0.07	0.50		2	5/10/19 08:08:00	N	II
KQ1906237-29	Carbon, Total Organic	DUP	K1904195-005	Water	1.58 mg/L	10 mL	1.58 mg/L	1	0.07	0.50		<1	5/10/19 08:36:00	N	II
KQ1906237-30	Carbon, Total Organic	DUP	K1904032-001	Water	17.34 mg/L	10 mL	17.3 mg/L	1	0.07	0.50		2	5/10/19 09:04:00	N	II
KQ1906237-31	Carbon, Total Organic	DUP	K1904032-002	Water	0.61 mg/L	10 mL	0.61 mg/L	1	0.07	0.50		34*	5/10/19 09:32:00	N	II

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# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 635077 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1904065-001	Carbon, Total Organic	N/A		Water	7.02 mg/L	10 mL	702 mg/L	100	7	50			5/10/19 10:59:00	N	II
K1904071-001	Carbon, Total Organic	N/A		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 10:00:00	N	III
K1904094-001	Carbon, Total Organic	N/A		Ground Water	10.84 mg/L	10 mL	10.8 mg/L	1	0.07	0.50			5/10/19 11:27:00	N	II
K1904094-002	Carbon, Total Organic	N/A		Ground Water	7.99 mg/L	10 mL	7.99 mg/L	1	0.07	0.50			5/10/19 11:55:00	N	II
K1904094-003	Carbon, Total Organic	N/A		Ground Water	2.62 mg/L	10 mL	2.62 mg/L	1	0.07	0.50			5/10/19 12:23:00	N	II
K1904094-004	Carbon, Total Organic	N/A		Ground Water	1.57 mg/L	10 mL	1.57 mg/L	1	0.07	0.50			5/10/19 12:51:00	N	II
K1904094-005	Carbon, Total Organic	N/A		Ground Water	0.89 mg/L	10 mL	0.89 mg/L	1	0.07	0.50			5/10/19 13:19:00	N	II
K1904094-006	Carbon, Total Organic	N/A		Ground Water	0.55 mg/L	10 mL	0.55 mg/L	1	0.07	0.50			5/10/19 13:47:00	N	II
K1904094-007	Carbon, Total Organic	N/A		Ground Water	2.60 mg/L	10 mL	2.60 mg/L	1	0.07	0.50			5/10/19 14:15:00	N	II
K1904133-001	Carbon, Total Organic	N/A		Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 14:44:00	N	I
K1904163-001	Carbon, Total Organic	N/A		Ground Water	1.35 mg/L	10 mL	1.35 mg/L	1	0.07	0.50			5/10/19 17:06:00	N	II
K1904163-002	Carbon, Total Organic	N/A		Ground Water	0.47 mg/L	10 mL	0.47 mg/L J	1	0.07	0.50			5/10/19 17:34:00	N	II
K1904163-003	Carbon, Total Organic	N/A		Ground Water	1.45 mg/L	10 mL	1.45 mg/L	1	0.07	0.50			5/10/19 18:02:00	N	II
K1904163-004	Carbon, Total Organic	N/A		Ground Water	0.74 mg/L	10 mL	0.74 mg/L	1	0.07	0.50			5/10/19 18:30:00	N	II
K1904163-005	Carbon, Total Organic	N/A		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 18:58:00	N	II
K1904205-001	Carbon, Total Organic	N/A		Water	35.34 mg/L	10 mL	35.3 mg/L	1	0.07	0.50			5/10/19 19:26:00	N	IV
K1904205-002	Carbon, Total Organic	N/A		Water	11.17 mg/L	10 mL	11.2 mg/L	1	0.07	0.50			5/10/19 19:55:00	N	IV
KQ1906238-01	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 06:28:00	N	III
KQ1906238-02	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 10:44:00	N	III
KQ1906238-03	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 16:22:00	N	III
KQ1906238-04	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 21:05:00	N	III
KQ1906238-05	Carbon, Total Organic	CCV		Surface Water	24.68 mg/L	10 mL	24.7 mg/L	1					5/10/19 06:13:00	N	III
KQ1906238-06	Carbon, Total Organic	CCV		Surface Water	24.85 mg/L	10 mL	24.9 mg/L	1					5/10/19 10:29:00	N	III
KQ1906238-07	Carbon, Total Organic	CCV		Surface Water	24.02 mg/L	10 mL	24.0 mg/L	1					5/10/19 16:07:00	N	III

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

05/13/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 635077 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1906238-08	Carbon, Total Organic	CCV		Surface Water	24.34 mg/L	10 mL	24.3 mg/L	1					5/10/19 20:51:00	N	III
KQ1906238-09	Carbon, Total Organic	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 16:37:00	N	III
KQ1906238-10	Carbon, Total Organic	LCS		Surface Water	24.84 mg/L	10 mL	24.8 mg/L	1	0.07	0.50	99		5/10/19 16:51:00	N	III
KQ1906238-11	Carbon, Total Organic	MS	K1904071-001	Surface Water	25.61 mg/L	10 mL	25.6 mg/L	1	0.07	0.50	102		5/10/19 10:15:00	N	III
KQ1906238-13	Carbon, Total Organic	DUP	K1904065-001	Water	7.10 mg/L	10 mL	710 mg/L	100	7	50		1	5/10/19 10:59:00	N	II
KQ1906238-14	Carbon, Total Organic	DUP	K1904094-001	Ground Water	10.73 mg/L	10 mL	10.7 mg/L	1	0.07	0.50		1	5/10/19 11:27:00	N	II
KQ1906238-15	Carbon, Total Organic	DUP	K1904094-002	Ground Water	7.72 mg/L	10 mL	7.72 mg/L	1	0.07	0.50		3	5/10/19 11:55:00	N	II
KQ1906238-16	Carbon, Total Organic	DUP	K1904094-003	Ground Water	2.19 mg/L	10 mL	2.19 mg/L	1	0.07	0.50		18*	5/10/19 12:23:00	N	II
KQ1906238-17	Carbon, Total Organic	DUP	K1904094-004	Ground Water	1.56 mg/L	10 mL	1.56 mg/L	1	0.07	0.50		<1	5/10/19 12:51:00	N	II
KQ1906238-18	Carbon, Total Organic	DUP	K1904094-005	Ground Water	0.83 mg/L	10 mL	0.83 mg/L	1	0.07	0.50		7	5/10/19 13:19:00	N	II
KQ1906238-19	Carbon, Total Organic	DUP	K1904094-006	Ground Water	0.55 mg/L	10 mL	0.55 mg/L	1	0.07	0.50		1	5/10/19 13:47:00	N	II
KQ1906238-20	Carbon, Total Organic	DUP	K1904094-007	Ground Water	2.38 mg/L	10 mL	2.38 mg/L	1	0.07	0.50		9	5/10/19 14:15:00	N	II
KQ1906238-21	Carbon, Total Organic	DUP	K1904133-001	Drinking Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	5/10/19 14:44:00	N	I
KQ1906238-22	Carbon, Total Organic	DUP	K1904163-001	Ground Water	1.27 mg/L	10 mL	1.27 mg/L	1	0.07	0.50		6	5/10/19 17:06:00	N	II
KQ1906238-23	Carbon, Total Organic	DUP	K1904163-002	Ground Water	0.44 mg/L	10 mL	0.44 mg/L J	1	0.07	0.50		8	5/10/19 17:34:00	N	II
KQ1906238-24	Carbon, Total Organic	DUP	K1904163-003	Ground Water	1.33 mg/L	10 mL	1.33 mg/L	1	0.07	0.50		9	5/10/19 18:02:00	N	II
KQ1906238-25	Carbon, Total Organic	DUP	K1904163-004	Ground Water	0.77 mg/L	10 mL	0.77 mg/L	1	0.07	0.50		4	5/10/19 18:30:00	N	II
KQ1906238-26	Carbon, Total Organic	DUP	K1904163-005	Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	5/10/19 18:58:00	N	II
KQ1906238-27	Carbon, Total Organic	DUP	K1904205-001	Water	35.34 mg/L	10 mL	35.3 mg/L	1	0.07	0.50		<1	5/10/19 19:26:00	N	IV
KQ1906238-28	Carbon, Total Organic	DUP	K1904205-002	Water	10.89 mg/L	10 mL	10.9 mg/L	1	0.07	0.50		3	5/10/19 19:55:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 635078 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1904058-001	Carbon, Dissolved Organic (DOC)	N/A		Water	5.20 mg/L	10 mL	5.20 mg/L U	1	0.07	0.50			5/10/19 22:18:00	N	II
K1904058-002	Carbon, Dissolved Organic (DOC)	N/A		Water	2.04 mg/L	10 mL	2.04 mg/L	1	0.07	0.50			5/10/19 22:46:00	N	II
K1904071-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 21:20:00	N	III
KQ1906239-01	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 21:05:00	N	III
KQ1906239-02	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/10/19 23:57:00	N	III
KQ1906239-03	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.18 mg/L	10 mL	24.2 mg/L	1					5/10/19 23:42:00	N	III
KQ1906239-04	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.47 mg/L	10 mL	24.5 mg/L	1					5/11/19 00:41:00	N	III
KQ1906239-05	Carbon, Dissolved Organic (DOC)	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/11/19 00:12:00	N	III
KQ1906239-06	Carbon, Dissolved Organic (DOC)	LCS		Surface Water	25.12 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		5/11/19 00:26:00	N	III
KQ1906239-07	Carbon, Dissolved Organic (DOC)	MS	K1904071-001	Surface Water	24.79 mg/L	10 mL	24.8 mg/L	1	0.07	0.50	99		5/10/19 21:49:00	N	III
KQ1906239-08	Carbon, Dissolved Organic (DOC)	DUP	K1904071-001	Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	5/10/19 21:20:00	N	III
KQ1906239-09	Carbon, Dissolved Organic (DOC)	DUP	K1904058-001	Water	5.13 mg/L	10 mL	5.13 mg/L	1	0.07	0.50		1	5/10/19 22:18:00	N	II
KQ1906239-10	Carbon, Dissolved Organic (DOC)	DUP	K1904058-002	Water	2.09 mg/L	10 mL	2.09 mg/L	1	0.07	0.50		2	5/10/19 22:46:00	N	II
KQ1906239-11	Carbon, Dissolved Organic (DOC)	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			5/11/19 00:56:00	N	III
KQ1906239-12	Carbon, Dissolved Organic (DOC)	CCV		Surface Water	24.34 mg/L	10 mL	24.3 mg/L	1					5/10/19 20:51:00	N	III

05/13/19

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

TOC: 635075, 635076, 635077
DOC: 635078

Schedule: 05092019

Version: 5
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/05/09 18:20 - Thursday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1903942-004.01 4x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
4	Sample	K1904161-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K1904161-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	K1904161-002.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
7	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
8	Sample	K1904159-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1904159-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1904159-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1904159-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1904159-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1904159-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1904158-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1904074-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1904115-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1904181-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1904182-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1904195-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1904195-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1904195-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1904195-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1904195-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1904032-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1904032-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1904071-001.04	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
28	Sample	K1904071-001.04 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1904065-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1904094-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1904094-002.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K1904094-003.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K1904094-004.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1904094-005.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1904094-006.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1904094-007.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1904133-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

05/13/19

Schedule: 05092019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K1904163-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1904163-002.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1904163-003.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1904163-004.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1904163-005.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1904205-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1904205-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	K1904071-001.03 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K1904071-001.03 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
50	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
51	Sample	K1904058-001.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K1904058-002.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
54	Sample	MB4	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	24.926	0.0000	24.9255	24.9255	24.9	5/9/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/9/2019
4	MB1	1	0.000	0.0000	0.0000	0	<0.5	5/9/2019
5	MB1d	1	0.000	0.0000	0.0000	0	<0.5	5/9/2019
6	MB1t	1	0.000	0.0000	0.0000	0	<0.5	5/9/2019
7	MB1q	1	0.000	0.0000	0.0000	0	<0.5	5/9/2019
8	[TOC] LCS [24ppm]	1	25.023	0.0000	25.0234	25.0234	25	5/9/2019
9	[TOC] LCS [24ppm]d	1	25.037	0.0000	25.0368	25.0368	25.04	5/9/2019
10	[TOC] LCS [24ppm]t	1	25.510	0.0000	25.5102	25.5102	25.51	5/9/2019
11	[TOC] LCS [24ppm]q	1	25.466	0.0000	25.4658	25.4658	25.5	5/9/2019
12	K1903942-004	1	7.196	0.0000	7.1956	7.1956	7.20	5/9/2019
13	K1903942-004d	1	7.224	0.0000	7.2244	7.2244	7.22	5/9/2019
14	K1903942-004t	1	7.260	0.0000	7.2600	7.26	7.26	5/9/2019
15	K1903942-004q	1	7.240	0.0000	7.2403	7.2403	7.2	5/9/2019
16	C] CCV 25 ppm [25 p	1	25.032	0.0000	25.0320	25.032	25.0	5/10/2019
17	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
18		1		0.0000	0.0000	0	<0.5	
19		1		0.0000	0.0000	0	<0.5	
20		1		0.0000	0.0000	0	<0.5	
21		1		0.0000	0.0000	0	<0.5	
22		1		0.0000	0.0000	0	<0.5	
23		1		0.0000	0.0000	0	<0.5	
24		1		0.0000	0.0000	0	<0.5	
25		1		0.0000	0.0000	0	<0.5	

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: BCD	Date Analyzed 5/9/19		
Reviewed By: [signature]	Date Reviewed 05/13/19		

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	24.926	0.0000	24.9255	24.9255	24.9	5/9/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/9/2019
4	K1904161-001	1	2.097	0.0000	2.0968	2.0968	2.1	5/9/2019
5	K1904161-001d	1	1.998	0.0000	1.9982	1.9982	2.0	5/9/2019
6	K1904161-002	1	0.981	0.0000	0.9807	0.9807	0.98	5/9/2019
7	K1904161-002d	1	1.055	0.0000	1.0549	1.0549	1.1	5/9/2019
8	K1904161-002ms	1	24.540	0.0000	24.5398	24.5398	25	5/9/2019
9	K1904159-001	1	1.741	0.0000	1.7408	1.7408	1.74	5/10/2019
10	K1904159-001d	1	1.691	0.0000	1.6907	1.6907	1.69	5/10/2019
11	K1904159-002	1	1.801	0.0000	1.8009	1.8009	1.8	5/10/2019
12	K1904159-002d	1	1.867	0.0000	1.8665	1.8665	1.87	5/10/2019
13	C] CCV 25 ppm [25 p	1	25.032	0.0000	25.0320	25.032	25.03	5/10/2019
14	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
15	K1904159-003	1	1.134	0.0000	1.1342	1.1342	1.1	5/10/2019
16	K1904159-003d	1	1.081	0.0000	1.0813	1.0813	1.1	5/10/2019
17	K1904159-004	1	1.932	0.0000	1.9323	1.9323	1.93	5/10/2019
18	K1904159-004d	1	1.783	0.0000	1.7833	1.7833	1.8	5/10/2019
19	K1904159-005	1	1.103	0.0000	1.1028	1.1028	1.1	5/10/2019
20	K1904159-005d	1	1.055	0.0000	1.0552	1.0552	1.06	5/10/2019
21	K1904159-006	1	1.984	0.0000	1.9835	1.9835	1.98	5/10/2019
22	K1904159-006d	1	2.051	0.0000	2.0509	2.0509	2.1	5/10/2019
23	K1904158-001	1	1.456	0.0000	1.4556	1.4556	1.5	5/10/2019
24	K1904158-001d	1	1.420	0.0000	1.4195	1.4195	1.42	5/10/2019
25	K1904074-001	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

	date	time
Analyzed By: BB	Date Analyzed 5/9/19	
Reviewed By: [signature]	Date Reviewed 05/13/19	

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1904074-001d	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
27	K1904115-001	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
28	K1904115-001d	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
29	K1904181-001	1	0.967	0.0000	0.9668	0.9668	1.0	5/10/2019
30	K1904181-001d	1	0.988	0.0000	0.9879	0.9879	1.0	5/10/2019
31	K1904182-001	1	0.307	0.0000	0.3070	0.307	<0.5	5/10/2019
32	K1904182-001d	1	0.349	0.0000	0.3492	0.3492	<0.5	5/10/2019
33	K1904195-001	1	2.139	0.0000	2.1392	2.1392	2.1	5/10/2019
34	K1904195-001d	1	2.130	0.0000	2.1302	2.1302	2.1	5/10/2019
35	C] CCV 25 ppm [25 p	1	24.678	0.0000	24.6781	24.6781	24.7	5/10/2019
36	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
37	MB2	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
38	[TOC] LCS [24ppm]	1	25.280	0.0000	25.2799	25.2799	25.3	5/10/2019
39	K1904195-002	1	3.342	0.0000	3.3419	3.3419	3.3	5/10/2019
40	K1904195-002d	1	3.252	0.0000	3.2522	3.2522	3.3	5/10/2019
41	K1904195-003	1	1.359	0.0000	1.3590	1.359	1.4	5/10/2019
42	K1904195-003d	1	1.303	0.0000	1.3034	1.3034	1.3	5/10/2019
43	K1904195-004	1	1.560	0.0000	1.5595	1.5595	1.6	5/10/2019
44	K1904195-004d	1	1.529	0.0000	1.5285	1.5285	1.5	5/10/2019
45	K1904195-005	1	1.572	0.0000	1.5717	1.5717	1.6	5/10/2019
46	K1904195-005d	1	1.576	0.0000	1.5758	1.5758	1.6	5/10/2019
47	K1904032-001	1	16.993	0.0000	16.9929	16.9929	17.0	5/10/2019
48	K1904032-001d	1	17.339	0.0000	17.3388	17.3388	17.3	5/10/2019
49	K1904032-002	1	0.853	0.0000	0.8526	0.8526	0.9	5/10/2019
50	K1904032-002d	1	0.607	0.0000	0.6072	0.6072	0.6	5/10/2019

Analyzed By: BCP	Date Analyzed 5/9/19
Reviewed By: [signature]	Date Reviewed 05/13/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	24.678	0.0000	24.6781	24.6781	24.7	5/10/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
4	K1904071-001	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
5	K1904071-001ms	1	25.607	0.0000	25.6068	25.6068	25.6	5/10/2019
6	C] CCV 25 ppm [25 p	1	24.850	0.0000	24.8503	24.8503	24.85	5/10/2019
7	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
8	K1904065-001	100	7.024	0.0000	7.0242	702.42	702	5/10/2019
9	K1904065-001d	100	7.101	0.0000	7.1012	710.12	710.12	5/10/2019
10	K1904094-001	1	10.841	0.0000	10.8408	10.8408	10.84	5/10/2019
11	K1904094-001d	1	10.730	0.0000	10.7297	10.7297	10.7	5/10/2019
12	K1904094-002	1	7.994	0.0000	7.9937	7.9937	7.99	5/10/2019
13	K1904094-002d	1	7.722	0.0000	7.7217	7.7217	7.72	5/10/2019
14	K1904094-003	1	2.623	0.0000	2.6225	2.6225	2.62	5/10/2019
15	K1904094-003d	1	2.194	0.0000	2.1943	2.1943	2.2	5/10/2019
16	K1904094-004	1	1.569	0.0000	1.5686	1.5686	1.6	5/10/2019
17	K1904094-004d	1	1.562	0.0000	1.5615	1.5615	1.56	5/10/2019
18	K1904094-005	1	0.893	0.0000	0.8930	0.893	0.9	5/10/2019
19	K1904094-005d	1	0.833	0.0000	0.8325	0.8325	0.8	5/10/2019
20	K1904094-006	1	0.547	0.0000	0.5466	0.5466	0.55	5/10/2019
21	K1904094-006d	1	0.555	0.0000	0.5545	0.5545	0.55	5/10/2019
22	K1904094-007	1	2.595	0.0000	2.5951	2.5951	2.6	5/10/2019
23	K1904094-007d	1	2.383	0.0000	2.3830	2.383	2.4	5/10/2019
24	K1904133-001	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
25	K1904133-001d	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

	date	time
Analyzed By: BCP	Date Analyzed 5/9/19	
Reviewed By: [signature]	Date Reviewed 05/13/19	

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	C] CCV 25 ppm [25 p	1	24.021	0.0000	24.0206	24.0206	24.02	5/10/2019
27	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
28	MB3	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
29	[TOC] LCS [25ppm]	1	24.837	0.0000	24.8366	24.8366	24.8	5/10/2019
30	K1904163-001	1	1.347	0.0000	1.3470	1.347	1.3	5/10/2019
31	K1904163-001d	1	1.270	0.0000	1.2703	1.2703	1.3	5/10/2019
32	K1904163-002	1	0.473	0.0000	0.4733	0.4733	<0.5	5/10/2019
33	K1904163-002d	1	0.435	0.0000	0.4353	0.4353	<0.5	5/10/2019
34	K1904163-003	1	1.451	0.0000	1.4509	1.4509	1.5	5/10/2019
35	K1904163-003d	1	1.326	0.0000	1.3264	1.3264	1.3	5/10/2019
36	K1904163-004	1	0.743	0.0000	0.7433	0.7433	0.7	5/10/2019
37	K1904163-004d	1	0.771	0.0000	0.7707	0.7707	0.8	5/10/2019
38	K1904163-005	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
39	K1904163-005d	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
40	K1904205-001	1	35.335	0.0000	35.3351	35.3351	35.3	5/10/2019
41	K1904205-001d	1	35.343	0.0000	35.3429	35.3429	35.3	5/10/2019
42	K1904205-002	1	11.166	0.0000	11.1655	11.1655	11.2	5/10/2019
43	K1904205-002d	1	10.888	0.0000	10.8882	10.8882	10.9	5/10/2019
44	C] CCV 25 ppm [25 p	1	24.341	0.0000	24.3410	24.341	24.3	5/10/2019
45	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By: BCP	Date Analyzed 5/9/19
Reviewed By: [signature]	Date Reviewed 05/13/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	24.341	0.0000	24.3410	24.341	24.3	5/10/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
4	K1904071-001	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
5	K1904071-001d	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
6	K1904071-001ms	1	24.793	0.0000	24.7933	24.7933	24.79	5/10/2019
7	K1904058-001	1	5.199	0.0000	5.1992	5.1992	5.2	5/10/2019
8	K1904058-001d	1	5.131	0.0000	5.1305	5.1305	5	5/10/2019
9	K1904058-002	1	2.041	0.0000	2.0408	2.0408	2.04	5/10/2019
10	K1904058-002d	1	2.087	0.0000	2.0873	2.0873	2.09	5/10/2019
11	C] CCV 25 ppm [25 p	1	24.183	0.0000	24.1833	24.1833	24.2	5/10/2019
12	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
13	MB4	1	0.000	0.0000	0.0000	0	<0.5	5/11/2019
14	[TOC] LCS [25ppm]	1	25.116	0.0000	25.1159	25.1159	25.12	5/11/2019
15	C] CCV 25 ppm [25 p	1	24.467	0.0000	24.4668	24.4668	24.5	5/11/2019
16	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/11/2019
17		1		0.0000	0.0000	0	<0.5	
18		1		0.0000	0.0000	0	<0.5	
19		1		0.0000	0.0000	0	<0.5	
20		1		0.0000	0.0000	0	<0.5	
21		1		0.0000	0.0000	0	<0.5	
22		1		0.0000	0.0000	0	<0.5	
23		1		0.0000	0.0000	0	<0.5	
24		1		0.0000	0.0000	0	<0.5	
25		1		0.0000	0.0000	0	<0.5	

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: BCD		Date Analyzed 5/9/19	
Reviewed By: [signature]		Date Reviewed 05/13/19	

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	C] CCV 25 ppm [25 p	1	24.850	0.0000	24.8503	24.8503	24.85	5/10/2019
52	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	5/10/2019
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By:	BCP	Date Analyzed	5/9/19
Reviewed By:	[signature]	Date Reviewed	05/13/19

00938937

Fusion Report - 05092019
Thursday, May 09, 2019 05:16 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/05/11 10:32 - Saturday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	05092019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5)		
Comment:			

Report Results

05/13/19

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/05/09 17:16

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.44	18.05	4.61	49.62	05:23
2	TC Clean	12.76	15.75	2.98	50.07	04:06
3	TC Clean	3.34	6.39	3.05	50.05	03:47
4	TC Clean	2.50	5.39	2.89	50.09	03:49

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/05/09 17:38

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.82	15.92	3.10	49.61	05:12
2	TC Clean	6.95	9.93	2.98	50.09	04:04
3	TC Clean	2.20	5.33	3.13	50.11	03:48

4	TC Clean	1.56	4.76	3.20	50.10	03:47

Sample Type: Clean — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/05/09 18:00

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.57	15.67	3.10	49.61	05:13
2	TC Clean	4.30	7.43	3.13	50.09	04:07
3	TC Clean	1.51	4.69	3.18	50.10	03:48
4	TC Clean	1.08	4.23	3.15	50.09	03:47

Sample Type: Blank (Creating v1254) — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2019/05/09 18:22

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.85	3.84	2.99	49.57	05:13
2	TC Clean	3.42	6.48	3.06	50.09	04:05
3	TC Clean	1.50	4.35	2.85	50.10	03:48
4	TC Clean	1.24	4.27	3.02	50.06	03:47
5	Reagent Blank	2.93	5.90	2.97	50.07	05:06
6	Acid Blank	1.16	4.17	3.01	49.68	05:28

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.0113 ppm	0.0000 ppm	0.0000%	2019/05/09 18:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0113	0.1129	8.79	11.90	3.12	50.02	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.9255 ppm (PASS)	0.0000 ppm	0%	2019/05/09 19:10

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9255	249.2546	178.66	181.55	2.89	49.97	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/09 19:25

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.20	9.26	3.06	49.99	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/09 19:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.18	9.22	3.04	49.93	10:28
2	TOC	0.0000	0.0000	6.23	9.32	3.10	50.00	10:30
3	TOC	0.0000	0.0000	6.19	9.09	2.90	49.98	10:27
4	TOC	0.0000	0.0000	6.08	8.93	2.85	49.95	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 5

			Concentration			Min / Max				

	Pos	BAT	(ppm)	Dil	Sample ID	(% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.2591 ppm (PASS)	0.2650 ppm	1.05%	2019/05/09 20:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.0234	250.2342	179.32	182.28	2.96	49.97	10:28
C	TOC	25.0 ppm	2	25.0368	250.3683	179.41	182.30	2.89	50.03	10:29
C	TOC	25.0 ppm	3	25.5102	255.1017	182.62	185.61	2.99	49.95	10:27
C	TOC	25.0 ppm	4	25.4658	254.6583	182.32	185.36	3.04	49.95	10:26

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample

From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/09 21:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.68	10.55	2.87	49.97	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K1903942-004.01	7.2301 ppm	0.0272 ppm	0.3800%	2019/05/09 21:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.1956	71.9565	57.56	60.57	3.02	49.90	10:25
2	TOC	7.2244	72.2437	57.75	60.87	3.12	49.86	10:27
3	TOC	7.2600	72.6003	57.99	61.03	3.03	49.83	10:26
4	TOC	7.2403	72.4029	57.86	60.80	2.94	49.83	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1904161-001.01	2.0475 ppm	0.0697 ppm	3.4000%	2019/05/09 22:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0968	20.9675	22.94	25.83	2.89	49.81	10:32
2	TOC	1.9982	19.9819	22.28	25.18	2.90	49.79	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC)	CAS_salt_010711	CAS_salt_010711

(v1254) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	K1904161-002.01	1.0178 ppm	0.0525 ppm	5.1600%	2019/05/09 23:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9807	9.8065	15.37	18.28	2.91	49.78	10:29
2	TOC	1.0549	10.5490	15.87	18.77	2.90	49.78	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1904161-002.01 ms	24.5398 ppm	0.0000 ppm	0.0000%	2019/05/09 23:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.5398	245.3979	175.29	178.28	2.99	49.97	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/09 23:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.00	9.93	2.93	49.84	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1904159-001.01	1.7158 ppm	0.0354 ppm	2.0600%	2019/05/10 00:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7408	17.4083	20.53	23.49	2.96	49.82	10:27
2	TOC	1.6907	16.9074	20.19	23.18	2.99	49.81	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1904159-002.01	1.8337 ppm	0.0464 ppm	2.5300%	2019/05/10 00:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8009	18.0093	20.94	23.83	2.89	49.85	10:25
2	TOC	1.8665	18.6649	21.38	24.33	2.95	49.81	10:28

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.0320 ppm (PASS)	0.0000 ppm	0%	2019/05/10 01:03

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.0320	250.3197	179.38	182.41	3.03	49.81	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/10 01:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.33	8.36	3.03	49.81	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K1904159-003.01	1.1077 ppm	0.0374 ppm	3.3800%	2019/05/10 01:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1342	11.3416	16.41	19.31	2.90	49.84	10:27
2	TOC	1.0813	10.8127	16.05	18.92	2.87	49.84	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◆	11	TOC	K1904159-004.01	1.8578 ppm	0.1054 ppm	5.6700%	2019/05/10 02:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9323	19.3234	21.83	24.60	2.77	49.87	10:28
2	TOC	1.7833	17.8325	20.82	23.69	2.88	49.88	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	K1904159-005.01	1.0790 ppm	0.0336 ppm	3.1200%	2019/05/10 02:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.1028	11.0278	16.20	19.19	2.99	49.91	10:26
2	TOC	1.0552	10.5520	15.87	18.88	3.01	49.90	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	K1904159-006.01	2.0172 ppm	0.0477 ppm	2.3700%	2019/05/10 02:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9835	19.8346	22.18	25.24	3.07	49.94	10:28
2	TOC	2.0509	20.5094	22.63	25.44	2.81	49.94	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	14	TOC	K1904158-001.01	1.4376 ppm	0.0255 ppm	1.7800%	2019/05/10 03:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4556	14.5561	18.59	21.55	2.96	49.95	10:25
2	TOC	1.4195	14.1952	18.35	21.36	3.01	49.96	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	15	TOC	K1904074-001.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/10 03:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.25	8.10	2.85	49.99	10:26
2	TOC	0.0000	0.0000	5.00	7.99	2.99	50.00	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1904115-001.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/10 04:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.08	10.91	2.83	50.02	10:29
2	TOC	0.0000	0.0000	7.91	10.91	3.00	50.02	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1904181-001.02	0.9773 ppm	0.0149 ppm	1.5200%	2019/05/10 04:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9668	9.6681	15.27	18.24	2.96	50.04	10:27
2	TOC	0.9879	9.8787	15.42	18.17	2.75	50.07	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K1904182-001.01	0.3281 ppm	0.0299 ppm	9.1100%	2019/05/10 05:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3070	3.0696	10.80	13.58	2.78	50.07	10:27
2	TOC	0.3492	3.4924	11.08	13.90	2.82	50.08	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K1904195-001.01	2.1347 ppm	0.0064 ppm	0.3000%	2019/05/10 05:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1392	21.3918	23.23	26.05	2.81	50.12	10:28
2	TOC	2.1302	21.3019	23.17	26.10	2.93	50.16	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6781 ppm (PASS)	0.0000 ppm	0%	2019/05/10 06:13

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6781	246.7810	176.98	179.94	2.96	50.08	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/10 06:28

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.32	8.14	2.81	50.00	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/10 06:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.45	7.30	2.85	49.96	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.2799 ppm (PASS)	0.0000 ppm	0%	2019/05/10 06:57

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

	Type									
C	TOC	25.0 ppm	1	25.2799	252.7991	181.06	184.05	2.99	49.92	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1904195-002.01	3.2970 ppm	0.0634 ppm	1.9200%	2019/05/10 07:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3419	33.4190	31.40	34.35	2.96	49.87	10:30
2	TOC	3.2522	32.5218	30.79	33.64	2.85	49.85	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1904195-003.01	1.3312 ppm	0.0393 ppm	2.9500%	2019/05/10 07:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3590	13.5897	17.94	20.69	2.76	49.83	10:30
2	TOC	1.3034	13.0343	17.56	20.31	2.75	49.79	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1904195-004.01	1.5440 ppm	0.0219 ppm	1.4200%	2019/05/10 08:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5595	15.5948	19.30	22.12	2.82	49.78	10:31
2	TOC	1.5285	15.2854	19.09	21.94	2.86	49.83	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1904195-005.01	1.5738 ppm	0.0029 ppm	0.1900%	2019/05/10 08:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5717	15.7170	19.38	22.17	2.79	49.81	10:26
2	TOC	1.5758	15.7583	19.41	22.15	2.75	49.82	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1904032-001.01	17.1658 ppm	0.2446 ppm	1.4200%	2019/05/10 09:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	16.9929	169.9287	124.06	126.97	2.91	49.81	10:25
2	TOC	17.3388	173.3878	126.41	129.43	3.03	49.80	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1904032-002.01	0.7299 ppm	0.1735 ppm	23.7800%	2019/05/10 09:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8526	8.5263	14.50	17.57	3.08	49.83	10:29
2	TOC	0.6072	6.0720	12.83	15.74	2.91	49.81	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1904071-001.04	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/10 10:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.03	8.16	3.13	49.84	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1904071-001.04 ms	25.6068 ppm	0.0000 ppm	0.0000%	2019/05/10 10:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.6068	256.0683	182.53	185.41	2.88	49.75	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.8503 ppm (PASS)	0.0000 ppm	0%	2019/05/10 10:29

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.8503	248.5032	178.14	181.05	2.91	49.75	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/10 10:44

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.62	8.36	2.75	50.00	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1904065-001.01 100x	7.0627 ppm	0.0545 ppm	0.7700%	2019/05/10 10:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.0242	70.2417	56.39	59.23	2.84	49.99	10:29
2	TOC	7.1012	71.0121	56.91	59.88	2.97	49.96	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K1904094-001.03	10.7852 ppm	0.0785 ppm	0.7300%	2019/05/10 11:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.8408	108.4079	82.30	85.29	2.99	50.10	10:27
2	TOC	10.7297	107.2971	81.54	84.48	2.93	49.97	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	K1904094-002.03	7.8577 ppm	0.1923 ppm	2.4500%	2019/05/10 11:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.9937	79.9368	62.97	65.86	2.89	50.12	10:29
2	TOC	7.7217	77.2173	61.13	64.13	3.01	50.14	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K1904094-003.03	2.4084 ppm	0.3028 ppm	12.5700%	2019/05/10 12:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6225	26.2254	26.51	29.25	2.74	50.15	10:30
2	TOC	2.1943	21.9428	23.61	26.59	2.99	50.18	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K1904094-004.03	1.5651 ppm	0.0050 ppm	0.3200%	2019/05/10 12:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5686	15.6861	19.36	22.35	2.99	50.15	10:27
2	TOC	1.5615	15.6154	19.31	22.14	2.83	50.19	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1904094-005.03	0.8627 ppm	0.0428 ppm	4.9600%	2019/05/10 13:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8930	8.9300	14.77	17.56	2.79	50.19	10:26
2	TOC	0.8325	8.3245	14.36	17.24	2.88	50.24	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1904094-006.03	0.5506 ppm	0.0055 ppm	1.0000%	2019/05/10 13:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5466	5.4665	12.42	15.15	2.72	50.17	10:29

2	TOC	0.5545	5.5446	12.48	15.29	2.82	50.27	10:32

Dilution 1:10 | **Blank Contribution** (TC) 8.7114 (IC) (v1254) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	36	TOC	K1904094-007.03	2.4891 ppm	0.1500 ppm	6.0300%	2019/05/10 14:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5951	25.9514	26.33	29.18	2.86	50.24	10:32
2	TOC	2.3830	23.8299	24.89	27.81	2.93	50.17	10:28

Dilution 1:10 | **Blank Contribution** (TC) 8.7114 (IC) (v1254) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	37	TOC	K1904133-001.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/10 14:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.06	9.93	2.87	50.18	10:30
2	TOC	0.0000	0.0000	6.79	9.66	2.87	50.27	10:26

Dilution 1:10 | **Blank Contribution** (TC) 8.7114 (IC) (v1254) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	38	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/10 15:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.10	6.93	2.84	50.17	10:26
2	TOC	0.0000	0.0000	4.38	7.17	2.79	50.20	10:26
3	TOC	0.0000	0.0000	3.94	6.84	2.90	50.29	10:27
4	TOC	0.0000	0.0000	4.00	6.84	2.84	50.18	10:25

Dilution 1:10 | **Blank Contribution** (TC) 8.7114 (IC) (v1254) | **Method** CAS_salt_010711 (v4) | **Calibration** CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.0206 ppm (PASS)	0.0000 ppm	0%	2019/05/10 16:07

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

00938951

B	TOC	25 ppm	1	24.0206	240.2062	172.51	175.43	2.91	50.21	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/10 16:22

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	4.58	7.57	2.99	50.28	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/10 16:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	3.74	6.63	2.89	50.29	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.8366 ppm (PASS)	0.0000 ppm	0%	2019/05/10 16:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.8366	248.3662	178.05	181.00	2.95	50.22	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	K1904163-001.03	1.3087 ppm	0.0543 ppm	4.1500%	2019/05/10 17:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3470	13.4704	17.85	20.81	2.96	50.24	10:27
2	TOC	1.2703	12.7029	17.33	20.14	2.80	50.32	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	41	TOC	K1904163-002.03	0.4543 ppm	0.0269 ppm	5.9200%	2019/05/10 17:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4733	4.7328	11.92	14.78	2.86	50.30	10:27
2	TOC	0.4353	4.3528	11.67	14.56	2.89	50.26	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	42	TOC	K1904163-003.03	1.3887 ppm	0.0880 ppm	6.3400%	2019/05/10 18:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4509	14.5090	18.56	21.11	2.55	50.25	10:25
2	TOC	1.3264	13.2641	17.72	20.82	3.11	50.38	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	43	TOC	K1904163-004.03	0.7570 ppm	0.0194 ppm	2.5600%	2019/05/10 18:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7433	7.4332	13.76	16.65	2.89	50.30	10:31
2	TOC	0.7707	7.7072	13.94	16.96	3.02	50.15	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	44	TOC	K1904163-005.03	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/10 18:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	0.0000	0.0000	6.58	9.46	2.88	50.19	10:31
2	TOC	0.0000	0.0000	6.58	9.46	2.88	50.17	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	K1904205-001.01	35.3390 ppm	0.0055 ppm	0.0200%	2019/05/10 19:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	35.3351	353.3511	248.56	251.48	2.91	50.19	10:29
2	TOC	35.3429	353.4292	248.62	251.54	2.92	50.19	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1904205-002.01	11.0269 ppm	0.1960 ppm	1.7800%	2019/05/10 19:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.1655	111.6548	84.50	87.46	2.96	50.23	10:29
2	TOC	10.8882	108.8823	82.62	85.63	3.01	50.24	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/10 20:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.84	9.73	2.89	50.28	10:25
2	TOC	0.0000	0.0000	5.94	8.90	2.96	50.30	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.3410 ppm (PASS)	0.0000 ppm	0%	2019/05/10 20:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3410	243.4104	174.69	177.57	2.88	50.20	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/10 21:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.28	8.13	2.85	50.21	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample

From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	48	TOC	K1904071-001.03 doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/10 21:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.64	7.58	2.95	50.27	10:27
2	TOC	0.0000	0.0000	4.26	7.41	3.14	50.11	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	49	TOC	K1904071-001.03 ms doc	24.7933 ppm	0.0000 ppm	0.0000%	2019/05/10 21:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	24.7933	247.9333	177.01	180.01	3.00	50.13	10:35

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	50	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/10 22:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.08	8.09	3.01	50.14	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	K1904058-001.02 doc	5.1648 ppm	0.0485 ppm	0.9400%	2019/05/10 22:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1992	51.9917	44.00	46.91	2.91	50.03	10:29
2	TOC	5.1305	51.3051	43.54	46.51	2.97	50.13	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	52	TOC	K1904058-002.02 doc	2.0640 ppm	0.0329 ppm	1.5900%	2019/05/10 22:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0408	20.4077	22.56	25.53	2.97	49.97	10:28
2	TOC	2.0873	20.8732	22.88	25.74	2.86	49.92	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	53	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/10 23:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.02	7.87	2.85	49.96	10:28
2	TOC	0.0000	0.0000	5.13	8.18	3.05	49.91	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.1833 ppm (PASS)	0.0000 ppm	0%	2019/05/10 23:42

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1833	241.8326	173.62	176.53	2.91	50.03	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria	Do Nothing	CAS_salt_010711	CAS_salt_010711	50 ppmC

met.	(v4)	(v30)

Sample Type: Check Standard --> CCB — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/10 23:57

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.18	7.99	2.81	49.93	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	54	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/05/11 00:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.23	7.15	2.92	49.89	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7114 (IC) (v1254)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	25.1159 ppm (PASS)	0.0000 ppm	0%	2019/05/11 00:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.1159	251.1594	179.95	182.90	2.96	49.87	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.4668 ppm (PASS)	0.0000 ppm	0%	2019/05/11 00:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4668	244.6685	175.54	178.68	3.14	49.84	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 5

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/05/11 00:56

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	4.96	7.91	2.94	49.84	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1253	1.3423	1.1900	0.0000	0.0000	0.0000	2019/05/07 15:06	Fusion1 (Fusion1)
v1254	0.9757	1.1630	0.0000	0.0000	0.0000	2019/05/09 18:55	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version:	v30	Calibration curve formula:	TOC: y = 6.788x + 9.463
Ver Creation:	2019/03/05 17:42	r^2 value:	TOC: r^2 = 0.99963
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

00938958

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4 Operator: Fusion1 (Fusion1)
Ver Creation: 2019/02/21 17:57
Comment:

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

00938959

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/05/11 01:13

ALS Environmental

StarLIMS Run: 635075, 635076, 635077, 635078

Analysis: TOC

Method: 415.1, SM 5310 C, 9060, 9060A

CCV: 11-GEN-05-77K 50 ppm LCS: 11-GEN-05-77D 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-77M

21 % H3PO4: 11-GEN-05-77O

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: NA

Analyzed By: BED	Date Analyzed: 5/11/19-5/10/19-5/9/19
Reviewed By: Thank you	Date Reviewed: 05/13/19

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1913332, 1913338, 1913342, 1913345

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2253(239553)

General Set Information: There were ten field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1913338001 was analyzed and reported from a 1:100 dilution. Field sample 1913342004 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 653683) was less than 1/2 the CRDL. The recovery for the LCS (653684) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 1913342006/007. 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 653681) is reported from the analysis of the Laboratory Control Sample (LCS – 653684) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Stephen Brose	May 22, 2019
Analyst	Date

ANALYTICAL REPORT

Report Date: May 22, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1913345**
Project ID: HS19050397
Purchase Order: HS19050397
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18-24-SP650_050719_BIX	1913345001	05/07/19	05/09/19	

ANALYTICAL REPORT

Workorder: 34-1913345
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18-24-SP650_050719_BIX** | Sampling Site: NA | Collected: 05/07/2019
Lab ID: 1913345001 | Media: 125 mL Nalgene | Received: 05/09/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2253 (HBN: 239553) | **Percent Solid:** NA
Analyzed: 05/21/2019 11:10 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 239553)**

Field sample 1913338001 was analyzed and reported from a 1:100 dilution. Field sample 1913342004 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Stephen Brose 05/22/2019 06:38	/S/ Thomas Bosch 05/22/2019 11:11

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1913345
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1913345

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2253 (HBN: 239553)
		Prepared By:	NA	**Analyzed By:**	Stephen Brose

Blank

LMB: 653683
Analyzed: 05/21/2019 08:29
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 653684
Analyzed: 05/21/2019 08:02
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.08	4.00	102	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1913342005	**MS:**	1913342006	**MSD:**	1913342007
Analyzed:	05/21/2019 10:03	**Analyzed:**	05/21/2019 10:17	**Analyzed:**	05/21/2019 10:30
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.78	4	94.4	78.8	123.8	3.72	93.0	1.51	0.0	20.0

Comments

Field sample 1913338001 was analyzed and reported from a 1:100 dilution. Field sample 1913342004 was analyzed and reported from a 1:10 dilution. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Stephen Brose	/S/ Thomas Bosch
05/22/2019 06:38	05/22/2019 11:11

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

W 1913345

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

18698/#2

SAMPLING STATE: **Dept of Defense**

COC ID: **11270**

1913345

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19050397
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19050397-02**	**LH18/24-SP650_050719_BIX**	**Water**	**07 May 2019 14:00**
	SUB_Perch-6850			16 May 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Mangum Date/Time: 5/8/19 18:00

Received By: Lulu Warnto IACS Date/Time: 5/9/19 1018

Cooler ID(s): _____ Temperature(s): _____

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19050397	***Split:***	**Workorder ID:** 1913345	**Level:** ENV_LVL4	**Requested Analysis**	
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly		
Comments:			**Preservatives**		
			COOL		
			Containers		

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	EPA 6850, DoD QSM															
1	05/07/2019 14:00	LH18-24-SP650_050719_BIX	1913345001		Water	A	1	A															
2																							
3																							
4																							
5																							
6																							
7																							
8																							
9																							
10																							

80 of 163

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	05/09/2019 10:18	ALS Sample Receiving	Sample Login
Julie Warath	5/9/19 1400	14B	storage
14B	5/20/19 1400	[signature]	COC Analysis

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00938968

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston — Project/Task/Site: 1913345

Date/Time of Receipt: 5/9/19 1018 — Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA	
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA	
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA	
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA	

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 - 9390	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Lilu Worth (Signature) — Julie Worth (Printed Name) — 5/9/19 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159463-494 RIT2 EXP 01/20

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 08MAY19
ACTWGT: 21.30 LB
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19050397/398/401/403 RJ

FedEx Express

J181111808050101uv

THU - 09 MAY 3:00P
STANDARD OVERNIGHT

TRK# 0201 **4809 7833 6238**

AX BTFA

84123
UT-US **SLC**

Batch Worklist

Batch: ELMS/ 2253
Rule: EPA 6850, DoD QSM Water

Created: 5/20/2019 06:13
Analyst: S. Brose

Instrument:
Status: WP

HBN: 239553

Workorder: 1913332 [ENV_LVL4]
Workorder: 1913338 [ENV_LVL4]
Workorder: 1913342 [ENV_LVL4]
Workorder: 1913345 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	653680	CCV for HBN 239553 [ELMS/2253]				CCV	3		E685041C3Q	6214		5/22/2019	
2	653681	RLVS for HBN 239553 [ELMS/2253				RLVS	3		E685041C3Q	6214		5/22/2019	
3	653682	ICS for HBN 239553 [ELMS/2253]				ICS	3		E6850..D3Q	6214		5/22/2019	
4	653683	LMB for HBN 239553 [ELMS/2253]				LMB	3		E6850Q413Q	6214		5/22/2019	
5	653684	LCS for HBN 239553 [ELMS/2253]				LCS	3		E6850Q413Q	6214		5/22/2019	
6	1913332001	LH18/24-SP650_050719_BIX				SAMPLE	3	1913332001-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
7	1913338001	LH18/24-SP140_050719				SAMPLE	3	1913338001-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
8	1913342001	50WW10-190507				SAMPLE	3	1913342001-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
9	1913342002	50WW09-190507				SAMPLE	3	1913342002-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
10	1913342003	50WW09-190507-FD				FLDDUP	3	1913342003-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
11	1913342004	50WW08-190507				SAMPLE	3	1913342004-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
12	1913342005	50WW23-190507				SAMPLE	3	1913342005-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
13	1913342006	50WW23-190507MS				MS	3	1913342006-A	E6850Q413Q	5480		5/22/2019	
14	1913342007	50WW23-190507MSD				MSD	3	1913342007-A	E6850Q413Q	5480		5/22/2019	
15	1913342008	50WW24-190507				SAMPLE	3	1913342008-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
16	1913342009	50WW05-190507				SAMPLE	3	1913342009-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
17	1913345001	LH18-24-SP650_050719_BIX				SAMPLE	3	1913345001-A	E6850Q41.3	5480	6/4/2019	5/22/2019	
18	653685	CCV for HBN 239553 [ELMS/2253]				CCV	3		E685041C3Q	6214		5/22/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1913332(001), 1913338(001), 1913342(001-009), 1913345(001)
ELMS Batch/HBN ID: 2253 (239553)
Prep Date: 05/21/2019 Analysis Date: 05/21/2019 Analyst: S. Brose
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\MAY\21MAY19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:
Water: Samples were prepared by SAB. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: **LCMS04** Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 653684; Target = 4.0µg/L. ASTM type II water was used for LMB 653683.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1913342006/007 (Client ID: 50WW23-190507). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:
1) Results reported in µg/L. Field samples 1913338001 and 1913342004 required 1:100 and 1:10 dilutions respectively. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\MAY\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\239553-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 653681) is reported from the analysis of the Laboratory Control Sample (LCS – 653684) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, many of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS/2253 HBN: 238553 Sample Set IDs if Applicable: 191332/38/42/45	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	SB	TB
Standards traceability checked and meets criteria	SB	TB
Standard curve coefficients evaluated and meet criteria	SB	TB
ICVs analyzed and meet acceptance criteria	SB	TB
CCVs analyzed and meet acceptance criteria	SB	TB
Retention Time Windows checked	SB	TB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	SB	TB
Method Preparation Blanks analyzed and meet acceptance criteria	SB	TB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	SB	TB
RLVS analyzed	SB	TB
Preparation and analysis hold times met	SB	TB
Preparation deviations and re-preparations noted when performed	SB	TB
Analysis deviations and re-analyses noted when performed	SB	TB
Sample dilution factors noted on reports	SB	TB
Electronic records in HBN transcription accuracy and completeness checked	SB	TB
Preparation and analysis calculations checked	SB	TB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	SB	TB
Manual integrations checked	SB	TB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

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New Haven, CT 06513
USA

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CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Report: C:\HPCHEM\1\DATA\21MAY19D\21MAY19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	653680 CCV@25	Vial 71	1	Control	1	2.40704e6	8.594	23.99302
*	653684 QC@4.0	Vial 72	1	Control	2	3.96639e5	8.823	4.08274
*	653682 ICS@4.0	Vial 73	1	Control	3	3.14960e5	8.612	3.74421
*	653683 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1913332001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	1913338001 100	Vial 76	1	Sample	6	3.99368e6	8.959	4178.24239
*	1913342001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1913342002	Vial 78	1	Sample	8	6.18077e5	8.360	7.21259
*	1913342003	Vial 79	1	Sample	9	6.79913e5	8.381	7.76574
*	1913342004 10X	Vial 80	1	Sample	10	2.09294e6	8.642	226.56793
*	1913342005	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1913342006 MS	Vial 82	1	Sample	12	2.30072e5	8.281	3.77790
*	1913342007 SD	Vial 83	1	Sample	13	2.23456e5	8.296	3.72139
*	1913342008	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1913342009	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1913345001	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	653685 CCV@25	Vial 71	1	Control	17	1.93838e6	8.628	23.36594

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	653680 CCV@25	Vial 71	1	Control	1	7.14295e5	8.612	23.97986
*	653684 QC@4.0	Vial 72	1	Control	2	1.27284e5	8.838	4.26129
*	653682 ICS@4.0	Vial 73	1	Control	3	1.12778e5	8.627	4.34080
*	653683 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1913332001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	1913338001 100	Vial 76	1	Sample	6	1.20507e6	8.974	4254.41607
*	1913342001	Vial 77	1	Sample	7	0.00000	0.000	0.00000
*	1913342002	Vial 78	1	Sample	8	2.00267e5	8.373	7.73270
*	1913342003	Vial 79	1	Sample	9	2.18020e5	8.395	8.25365
*	1913342004 10X	Vial 80	1	Sample	10	6.29788e5	8.660	229.37195
*	1913342005	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1913342006 MS	Vial 82	1	Sample	12	8.05070e4	8.292	4.28262
*	1913342007 SD	Vial 83	1	Sample	13	7.84560e4	8.311	4.22992
*	1913342008	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1913342009	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1913345001	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	653685 CCV@25	Vial 71	1	Control	17	5.93941e5	8.647	24.07193

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	653680 CCV@25	Vial 71	1	Control	1	3.05962e5	8.618	5.00000
*	653684 QC@4.0	Vial 72	1	Control	2	3.19796e5	8.842	5.00000
*	653682 ICS@4.0	Vial 73	1	Control	3	2.78118e5	8.629	5.00000
*	653683 LMB	Vial 74	1	Control	4	3.07550e5	8.973	5.00000
*	1913332001	Vial 75	1	Sample	5	2.84011e5	8.455	5.00000
*	1913338001 100	Vial 76	1	Sample	6	2.80006e5	8.979	500.00000
*	1913342001	Vial 77	1	Sample	7	2.92233e5	8.419	5.00000
*	1913342002	Vial 78	1	Sample	8	2.75334e5	8.385	5.00000
*	1913342003	Vial 79	1	Sample	9	2.80514e5	8.402	5.00000
*	1913342004 10X	Vial 80	1	Sample	10	2.82646e5	8.663	50.00000
*	1913342005	Vial 81	1	Sample	11	2.06104e5	8.293	5.00000
*	1913342006 MS	Vial 82	1	Sample	12	2.01255e5	8.301	5.00000
*	1913342007 SD	Vial 83	1	Sample	13	1.98591e5	8.312	5.00000
*	1913342008	Vial 84	1	Sample	14	2.10825e5	8.375	5.00000

Batch Report: C:\HPCHEM\1\DATA\21MAY19D\21MAY19D.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	1913342009	Vial 85	1	Sample	15	2.18072e5	8.384	5.00000
*	1913345001	Vial 86	1	Sample	16	2.17961e5	8.508	5.00000
*	653685 CCV@25	Vial 71	1	Control	17	2.53387e5	8.650	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAY\21MAY19D.S

Sequence Table:

Method and Injection Info Part:

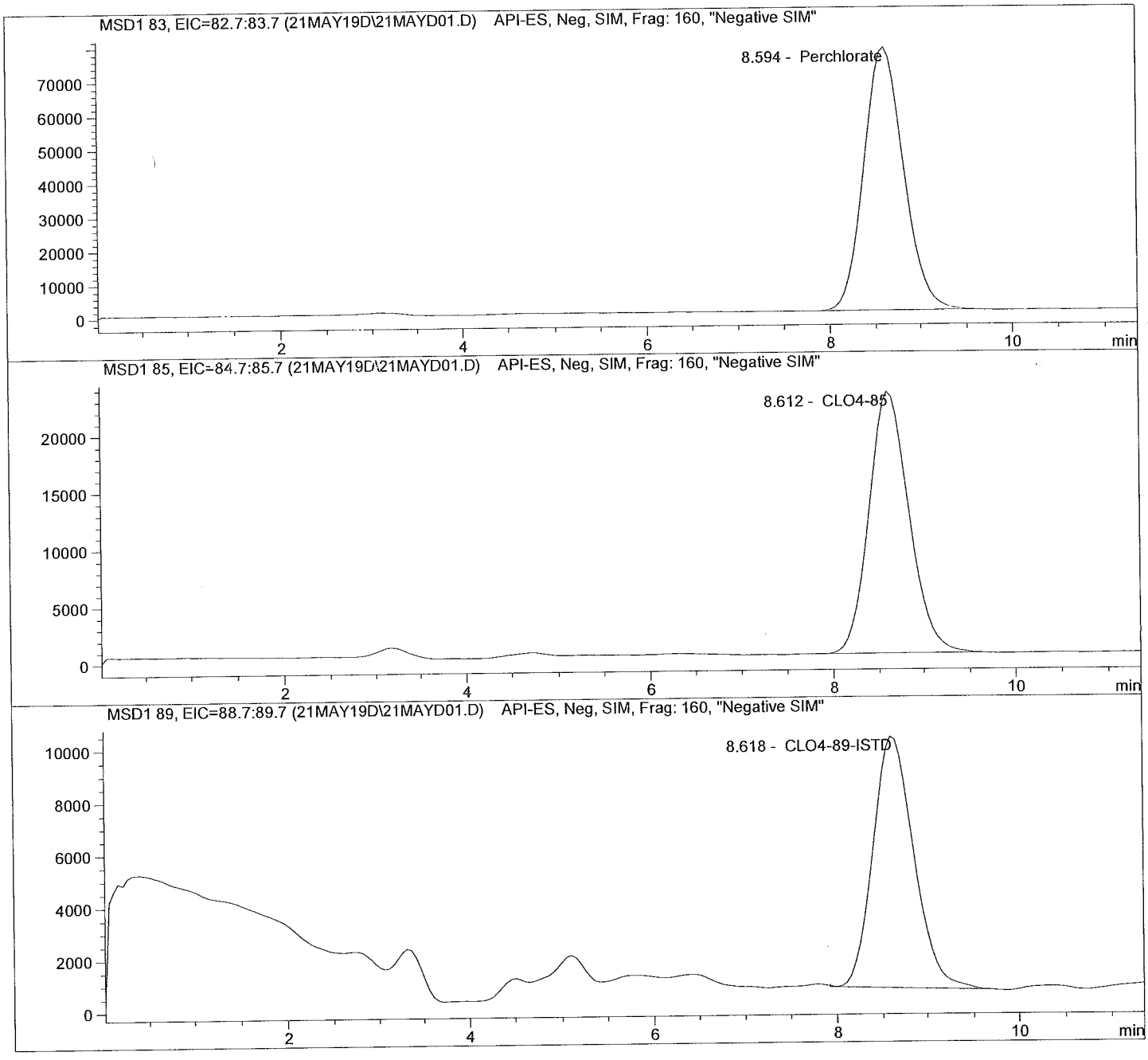
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	653680	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	653684	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	653682	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	653683	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1913332001		CLO4-AQN	1	Sample		
6	Vial 76	1913338001	100	CLO4-AQN	1	Sample		
7	Vial 77	1913342001		CLO4-AQN	1	Sample		
8	Vial 78	1913342002		CLO4-AQN	1	Sample		
9	Vial 79	1913342003		CLO4-AQN	1	Sample		
10	Vial 80	1913342004	10X	CLO4-AQN	1	Sample		
11	Vial 81	1913342005		CLO4-AQN	1	Sample		
12	Vial 82	1913342006	MS	CLO4-AQN	1	Sample		
13	Vial 83	1913342007	SD	CLO4-AQN	1	Sample		
14	Vial 84	1913342008		CLO4-AQN	1	Sample		
15	Vial 85	1913342009		CLO4-AQN	1	Sample		
16	Vial 86	1913345001		CLO4-AQN	1	Sample		
17	Vial 71	653685	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD01.D Sample Name: 653680 CCV@25

Injection Date:	5/21/2019 07:49:32	Seq Line:	1
Sample Name:	653680 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD01.D Sample Name: 653680 CCV@25

Injection Date:	5/21/2019 07:49:32	Seq Line:	1
Sample Name:	653680 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1 MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.594	PBA	2407042.7	23.9930	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.612	BBA	714295.0	23.9799	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.618	BBA	305961.9	5.0000	CLO4-89-ISTD

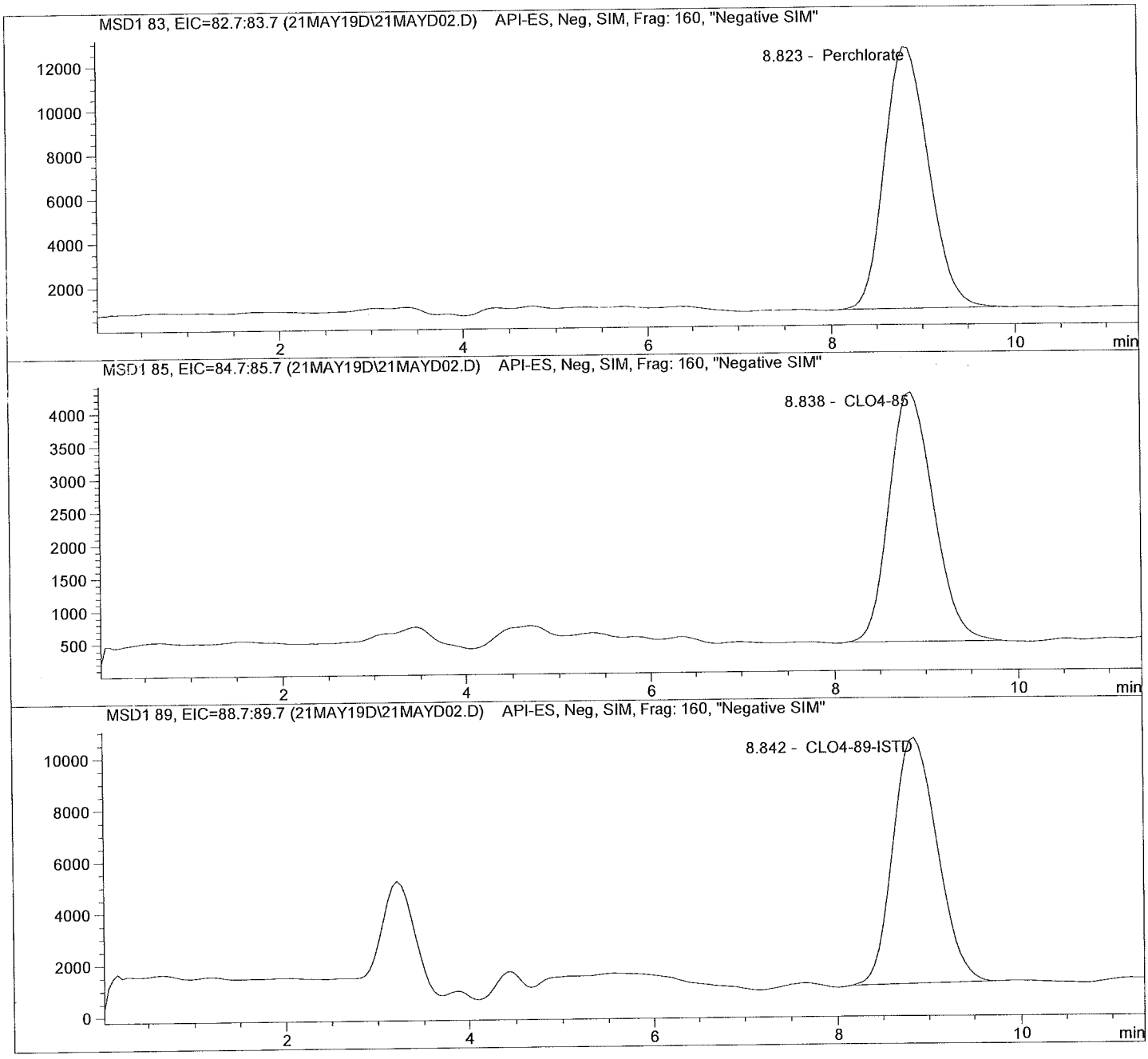
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD02.D Sample Name: 653684 QC@4.0

Injection Date:	5/21/2019 08:02:56	Seq Line:	2
Sample Name:	653684 QC@4.0	Location:	Vial 72
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD02.D Sample Name: 653684 QC@4.0

Injection Date:	5/21/2019 08:02:56	Seq Line:	2
Sample Name:	653684 QC@4.0	Location:	Vial 72
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.823	PBA	396638.7	4.0827	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.838	BBA	127284.0	4.2613	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.842	PBA	319795.5	5.0000	CLO4-89-ISTD

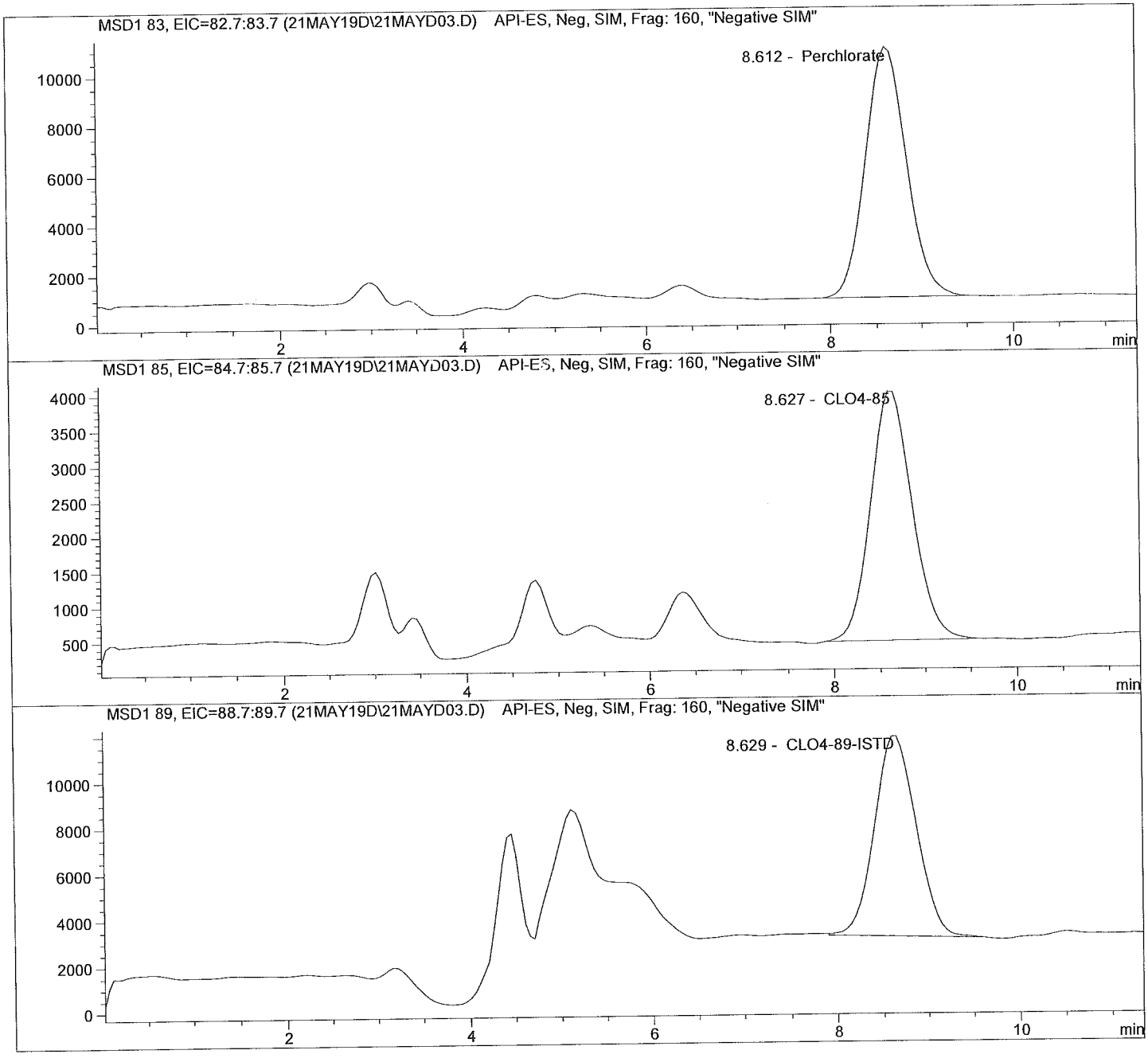
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD03.D Sample Name: 653682 ICS@4.0

Injection Date:	5/21/2019 08:16:19	Seq Line:	3
Sample Name:	653682 ICS@4.0	Location:	Vial 73
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD03.D Sample Name: 653682 ICS@4.0

Injection Date:	5/21/2019 08:16:19	Seq Line:	3
Sample Name:	653682 ICS@4.0	Location:	Vial 73
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.612	PBA	314959.5	3.7442	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.627	PBA	112778.0	4.3408	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.629	BBA	278118.1	5.0000	CLO4-89-ISTD

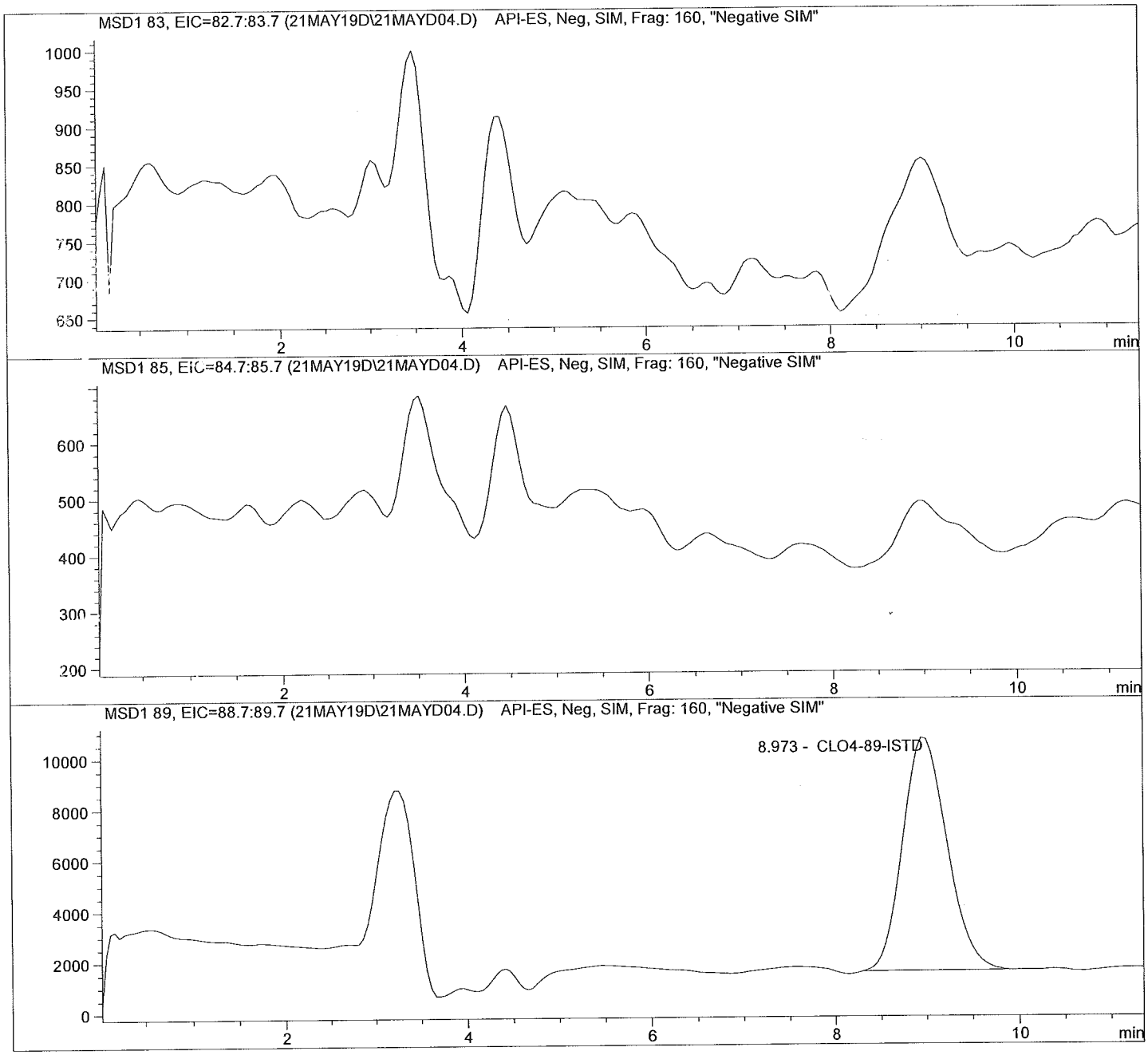
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD04.D Sample Name: 653683 LMB

Injection Date:	5/21/2019 08:29:45	Seq Line:	4
Sample Name:	653683 LMB	Location:	Vial 74
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD04.D Sample Name: 653683 LMB

Injection Date:	5/21/2019 08:29:45	Seq Line:	4
Sample Name:	653683 LMB	Location:	Vial 74
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.973	PBA	307549.9	5.0000	CLO4-89-ISTD

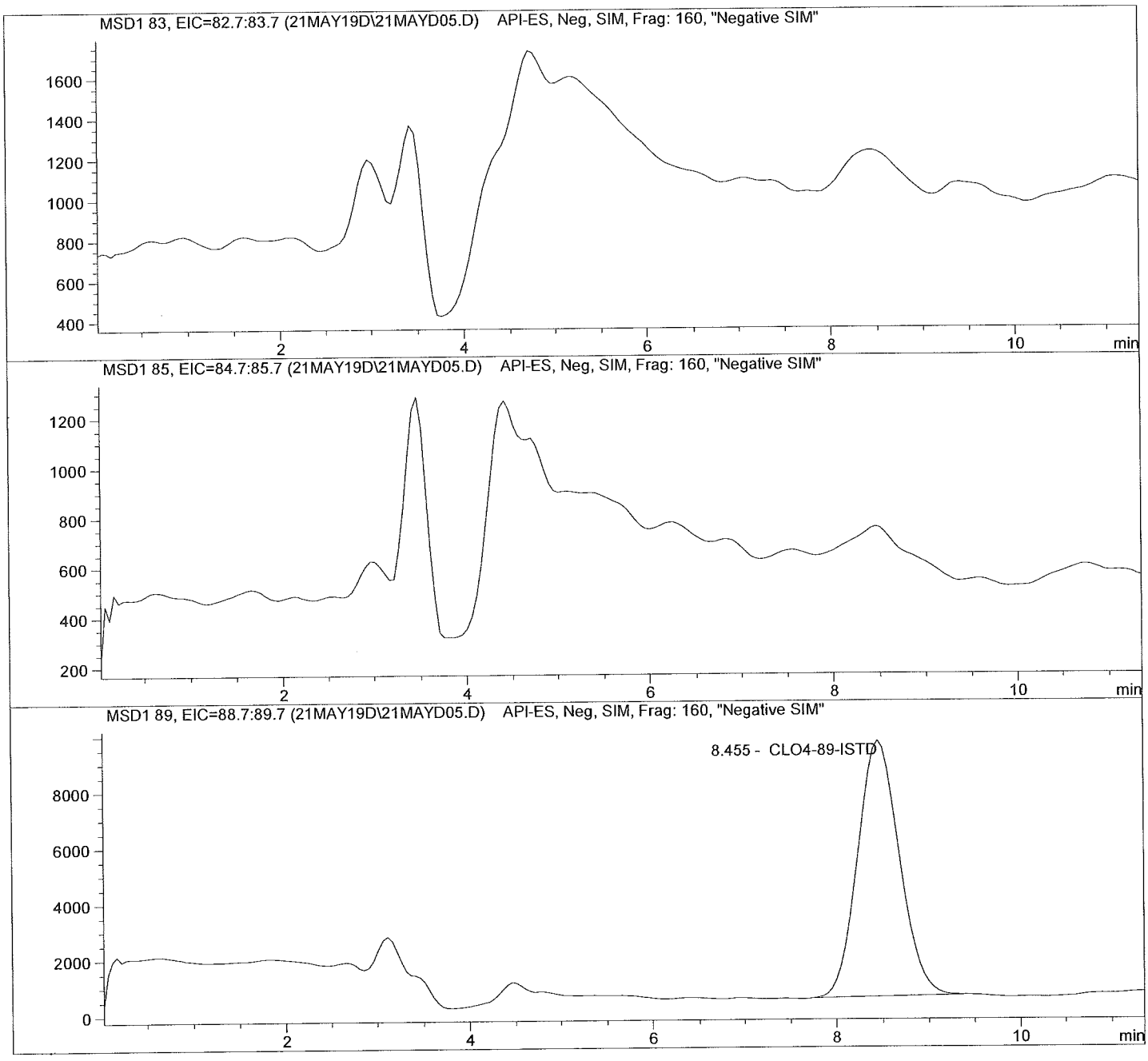
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD05.D Sample Name: 1913332001

Injection Date:	5/21/2019 08:43:07	Seq Line:	5
Sample Name:	1913332001	Location:	Vial 75
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD05.D Sample Name: 1913332001

Injection Date:	5/21/2019 08:43:07	Seq Line:	5
Sample Name:	1913332001	Location:	Vial 75
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.455	PBA	284011.2	5.0000	CLO4-89-ISTD

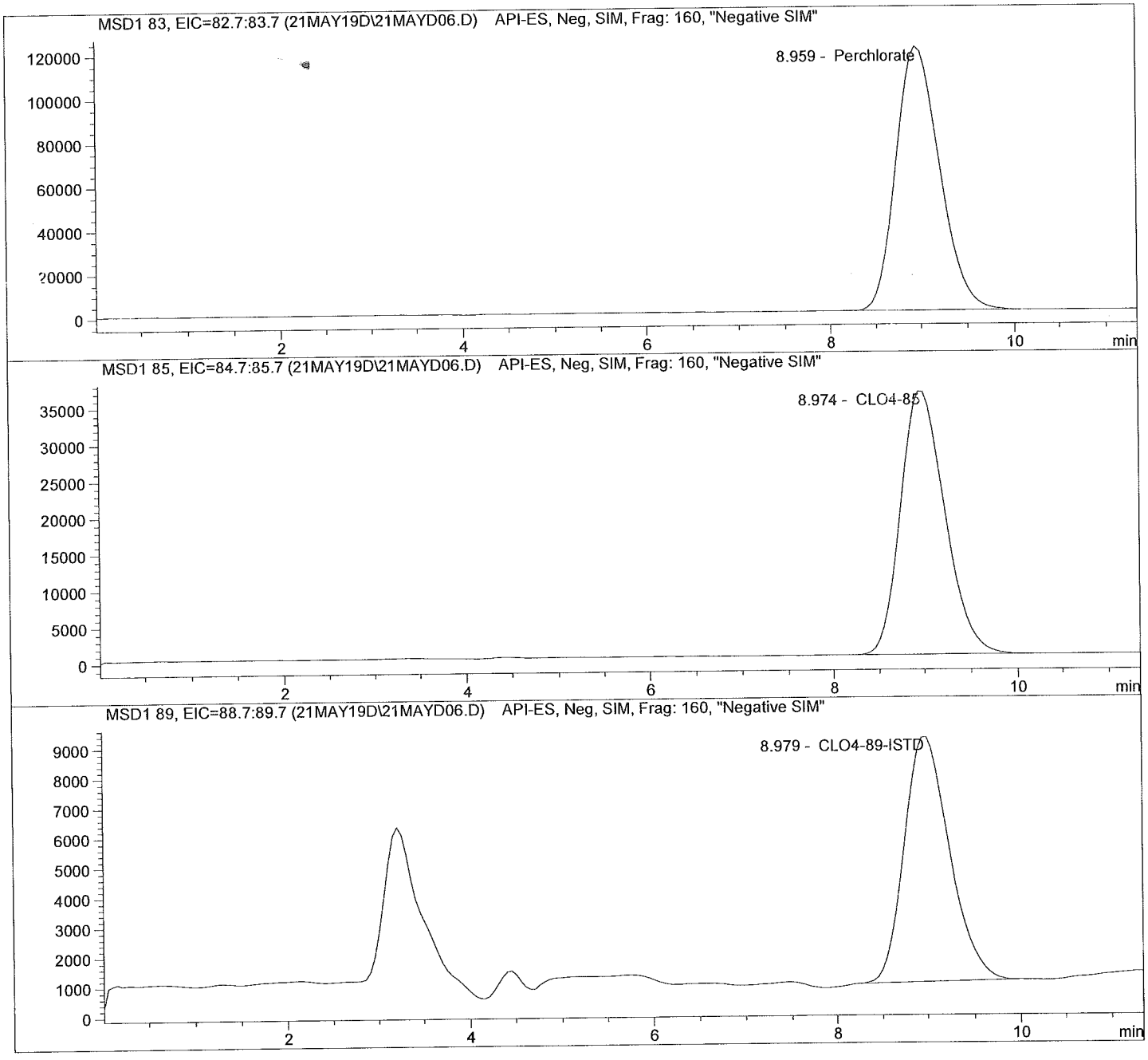
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD06.D Sample Name: 1913338001 100

Injection Date:	5/21/2019 08:56:30	Seq Line:	6
Sample Name:	1913338001 100	Location:	Vial 76
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD06.D Sample Name: 1913338001 100

Injection Date:	5/21/2019 08:56:30	Seq Line:	6
Sample Name:	1913338001 100	Location:	Vial 76
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.959	PBA	3993682.8	4178.2424	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.974	PBA	1205073.2	4254.4161	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.979	BBA	280005.7	500.0000	CLO4-89-ISTD

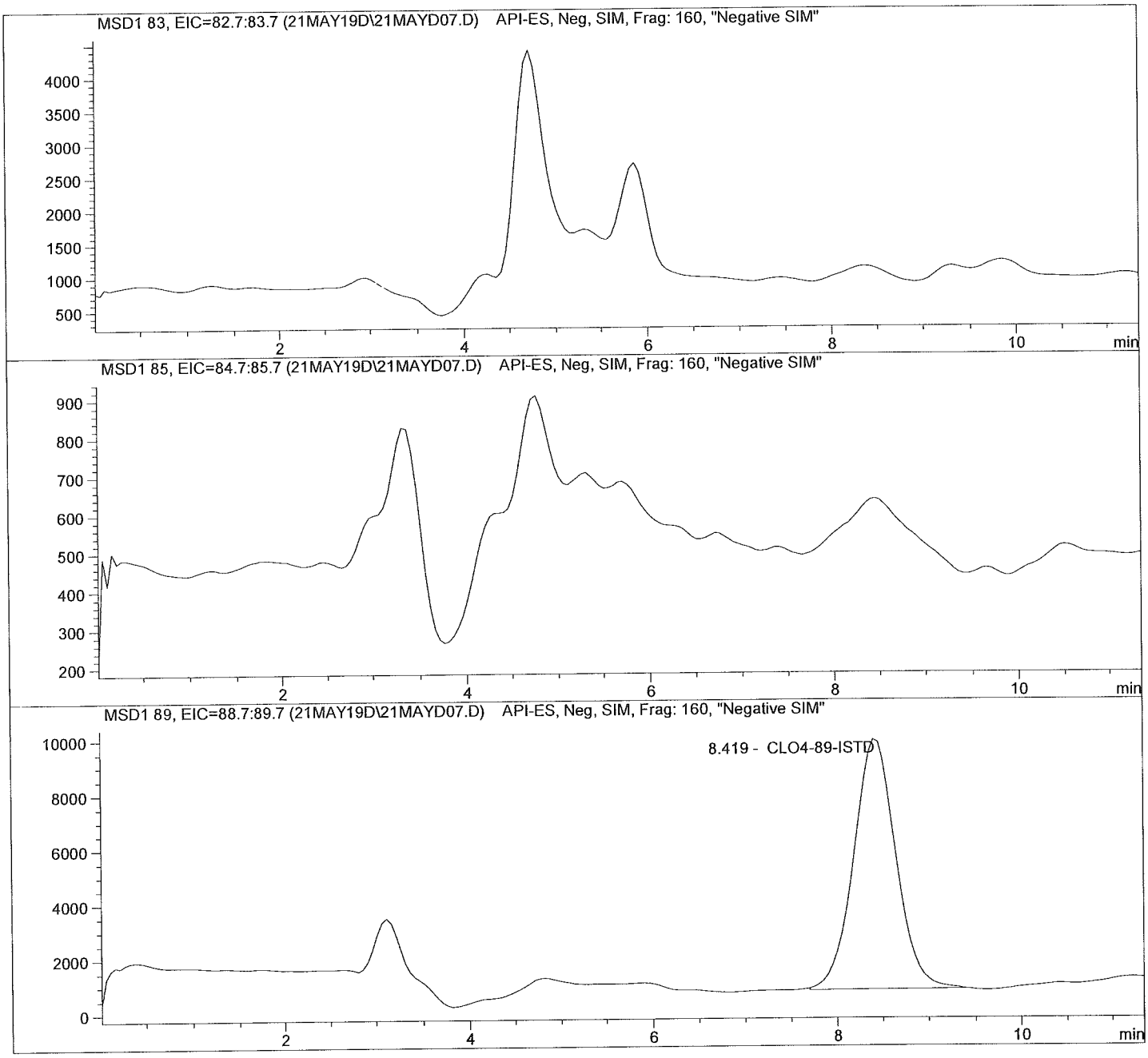
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD07.D Sample Name: 1913342001

Injection Date:	5/21/2019 09:10:03	Seq Line:	7
Sample Name:	1913342001	Location:	Vial 77
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD07.D Sample Name: 1913342001

Injection Date:	5/21/2019 09:10:03	Seq Line:	7
Sample Name:	1913342001	Location:	Vial 77
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.419	BBA	292233.0	5.0000	CLO4-89-ISTD

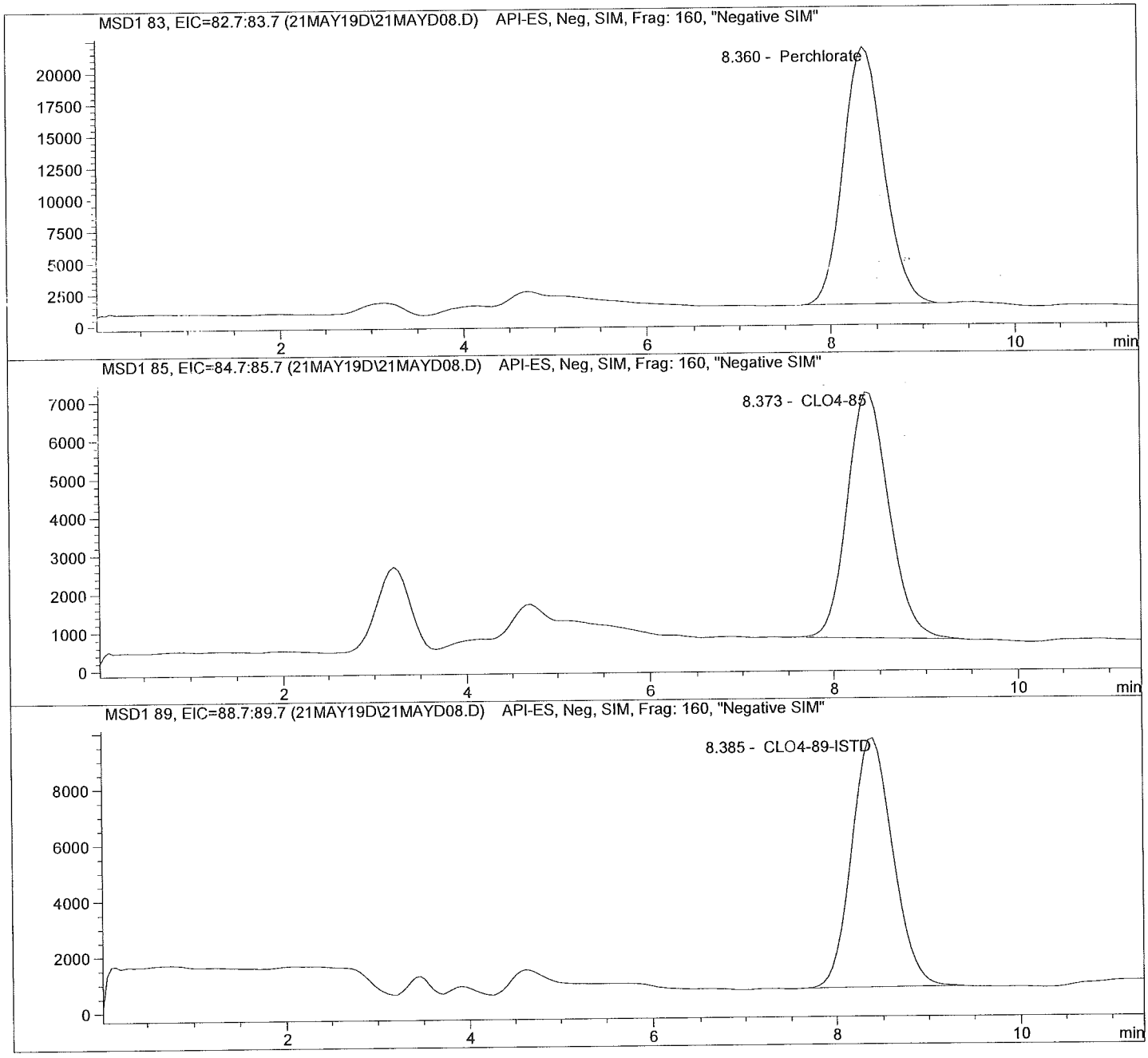
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD08.D Sample Name: 1913342002

Injection Date:	5/21/2019 09:23:25	Seq Line:	8
Sample Name:	1913342002	Location:	Vial 78
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD08.D Sample Name: 1913342002

Injection Date:	5/21/2019 09:23:25	Seq Line:	8
Sample Name:	1913342002	Location:	Vial 78
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.360	PBA	618077.5	7.2126	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.373	BBA	200267.3	7.7327	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.385	PBA	275333.5	5.0000	CLO4-89-ISTD

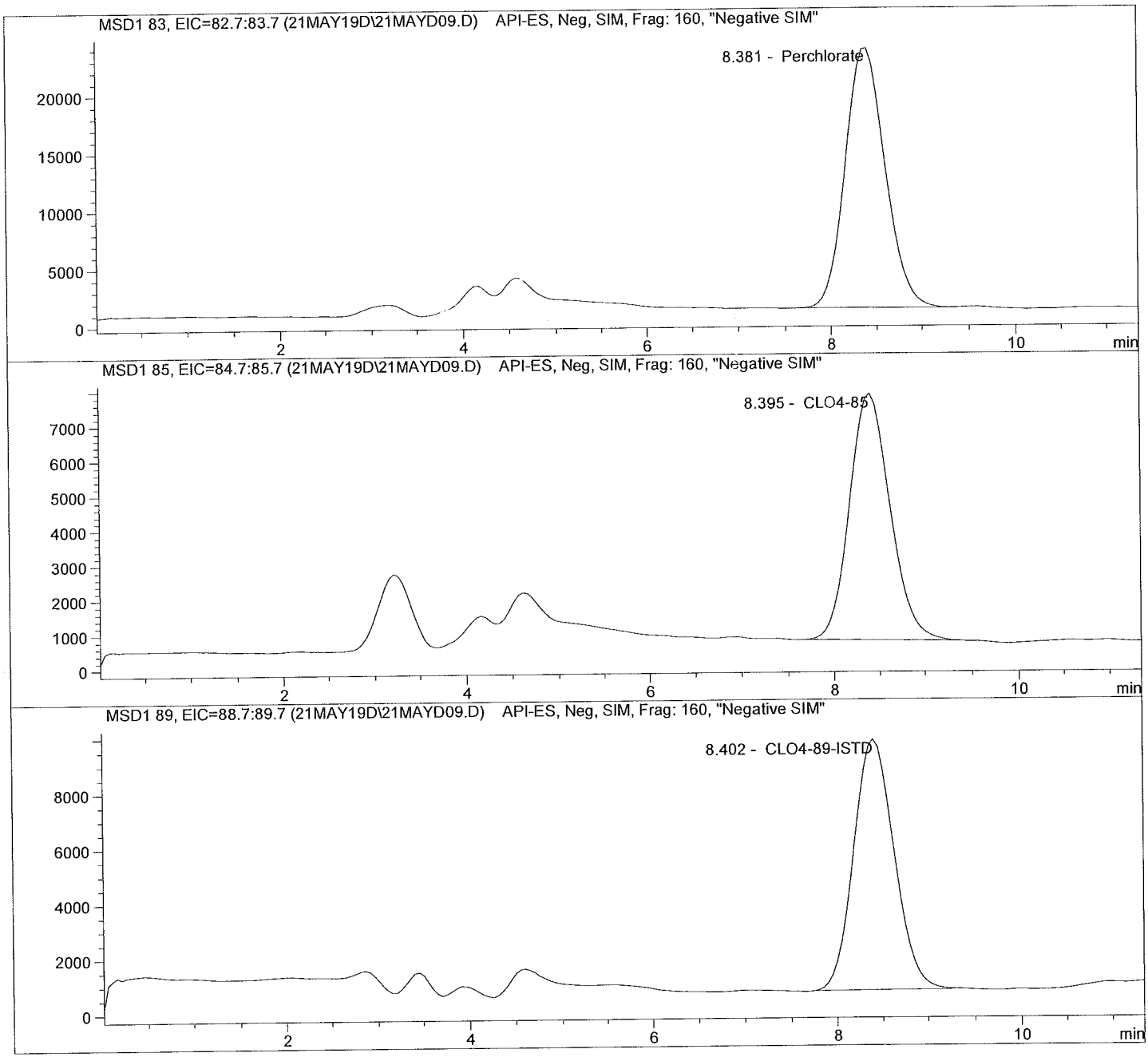
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD09.D Sample Name: 1913342003

Injection Date:	5/21/2019 09:36:53	Seq Line:	9
Sample Name:	1913342003	Location:	Vial 79
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD09.D Sample Name: 1913342003

Injection Date:	5/21/2019 09:36:53	Seq Line:	9
Sample Name:	1913342003	Location:	Vial 79
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.381	PBA	679913.4	7.7657	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.395	PBA	218019.8	8.2536	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.402	PBA	280514.3	5.0000	CLO4-89-ISTD

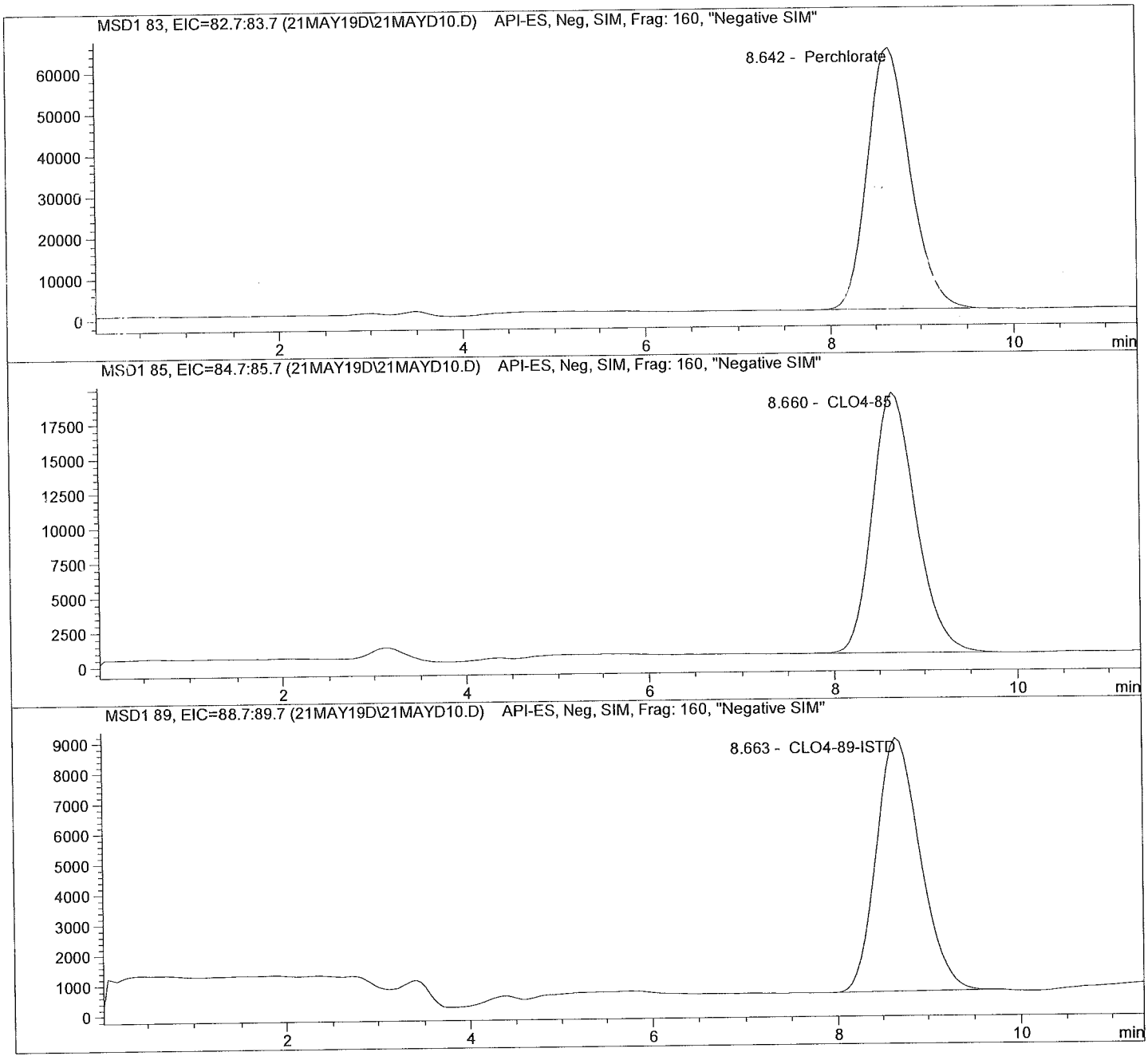
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD10.D Sample Name: 1913342004 10X

Injection Date:	5/21/2019 09:50:15	Seq Line:	10
Sample Name:	1913342004 10X	Location:	Vial 80
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD10.D Sample Name: 1913342004 10X

Injection Date:	5/21/2019 09:50:15	Seq Line:	10
Sample Name:	1913342004 10X	Location:	Vial 80
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.642	BBA	2092939.0	226.5679	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.660	BBA	629787.7	229.3720	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.663	PBA	282645.6	50.0000	CLO4-89-ISTD

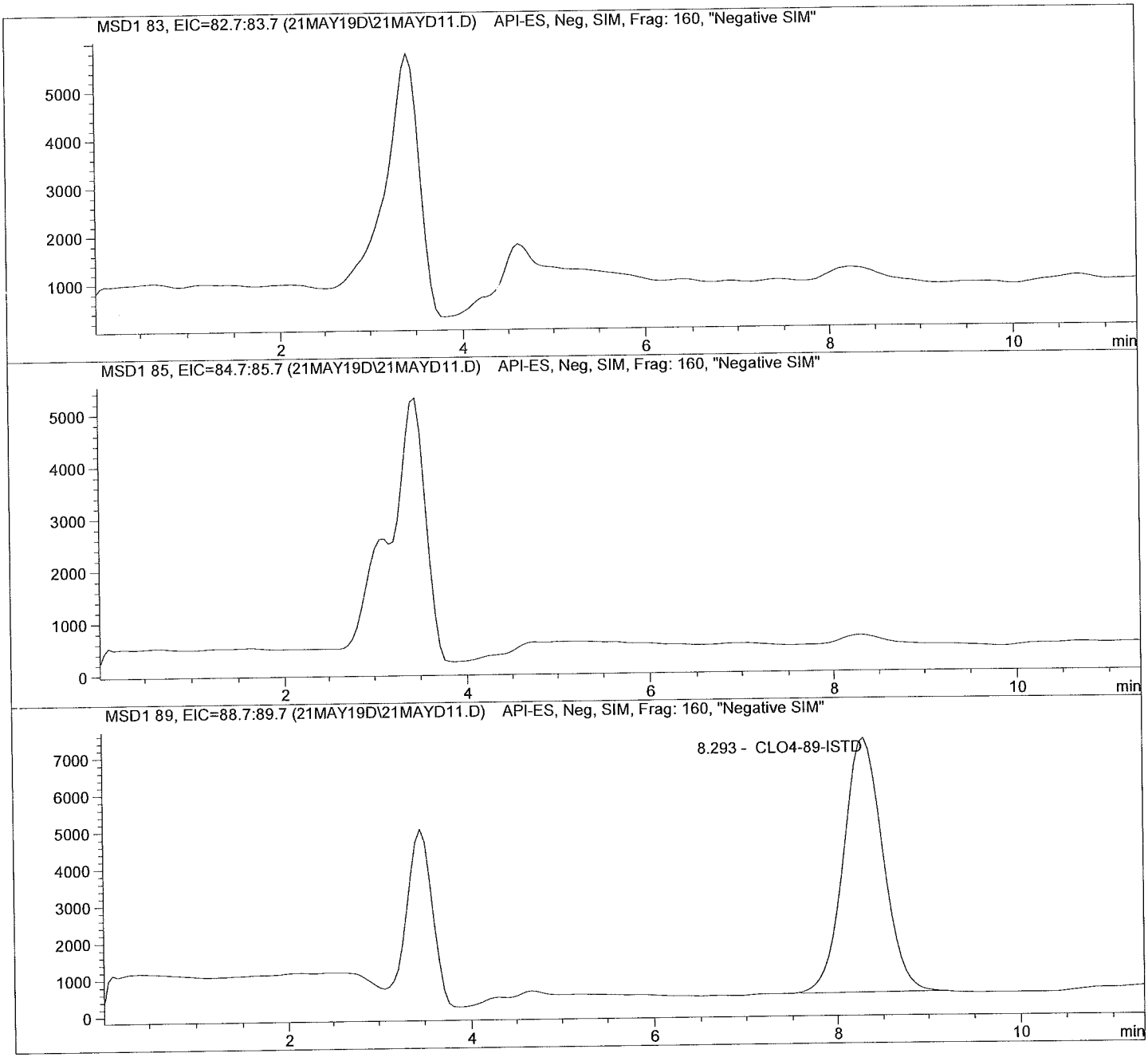
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD11.D Sample Name: 1913342005

Injection Date:	5/21/2019 10:03:44	Seq Line:	11
Sample Name:	1913342005	Location:	Vial 81
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD11.D Sample Name: 1913342005

Injection Date:	5/21/2019 10:03:44	Seq Line:	11
Sample Name:	1913342005	Location:	Vial 81
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.293	BBA	206103.9	5.0000	CLO4-89-ISTD

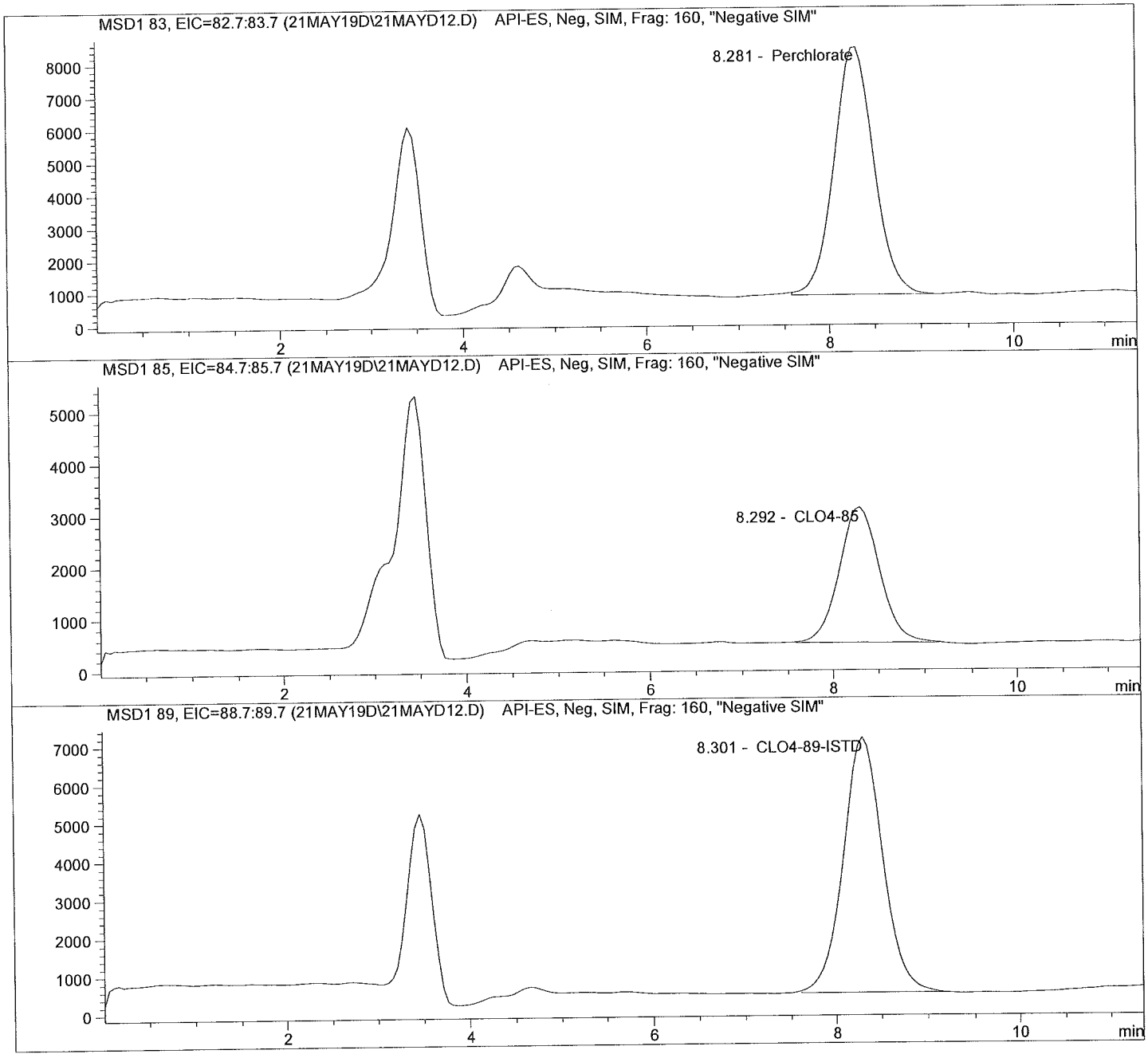
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD12.D Sample Name: 1913342006 MS

Injection Date:	5/21/2019 10:17:04	Seq Line:	12
Sample Name:	1913342006 MS	Location:	Vial 82
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD12.D Sample Name: 1913342006 MS

Injection Date:	5/21/2019 10:17:04	Seq Line:	12
Sample Name:	1913342006 MS	Location:	Vial 82
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.281	BBA	230072.2	3.7779	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.292	BBA	80507.0	4.2826	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.301	BBA	201254.7	5.0000	CLO4-89-ISTD

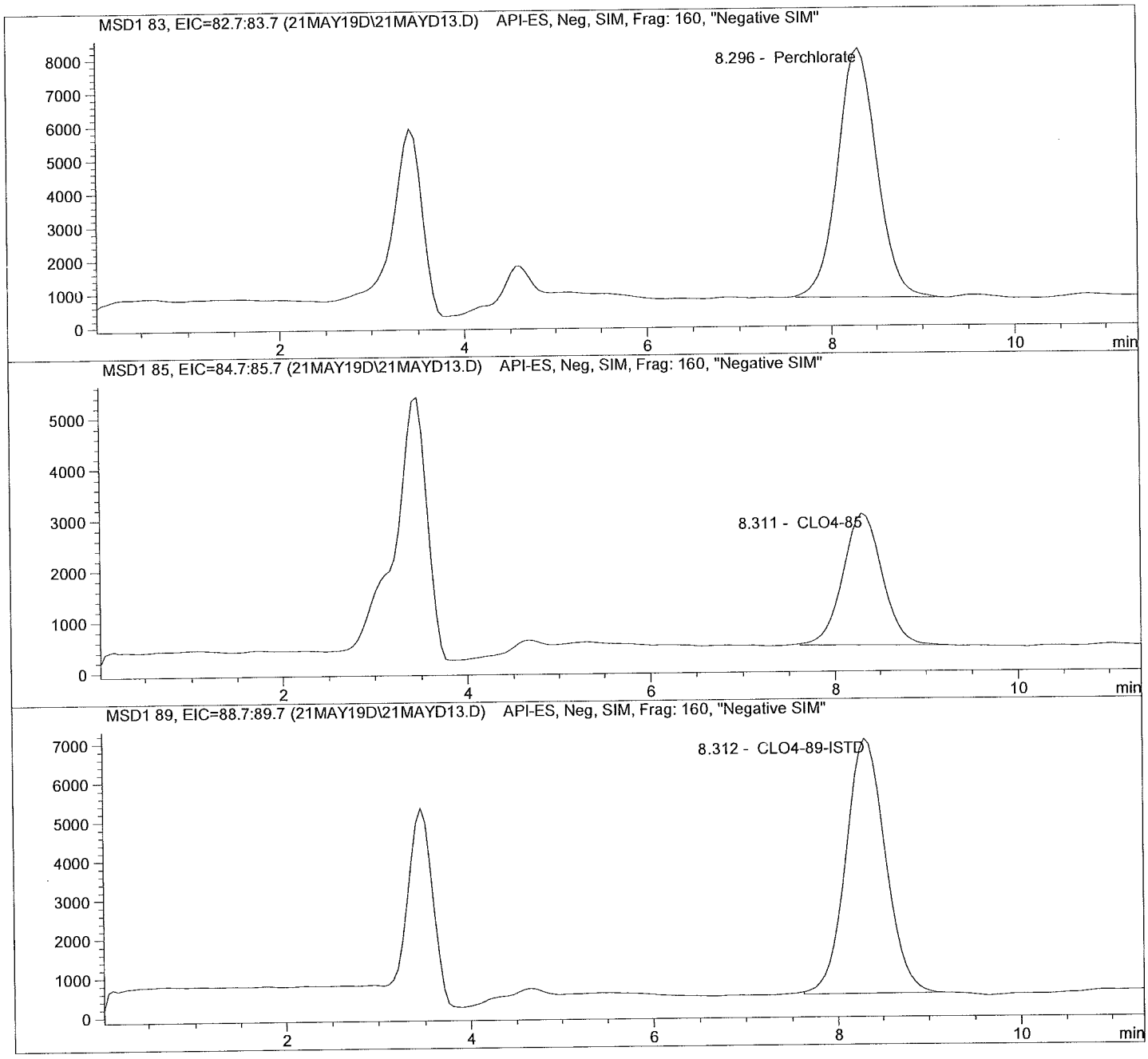
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD13.D Sample Name: 1913342007 SD

Injection Date:	5/21/2019 10:30:27	Seq Line:	13
Sample Name:	1913342007 SD	Location:	Vial 83
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD13.D Sample Name: 1913342007 SD

Injection Date:	5/21/2019 10:30:27	Seq Line:	13
Sample Name:	1913342007 SD	Location:	Vial 83
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.296	BBA	223455.8	3.7214	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.311	BBA	78456.0	4.2299	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.312	BBA	198591.3	5.0000	CLO4-89-ISTD

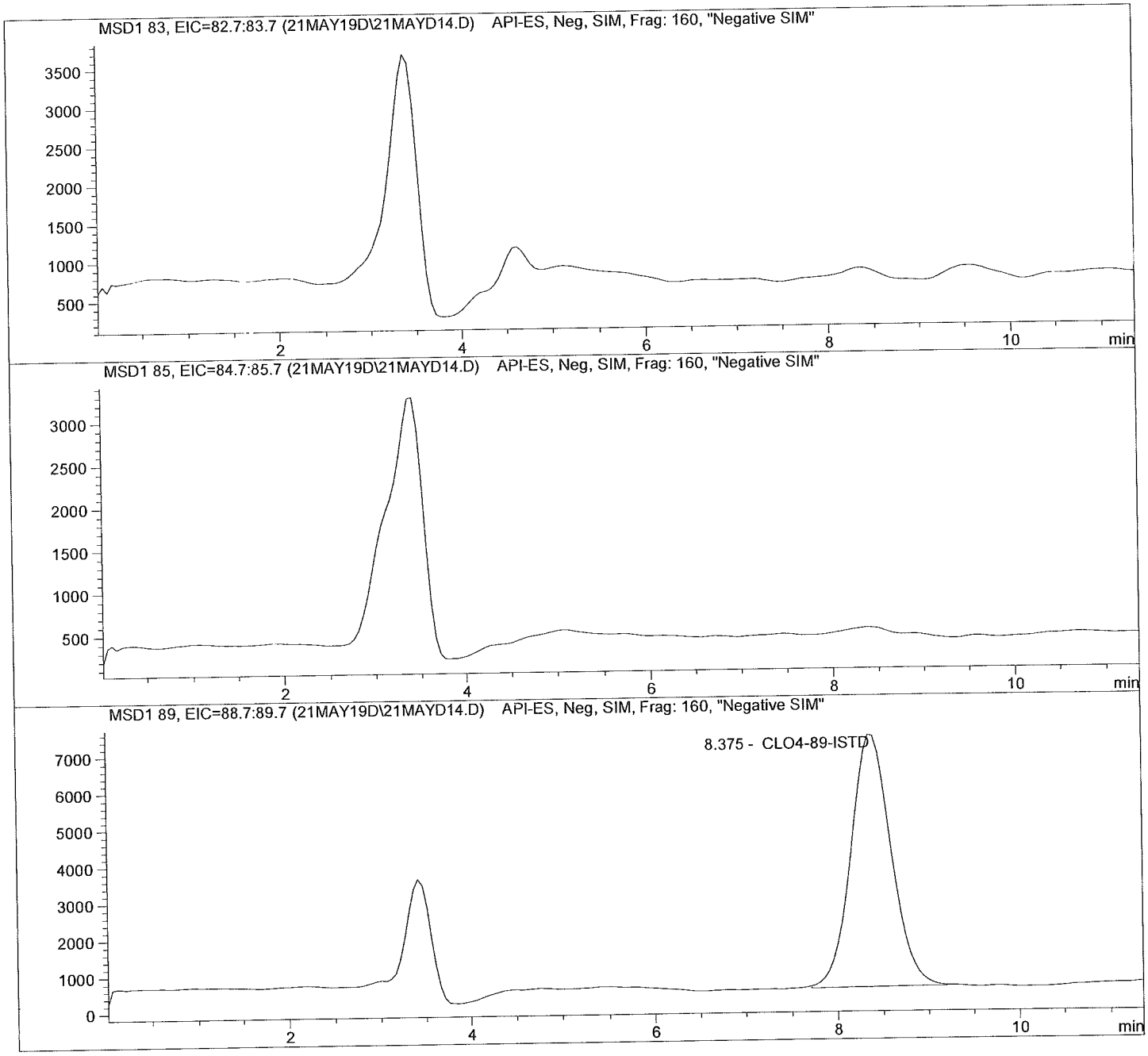
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD14.D Sample Name: 1913342008

Injection Date:	5/21/2019 10:43:48	Seq Line:	14
Sample Name:	1913342008	Location:	Vial 84
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD14.D Sample Name: 1913342008

Injection Date:	5/21/2019 10:43:48	Seq Line:	14
Sample Name:	1913342008	Location:	Vial 84
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.375	BBA	210825.1	5.0000	CLO4-89-ISTD

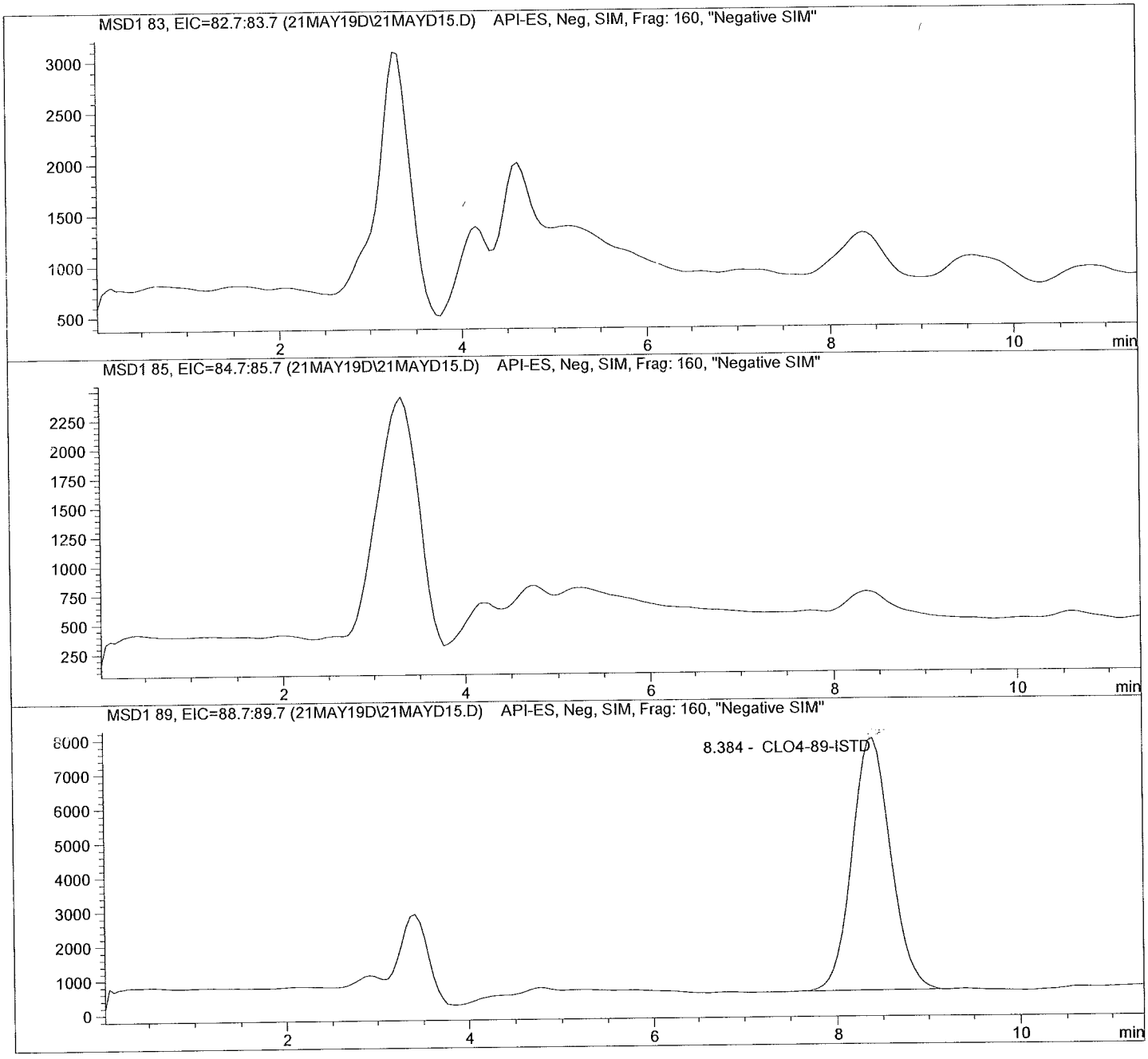
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD15.D Sample Name: 1913342009

Injection Date:	5/21/2019 10:57:10	Seq Line:	15
Sample Name:	1913342009	Location:	Vial 85
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD15.D Sample Name: 1913342009

Injection Date:	5/21/2019 10:57:10	Seq Line:	15
Sample Name:	1913342009	Location:	Vial 85
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.384	BBA	218072.4	5.0000	CLO4-89-ISTD

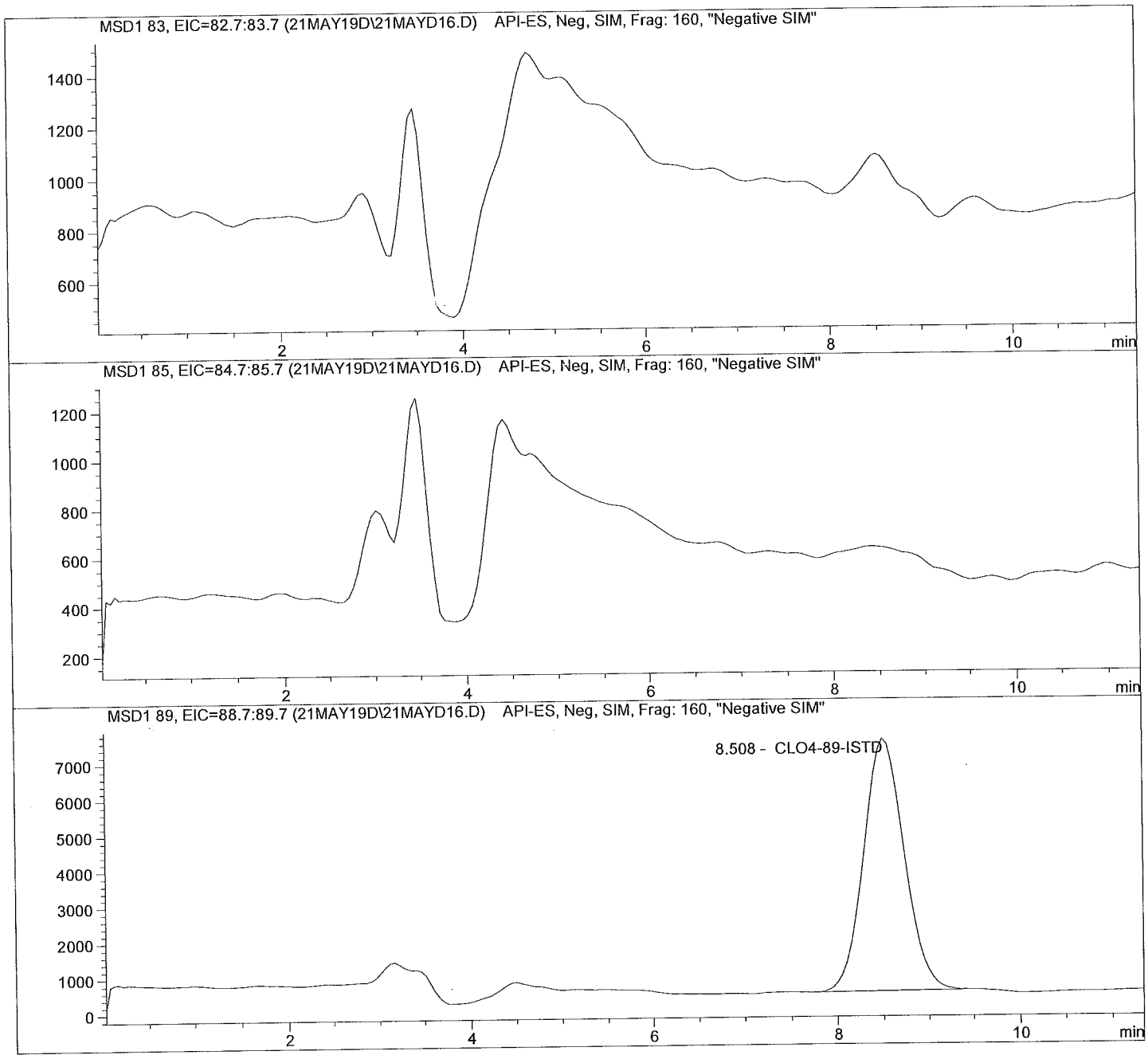
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD16.D Sample Name: 1913345001

Injection Date:	5/21/2019 11:10:33	Seq Line:	16
Sample Name:	1913345001	Location:	Vial 86
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD16.D Sample Name: 1913345001

Injection Date:	5/21/2019 11:10:33	Seq Line:	16
Sample Name:	1913345001	Location:	Vial 86
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.508	PBA	217961.0	5.0000	CLO4-89-ISTD

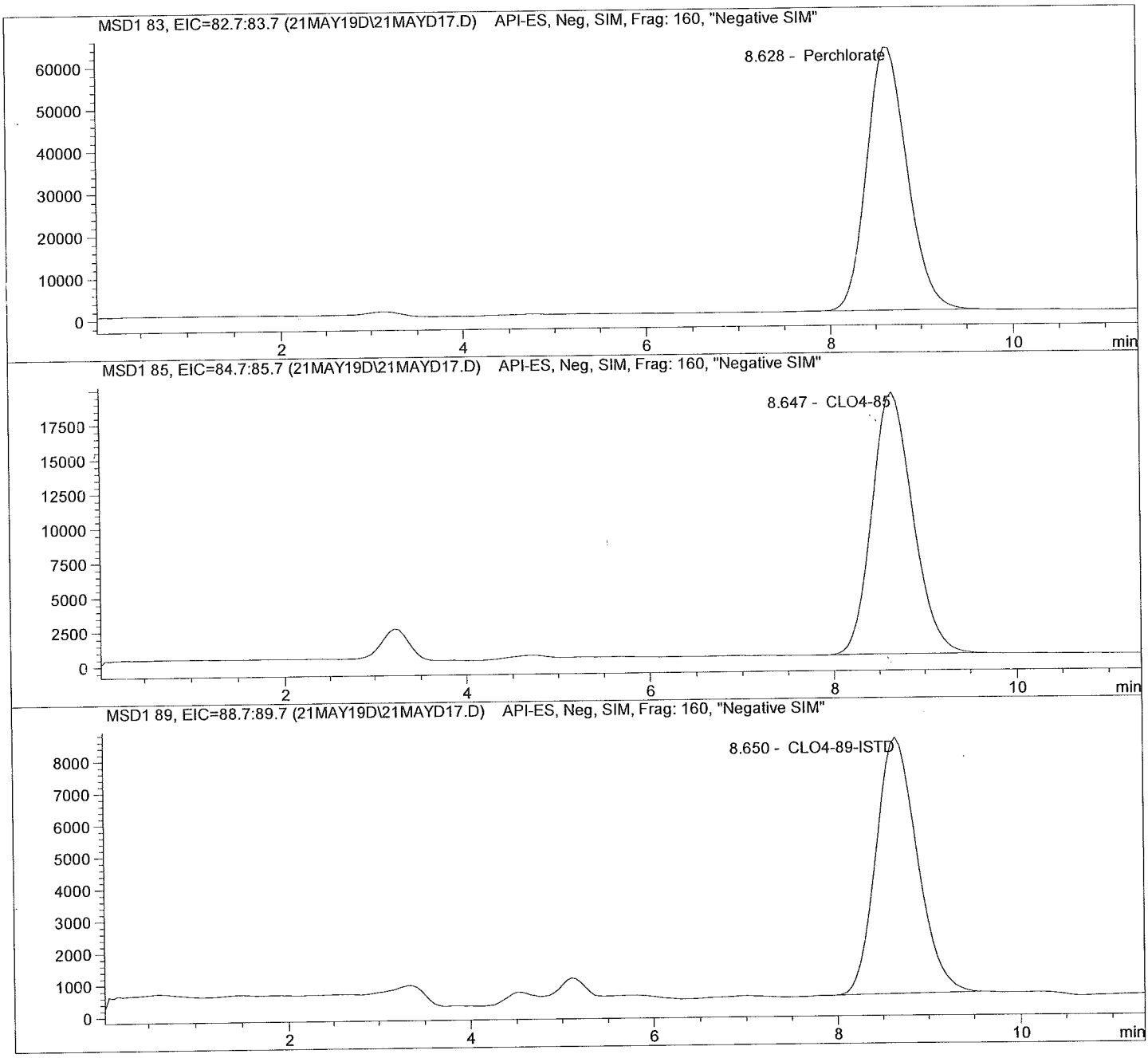
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD17.D Sample Name: 653685 CCV@25

Injection Date:	5/21/2019 11:23:56	Seq Line:	17
Sample Name:	653685 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\21MAY19D\21MAYD17.D Sample Name: 653685 CCV@25

Injection Date:	5/21/2019 11:23:56	Seq Line:	17
Sample Name:	653685 CCV@25	Location:	Vial 71
Acq Operator:	6214	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.628	PBA	1938377.4	23.3659	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.647	PBA	593941.4	24.0719	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.650	PBA	253387.5	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

RetTime [min]	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
	7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

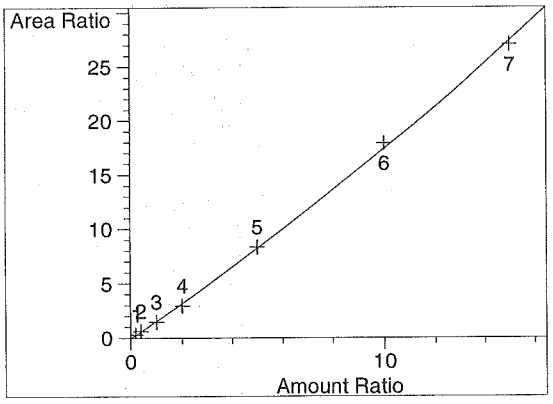
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

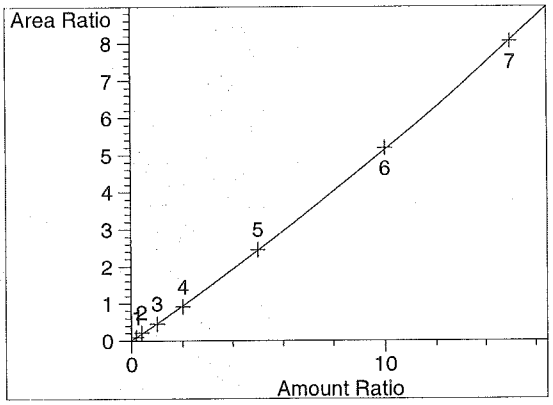
Peak Sum Table

No Entries in table

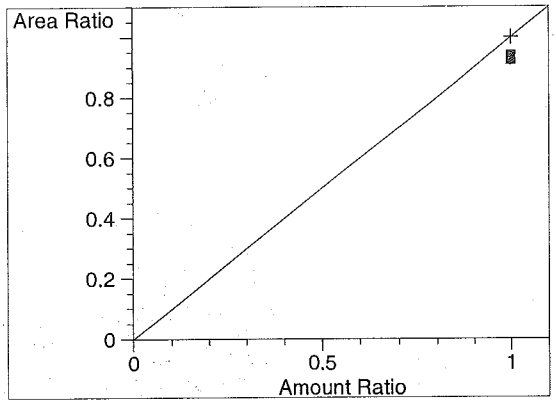
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Report: C:\HPCHEM\1\DATA\19MAR19I\19MAR19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

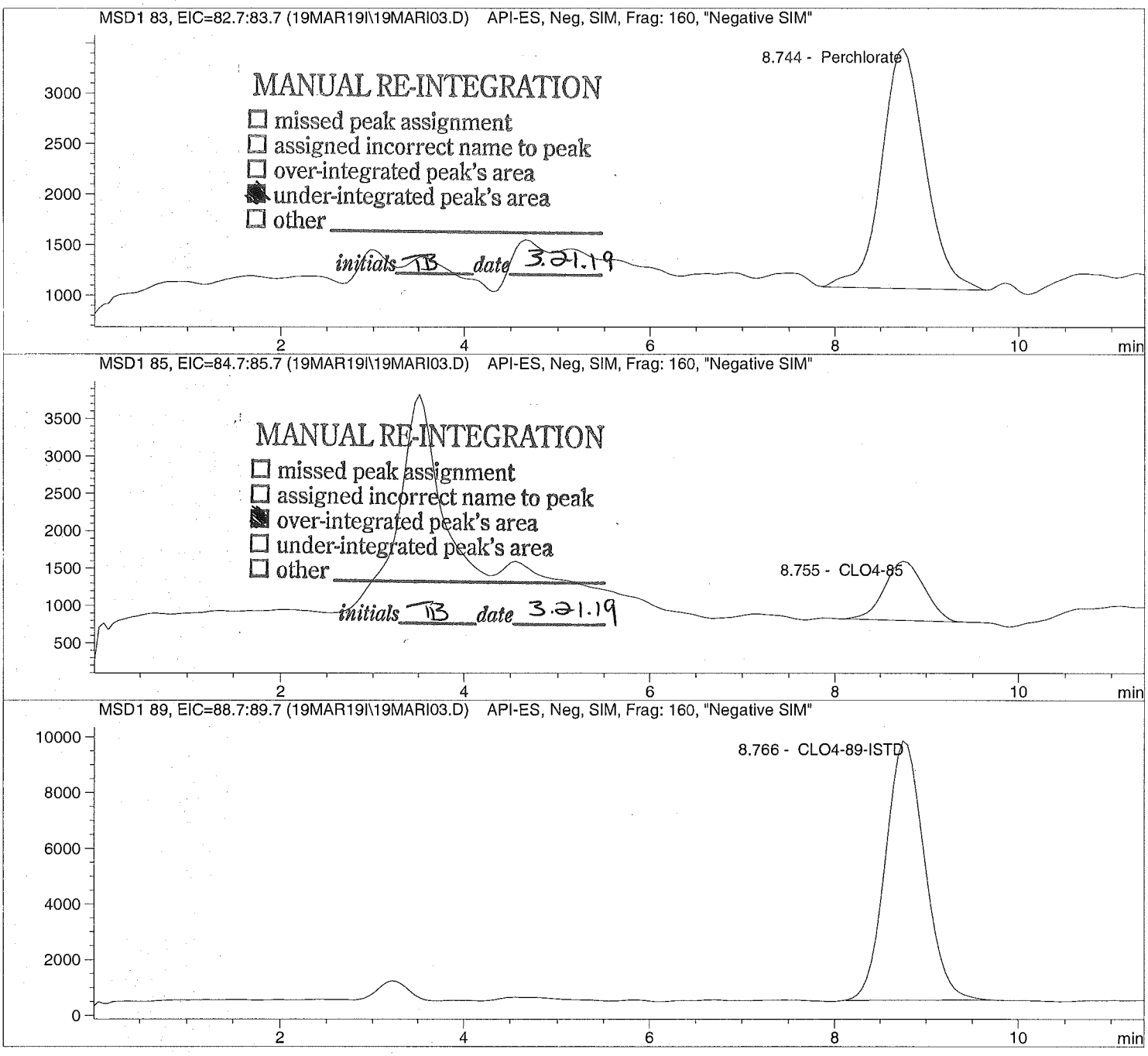
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

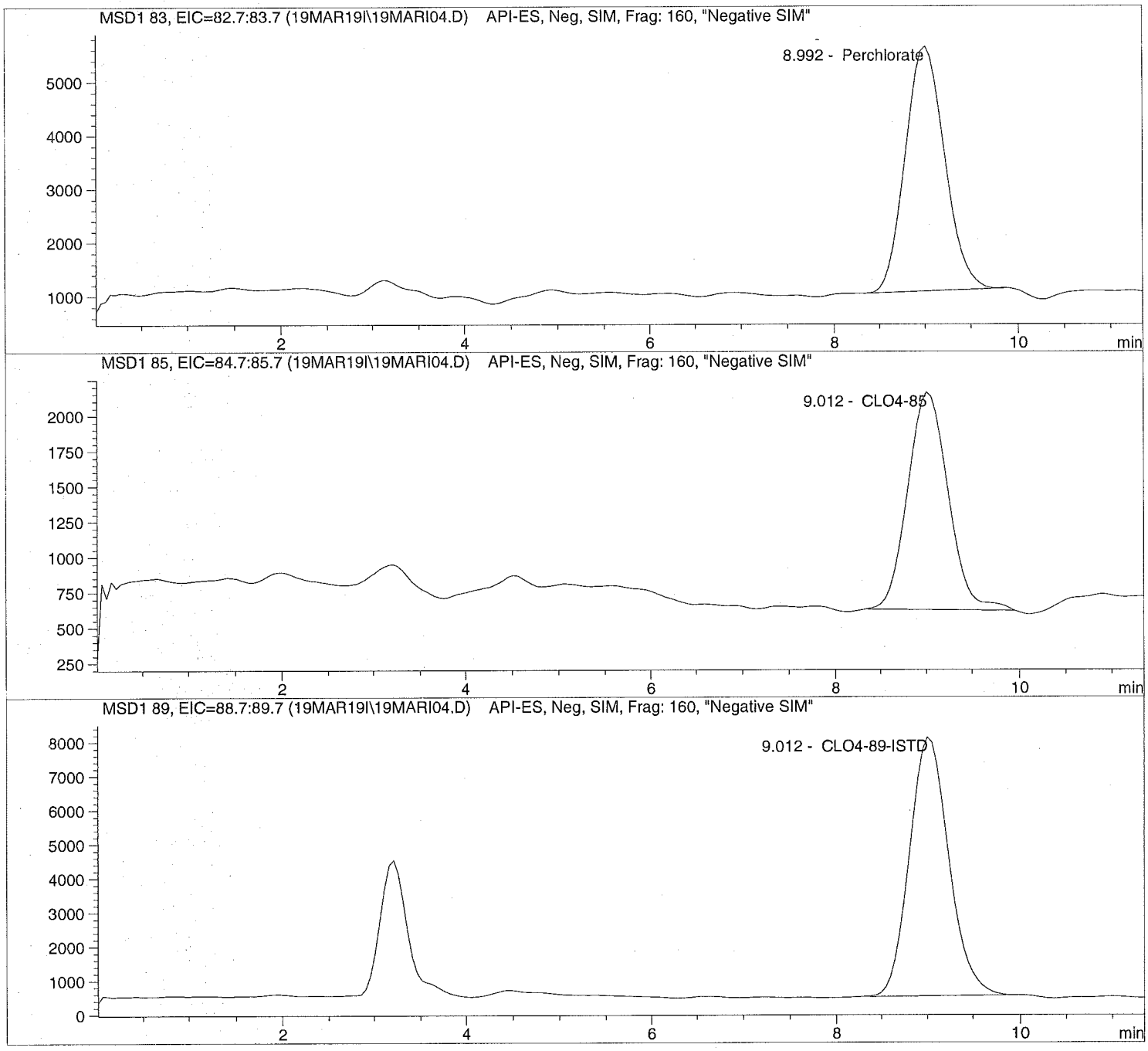
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

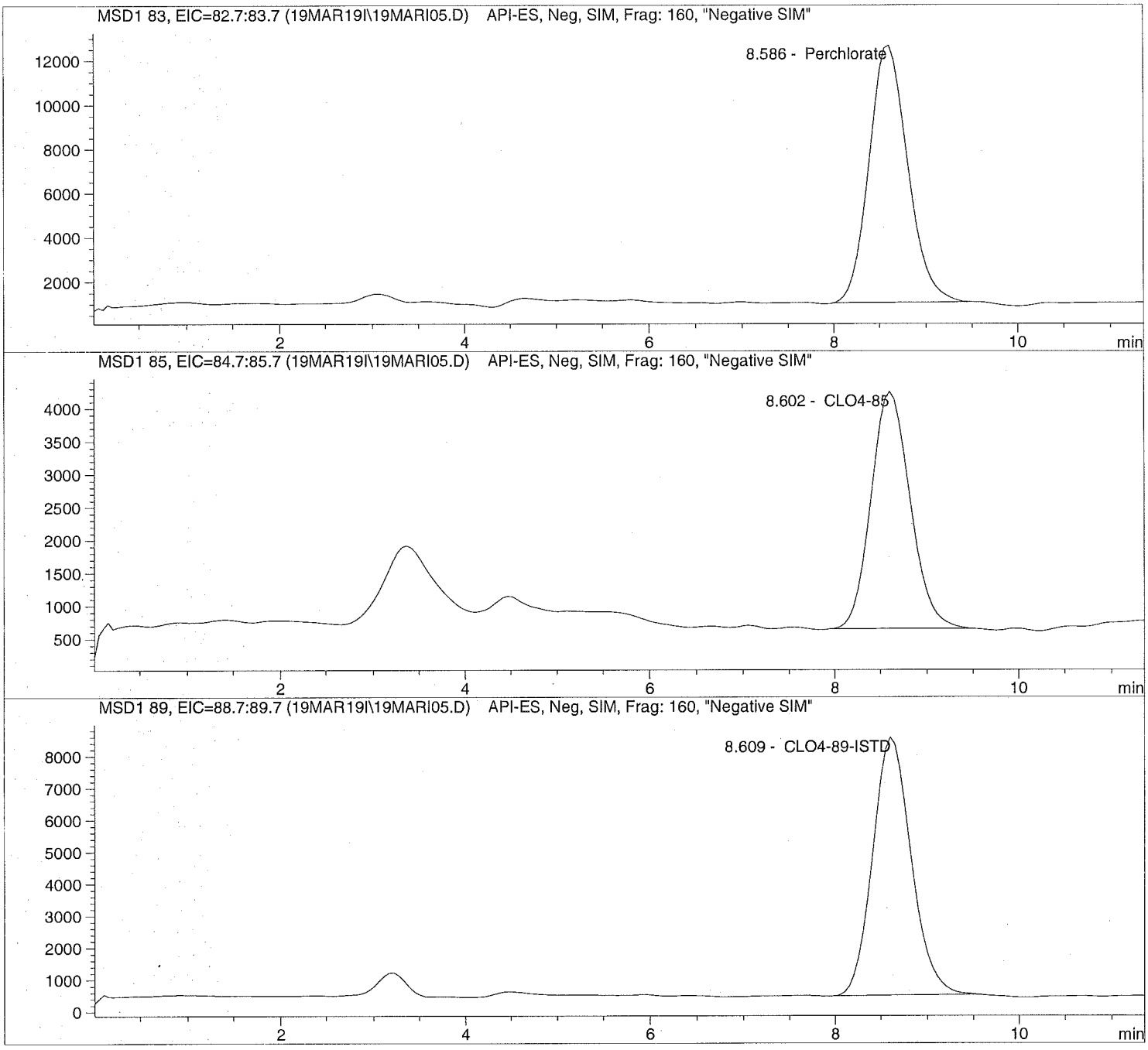
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

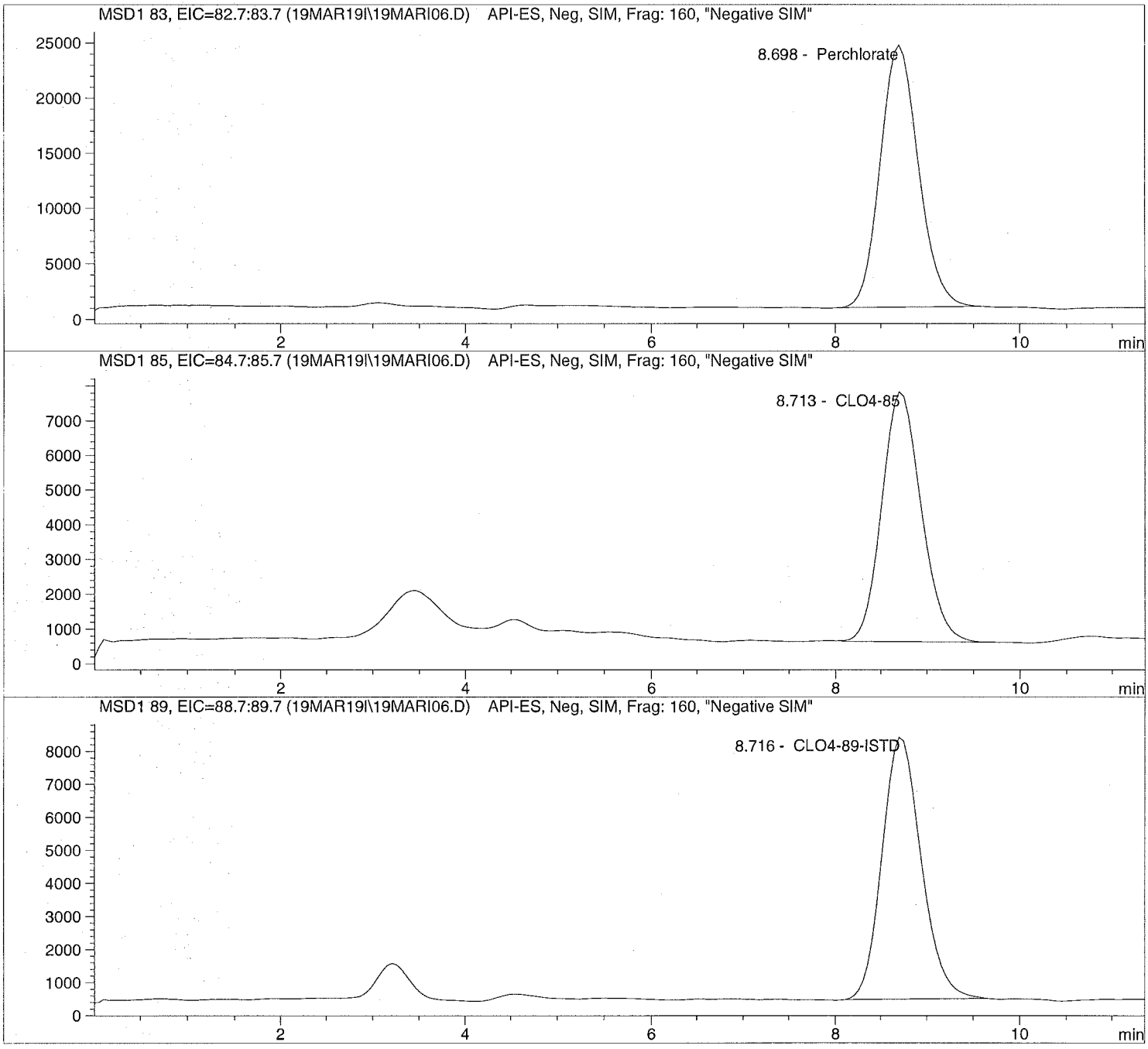
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

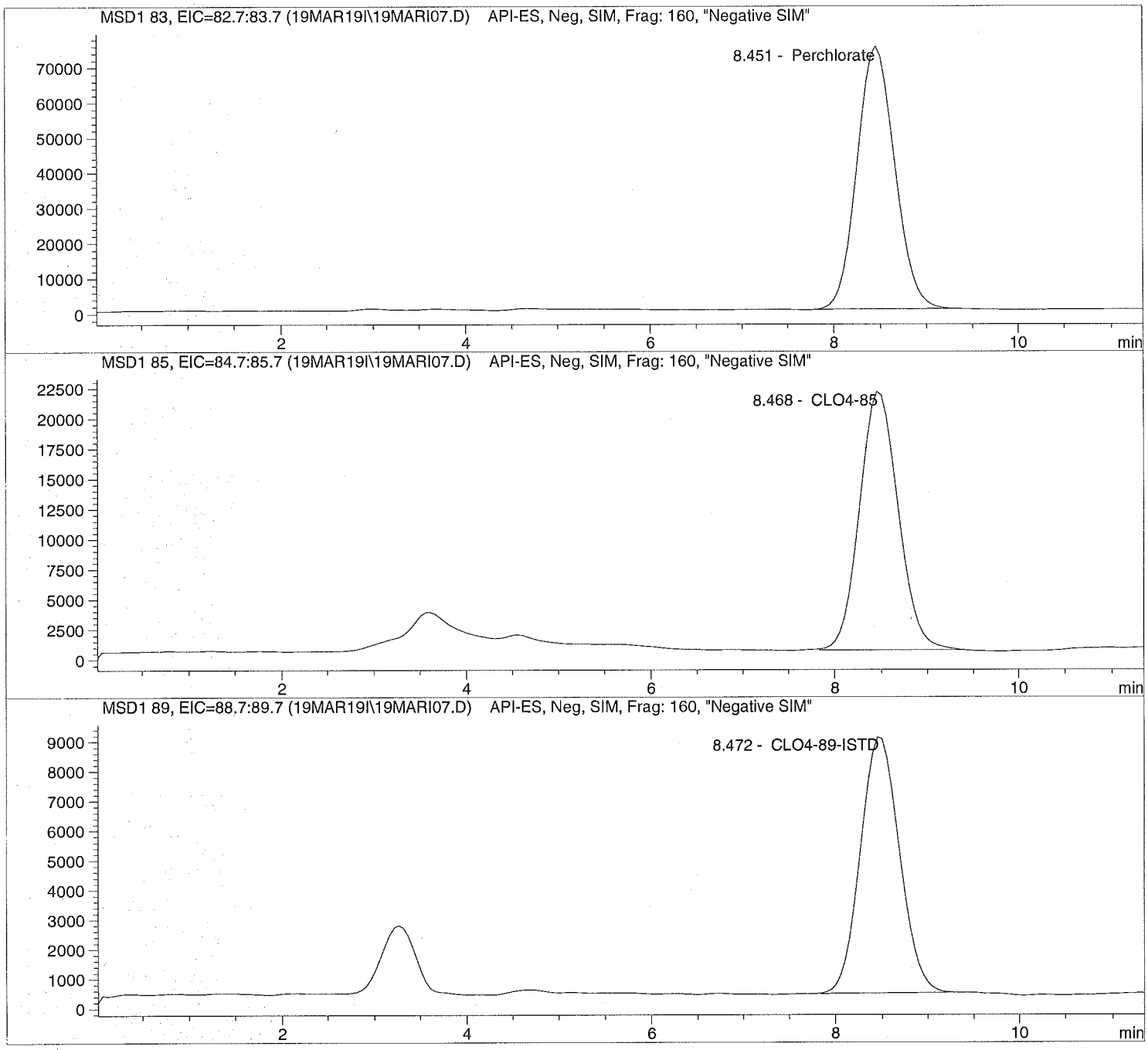
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

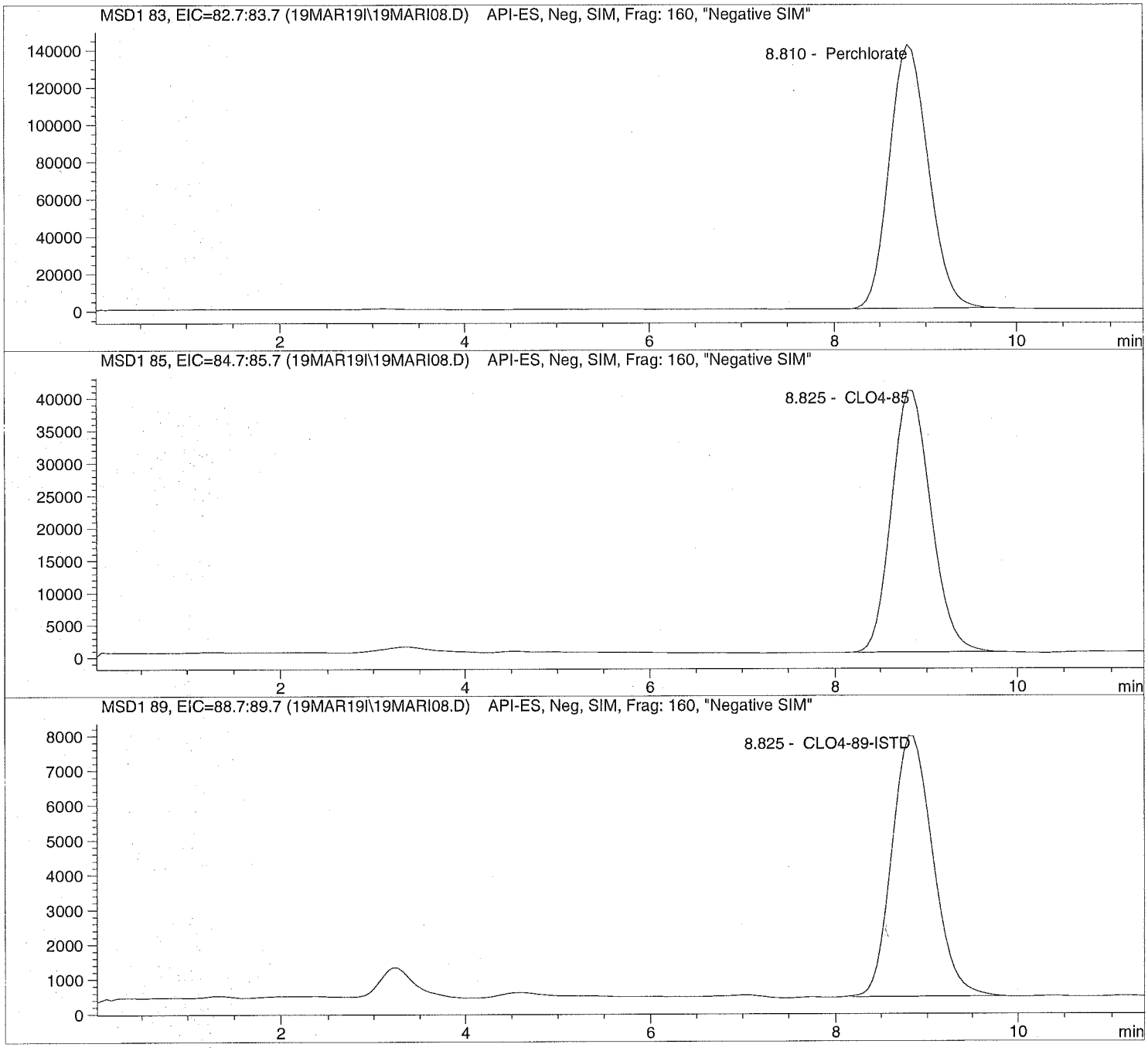
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

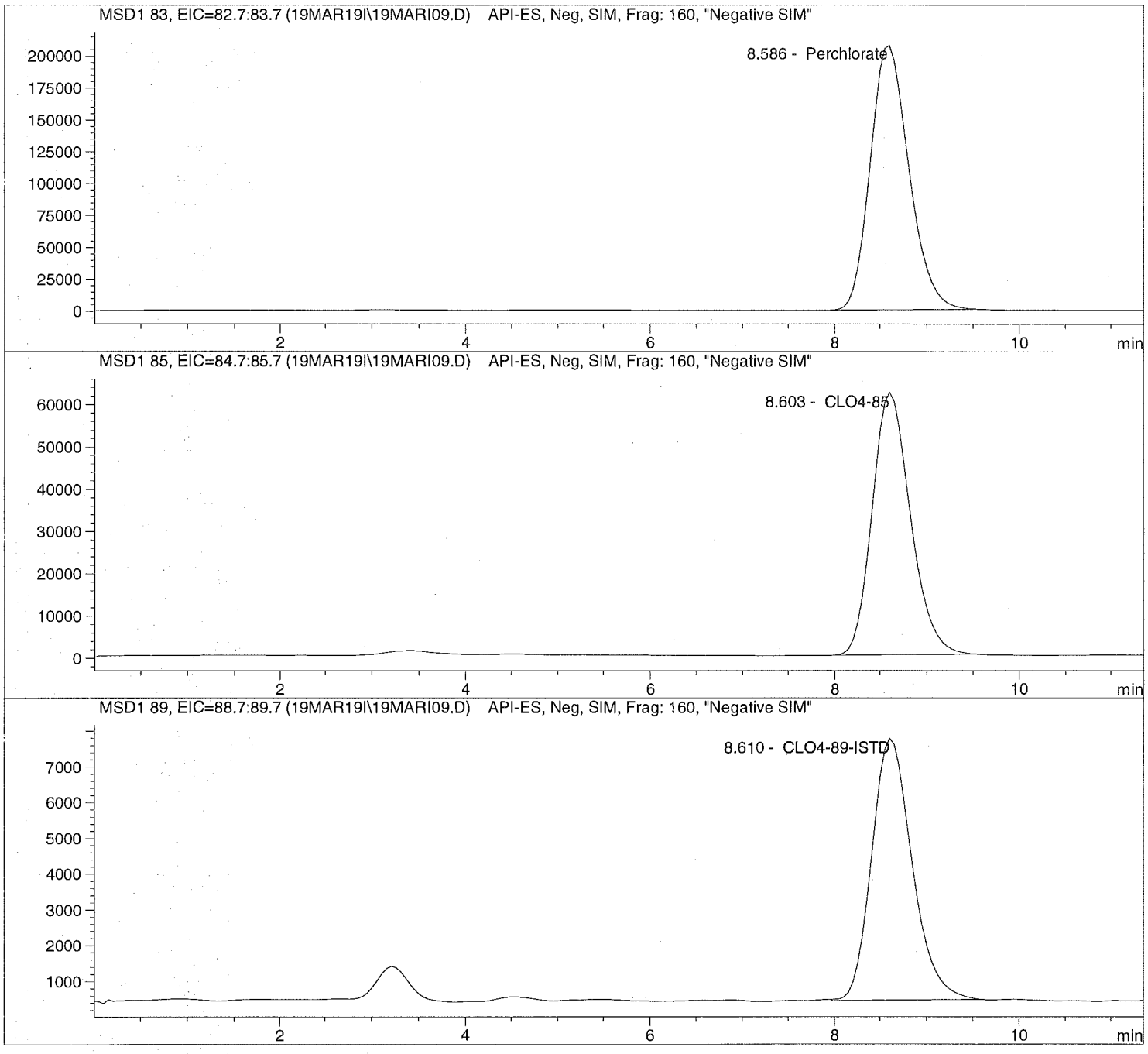
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

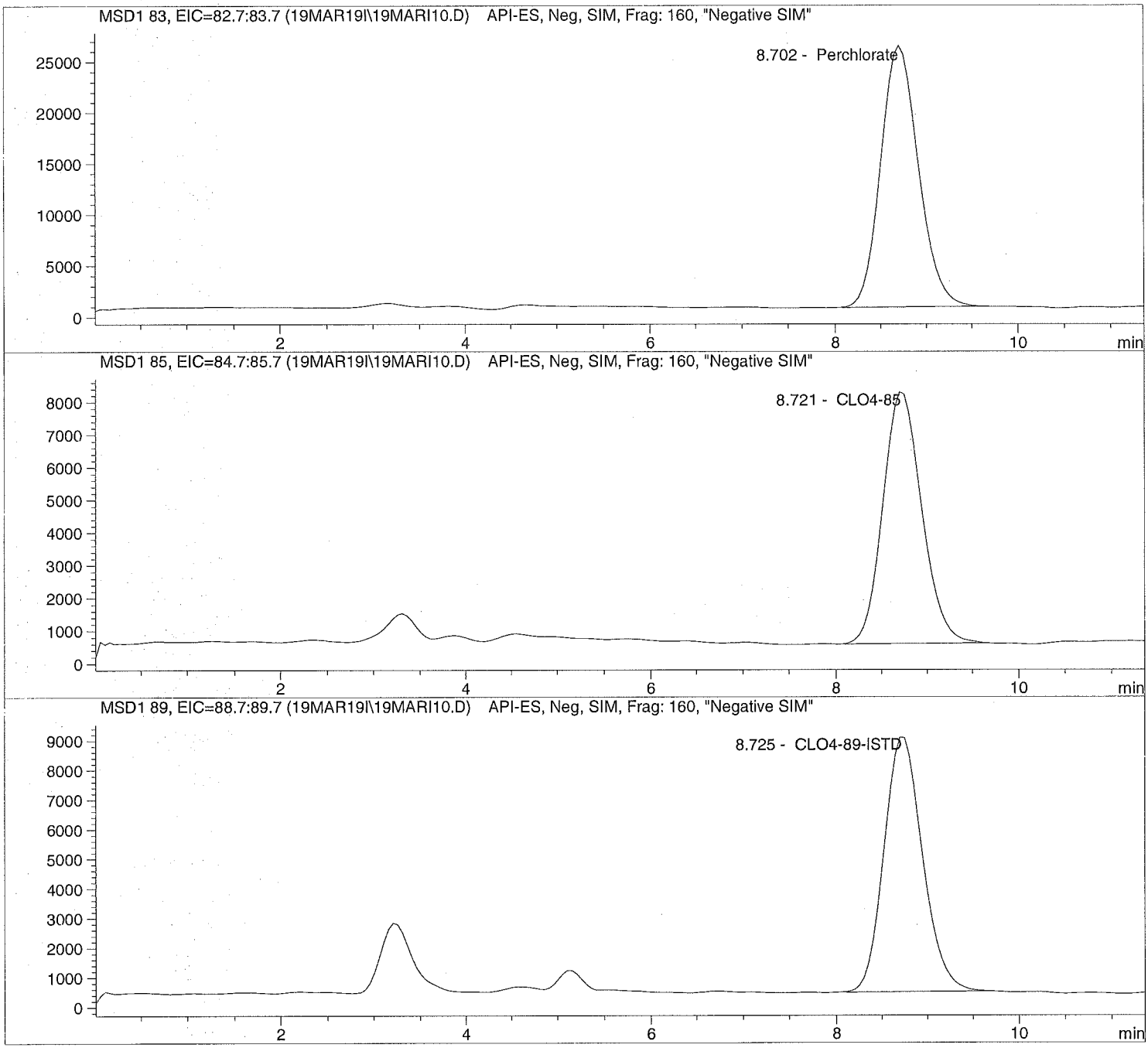
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

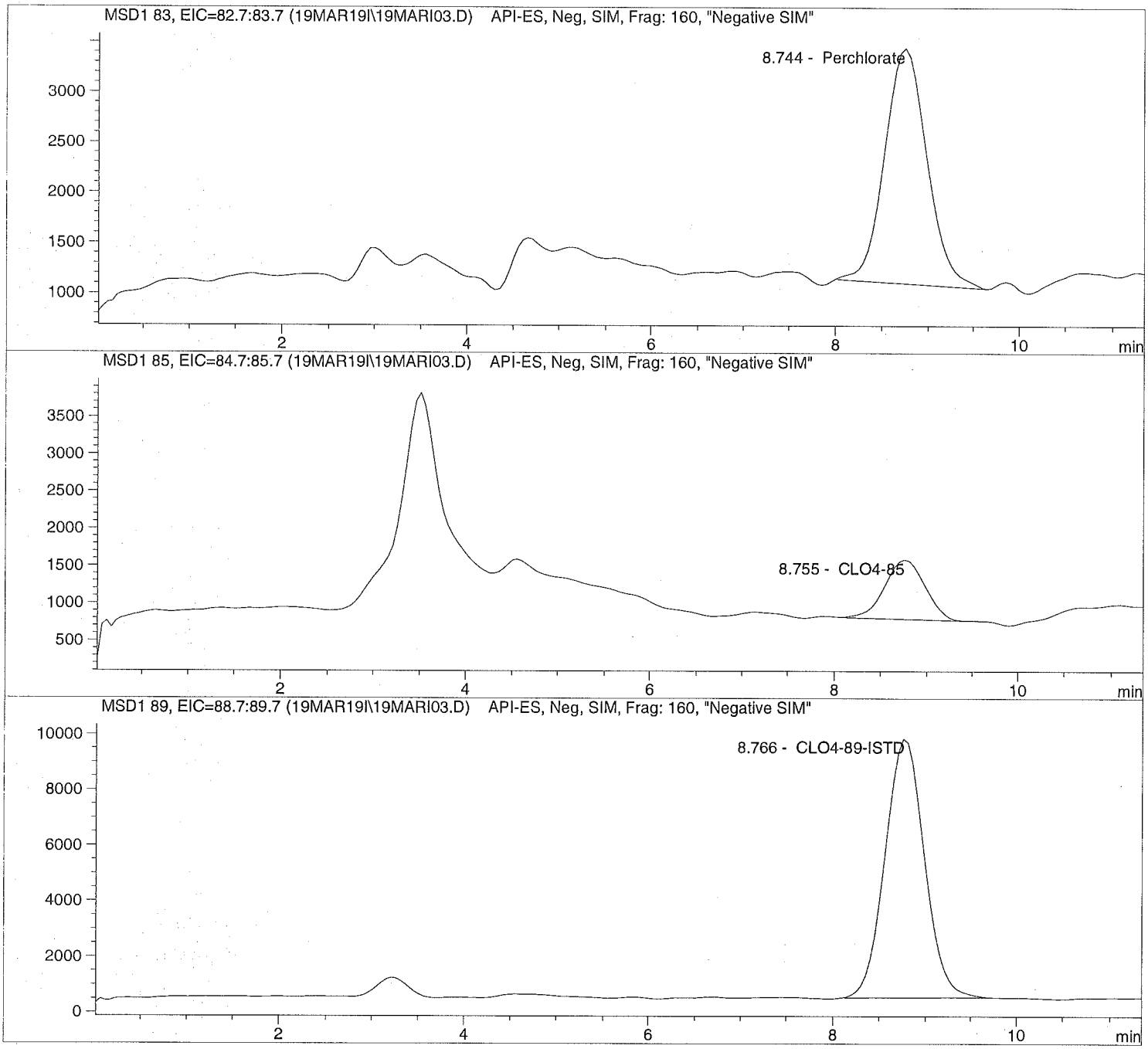
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19050138

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19050138-01	LH18/24-SP650_050119	Water		01-May-2019 14:00	02-May-2019 12:50	☐
HS19050138-02	Trip Blank	Water	CG 040119 -194	01-May-2019 00:00	02-May-2019 12:50	☐

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19050138

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R338430

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method SW9056

Batch ID: R337814

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19050138
Sample ID: LH18/24-SP650_050119 Lab ID:HS19050138-01
Collection Date: 01-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:49
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:49
1,2-Dichloroethane	**0.51**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	14-May-2019 12:49
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:49
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	14-May-2019 12:49
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	14-May-2019 12:49
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	14-May-2019 12:49
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	14-May-2019 12:49
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	14-May-2019 12:49
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:49
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19050138
Sample ID: LH18/24-SP650_050119 Lab ID:HS19050138-01
Collection Date: 01-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
cis-1,2-Dichloroethene	**2.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	14-May-2019 12:49
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	14-May-2019 12:49
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	14-May-2019 12:49
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	14-May-2019 12:49
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	14-May-2019 12:49
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:49
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
Trichloroethene	**0.65**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	14-May-2019 12:49
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:49
Surr: 1,2-Dichloroethane-d4	*87.6*			**0**	*81-118*	*%REC*	*1*	*14-May-2019 12:49*
Surr: 4-Bromofluorobenzene	*98.7*			**0**	*85-114*	*%REC*	*1*	*14-May-2019 12:49*
Surr: Dibromofluoromethane	*90.3*			**0**	*80-119*	*%REC*	*1*	*14-May-2019 12:49*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*14-May-2019 12:49*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: AJH
Chloride	**302**		**2.00**	**5.00**	**5.00**	**mg/L**	10	03-May-2019 06:28
Sulfate	**15.0**		**2.00**	**5.00**	**5.00**	**mg/L**	10	03-May-2019 06:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19050138
Sample ID: Trip Blank Lab ID:HS19050138-02
Collection Date: 01-May-2019 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:01
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:01
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	14-May-2019 12:01
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	14-May-2019 12:01
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	14-May-2019 12:01
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	14-May-2019 12:01
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	14-May-2019 12:01
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	14-May-2019 12:01
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19050138

Sample ID: Trip Blank Lab ID:HS19050138-02

Collection Date: 01-May-2019 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	14-May-2019 12:01
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	14-May-2019 12:01
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	14-May-2019 12:01
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	14-May-2019 12:01
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	14-May-2019 12:01
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	14-May-2019 12:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	14-May-2019 12:01
Surr: 1,2-Dichloroethane-d4	*86.7*			**0**	*81-118*	*%REC*	*1*	*14-May-2019 12:01*
Surr: 4-Bromofluorobenzene	*97.2*			**0**	*85-114*	*%REC*	*1*	*14-May-2019 12:01*
Surr: Dibromofluoromethane	*88.8*			**0**	*80-119*	*%REC*	*1*	*14-May-2019 12:01*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*14-May-2019 12:01*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R337814	**Test Name :** ANIONS BY SW9056A			**Matrix:** Water		
HS19050138-01	LH18/24-SP650_050119	01 May 2019 14:00			03 May 2019 06:28	10
Batch ID R338430	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19050138-01	LH18/24-SP650_050119	01 May 2019 14:00			14 May 2019 12:49	1
HS19050138-02	Trip Blank	01 May 2019 00:00			14 May 2019 12:01	1

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190514** Units: **UG/L** Analysis Date: **14-May-2019 11:37**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075195** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190514** Units: **UG/L** Analysis Date: **14-May-2019 11:37**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075195** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*42.59*	*1.0*	*50*	*0*	*85.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.97*	*1.0*	*50*	*0*	*97.9*	*85 - 114*				
Surr: Dibromofluoromethane	*43.89*	*1.0*	*50*	*0*	*87.8*	*80 - 119*				
Surr: Toluene-d8	*52.89*	*1.0*	*50*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190514** Units: **UG/L** Analysis Date: **14-May-2019 10:49**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075194** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.65	1.0	20	0	98.3	78 - 124				
1,1,1-Trichloroethane	19.21	1.0	20	0	96.0	74 - 131				
1,1,2,2-Tetrachloroethane	19.94	1.0	20	0	99.7	71 - 121				
1,1,2-Trichloroethane	19.79	1.0	20	0	98.9	80 - 119				
1,1-Dichloroethane	19.1	1.0	20	0	95.5	77 - 125				
1,1-Dichloroethene	19.64	1.0	20	0	98.2	71 - 131				
1,1-Dichloropropene	19.1	1.0	20	0	95.5	78 - 125				
1,2,3-Trichlorobenzene	22.8	1.0	20	0	114	69 - 129				
1,2,3-Trichloropropane	19.99	1.0	20	0	99.9	73 - 122				
1,2,4-Trichlorobenzene	20.95	1.0	20	0	105	69 - 130				
1,2,4-Trimethylbenzene	19.27	1.0	20	0	96.3	76 - 124				
1,2-Dibromo-3-chloropropane	20.82	1.0	20	0	104	62 - 128				
1,2-Dibromoethane	19.76	1.0	20	0	98.8	77 - 121				
1,2-Dichlorobenzene	19.39	1.0	20	0	96.9	80 - 119				
1,2-Dichloroethane	19.2	1.0	20	0	96.0	73 - 128				
1,2-Dichloropropane	20.1	1.0	20	0	100	78 - 122				
1,3,5-Trimethylbenzene	19.23	1.0	20	0	96.2	75 - 124				
1,3-Dichlorobenzene	19.33	1.0	20	0	96.7	80 - 119				
1,3-Dichloropropane	19.66	1.0	20	0	98.3	80 - 119				
1,4-Dichlorobenzene	19.64	1.0	20	0	98.2	79 - 118				
2,2-Dichloropropane	19.71	1.0	20	0	98.6	60 - 139				
2-Butanone	41.52	2.0	40	0	104	56 - 143				
2-Chlorotoluene	18.51	1.0	20	0	92.5	79 - 122				
2-Hexanone	40.58	2.0	40	0	101	57 - 139				
4-Chlorotoluene	18.69	1.0	20	0	93.4	78 - 122				
4-Isopropyltoluene	18.93	1.0	20	0	94.6	77 - 127				
4-Methyl-2-pentanone	39.72	2.0	40	0	99.3	67 - 130				
Acetone	44.55	2.0	40	0	111	39 - 160				
Benzene	19.69	1.0	20	0	98.4	79 - 120				
Bromobenzene	19.68	1.0	20	0	98.4	80 - 120				
Bromochloromethane	19.96	1.0	20	0	99.8	78 - 123				
Bromodichloromethane	20.01	1.0	20	0	100	79 - 125				
Bromoform	21	1.0	20	0	105	66 - 130				
Bromomethane	22.76	1.0	20	0	114	53 - 141				

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-190514** Units: **UG/L** Analysis Date: **14-May-2019 10:49**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075194** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	39.51	2.0	40	0	98.8	64 - 133				
Carbon tetrachloride	18.82	1.0	20	0	94.1	72 - 136				
Chlorobenzene	19.91	1.0	20	0	99.5	82 - 118				
Chloroethane	18.27	1.0	20	0	91.3	60 - 138				
Chloroform	19.45	1.0	20	0	97.2	79 - 124				
Chloromethane	18.59	1.0	20	0	93.0	50 - 139				
cis-1,2-Dichloroethene	19.06	1.0	20	0	95.3	78 - 123				
cis-1,3-Dichloropropene	20.18	1.0	20	0	101	75 - 124				
Dibromochloromethane	19.83	1.0	20	0	99.2	74 - 126				
Dibromomethane	20.15	1.0	20	0	101	79 - 123				
Dichlorodifluoromethane	21.17	1.0	20	0	106	32 - 152				
Ethylbenzene	19.47	1.0	20	0	97.3	79 - 121				
Hexachlorobutadiene	20.77	1.0	20	0	104	66 - 134				
Isopropylbenzene	19.15	1.0	20	0	95.7	72 - 131				
m,p-Xylene	38.81	2.0	40	0	97.0	80 - 121				
Methylene chloride	20.12	2.0	20	0	101	74 - 124				
Naphthalene	20.78	1.0	20	0	104	61 - 128				
n-Butylbenzene	19.23	1.0	20	0	96.1	75 - 128				
n-Propylbenzene	18.85	1.0	20	0	94.2	76 - 126				
o-Xylene	19.46	1.0	20	0	97.3	78 - 122				
sec-Butylbenzene	18.62	1.0	20	0	93.1	77 - 126				
Styrene	20.18	1.0	20	0	101	78 - 123				
tert-Butylbenzene	18.7	1.0	20	0	93.5	78 - 124				
Tetrachloroethene	19.22	1.0	20	0	96.1	74 - 129				
Toluene	19.42	1.0	20	0	97.1	80 - 121				
trans-1,2-Dichloroethene	19.89	1.0	20	0	99.5	75 - 124				
trans-1,3-Dichloropropene	20.67	1.0	20	0	103	73 - 127				
Trichloroethene	19.92	1.0	20	0	99.6	79 - 123				
Trichlorofluoromethane	19.39	1.0	20	0	96.9	65 - 141				
Vinyl chloride	19.64	1.0	20	0	98.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.83*	*1.0*	*50*	*0*	*99.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.82*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*48.75*	*1.0*	*50*	*0*	*97.5*	*80 - 119*				
Surr: Toluene-d8	*48.69*	*1.0*	*50*	*0*	*97.4*	*89 - 112*				

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19050304-05MS** Units: **UG/L** Analysis Date: **14-May-2019 14:26**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075202** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.96	1.0	20	0	89.8	78 - 124				
1,1,1-Trichloroethane	17.27	1.0	20	0	86.4	74 - 131				
1,1,2,2-Tetrachloroethane	19.07	1.0	20	0	95.4	71 - 121				
1,1,2-Trichloroethane	18.35	1.0	20	0	91.8	80 - 119				
1,1-Dichloroethane	16.46	1.0	20	0	82.3	77 - 125				
1,1-Dichloroethene	17.19	1.0	20	0	86.0	71 - 131				
1,1-Dichloropropene	18.19	1.0	20	0	91.0	78 - 125				
1,2,3-Trichlorobenzene	21.91	1.0	20	0	110	69 - 129				
1,2,3-Trichloropropane	18.51	1.0	20	0	92.6	73 - 122				
1,2,4-Trichlorobenzene	20.05	1.0	20	0	100	69 - 130				
1,2,4-Trimethylbenzene	17.85	1.0	20	0	89.3	76 - 124				
1,2-Dibromo-3-chloropropane	20.62	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	18.37	1.0	20	0	91.9	77 - 121				
1,2-Dichlorobenzene	18.43	1.0	20	0	92.2	80 - 119				
1,2-Dichloroethane	16.81	1.0	20	0	84.1	73 - 128				
1,2-Dichloropropane	17.63	1.0	20	0	88.2	78 - 122				
1,3,5-Trimethylbenzene	18.57	1.0	20	0	92.8	75 - 124				
1,3-Dichlorobenzene	18.44	1.0	20	0	92.2	80 - 119				
1,3-Dichloropropane	18.25	1.0	20	0	91.3	80 - 119				
1,4-Dichlorobenzene	18.41	1.0	20	0	92.1	79 - 118				
2,2-Dichloropropane	17.18	1.0	20	0	85.9	60 - 139				
2-Butanone	36.74	2.0	40	0	91.9	56 - 143				
2-Chlorotoluene	18.14	1.0	20	0	90.7	79 - 122				
2-Hexanone	36.41	2.0	40	0	91.0	57 - 139				
4-Chlorotoluene	18.02	1.0	20	0	90.1	78 - 122				
4-Isopropyltoluene	19.4	1.0	20	0	97.0	77 - 127				
4-Methyl-2-pentanone	37.53	2.0	40	0	93.8	67 - 130				
Acetone	41.3	2.0	40	5.033	90.7	39 - 160				
Benzene	17.22	1.0	20	0	86.1	79 - 120				
Bromobenzene	17.54	1.0	20	0	87.7	80 - 120				
Bromochloromethane	16.53	1.0	20	0	82.6	78 - 123				
Bromodichloromethane	17.16	1.0	20	0	85.8	79 - 125				
Bromoform	18.69	1.0	20	0	93.5	66 - 130				
Bromomethane	14.83	1.0	20	0	74.1	53 - 141				

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19050304-05MS** Units: **UG/L** Analysis Date: **14-May-2019 14:26**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075202** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	34.64	2.0	40	0	86.6	64 - 133				
Carbon tetrachloride	17.45	1.0	20	0	87.2	72 - 136				
Chlorobenzene	18.68	1.0	20	0	93.4	82 - 118				
Chloroethane	16.04	1.0	20	0	80.2	60 - 138				
Chloroform	16.36	1.0	20	0	81.8	79 - 124				
Chloromethane	14.06	1.0	20	0	70.3	50 - 139				
cis-1,2-Dichloroethene	16.27	1.0	20	0	81.4	78 - 123				
cis-1,3-Dichloropropene	18.73	1.0	20	0	93.7	75 - 124				
Dibromochloromethane	18.41	1.0	20	0	92.0	74 - 126				
Dibromomethane	17.7	1.0	20	0	88.5	79 - 123				
Dichlorodifluoromethane	15.98	1.0	20	0	79.9	32 - 152				
Ethylbenzene	18.41	1.0	20	0	92.1	79 - 121				
Hexachlorobutadiene	21.25	1.0	20	0	106	66 - 134				
Isopropylbenzene	18.73	1.0	20	0	93.7	72 - 131				
m,p-Xylene	37.34	2.0	40	0	93.4	80 - 121				
Methylene chloride	16.74	2.0	20	0	83.7	74 - 124				
Naphthalene	20.25	1.0	20	0	101	61 - 128				
n-Butylbenzene	19.47	1.0	20	0	97.4	75 - 128				
n-Propylbenzene	19.15	1.0	20	0	95.8	76 - 126				
o-Xylene	19.15	1.0	20	0	95.7	78 - 122				
sec-Butylbenzene	19.76	1.0	20	0	98.8	77 - 126				
Styrene	18.13	1.0	20	0	90.7	78 - 123				
tert-Butylbenzene	19.35	1.0	20	0	96.8	78 - 124				
Tetrachloroethene	18.9	1.0	20	0	94.5	74 - 129				
Toluene	18.38	1.0	20	0	91.9	80 - 121				
trans-1,2-Dichloroethene	17.28	1.0	20	0	86.4	75 - 124				
trans-1,3-Dichloropropene	17.81	1.0	20	0	89.1	73 - 127				
Trichloroethene	18.37	1.0	20	0	91.9	79 - 123				
Trichlorofluoromethane	16.85	1.0	20	0	84.3	65 - 141				
Vinyl chloride	17.11	1.0	20	0	85.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*43.63*	*1.0*	*50*	*0*	*87.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.27*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*45.19*	*1.0*	*50*	*0*	*90.4*	*80 - 119*				
Surr: Toluene-d8	*52*	*1.0*	*50*	*0*	*104*	*89 - 112*				

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19050304-05MSD** Units: **UG/L** Analysis Date: **14-May-2019 14:50**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075203** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.05	1.0	20	0	90.3	78 - 124	17.96	0.499	20	
1,1,1-Trichloroethane	16.75	1.0	20	0	83.7	74 - 131	17.27	3.11	20	
1,1,2,2-Tetrachloroethane	20.62	1.0	20	0	103	71 - 121	19.07	7.82	20	
1,1,2-Trichloroethane	18.77	1.0	20	0	93.9	80 - 119	18.35	2.27	20	
1,1-Dichloroethane	15.96	1.0	20	0	79.8	77 - 125	16.46	3.1	20	
1,1-Dichloroethene	16.38	1.0	20	0	81.9	71 - 131	17.19	4.84	20	
1,1-Dichloropropene	17.86	1.0	20	0	89.3	78 - 125	18.19	1.86	20	
1,2,3-Trichlorobenzene	24.61	1.0	20	0	123	69 - 129	21.91	11.6	20	
1,2,3-Trichloropropane	20.12	1.0	20	0	101	73 - 122	18.51	8.29	20	
1,2,4-Trichlorobenzene	21.58	1.0	20	0	108	69 - 130	20.05	7.37	20	
1,2,4-Trimethylbenzene	19.04	1.0	20	0	95.2	76 - 124	17.85	6.43	20	
1,2-Dibromo-3-chloropropane	23.37	1.0	20	0	117	62 - 128	20.62	12.5	20	
1,2-Dibromoethane	18.7	1.0	20	0	93.5	77 - 121	18.37	1.8	20	
1,2-Dichlorobenzene	20.02	1.0	20	0	100	80 - 119	18.43	8.27	20	
1,2-Dichloroethane	16.81	1.0	20	0	84.1	73 - 128	16.81	0.00614	20	
1,2-Dichloropropane	17.42	1.0	20	0	87.1	78 - 122	17.63	1.19	20	
1,3,5-Trimethylbenzene	19.67	1.0	20	0	98.3	75 - 124	18.57	5.76	20	
1,3-Dichlorobenzene	19.64	1.0	20	0	98.2	80 - 119	18.44	6.33	20	
1,3-Dichloropropane	18.61	1.0	20	0	93.0	80 - 119	18.25	1.94	20	
1,4-Dichlorobenzene	19.37	1.0	20	0	96.8	79 - 118	18.41	5.05	20	
2,2-Dichloropropane	16.54	1.0	20	0	82.7	60 - 139	17.18	3.8	20	
2-Butanone	36.99	2.0	40	0	92.5	56 - 143	36.74	0.672	20	
2-Chlorotoluene	19.27	1.0	20	0	96.3	79 - 122	18.14	6	20	
2-Hexanone	38.67	2.0	40	0	96.7	57 - 139	36.41	6.02	20	
4-Chlorotoluene	19.19	1.0	20	0	96.0	78 - 122	18.02	6.3	20	
4-Isopropyltoluene	20.54	1.0	20	0	103	77 - 127	19.4	5.71	20	
4-Methyl-2-pentanone	38.72	2.0	40	0	96.8	67 - 130	37.53	3.12	20	
Acetone	42.23	2.0	40	5.033	93.0	39 - 160	41.3	2.22	20	
Benzene	17.15	1.0	20	0	85.7	79 - 120	17.22	0.446	20	
Bromobenzene	18.86	1.0	20	0	94.3	80 - 120	17.54	7.22	20	
Bromochloromethane	15.89	1.0	20	0	79.5	78 - 123	16.53	3.91	20	
Bromodichloromethane	16.76	1.0	20	0	83.8	79 - 125	17.16	2.31	20	
Bromoform	19.5	1.0	20	0	97.5	66 - 130	18.69	4.22	20	
Bromomethane	14.44	1.0	20	0	72.2	53 - 141	14.83	2.67	20	

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R338430 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19050304-05MSD** Units: **UG/L** Analysis Date: **14-May-2019 14:50**
Client ID: Run ID: **VOA6_338430** SeqNo: **5075203** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	33.71	2.0	40	0	84.3	64 - 133	34.64	2.72	20	
Carbon tetrachloride	17.32	1.0	20	0	86.6	72 - 136	17.45	0.729	20	
Chlorobenzene	18.86	1.0	20	0	94.3	82 - 118	18.68	0.95	20	
Chloroethane	15.18	1.0	20	0	75.9	60 - 138	16.04	5.54	20	
Chloroform	15.86	1.0	20	0	79.3	79 - 124	16.36	3.15	20	
Chloromethane	13.31	1.0	20	0	66.6	50 - 139	14.06	5.44	20	
cis-1,2-Dichloroethene	15.91	1.0	20	0	79.6	78 - 123	16.27	2.26	20	
cis-1,3-Dichloropropene	18.59	1.0	20	0	92.9	75 - 124	18.73	0.759	20	
Dibromochloromethane	18.51	1.0	20	0	92.5	74 - 126	18.41	0.558	20	
Dibromomethane	17.47	1.0	20	0	87.4	79 - 123	17.7	1.28	20	
Dichlorodifluoromethane	15.52	1.0	20	0	77.6	32 - 152	15.98	2.93	20	
Ethylbenzene	18.16	1.0	20	0	90.8	79 - 121	18.41	1.34	20	
Hexachlorobutadiene	21.15	1.0	20	0	106	66 - 134	21.25	0.477	20	
Isopropylbenzene	19.08	1.0	20	0	95.4	72 - 131	18.73	1.81	20	
m,p-Xylene	37.75	2.0	40	0	94.4	80 - 121	37.34	1.1	20	
Methylene chloride	16.03	2.0	20	0	80.1	74 - 124	16.74	4.31	20	
Naphthalene	22.61	1.0	20	0	113	61 - 128	20.25	11	20	
n-Butylbenzene	20.47	1.0	20	0	102	75 - 128	19.47	5.02	20	
n-Propylbenzene	20.31	1.0	20	0	102	76 - 126	19.15	5.87	20	
o-Xylene	19.03	1.0	20	0	95.1	78 - 122	19.15	0.637	20	
sec-Butylbenzene	20.71	1.0	20	0	104	77 - 126	19.76	4.7	20	
Styrene	17.96	1.0	20	0	89.8	78 - 123	18.13	0.935	20	
tert-Butylbenzene	20.46	1.0	20	0	102	78 - 124	19.35	5.56	20	
Tetrachloroethene	19.07	1.0	20	0	95.4	74 - 129	18.9	0.914	20	
Toluene	18.07	1.0	20	0	90.4	80 - 121	18.38	1.68	20	
trans-1,2-Dichloroethene	17.11	1.0	20	0	85.5	75 - 124	17.28	0.993	20	
trans-1,3-Dichloropropene	17.87	1.0	20	0	89.3	73 - 127	17.81	0.302	20	
Trichloroethene	17.81	1.0	20	0	89.1	79 - 123	18.37	3.1	20	
Trichlorofluoromethane	16.6	1.0	20	0	83.0	65 - 141	16.85	1.52	20	
Vinyl chloride	16.44	1.0	20	0	82.2	58 - 137	17.11	3.99	20	
Surr: 1,2-Dichloroethane-d4	*43.69*	*1.0*	*50*	*0*	*87.4*	*81 - 118*	*43.63*	*0.13*	*20*	
Surr: 4-Bromofluorobenzene	*49.42*	*1.0*	*50*	*0*	*98.8*	*85 - 114*	*50.27*	*1.71*	*20*	
Surr: Dibromofluoromethane	*44.57*	*1.0*	*50*	*0*	*89.1*	*80 - 119*	*45.19*	*1.39*	*20*	
Surr: Toluene-d8	*52.58*	*1.0*	*50*	*0*	*105*	*89 - 112*	*52*	*1.12*	*20*	

ALS Houston, US Date: 15-May-19

Client:	Bhate Environmental Associates, Inc.
Project:	Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder:	HS19050138

QC BATCH REPORT

Batch ID:	**R338430 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch:	HS19050138-01	HS19050138-02

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R337814 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW2-050219** Units: **mg/L** Analysis Date: **02-May-2019 21:41**
Client ID: Run ID: **ICS2100_337814** SeqNo: **5061734** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW2-050219** Units: **mg/L** Analysis Date: **02-May-2019 21:55**
Client ID: Run ID: **ICS2100_337814** SeqNo: **5061735** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.13	0.500	20	0	101	80 - 120				
Sulfate	20.05	0.500	20	0	100	80 - 120				

LCSD Sample ID: **WLCSDW2-050219** Units: **mg/L** Analysis Date: **02-May-2019 22:10**
Client ID: Run ID: **ICS2100_337814** SeqNo: **5061736** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.37	0.500	20	0	96.8	80 - 120	20.13	3.87	20	
Sulfate	19.23	0.500	20	0	96.2	80 - 120	20.05	4.17	20	

MS Sample ID: **HS19041545-10MS** Units: **mg/L** Analysis Date: **03-May-2019 03:32**
Client ID: Run ID: **ICS2100_337814** SeqNo: **5061745** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	65.95	2.50	50	15.1	102	80 - 120				
Sulfate	133.5	2.50	50	78.44	110	80 - 120				

MS Sample ID: **HS19041537-01MS** Units: **mg/L** Analysis Date: **02-May-2019 23:08**
Client ID: Run ID: **ICS2100_337814** SeqNo: **5061738** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	27.68	0.500	10	16.95	107	80 - 120				
Sulfate	86.19	0.500	10	75.01	112	80 - 120				O

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19050138

QC BATCH REPORT

Batch ID: R337814 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19041545-10MSD** Units: **mg/L** Analysis Date: **03-May-2019 03:47**
Client ID: Run ID: **ICS2100_337814** SeqNo: **5061746** PrepDate: DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	65.05	2.50	50	15.1	99.9	80 - 120	65.95	1.37	20	
Sulfate	129.9	2.50	50	78.44	103	80 - 120	133.5	2.69	20	

MSD Sample ID: **HS19041537-01MSD** Units: **mg/L** Analysis Date: **02-May-2019 23:23**
Client ID: Run ID: **ICS2100_337814** SeqNo: **5061739** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	26.91	0.500	10	16.95	99.6	80 - 120	27.68	2.81	20	
Sulfate	0.5000	0.500	10	75.01	0	80 - 120	86.19	0	20	U

The following samples were analyzed in this batch: HS19050138-01

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: **HS19050138**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Houston, US Date: 15-May-19

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 15-May-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19050138

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19050138-01	LH18/24-SP650_050119	Login	5/2/2019 5:17:11 PM	JRM	WET158
HS19050138-01	LH18/24-SP650_050119	Login	5/2/2019 5:17:11 PM	JRM	VOA216
HS19050138-02	Trip Blank	Login	5/2/2019 5:17:11 PM	JRM	VOA216

00939073

ALS Houston, US Date: 15-May-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19050138
Date/Time Received: **02-May-2019 12:50**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 2-May-2019 Date
Reviewed by: *RJ Modashia* eSignature 2-May-2019 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.8c/1.8c UC/C	IR11	
Cooler(s)/Kit(s):	43551		
Date/Time sample(s) sent to storage:	05/02/2019 17:20		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

00939074

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210, Houston, Tx. 77099 ATTN: R.J. Modashia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. NWO1312.0150.0 16.0001

Job: GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES

Prepared By: Scott Beesinger

P.O Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC	Analyses: CHLORIDE, SULFATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_050119	Water	05/01/19 / 14:00		3	3		HCL	
LH18/24-SP650_050119	Water	05/01/19 / 14:00		1		1	NONE	
Trip Blank	Water	05/01/19		2	2		HCL	

Additional Remarks: STANDARD TAT ON ALL PARAMETERS.

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	05/01/19	14:30	J. [illegible]	5/2/19	12:30						

9For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

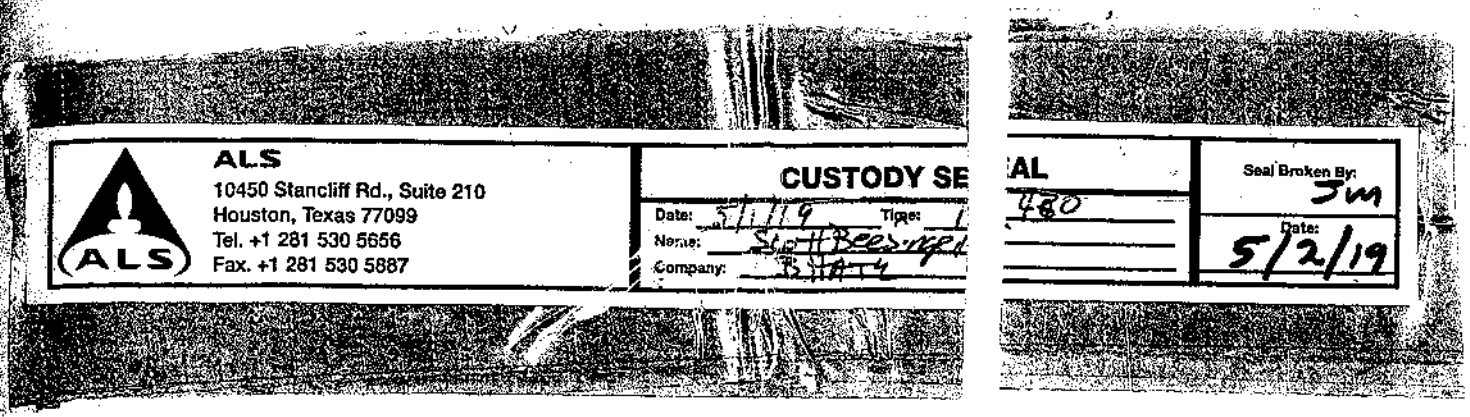
Remarks: Cooler ~~45~~ IR 43551 IR11
Temp 1.8 CF0.0

HS19050138

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Bi-Weekly Samples

(Word) S:\Forms\Chain of Custody - BiWeekly

00939075



ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTODY SE
Date: 5/1/19 Time:
Name: Scott Beesinger
Company: SHAW

AL
480

Seal Broken By:
JM
Date:
5/2/19

RMA:

FedEx Express

RETURNS MON-SAT
PRIORITY OVERNIGHT
THU - 02 MAY 10:30
PRIORITY OVERNIGH

TRK# 4380 0535 4231

FedEx
TRK# 0221 4380 9535 4231

AB SGRA

77099
TX-US
IAH

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

June 17, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19051856**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on May 31, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

June 17, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19051859**

Laboratory Results for: **LHAAP 18/24 GWTP Quaterly Effluent**

Dear Marcia,

ALS Environmental received 3 sample(s) on May 31, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 17-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Work Order: HS19051859

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19051859-01	LH18/24-SP650_052919	Groundwater		29-May-2019 14:00	31-May-2019 08:37	☐
HS19051859-02	LH18/24-SP650_052919_BIX	Groundwater		29-May-2019 14:00	31-May-2019 08:37	☐
HS19051859-03	Trip Blank	Water	C&G-040119-199	29-May-2019 14:00	31-May-2019 08:37	☐

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18/24 GWTP Quaterly Effluent
Work Order:

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 141538

Sample ID: LCSD-141538

- LCS/LCSD RPD exceeded the laboratory acceptance limit for surrogate Nitrobenzene-d5. The individual recoveries met acceptance criteria.

GCMS Volatiles by Method SW8260

Batch ID: R339874

Sample ID: HS19051779-01MS

- MS and MSD are for an unrelated sample

Metals by Method SW7470

Batch ID: 141540

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 141478

Sample ID: HS19051850-03MS

- MS and MSD are for an unrelated sample

WetChemistry by Method SW9056

Batch ID: R340350

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E1664A

Batch ID: R340065

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E410.4

Batch ID: R339595

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Sample ID: LH18/24-SP650_052919
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051859
Lab ID:HS19051859-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 19:51
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	04-Jun-2019 19:51
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	04-Jun-2019 19:51
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 19:51
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	04-Jun-2019 19:51
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Sample ID: LH18/24-SP650_052919
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051859
Lab ID:HS19051859-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
cis-1,2-Dichloroethene	**2.6**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Jun-2019 19:51
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	04-Jun-2019 19:51
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 19:51
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 19:51
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 19:51
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Trichloroethene	**0.92**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Jun-2019 19:51
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 19:51
Surr: 1,2-Dichloroethane-d4	*89.7*			**0**	*81-118*	*%REC*	*1*	*04-Jun-2019 19:51*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*04-Jun-2019 19:51*
Surr: Dibromofluoromethane	*94.4*			**0**	*80-119*	*%REC*	*1*	*04-Jun-2019 19:51*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*04-Jun-2019 19:51*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 03-Jun-2019		Analyst: LG
1,4-Dioxane	**5.1**		**0.20**	**0.20**	**0.20**	**ug/L**	20	05-Jun-2019 10:38
Surr: 2-Fluorobiphenyl	*96.3*			**0**	*40-140*	*%REC*	*20*	*05-Jun-2019 10:38*
Surr: 4-Terphenyl-d14	*75.5*			**0**	*40-140*	*%REC*	*20*	*05-Jun-2019 10:38*
Surr: Nitrobenzene-d5	*71.3*			**0**	*40-140*	*%REC*	*20*	*05-Jun-2019 10:38*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Sample ID: LH18/24-SP650_052919
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051859
Lab ID:HS19051859-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 31-May-2019		Analyst: JHD
Aluminum	**0.0422**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	04-Jun-2019 16:32
Antimony	0.000500	U	0.000400	0.000500	0.00200	mg/L	1	04-Jun-2019 16:32
Arsenic	**0.000699**	J	**0.000400**	**0.000500**	**0.00200**	**mg/L**	1	04-Jun-2019 16:32
Barium	**0.114**		**0.00190**	**0.00250**	**0.00400**	**mg/L**	1	04-Jun-2019 16:32
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:32
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:32
Calcium	**8.42**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	04-Jun-2019 16:32
Chromium	**0.00105**	J	**0.000400**	**0.000500**	**0.00400**	**mg/L**	1	04-Jun-2019 16:32
Cobalt	**0.00105**	J	**0.000200**	**0.000500**	**0.00500**	**mg/L**	1	04-Jun-2019 16:32
Iron	**0.195**	J	**0.0120**	**0.0500**	**0.200**	**mg/L**	1	04-Jun-2019 16:32
Lead	0.00100	U	0.000600	0.00100	0.00200	mg/L	1	04-Jun-2019 16:32
Magnesium	**10.7**		**0.0500**	**0.250**	**1.00**	**mg/L**	5	01-Jun-2019 00:28
Manganese	**0.0833**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	04-Jun-2019 16:32
Nickel	**0.00257**		**0.000600**	**0.00100**	**0.00200**	**mg/L**	1	04-Jun-2019 16:32
Potassium	**1.46**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	04-Jun-2019 16:32
Selenium	0.00250	U	0.00110	0.00250	0.00200	mg/L	1	04-Jun-2019 16:32
Silver	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:32
Sodium	**280**		**0.0700**	**0.250**	**1.00**	**mg/L**	5	01-Jun-2019 00:28
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:32
Vanadium	**0.000969**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	04-Jun-2019 16:32
Zinc	**0.0228**		**0.00200**	**0.00200**	**0.00400**	**mg/L**	1	04-Jun-2019 16:32
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 03-Jun-2019		Analyst: FO
Mercury	**0.0000900**	J	**0.0000300**	**0.000100**	**0.000200**	**mg/L**	1	03-Jun-2019 13:55
OIL & GREASE (HEM) BY E1664A		**Method:E1664A**						Analyst: KAH
Oil and Grease	**1.46**	J	**0.610**	**1.00**	**2.00**	**mg/L**	1	07-Jun-2019 14:45
CHEMICAL OXYGEN DEMAND BY E410.4		**Method:E410.4**						Analyst: AJA
Chemical Oxygen Demand	**16.0**		**5.00**	**15.0**	**15.0**	**mg/L**	1	31-May-2019 17:30
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**253**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jun-2019 22:28
Sulfate	**33.0**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jun-2019 22:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Sample ID: LH18/24-SP650_052919_BIX
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051859
Lab ID:HS19051859-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jun-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Sample ID: Trip Blank
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051859
Lab ID:HS19051859-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 17:50
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	04-Jun-2019 17:50
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	04-Jun-2019 17:50
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 17:50
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	04-Jun-2019 17:50
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Sample ID: Trip Blank
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051859
Lab ID:HS19051859-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	04-Jun-2019 17:50
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 17:50
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 17:50
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 17:50
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 17:50
Surr: 1,2-Dichloroethane-d4	*91.1*			**0**	*81-118*	*%REC*	*1*	*04-Jun-2019 17:50*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*04-Jun-2019 17:50*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*1*	*04-Jun-2019 17:50*
Surr: Toluene-d8	*109*			**0**	*89-112*	*%REC*	*1*	*04-Jun-2019 17:50*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

Batch ID: 141478 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051859-01	1	10	10 (mL)	1

Batch ID: 141538 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051859-01	1	1000	1 (mL)	0.001

Batch ID: 141540 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051859-01	1	10 (mL)	10 (mL)	1

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 141478	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00		31 May 2019 11:00	04 Jun 2019 16:32	1
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00		31 May 2019 11:00	01 Jun 2019 00:28	5
Batch ID 141538	**Test Name :** SEMIVOLATILES SIM			**Matrix:** Groundwater		
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00		03 Jun 2019 13:22	05 Jun 2019 10:38	20
Batch ID 141540	**Test Name :** MERCURY BY SW7470A			**Matrix:** Groundwater		
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00		03 Jun 2019 10:00	03 Jun 2019 13:55	1
Batch ID R339595	**Test Name :** CHEMICAL OXYGEN DEMAND BY E410.4			**Matrix:** Groundwater		
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00			31 May 2019 17:30	1
Batch ID R339874	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19051859-03	Trip Blank	29 May 2019 14:00			04 Jun 2019 17:50	1
Batch ID R339874	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Groundwater		
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00			04 Jun 2019 19:51	1
Batch ID R340065	**Test Name :** OIL & GREASE (HEM) BY E1664A			**Matrix:** Groundwater		
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00			07 Jun 2019 14:45	1
Batch ID R340350	**Test Name :** ANIONS BY SW9056A			**Matrix:** Groundwater		
HS19051859-01	LH18/24-SP650_052919	29 May 2019 14:00			11 Jun 2019 22:28	10
Batch ID R340666	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Groundwater		
HS19051859-02	LH18/24-SP650_052919_BIX	29 May 2019 14:00			17 Jun 2019 18:06	1

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLKF1-141478** Units: **mg/L** Analysis Date: **31-May-2019 23:28**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102626** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.007575	0.0100								J
Antimony	0.000500	0.00200								U
Arsenic	0.000500	0.00200								U
Barium	0.00315	0.00400								J
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.04241	0.500								J
Chromium	0.000500	0.00400								U
Cobalt	0.000500	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00200								U
Magnesium	0.01861	0.200								J
Manganese	0.000746	0.00500								J
Nickel	0.00100	0.00200								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U
Sodium	0.1198	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.02232	0.00400								

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-141478** Units: **mg/L** Analysis Date: **31-May-2019 23:26**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102625** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.003227	0.0100								J
Antimony	0.000500	0.00200								U
Arsenic	0.000500	0.00200								U
Barium	0.00250	0.00400								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00400								U
Cobalt	0.000500	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00200								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00200								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00200	0.00400								U

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

LCS Sample ID: **LCS-141478** Units: **mg/L** Analysis Date: **31-May-2019 23:30**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102627** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09159	0.0100	0.1	0	91.6	80 - 120				
Antimony	0.04956	0.00200	0.05	0	99.1	80 - 120				
Arsenic	0.04876	0.00200	0.05	0	97.5	80 - 120				
Barium	0.04854	0.00400	0.05	0	97.1	80 - 120				
Beryllium	0.04803	0.00200	0.05	0	96.1	80 - 120				
Cadmium	0.04938	0.00200	0.05	0	98.8	80 - 120				
Calcium	4.702	0.500	5	0	94.0	80 - 120				
Chromium	0.04808	0.00400	0.05	0	96.2	80 - 120				
Cobalt	0.04631	0.00500	0.05	0	92.6	80 - 120				
Iron	4.869	0.200	5	0	97.4	80 - 120				
Lead	0.0475	0.00200	0.05	0	95.0	80 - 120				
Magnesium	4.706	0.200	5	0	94.1	80 - 120				
Manganese	0.04804	0.00500	0.05	0	96.1	80 - 120				
Nickel	0.04942	0.00200	0.05	0	98.8	80 - 120				
Potassium	4.811	0.200	5	0	96.2	80 - 120				
Selenium	0.0515	0.00200	0.05	0	103	80 - 120				
Silver	0.0546	0.00200	0.05	0	109	80 - 120				
Sodium	4.751	0.200	5	0	95.0	80 - 120				
Thallium	0.04748	0.00200	0.05	0	95.0	80 - 120				
Vanadium	0.04702	0.00500	0.05	0	94.0	80 - 120				
Zinc	0.05157	0.00400	0.05	0	103	80 - 120				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MS Sample ID: **HS19051850-03MS** Units: **mg/L** Analysis Date: **31-May-2019 23:39**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102632** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.143	0.0100	0.1	0.03095	112	80 - 120				
Antimony	0.04944	0.00200	0.05	-0.000554	100.0	80 - 120				
Arsenic	0.05055	0.00200	0.05	0.000794	99.5	80 - 120				
Barium	0.44	0.00400	0.05	0.3664	147	80 - 120				SO
Beryllium	0.04816	0.00200	0.05	0.000011	96.3	80 - 120				
Cadmium	0.05034	0.00200	0.05	0.000018	101	80 - 120				
Calcium	80.68	0.500	5	73.3	147	80 - 120				SO
Chromium	0.1352	0.00400	0.05	0.0279	215	80 - 120				S
Cobalt	0.05522	0.00500	0.05	0.006927	96.6	80 - 120				
Iron	5.781	0.200	5	0.6969	102	80 - 120				
Lead	0.05114	0.00200	0.05	0.000147	102	80 - 120				
Magnesium	25.76	0.200	5	20.51	105	80 - 120				O
Manganese	0.1893	0.00500	0.05	0.1059	167	80 - 120				S
Nickel	0.2741	0.00200	0.05	0.206	136	80 - 120				SO
Potassium	5.961	0.200	5	1.107	97.1	80 - 120				
Selenium	0.05099	0.00200	0.05	0.000467	101	80 - 120				
Silver	0.05342	0.00200	0.05	-0.000008	107	80 - 120				
Sodium	59.66	0.200	5	53.73	119	80 - 120				O
Thallium	0.05062	0.00200	0.05	-0.000018	101	80 - 120				
Vanadium	0.05114	0.00500	0.05	0.002713	96.9	80 - 120				
Zinc	0.05361	0.00400	0.05	0.003698	99.8	80 - 120				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19051850-03MSD** Units: **mg/L** Analysis Date: **31-May-2019 23:41**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102633** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.151	0.0100	0.1	0.03095	120	80 - 120	0.143	5.46	20	S
Antimony	0.05253	0.00200	0.05	-0.000554	106	80 - 120	0.04944	6.06	20	
Arsenic	0.05277	0.00200	0.05	0.000794	104	80 - 120	0.05055	4.3	20	
Barium	0.4384	0.00400	0.05	0.3664	144	80 - 120	0.44	0.368	20	SO
Beryllium	0.04972	0.00200	0.05	0.000011	99.4	80 - 120	0.04816	3.2	20	
Cadmium	0.0514	0.00200	0.05	0.000018	103	80 - 120	0.05034	2.08	20	
Calcium	84.17	0.500	5	73.3	217	80 - 120	80.68	4.24	20	SO
Chromium	0.1197	0.00400	0.05	0.0279	184	80 - 120	0.1352	12.2	20	S
Cobalt	0.05791	0.00500	0.05	0.006927	102	80 - 120	0.05522	4.74	20	
Iron	6.089	0.200	5	0.6969	108	80 - 120	5.781	5.19	20	
Lead	0.05042	0.00200	0.05	0.000147	101	80 - 120	0.05114	1.41	20	
Magnesium	27.04	0.200	5	20.51	131	80 - 120	25.76	4.87	20	SO
Manganese	0.2094	0.00500	0.05	0.1059	207	80 - 120	0.1893	10.1	20	S
Nickel	0.2818	0.00200	0.05	0.206	152	80 - 120	0.2741	2.77	20	SO
Potassium	6.227	0.200	5	1.107	102	80 - 120	5.961	4.35	20	
Selenium	0.05276	0.00200	0.05	0.000467	105	80 - 120	0.05099	3.42	20	
Silver	0.05362	0.00200	0.05	-0.000008	107	80 - 120	0.05342	0.362	20	
Sodium	62.68	0.200	5	53.73	179	80 - 120	59.66	4.93	20	SO
Thallium	0.05011	0.00200	0.05	-0.000018	100	80 - 120	0.05062	1.01	20	
Vanadium	0.05404	0.00500	0.05	0.002713	103	80 - 120	0.05114	5.52	20	
Zinc	0.05674	0.00400	0.05	0.003698	106	80 - 120	0.05361	5.68	20	

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19051850-03PDS** Units: **mg/L** Analysis Date: **31-May-2019 23:43**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102634** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1521	0.0100	0.1	0.03095	121	75 - 125				
Arsenic	0.1244	0.00200	0.1	0.000794	124	75 - 125				
Cadmium	0.1243	0.00200	0.1	0.000018	124	75 - 125				
Calcium	83.17	0.500	10	73.3	98.6	75 - 125				O
Cobalt	0.1211	0.00500	0.1	0.006927	114	75 - 125				
Iron	12.94	0.200	10	0.6969	122	75 - 125				
Lead	0.1242	0.00200	0.1	0.000147	124	75 - 125				
Magnesium	32.3	0.200	10	20.51	118	75 - 125				
Nickel	0.3242	0.00200	0.1	0.206	118	75 - 125				
Potassium	12.94	0.200	10	1.107	118	75 - 125				
Silver	0.1237	0.00200	0.1	-0.000008	124	75 - 125				
Sodium	64.04	0.200	10	53.73	103	75 - 125				O
Thallium	0.1233	0.00200	0.1	-0.000018	123	75 - 125				
Vanadium	0.122	0.00500	0.1	0.002713	119	75 - 125				
Zinc	0.1272	0.00400	0.1	0.003698	123	75 - 125				

PDS Sample ID: **HS19051850-03PDS** Units: **mg/L** Analysis Date: **03-Jun-2019 12:04**
Client ID: Run ID: **ICPMS04_339653** SeqNo: **5103542** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09062	0.00200	0.1	0	90.6	75 - 125				
Barium	0.4529	0.00400	0.1	0.3664	86.4	75 - 125				
Beryllium	0.09399	0.00200	0.1	0	94.0	75 - 125				
Chromium	0.1265	0.00400	0.1	0.0279	98.6	75 - 125				
Manganese	0.2079	0.00500	0.1	0.1059	102	75 - 125				
Selenium	0.094	0.00200	0.1	0	94.0	75 - 125				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

SD Sample ID: **HS19051850-03SD** Units: **mg/L** Analysis Date: **31-May-2019 23:38**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102631** PrepDate: **31-May-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.02554	0.0500					0.03095	0	10	J
Antimony	0.00250	0.0100					-0.000554	0	10	U
Arsenic	0.00250	0.0100					0.000794	0	10	U
Barium	0.3548	0.0200					0.3664	3.18	10	
Beryllium	0.00250	0.0100					0.000011	0	10	U
Cadmium	0.00250	0.0100					0.000018	0	10	U
Calcium	73.23	2.50					73.3	0.105	10	
Chromium	0.02755	0.0200					0.0279	1.26	10	
Cobalt	0.007246	0.0250					0.006927	0	10	J
Iron	0.6583	1.00					0.6969	0	10	J
Lead	0.00500	0.0100					0.000147	0	10	U
Magnesium	21.55	1.00					20.51	5.06	10	
Manganese	0.1139	0.0250					0.1059	7.61	10	
Nickel	0.2156	0.0100					0.206	4.67	10	
Potassium	1.116	1.00					1.107	0.792	10	
Selenium	0.0125	0.0100					0.000467	0	10	U
Silver	0.00250	0.0100					-0.000008	0	10	U
Sodium	55.55	1.00					53.73	3.38	10	
Thallium	0.00250	0.0100					-0.000018	0	10	U
Vanadium	0.008106	0.0250					0.002713	0	10	J
Zinc	0.0100	0.0200					0.003698	0	10	U

The following samples were analyzed in this batch: HS19051859-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141540 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-141540** Units: **mg/L** Analysis Date: **03-Jun-2019 13:52**
Client ID: Run ID: **HG03_339690** SeqNo: **5104033** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-141540** Units: **mg/L** Analysis Date: **03-Jun-2019 13:53**
Client ID: Run ID: **HG03_339690** SeqNo: **5104034** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00503	0.000200	0.005	0	101	80 - 120				

MS Sample ID: **HS19051859-01MS** Units: **mg/L** Analysis Date: **03-Jun-2019 13:57**
Client ID: **LH18/24-SP650_052919** Run ID: **HG03_339690** SeqNo: **5104036** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.005	0.000200	0.005	0.00009	98.2	75 - 125				

MSD Sample ID: **HS19051859-01MSD** Units: **mg/L** Analysis Date: **03-Jun-2019 13:58**
Client ID: **LH18/24-SP650_052919** Run ID: **HG03_339690** SeqNo: **5104037** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00502	0.000200	0.005	0.00009	98.6	75 - 125	0.005	0.399	20	

The following samples were analyzed in this batch: HS19051859-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: 141538 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-141538** Units: **ug/L** Analysis Date: **05-Jun-2019 09:15**
Client ID: Run ID: **SV-5_339895** SeqNo: **5108847** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.07056*	*0*	*0.08*	*0*	*88.2*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.06728*	*0*	*0.08*	*0*	*84.1*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07988*	*0*	*0.08*	*0*	*99.9*	*40 - 140*				

LCS Sample ID: **LCS-141538** Units: **ug/L** Analysis Date: **05-Jun-2019 08:33**
Client ID: Run ID: **SV-5_339895** SeqNo: **5108833** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.0845	0.010	0.08	0	106	40 - 140				
Surr: 2-Fluorobiphenyl	*0.08883*	*0*	*0.08*	*0*	*111*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.06752*	*0*	*0.08*	*0*	*84.4*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.06431*	*0*	*0.08*	*0*	*80.4*	*40 - 140*				

LCSD Sample ID: **LCSD-141538** Units: **ug/L** Analysis Date: **05-Jun-2019 08:54**
Client ID: Run ID: **SV-5_339895** SeqNo: **5108846** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08994	0.010	0.08	0	112	40 - 140	0.0845	6.24	20	
Surr: 2-Fluorobiphenyl	*0.0828*	*0*	*0.08*	*0*	*104*	*40 - 140*	*0.08883*	*7.03*	*20*	
Surr: 4-Terphenyl-d14	*0.0602*	*0*	*0.08*	*0*	*75.2*	*40 - 140*	*0.06752*	*11.5*	*20*	
Surr: Nitrobenzene-d5	*0.08236*	*0*	*0.08*	*0*	*103*	*40 - 140*	*0.06431*	*24.6*	*20*	R

The following samples were analyzed in this batch: HS19051859-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 17:26**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108298** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 17:26**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108298** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.91*	*1.0*	*50*	*0*	*89.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.35*	*1.0*	*50*	*0*	*98.7*	*85 - 114*				
Surr: Dibromofluoromethane	*46.74*	*1.0*	*50*	*0*	*93.5*	*80 - 119*				
Surr: Toluene-d8	*53.5*	*1.0*	*50*	*0*	*107*	*89 - 112*				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 16:38**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108297** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.65	1.0	20	0	98.2	78 - 124				
1,1,1-Trichloroethane	19.34	1.0	20	0	96.7	74 - 131				
1,1,2,2-Tetrachloroethane	20.2	1.0	20	0	101	71 - 121				
1,1,2-Trichloroethane	20.99	1.0	20	0	105	80 - 119				
1,1-Dichloroethane	19.06	1.0	20	0	95.3	77 - 125				
1,1-Dichloroethene	18.87	1.0	20	0	94.4	71 - 131				
1,1-Dichloropropene	18.09	1.0	20	0	90.4	78 - 125				
1,2,3-Trichlorobenzene	24.79	1.0	20	0	124	69 - 129				
1,2,3-Trichloropropane	19.34	1.0	20	0	96.7	73 - 122				
1,2,4-Trichlorobenzene	23.55	1.0	20	0	118	69 - 130				
1,2,4-Trimethylbenzene	18.31	1.0	20	0	91.6	76 - 124				
1,2-Dibromo-3-chloropropane	20.72	1.0	20	0	104	62 - 128				
1,2-Dibromoethane	20.66	1.0	20	0	103	77 - 121				
1,2-Dichlorobenzene	19.72	1.0	20	0	98.6	80 - 119				
1,2-Dichloroethane	19.85	1.0	20	0	99.2	73 - 128				
1,2-Dichloropropane	20.15	1.0	20	0	101	78 - 122				
1,3,5-Trimethylbenzene	17.9	1.0	20	0	89.5	75 - 124				
1,3-Dichlorobenzene	18.94	1.0	20	0	94.7	80 - 119				
1,3-Dichloropropane	20.87	1.0	20	0	104	80 - 119				
1,4-Dichlorobenzene	18.66	1.0	20	0	93.3	79 - 118				
2,2-Dichloropropane	19.73	1.0	20	0	98.7	60 - 139				
2-Butanone	47.14	2.0	40	0	118	56 - 143				
2-Chlorotoluene	17.89	1.0	20	0	89.5	79 - 122				
2-Hexanone	44.83	2.0	40	0	112	57 - 139				
4-Chlorotoluene	18.29	1.0	20	0	91.4	78 - 122				
4-Isopropyltoluene	17.3	1.0	20	0	86.5	77 - 127				
4-Methyl-2-pentanone	41.57	2.0	40	0	104	67 - 130				
Acetone	49.02	2.0	40	0	123	39 - 160				
Benzene	19.02	1.0	20	0	95.1	79 - 120				
Bromobenzene	19.17	1.0	20	0	95.9	80 - 120				
Bromochloromethane	20.93	1.0	20	0	105	78 - 123				
Bromodichloromethane	19.64	1.0	20	0	98.2	79 - 125				
Bromoform	20.82	1.0	20	0	104	66 - 130				
Bromomethane	23.09	1.0	20	0	115	53 - 141				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 16:38**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108297** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	38.69	2.0	40	0	96.7	64 - 133				
Carbon tetrachloride	17.69	1.0	20	0	88.5	72 - 136				
Chlorobenzene	19.45	1.0	20	0	97.3	82 - 118				
Chloroethane	19.14	1.0	20	0	95.7	60 - 138				
Chloroform	20.04	1.0	20	0	100	79 - 124				
Chloromethane	15.66	1.0	20	0	78.3	50 - 139				
cis-1,2-Dichloroethene	19.81	1.0	20	0	99.1	78 - 123				
cis-1,3-Dichloropropene	20.05	1.0	20	0	100	75 - 124				
Dibromochloromethane	20.63	1.0	20	0	103	74 - 126				
Dibromomethane	20.31	1.0	20	0	102	79 - 123				
Dichlorodifluoromethane	18.37	1.0	20	0	91.8	32 - 152				
Ethylbenzene	18.95	1.0	20	0	94.8	79 - 121				
Hexachlorobutadiene	22.08	1.0	20	0	110	66 - 134				
Isopropylbenzene	17.97	1.0	20	0	89.9	72 - 131				
m,p-Xylene	37.67	2.0	40	0	94.2	80 - 121				
Methylene chloride	20.5	2.0	20	0	102	74 - 124				
Naphthalene	24.54	1.0	20	0	123	61 - 128				
n-Butylbenzene	17.48	1.0	20	0	87.4	75 - 128				
n-Propylbenzene	17.36	1.0	20	0	86.8	76 - 126				
o-Xylene	19.08	1.0	20	0	95.4	78 - 122				
sec-Butylbenzene	16.66	1.0	20	0	83.3	77 - 126				
Styrene	19.95	1.0	20	0	99.7	78 - 123				
tert-Butylbenzene	17.22	1.0	20	0	86.1	78 - 124				
Tetrachloroethene	18.71	1.0	20	0	93.5	74 - 129				
Toluene	19.64	1.0	20	0	98.2	80 - 121				
trans-1,2-Dichloroethene	19.19	1.0	20	0	96.0	75 - 124				
trans-1,3-Dichloropropene	20.51	1.0	20	0	103	73 - 127				
Trichloroethene	19.2	1.0	20	0	96.0	79 - 123				
Trichlorofluoromethane	18.09	1.0	20	0	90.5	65 - 141				
Vinyl chloride	18.75	1.0	20	0	93.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.33*	*1.0*	*50*	*0*	*107*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.97*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*53.7*	*1.0*	*50*	*0*	*107*	*80 - 119*				
Surr: Toluene-d8	*50.12*	*1.0*	*50*	*0*	*100*	*89 - 112*				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19051779-01MS** Units: **UG/L** Analysis Date: **04-Jun-2019 21:05**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108306** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	379.7	20	400	0	94.9	78 - 124				
1,1,1-Trichloroethane	352	20	400	0	88.0	74 - 131				
1,1,2,2-Tetrachloroethane	366.7	20	400	0	91.7	71 - 121				
1,1,2-Trichloroethane	380.6	20	400	0	95.2	80 - 119				
1,1-Dichloroethane	341.8	20	400	0	85.4	77 - 125				
1,1-Dichloroethene	356.6	20	400	0	89.2	71 - 131				
1,1-Dichloropropene	358.1	20	400	0	89.5	78 - 125				
1,2,3-Trichlorobenzene	347.8	20	400	0	86.9	69 - 129				
1,2,3-Trichloropropane	349.4	20	400	0	87.4	73 - 122				
1,2,4-Trichlorobenzene	373.2	20	400	0	93.3	69 - 130				
1,2,4-Trimethylbenzene	389.8	20	400	0	97.5	76 - 124				
1,2-Dibromo-3-chloropropane	336.5	20	400	0	84.1	62 - 128				
1,2-Dibromoethane	368.3	20	400	0	92.1	77 - 121				
1,2-Dichlorobenzene	382.4	20	400	0	95.6	80 - 119				
1,2-Dichloroethane	354.8	20	400	0	88.7	73 - 128				
1,2-Dichloropropane	375.8	20	400	0	94.0	78 - 122				
1,3,5-Trimethylbenzene	401.3	20	400	0	100	75 - 124				
1,3-Dichlorobenzene	384	20	400	0	96.0	80 - 119				
1,3-Dichloropropane	382.9	20	400	0	95.7	80 - 119				
1,4-Dichlorobenzene	373.9	20	400	0	93.5	79 - 118				
2,2-Dichloropropane	324.6	20	400	0	81.1	60 - 139				
2-Butanone	413.2	40	800	0	51.7	56 - 143				S
2-Chlorotoluene	378.8	20	400	0	94.7	79 - 122				
2-Hexanone	492.1	40	800	0	61.5	57 - 139				
4-Chlorotoluene	380.5	20	400	0	95.1	78 - 122				
4-Isopropyltoluene	397.3	20	400	0	99.3	77 - 127				
4-Methyl-2-pentanone	457.2	40	800	0	57.1	67 - 130				S
Acetone	465.2	40	800	0	58.2	39 - 160				
Benzene	361.9	20	400	0	90.5	79 - 120				
Bromobenzene	387.6	20	400	0	96.9	80 - 120				
Bromochloromethane	345.5	20	400	0	86.4	78 - 123				
Bromodichloromethane	354.6	20	400	0	88.7	79 - 125				
Bromoform	362.7	20	400	0	90.7	66 - 130				
Bromomethane	290.5	20	400	0	72.6	53 - 141				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19051779-01MS** Units: **UG/L** Analysis Date: **04-Jun-2019 21:05**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108306** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	549.2	40	800	0	68.6	64 - 133				
Carbon tetrachloride	364.1	20	400	0	91.0	72 - 136				
Chlorobenzene	376.7	20	400	0	94.2	82 - 118				
Chloroethane	332.8	20	400	0	83.2	60 - 138				
Chloroform	346.2	20	400	0	86.6	79 - 124				
Chloromethane	358	20	400	0	89.5	50 - 139				
cis-1,2-Dichloroethene	345.9	20	400	0	86.5	78 - 123				
cis-1,3-Dichloropropene	355	20	400	0	88.7	75 - 124				
Dibromochloromethane	377.7	20	400	0	94.4	74 - 126				
Dibromomethane	351.1	20	400	0	87.8	79 - 123				
Dichlorodifluoromethane	349.2	20	400	0	87.3	32 - 152				
Ethylbenzene	381.7	20	400	0	95.4	79 - 121				
Hexachlorobutadiene	413.2	20	400	0	103	66 - 134				
Isopropylbenzene	394.8	20	400	0	98.7	72 - 131				
m,p-Xylene	749.4	40	800	0	93.7	80 - 121				
Methylene chloride	414.4	40	400	0	104	74 - 124				
Naphthalene	328.1	20	400	0	82.0	61 - 128				
n-Butylbenzene	392.4	20	400	0	98.1	75 - 128				
n-Propylbenzene	390.4	20	400	0	97.6	76 - 126				
o-Xylene	376.8	20	400	0	94.2	78 - 122				
sec-Butylbenzene	395.7	20	400	0	98.9	77 - 126				
Styrene	377.9	20	400	0	94.5	78 - 123				
tert-Butylbenzene	398.9	20	400	0	99.7	78 - 124				
Tetrachloroethene	407.5	20	400	0	102	74 - 129				
Toluene	393.5	20	400	0	98.4	80 - 121				
trans-1,2-Dichloroethene	346.7	20	400	0	86.7	75 - 124				
trans-1,3-Dichloropropene	347.8	20	400	0	87.0	73 - 127				
Trichloroethene	367.7	20	400	0	91.9	79 - 123				
Trichlorofluoromethane	355.1	20	400	0	88.8	65 - 141				
Vinyl chloride	398.1	20	400	0	99.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*887.4*	*20*	*1000*	*0*	*88.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*1056*	*20*	*1000*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*955.1*	*20*	*1000*	*0*	*95.5*	*80 - 119*				
Surr: Toluene-d8	*1063*	*20*	*1000*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19051779-01MSD** Units: **UG/L** Analysis Date: **04-Jun-2019 21:29**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108307** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	367.2	20	400	0	91.8	78 - 124	379.7	3.34	20	
1,1,1-Trichloroethane	332.3	20	400	0	83.1	74 - 131	352	5.78	20	
1,1,2,2-Tetrachloroethane	360.3	20	400	0	90.1	71 - 121	366.7	1.76	20	
1,1,2-Trichloroethane	369.5	20	400	0	92.4	80 - 119	380.6	2.96	20	
1,1-Dichloroethane	325.1	20	400	0	81.3	77 - 125	341.8	5	20	
1,1-Dichloroethene	329.1	20	400	0	82.3	71 - 131	356.6	8.03	20	
1,1-Dichloropropene	337.5	20	400	0	84.4	78 - 125	358.1	5.92	20	
1,2,3-Trichlorobenzene	331.8	20	400	0	83.0	69 - 129	347.8	4.69	20	
1,2,3-Trichloropropane	343.3	20	400	0	85.8	73 - 122	349.4	1.76	20	
1,2,4-Trichlorobenzene	357.2	20	400	0	89.3	69 - 130	373.2	4.39	20	
1,2,4-Trimethylbenzene	377.3	20	400	0	94.3	76 - 124	389.8	3.28	20	
1,2-Dibromo-3-chloropropane	318.8	20	400	0	79.7	62 - 128	336.5	5.41	20	
1,2-Dibromoethane	362.9	20	400	0	90.7	77 - 121	368.3	1.47	20	
1,2-Dichlorobenzene	372.2	20	400	0	93.0	80 - 119	382.4	2.71	20	
1,2-Dichloroethane	338.6	20	400	0	84.6	73 - 128	354.8	4.68	20	
1,2-Dichloropropane	361	20	400	0	90.2	78 - 122	375.8	4.03	20	
1,3,5-Trimethylbenzene	383.3	20	400	0	95.8	75 - 124	401.3	4.61	20	
1,3-Dichlorobenzene	375	20	400	0	93.7	80 - 119	384	2.38	20	
1,3-Dichloropropane	377.7	20	400	0	94.4	80 - 119	382.9	1.36	20	
1,4-Dichlorobenzene	364	20	400	0	91.0	79 - 118	373.9	2.69	20	
2,2-Dichloropropane	300.4	20	400	0	75.1	60 - 139	324.6	7.75	20	
2-Butanone	406.9	40	800	0	50.9	56 - 143	413.2	1.53	20	S
2-Chlorotoluene	361.9	20	400	0	90.5	79 - 122	378.8	4.55	20	
2-Hexanone	486.1	40	800	0	60.8	57 - 139	492.1	1.24	20	
4-Chlorotoluene	368.9	20	400	0	92.2	78 - 122	380.5	3.1	20	
4-Isopropyltoluene	386.4	20	400	0	96.6	77 - 127	397.3	2.78	20	
4-Methyl-2-pentanone	457.6	40	800	0	57.2	67 - 130	457.2	0.0924	20	S
Acetone	450.9	40	800	0	56.4	39 - 160	465.2	3.12	20	
Benzene	344.2	20	400	0	86.0	79 - 120	361.9	5.03	20	
Bromobenzene	376.4	20	400	0	94.1	80 - 120	387.6	2.91	20	
Bromochloromethane	322.4	20	400	0	80.6	78 - 123	345.5	6.9	20	
Bromodichloromethane	345	20	400	0	86.2	79 - 125	354.6	2.76	20	
Bromoform	361.1	20	400	0	90.3	66 - 130	362.7	0.454	20	
Bromomethane	292.3	20	400	0	73.1	53 - 141	290.5	0.628	20	

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19051779-01MSD** Units: **UG/L** Analysis Date: **04-Jun-2019 21:29**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108307** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	437.5	40	800	0	54.7	64 - 133	549.2	22.6	20	SR
Carbon tetrachloride	345.2	20	400	0	86.3	72 - 136	364.1	5.33	20	
Chlorobenzene	359.3	20	400	0	89.8	82 - 118	376.7	4.73	20	
Chloroethane	298.2	20	400	0	74.5	60 - 138	332.8	11	20	
Chloroform	327.7	20	400	0	81.9	79 - 124	346.2	5.49	20	
Chloromethane	257.4	20	400	0	64.3	50 - 139	358	32.7	20	R
cis-1,2-Dichloroethene	330	20	400	0	82.5	78 - 123	345.9	4.71	20	
cis-1,3-Dichloropropene	340	20	400	0	85.0	75 - 124	355	4.3	20	
Dibromochloromethane	364.1	20	400	0	91.0	74 - 126	377.7	3.67	20	
Dibromomethane	343.3	20	400	0	85.8	79 - 123	351.1	2.23	20	
Dichlorodifluoromethane	290.4	20	400	0	72.6	32 - 152	349.2	18.4	20	
Ethylbenzene	367.9	20	400	0	92.0	79 - 121	381.7	3.7	20	
Hexachlorobutadiene	395.8	20	400	0	99.0	66 - 134	413.2	4.29	20	
Isopropylbenzene	382.6	20	400	0	95.6	72 - 131	394.8	3.14	20	
m,p-Xylene	717.3	40	800	0	89.7	80 - 121	749.4	4.39	20	
Methylene chloride	347.1	40	400	0	86.8	74 - 124	414.4	17.7	20	
Naphthalene	318.6	20	400	0	79.7	61 - 128	328.1	2.93	20	
n-Butylbenzene	379.9	20	400	0	95.0	75 - 128	392.4	3.24	20	
n-Propylbenzene	376.1	20	400	0	94.0	76 - 126	390.4	3.73	20	
o-Xylene	360.5	20	400	0	90.1	78 - 122	376.8	4.44	20	
sec-Butylbenzene	383.6	20	400	0	95.9	77 - 126	395.7	3.12	20	
Styrene	362.3	20	400	0	90.6	78 - 123	377.9	4.22	20	
tert-Butylbenzene	388.5	20	400	0	97.1	78 - 124	398.9	2.65	20	
Tetrachloroethene	385.4	20	400	0	96.4	74 - 129	407.5	5.57	20	
Toluene	373.9	20	400	0	93.5	80 - 121	393.5	5.13	20	
trans-1,2-Dichloroethene	326.7	20	400	0	81.7	75 - 124	346.7	5.92	20	
trans-1,3-Dichloropropene	332	20	400	0	83.0	73 - 127	347.8	4.67	20	
Trichloroethene	350	20	400	0	87.5	79 - 123	367.7	4.94	20	
Trichlorofluoromethane	333	20	400	0	83.2	65 - 141	355.1	6.44	20	
Vinyl chloride	325.9	20	400	0	81.5	58 - 137	398.1	20	20	
Surr: 1,2-Dichloroethane-d4	*879.9*	*20*	*1000*	*0*	*88.0*	*81 - 118*	*887.4*	*0.843*	*20*	
Surr: 4-Bromofluorobenzene	*1059*	*20*	*1000*	*0*	*106*	*85 - 114*	*1056*	*0.269*	*20*	
Surr: Dibromofluoromethane	*947.2*	*20*	*1000*	*0*	*94.7*	*80 - 119*	*955.1*	*0.821*	*20*	
Surr: Toluene-d8	*1055*	*20*	*1000*	*0*	*105*	*89 - 112*	*1063*	*0.745*	*20*	

ALS Houston, US Date: 17-Jun-19

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder:	HS19051859

QC BATCH REPORT

Batch ID:	**R339874 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19051859-01 HS19051859-03

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R339595 (0) **Instrument: WetChem_HS** **Method: CHEMICAL OXYGEN DEMAND BY E410.4**

MBLK Sample ID: **MBLK-R339595** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101809** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	15.0	15.0								U

LCS Sample ID: **LCS-R339595** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101808** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	103	15.0	100	0	103	85 - 115				

MS Sample ID: **HS19051880-02MS** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101810** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	88	15.0	50	34	108	80 - 120				

DUP Sample ID: **HS19051880-02DUP** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101811** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	32	15.0					34	6.06	20	

The following samples were analyzed in this batch: HS19051859-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R340065 (0) **Instrument: Balance1** **Method: OIL & GREASE (HEM) BY E1664A**

MBLK Sample ID: **WBLKW-060719** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112440** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	1.00	2.00								U

LCS Sample ID: **WLCSW-060719** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112442** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	38.4	2.00	40	0	96.0	78 - 114				

LCSD Sample ID: **WLCSDW-060719** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112441** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	38	2.00	40	0	95.0	78 - 114	38.4	1.05	18	

MS Sample ID: **HS19060196-01MS** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112436** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	40.83	2.00	40	1.667	97.9	78 - 114				

The following samples were analyzed in this batch: HS19051859-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R340350 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 13:36**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118828** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 13:54**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118829** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.46	0.500	20	0	97.3	80 - 120				
Sulfate	19.67	0.500	20	0	98.4	80 - 120				

LCSD Sample ID: **WLCSDW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 14:12**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118830** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.46	0.500	20	0	97.3	80 - 120	19.46	0.0308	20	
Sulfate	19.63	0.500	20	0	98.2	80 - 120	19.67	0.189	20	

MS Sample ID: **HS19060226-01MS** Units: **mg/L** Analysis Date: **11-Jun-2019 16:35**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118835** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	490.6	25.0	500	13.25	95.5	80 - 120				
Sulfate	1634	25.0	500	1163	94.1	80 - 120				

MS Sample ID: **HS19060224-03MS** Units: **mg/L** Analysis Date: **11-Jun-2019 15:43**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118832** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	108.2	5.00	100	12.57	95.6	80 - 120				
Sulfate	337.8	5.00	100	245	92.8	80 - 120				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: HS19051859

QC BATCH REPORT

Batch ID: R340350 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19060226-01MSD** Units: **mg/L** Analysis Date: **11-Jun-2019 17:28**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118838** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	489.3	25.0	500	13.25	95.2	80 - 120	490.6	0.255	20	
Sulfate	1631	25.0	500	1163	93.7	80 - 120	1634	0.13	20	

MSD Sample ID: **HS19060224-03MSD** Units: **mg/L** Analysis Date: **11-Jun-2019 16:00**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118833** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	108.4	5.00	100	12.57	95.8	80 - 120	108.2	0.157	20	
Sulfate	338.1	5.00	100	245	93.1	80 - 120	337.8	0.0846	20	

The following samples were analyzed in this batch: HS19051859-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
WorkOrder: **HS19051859**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 17-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Effluent
Work Order: HS19051859

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19051859-01	LH18/24-SP650_052919	Login	31/05/2019 11:30:39	PMG	Disposed
HS19051859-01	LH18/24-SP650_052919	Login	31/05/2019 11:30:39	PMG	Disposed
HS19051859-01	LH18/24-SP650_052919	Login	31/05/2019 11:30:39	PMG	Disposed
HS19051859-01	LH18/24-SP650_052919	Login	31/05/2019 11:30:39	PMG	Disposed
HS19051859-01	LH18/24-SP650_052919	Login	31/05/2019 11:30:39	PMG	Disposed
HS19051859-01	LH18/24-SP650_052919	Login	31/05/2019 11:30:39	PMG	Disposed
HS19051859-02	LH18/24-SP650_052919_BIX	Login	31/05/2019 11:30:39	PMG	Sub
HS19051859-03	Trip Blank	Login	31/05/2019 11:30:39	PMG	Disposed

ALS Houston, US Date: 17-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19051859
Date/Time Received: **31-May-2019 08:37**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 31-May-2019 Date
Reviewed by: *RJ Modashia* eSignature 31-May-2019 Date

Matrices: **Water**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:none
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.3c U/c	IR11	
Cooler(s)/Kit(s):	44407		
Date/Time sample(s) sent to storage:	5/31/19 11:45		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, Tx. 77099 ATTN: RJ Modashia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No.
NWO1312.0150.0
16.0001

Job:
GROUNDWATER TREATMENT PLANT QUARTERLY EFFLUENT SAMPLES

Prepared By:
Scott Beesinger

P. O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: ROD Volatiles	Total Metals	Oil & Grease	Chemical Oxygen Demand	Chloride & Sulfate	1, 4 - DIOXANE	PERCHLORATE				Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_052919	Water	05/29/19 / 14:00		4	3		1								HCL	
LH18/24-SP650_052919	Water	05/29/19 / 14:00		1		1									HNO3	
LH18/24-SP650_052919	Water	05/29/19 / 14:00		2					1	1					NONE	
LH18/24-SP650_052919	Water	05/29/19 / 14:00		1				1							H2SO4	
LH18/24-SP650_052919_BIX	Water	05/29/19 / 14:00		1							1				NONE	
Trip Blank	Water	05/29/19		2	2										HCL	

Additional Remarks: **STANDARD TURN AROUND TIME**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	05/29/19	14:30									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date
J. Mercer	5/31/19	08:37			

Remarks: Cooler 44407
Temp 2.3
IR11 CF0.0

HS19051859

Bhate Environmental Associates, Inc.
LHAAP 18/24 GWTP Quaterly Effluent

(Word) S:\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44407

CUSTODY SEAL

Date: 5/29/19 Time: 1400
Name: Scott Beesinger
Company: BHATE

Seal Broken By:
Date: 05/31/19

44407 MAY 31 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

44407

917 B03 1 10:30 A 8290 05.31

ORIGIN ID: 930-6193
SCOTT BEESI
BHATE ENVIRO ASSOCIATES
1203-B EAST GR AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 21SEP18
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 58 - RJ
RMA:

FedEx Express

RETURNS MON-SAT
PRIORITY OVERNIGHT

TRK# 0221 4380 9532 8290

77099

FedEx
TRK# 0221 4380 9532 8290
FRI - 31 MAY 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1915802, 1915803, 1915852, 1916229; 1916231; 1916232

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2261 (241120)

General Set Information: There were six field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 657797) was less than 1/2 the CRDL. The recovery for the LCS (657798) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Thomas Bosch June 12, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: June 13, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1915803**
Project ID: HS19051859
Purchase Order: HS19051859
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_052919_BIX	1915803001	05/29/19	06/01/19	

ANALYTICAL REPORT

Workorder: 34-1915803
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID:	**LH18/24-SP650_052919_BIX**	Sampling Site:	NA	Collected:	05/29/2019
Lab ID:	1915803001	Media:	125 mL Nalgene	Received:	06/01/2019
Matrix:	Water	Sampling Parameter:	NA		

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:** LCMS04
	Batch: ELMS/2261 (HBN: 241120)	**Percent Solid:** NA
	Analyzed: 06/11/2019 10:25	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 06/12/2019 12:46	/S/ Stephen Brose 06/13/2019 10:59

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1915803
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1915803

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2261 (HBN: 241120)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 657797
Analyzed: 06/11/2019 09:31
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 657798
Analyzed: 06/11/2019 09:04
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.34	4.00	109	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1915802001	**MS:**	657799
Analyzed:	06/11/2019 09:45	**Analyzed:**	06/11/2019 09:58
Dilution:	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L

	MSD:	657800
	Analyzed:	06/11/2019 10:12
	Dilution:	1
	Units:	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.57	4	114	78.8	123.8	4.78	120	4.65	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 06/12/2019 12:47	/S/ Stephen Brose 06/13/2019 10:59

Symbols and Definitions

✱ - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

W 1915803

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

1915803

SAMPLING STATE: **Colorado**

COC ID: **11498**

18698/#2

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19051859
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19051859-02**	**LH18/24-SP650_052919_BIX**	**Groundwater**	**29 May 2019 14:00**
	SUB_Perch-6850			14 Jun 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 5/31/19 1800

Received By: _____ Date/Time: 6/1/19 852

Cooler ID(s): 9459 Temperature(s): 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19051859 | ***Split:*** | **Workorder ID:** 1915803 | **Level:** ENV_LVL4

Client: ALS Environmental (Houston) | **Account:** 8101 | **Type:** 125Poly

Comments:

Preservatives: COOL

Requested Analysis: EPA 6850, DoD QSM

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis
1	05/29/2019 14:00	LH18/24-SP650_052919_BIX	1915803001		Water	A	1	A
2								
3								
4								
5								
6								
7								
8								
9								
10								

47 of 121

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Coates, Gayleen	06/01/2019 08:52	ALS Sample Receiving	Sample Login
R.33.1	6-3-19 10:18	BB	STORAGE
	6.11.19 0800	T. Bush	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ **Lab Notebook No.:** _____

Prepared / Analyzed by: _____ **Date / Time:** _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00939123

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Hopkin

Project/Task/Site: _____

Date/Time of Receipt: 6/1/19 852

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9459	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: _____ (Signature) Meredith Adams (Printed Name) 6/1/19 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018

Must Deliver Next Business Day
Time and Tempature Sensitive!

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 31MAY19
ACTWGT: 8.90 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19051856/1859/1863-RJ

FedEx Express

SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 0201 **4809 7834 6651**

XO BTFA

84123
UT-US **SLC**

Batch Worklist

Batch: ELMS/ 2261 **Created:** 6/11/2019 07:45 **Instrument:** **HBN:** 241120

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1915802 [ENV_LVL4]
Workorder: 1915803 [ENV_LVL4]
Workorder: 1915852 [ENV_LVL4]
Workorder: 1916229 [ENV_LVL4]
Workorder: 1916231 [ENV_LVL4]
Workorder: 1916232 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	657794	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	
2	657795	RLVS for HBN 241120 [ELMS/2261				RLVS	3		E685041C3Q	5311		6/13/2019	
3	657796	ICS for HBN 241120 [ELMS/2261]				ICS	3		E6850..D3Q	5311		6/13/2019	
4	657797	LMB for HBN 241120 [ELMS/2261]				LMB	3		E6850Q413Q	5311		6/13/2019	
5	657798	LCS for HBN 241120 [ELMS/2261]				LCS	3		E6850Q413Q	5311		6/13/2019	
6	1915802001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915802001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
7	657799	LH18/24-SP650...(1915802001MS)				MS	3		E6850Q413Q	5311		6/13/2019	
8	657800	LH18/24-SP65...(1915802001MSD)				MSD	3		E6850Q413Q	5311		6/13/2019	
9	1915803001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915803001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
10	1915852001	LH18/24-SP140_052919				SAMPLE	3	1915852001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
11	1916229001	LH18/24-SP140_060419				SAMPLE	3	1916229001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
12	1916231001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916231001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
13	1916232001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916232001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
14	657801	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	

00939126

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1915802 (001), 1915803 (001), 1915852 (001), 1916229 (001); 1916231 (001); 1916232 (001) ELMS Batch/HBN ID: 2261 (241120)
Prep Date: 06/11/2019 Analysis Date: 06/11/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\11JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 657798; Target = 4.0µg/L. ASTM type II water was used for LMB 657797.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\241120-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2261 HBN: 241120 Sample Set IDs if Applicable: 191580 2/191580 3/191585 2 191623 9/191623 1/191623 2	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED TESTING LABORATORY

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: JCC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

USstandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	657794 CCV@25	Vial 71	1	Control	1	1.90258e6	8.986	26.94929
*	657798 QC@4.0	Vial 72	1	Control	2	3.85542e5	8.884	4.34115
*	657796 ICS@4.0	Vial 73	1	Control	3	2.32261e5	8.623	3.98229
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	1.46622e5	8.522	4.56740
*	657800 158021D	Vial 77	1	Sample	7	1.54646e5	8.528	4.78474
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	3.32187e5	9.077	4885.02369
*	1916229001 1K	Vial 80	1	Sample	10	4.13979e5	9.091	6820.05588
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.42334e6	9.028	25.98075

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	657794 CCV@25	Vial 71	1	Control	1	5.56917e5	9.003	26.60911
*	657798 QC@4.0	Vial 72	1	Control	2	1.22598e5	8.893	4.50107
*	657796 ICS@4.0	Vial 73	1	Control	3	7.62920e4	8.637	4.24932
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	5.01097e4	8.545	5.09575
*	657800 158021D	Vial 77	1	Sample	7	5.24358e4	8.548	5.30516
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	1.07205e5	9.093	5161.49233
*	1916229001 1K	Vial 80	1	Sample	10	1.30297e5	9.110	7096.69575
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	4.26237e5	9.042	26.20612

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	657794 CCV@25	Vial 71	1	Control	1	2.13798e5	9.004	5.00000
*	657798 QC@4.0	Vial 72	1	Control	2	2.91481e5	8.904	5.00000
*	657796 ICS@4.0	Vial 73	1	Control	3	1.92225e5	8.645	5.00000
*	657797 LMB	Vial 74	1	Control	4	3.01884e5	9.082	5.00000
*	1915802001	Vial 75	1	Sample	5	1.12941e5	8.589	5.00000
*	657799 158021S	Vial 76	1	Sample	6	1.05110e5	8.545	5.00000
*	657800 158021D	Vial 77	1	Sample	7	1.05604e5	8.552	5.00000
*	1915803001	Vial 78	1	Sample	8	1.14182e5	8.546	5.00000
*	1915852001 1K	Vial 79	1	Sample	9	2.21981e5	9.097	5000.00000
*	1916229001 1K	Vial 80	1	Sample	10	1.95450e5	9.116	5000.00000
*	1916231001	Vial 81	1	Sample	11	1.33828e5	8.518	5.00000
*	1916232001	Vial 82	1	Sample	12	1.27034e5	8.502	5.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.66287e5	9.054	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

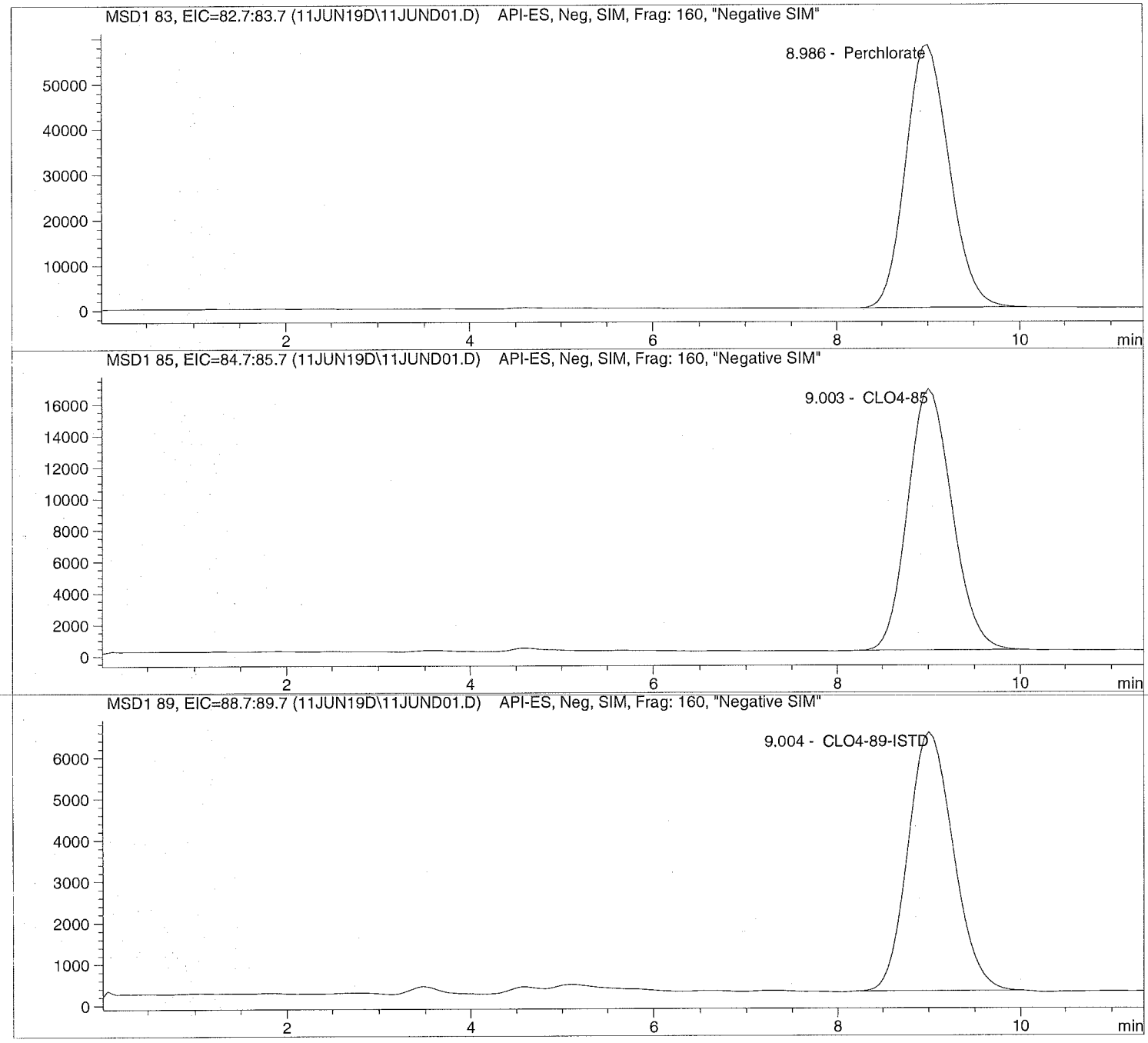
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	657794 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	657798 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	657796 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	657797 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1915802001	CLO4-AQN	1	Sample		
6	Vial 76	657799 158021S	CLO4-AQN	1	Sample		
7	Vial 77	657800 158021D	CLO4-AQN	1	Sample		
8	Vial 78	1915803001	CLO4-AQN	1	Sample		
9	Vial 79	1915852001 1K	CLO4-AQN	1	Sample		
10	Vial 80	1916229001 1K	CLO4-AQN	1	Sample		
11	Vial 81	1916231001	CLO4-AQN	1	Sample		
12	Vial 82	1916232001	CLO4-AQN	1	Sample		
13	Vial 71	657801 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.986	PBA	1902575.4	26.9493	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.003	PBA	556916.8	26.6091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.004	PBA	213798.0	5.0000	CLO4-89-ISTD

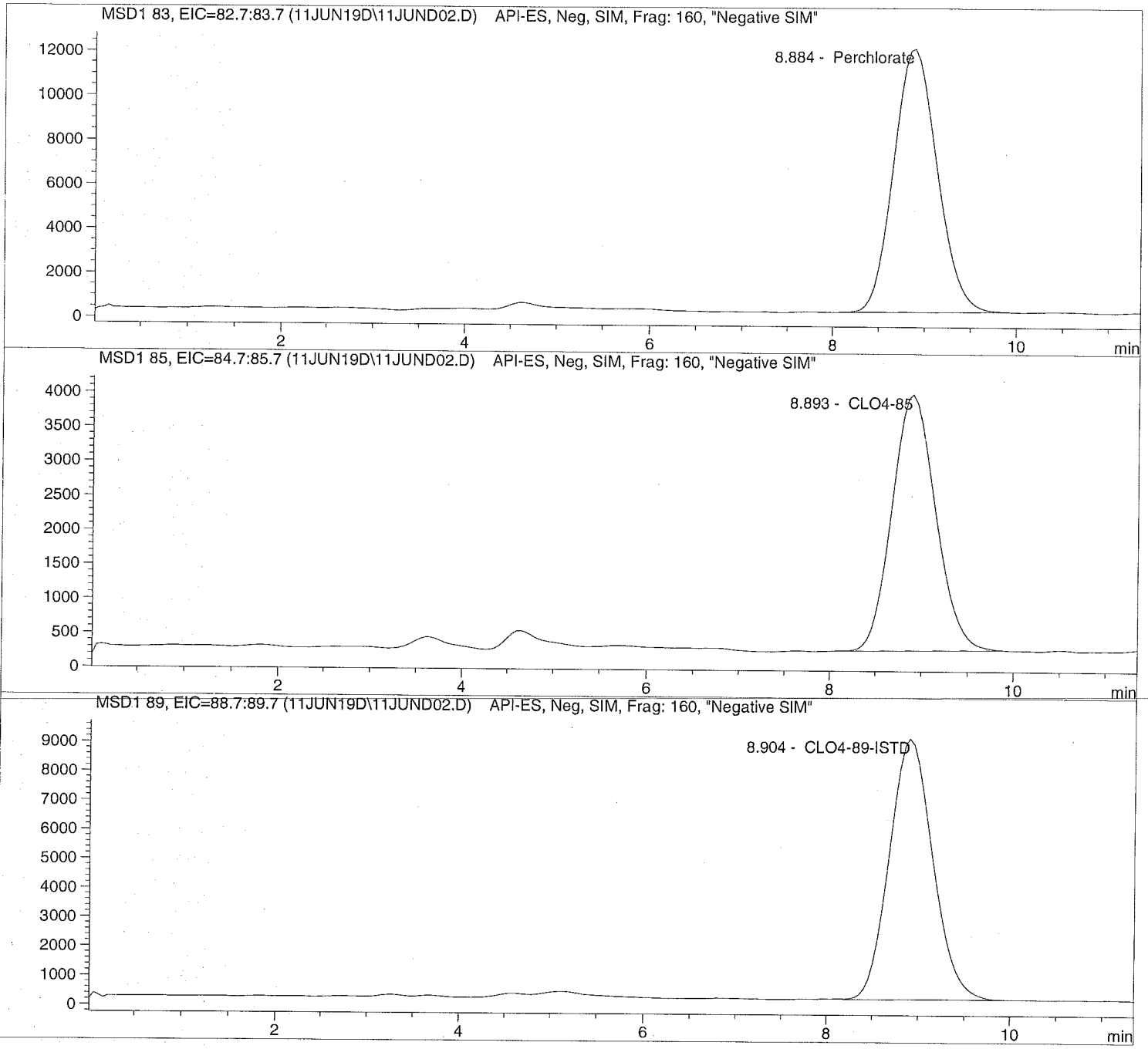
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.884	PBA	385541.7	4.3412	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.893	BBA	122598.4	4.5011	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.904	BBA	291480.6	5.0000	CLO4-89-ISTD

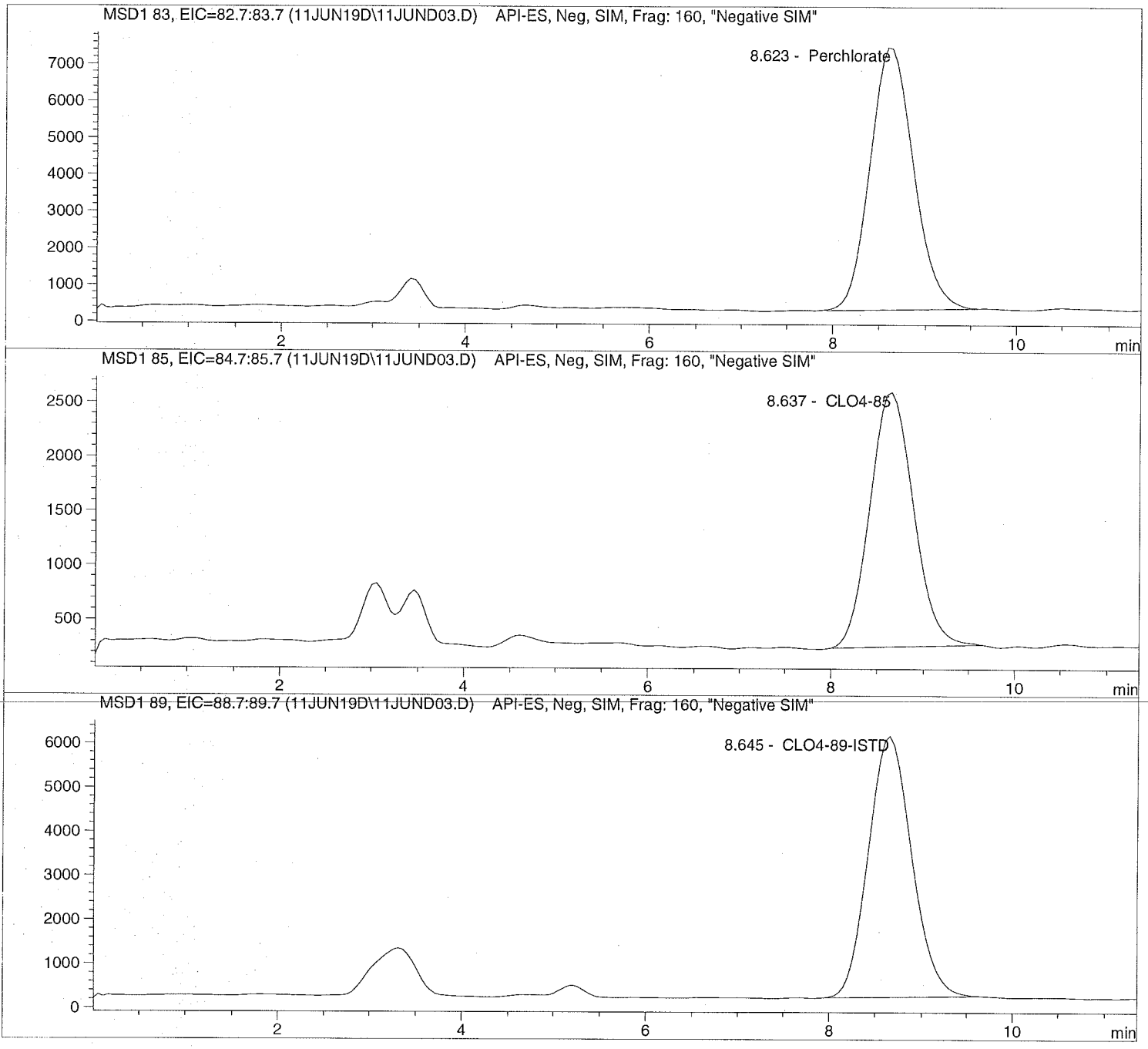
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.623	PBA	232261.2	3.9823	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.637	PBA	76292.0	4.2493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.645	PBA	192224.9	5.0000	CLO4-89-ISTD

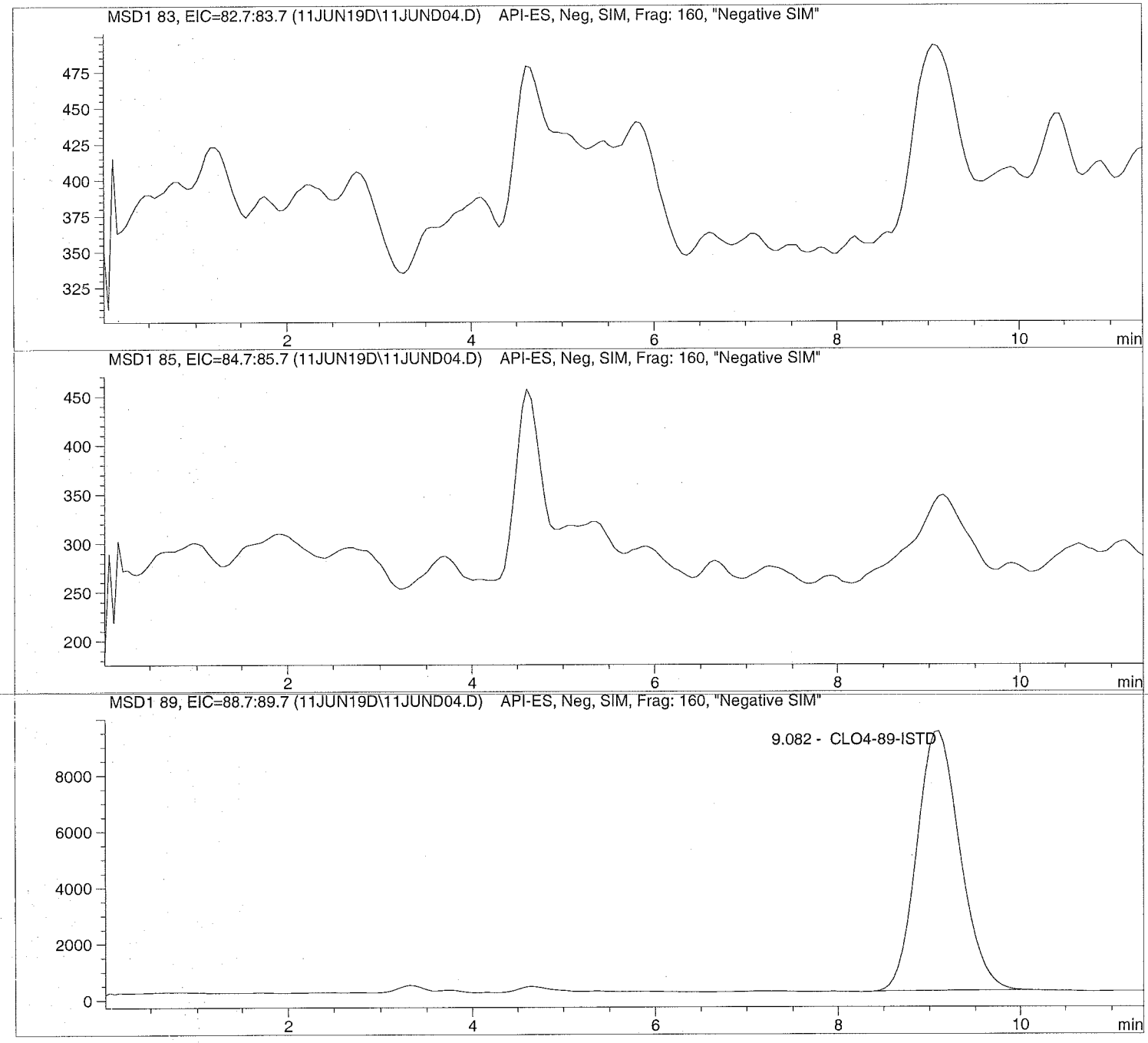
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.082	PBA	301883.5	5.0000	CLO4-89-ISTD

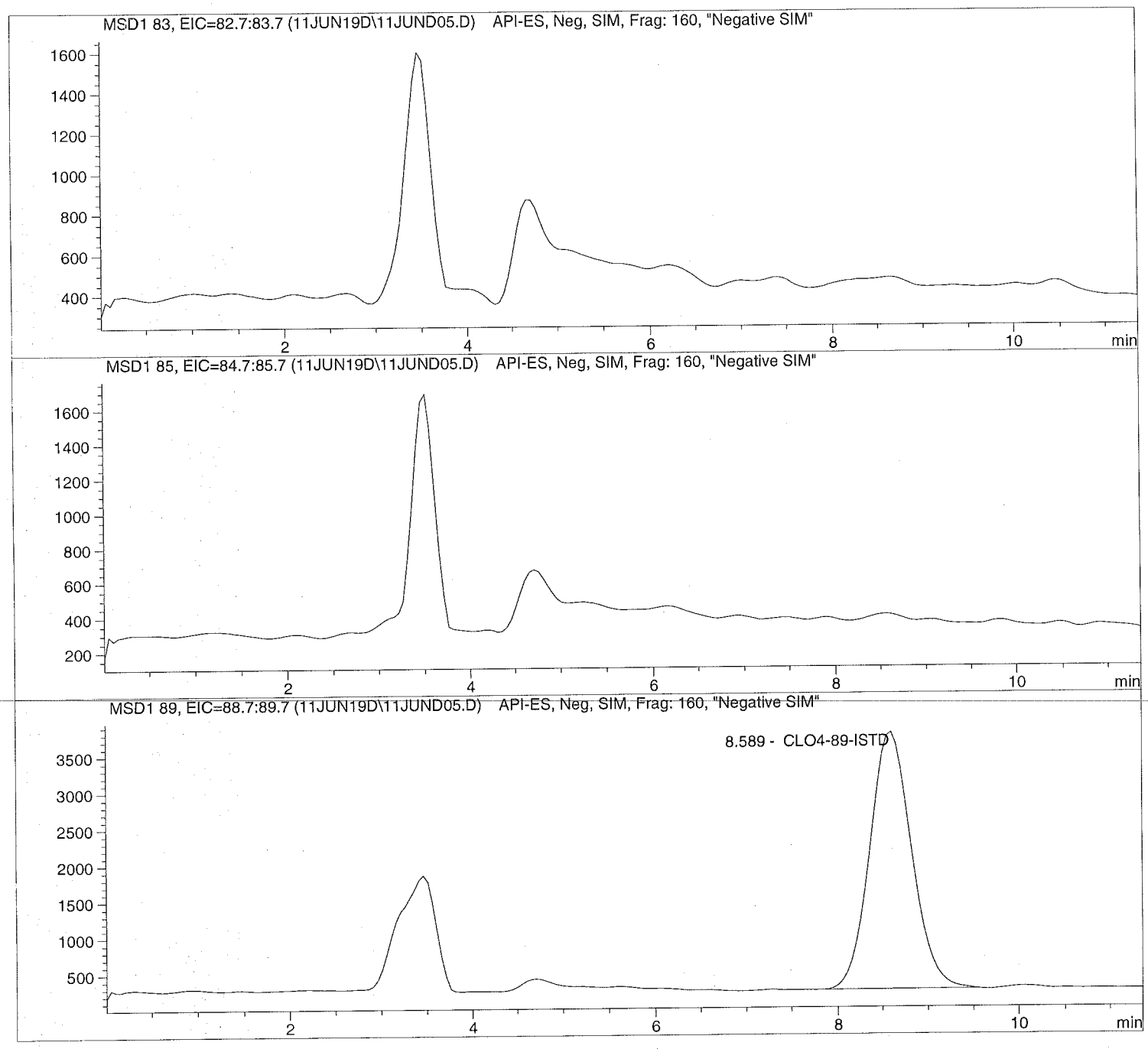
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.589	PBA	112941.5	5.0000	CLO4-89-ISTD

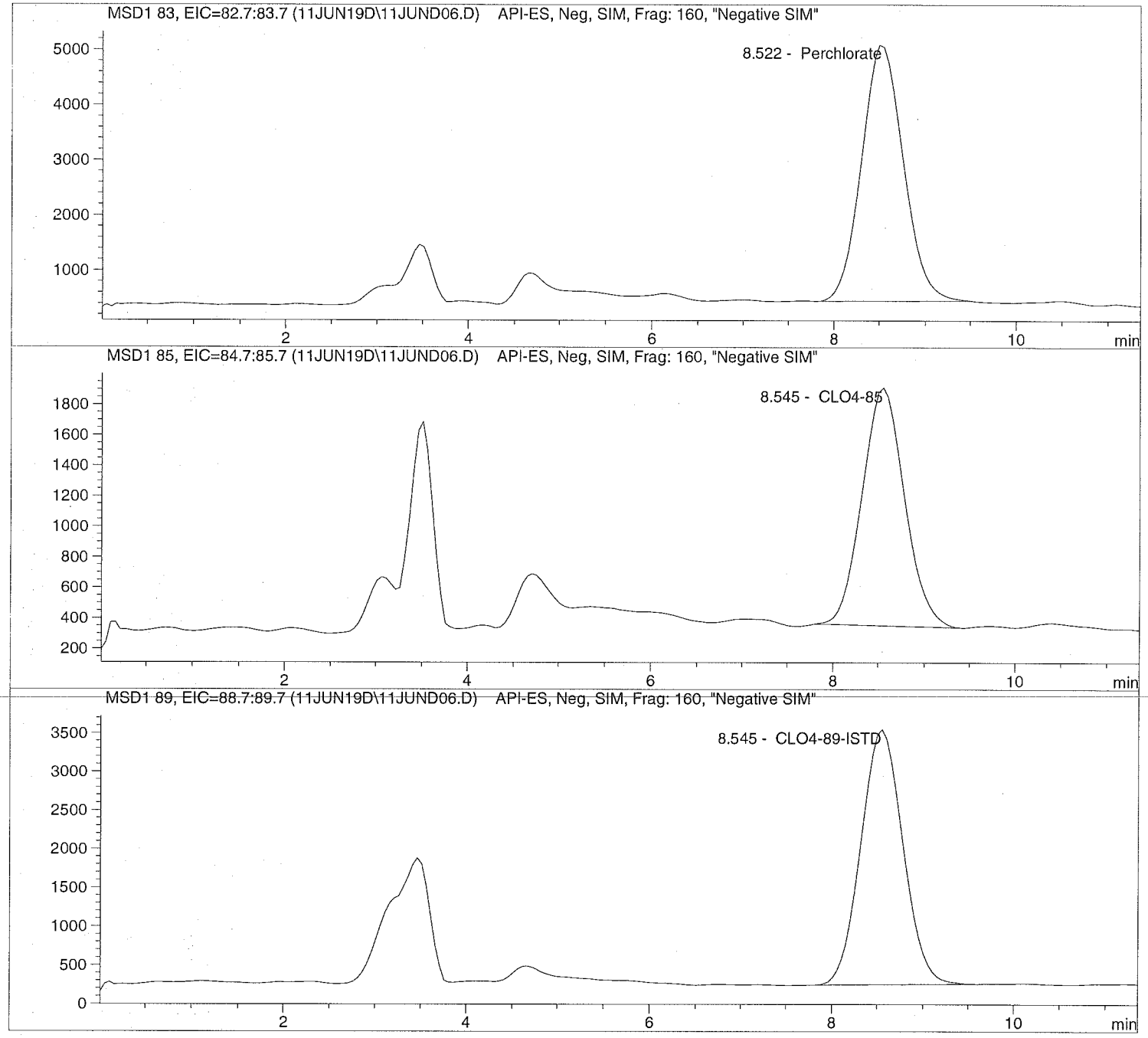
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.522	BBA	146622.1	4.5674	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	50109.7	5.0958	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	105110.4	5.0000	CLO4-89-ISTD

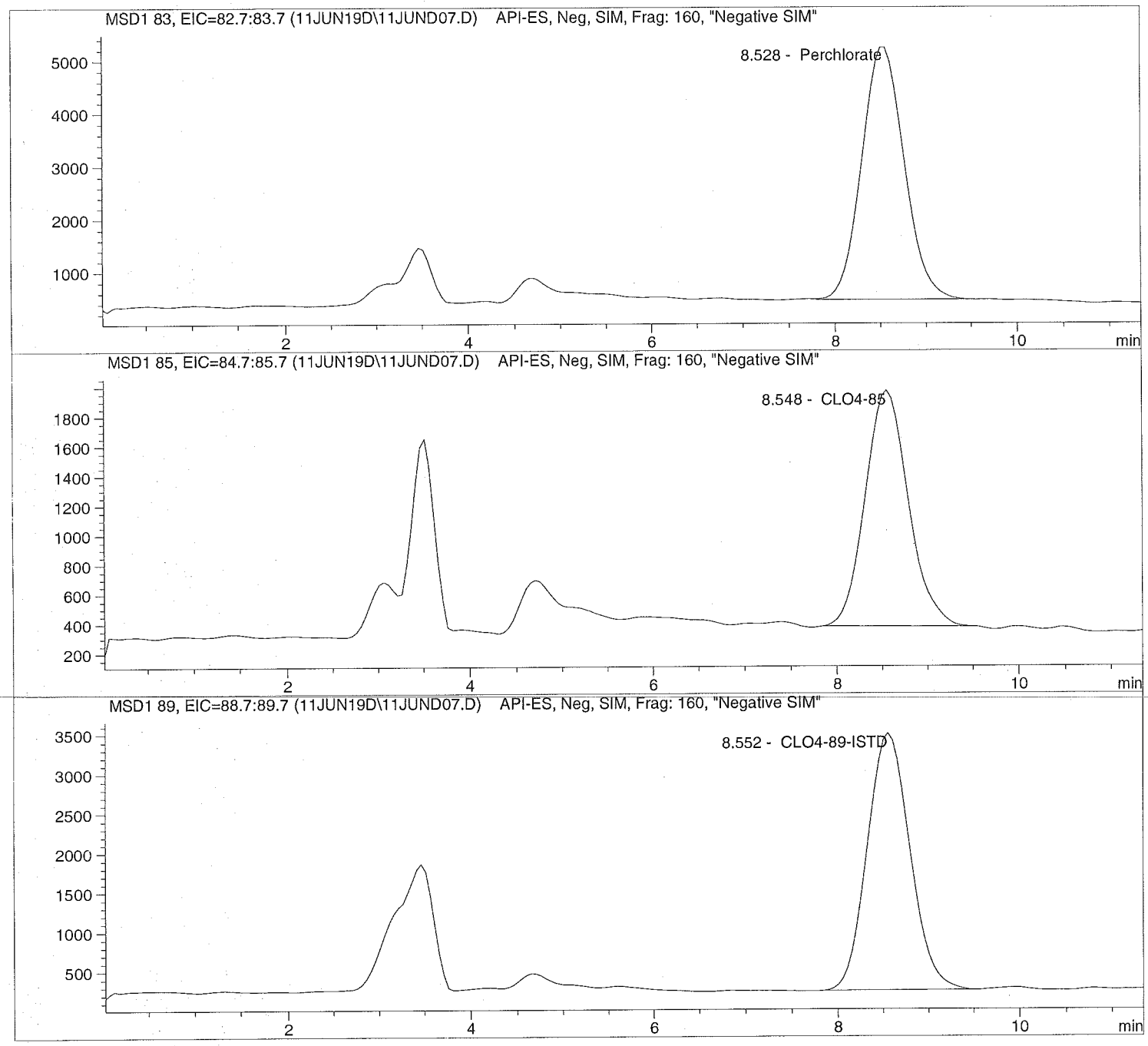
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND07.D Sample Name: 657800 158021D

Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND07.D Sample Name: 657800 158021D

Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.528	BBA	154645.8	4.7847	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.548	PBA	52435.8	5.3052	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.552	PBA	105604.1	5.0000	CLO4-89-ISTD

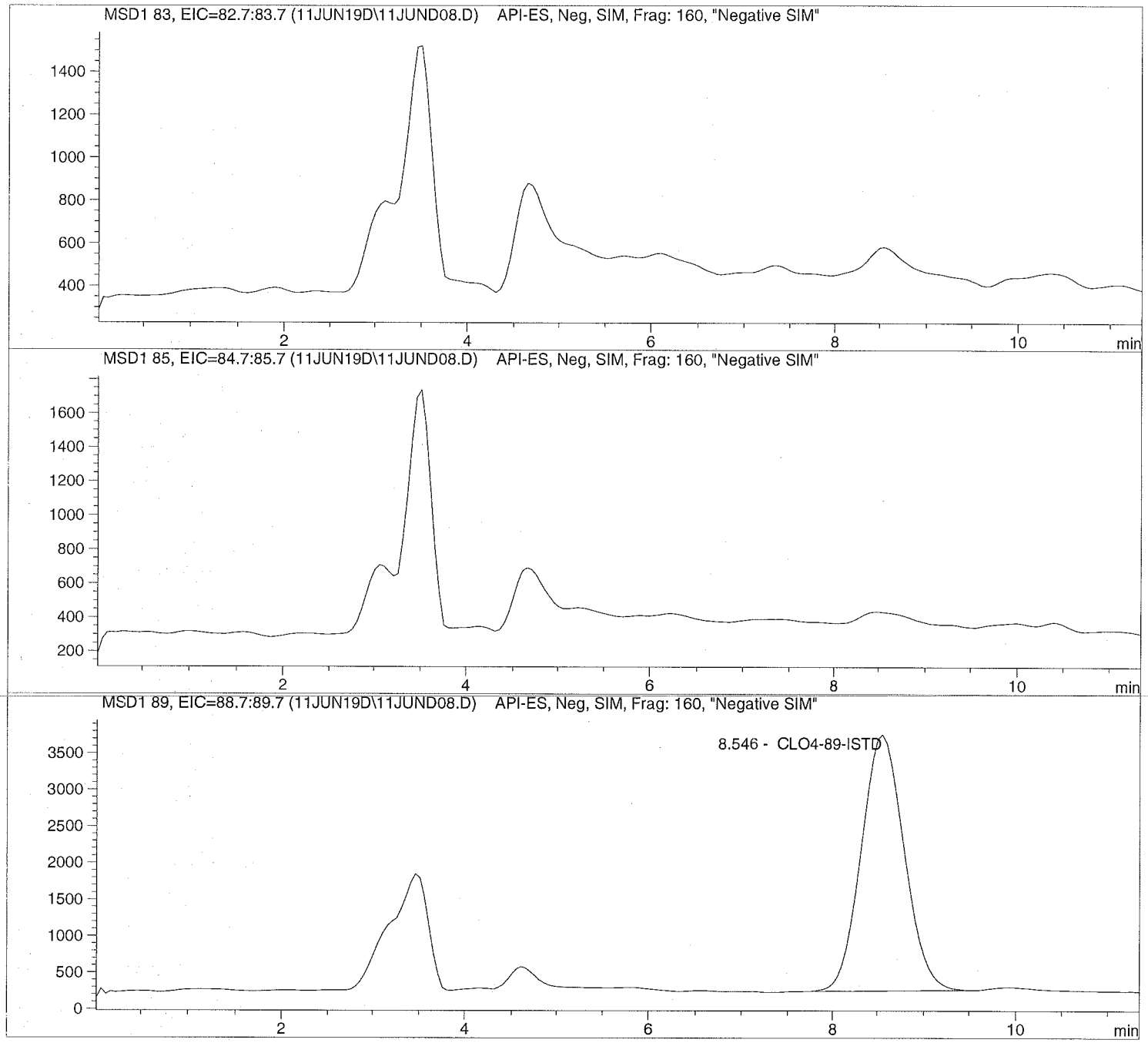
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.546	BBA	114182.4	5.0000	CLO4-89-ISTD

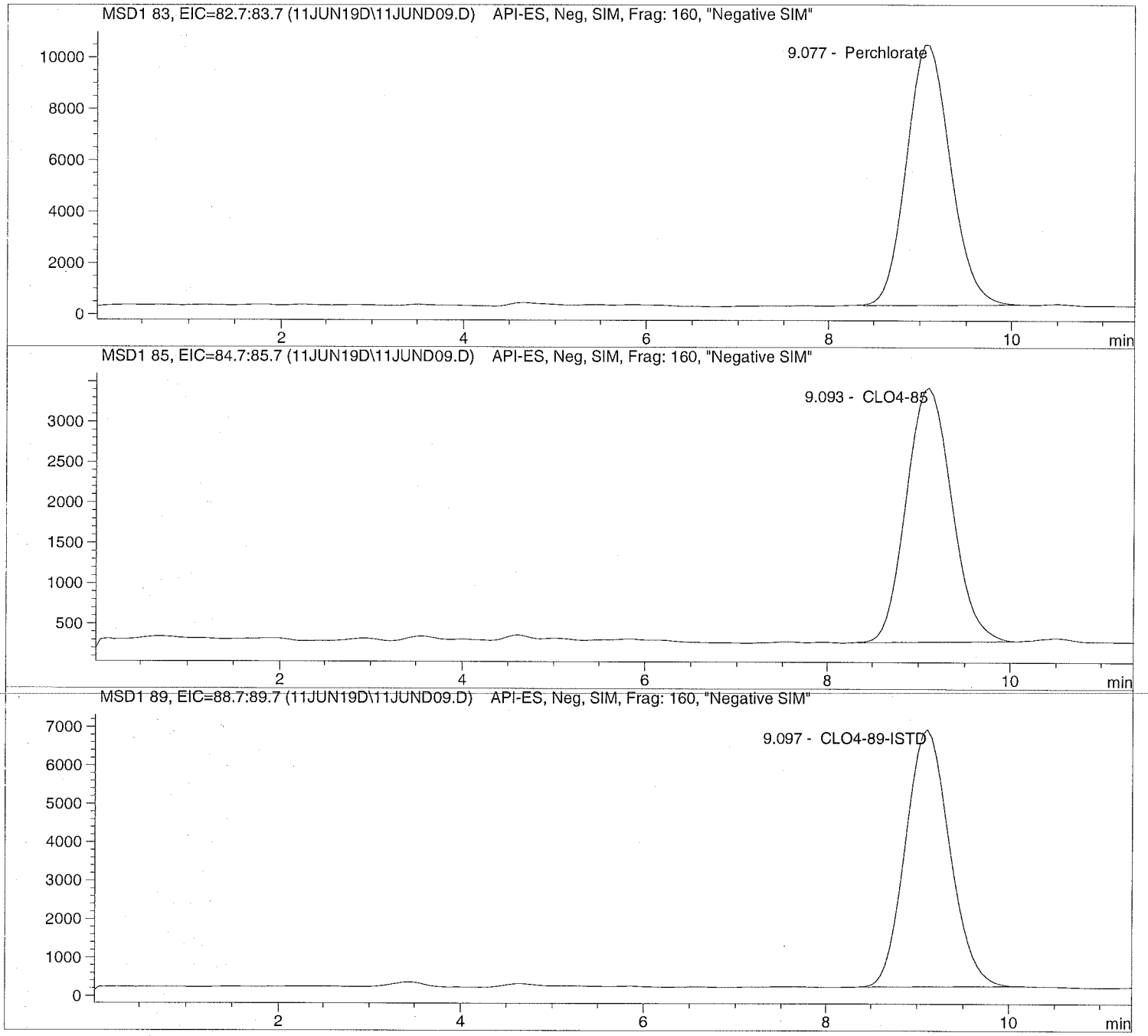
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.077	BBA	332187.1	4885.0237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.093	PBA	107205.2	5161.4923	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.097	PBA	221981.4	5000.0000	CLO4-89-ISTD

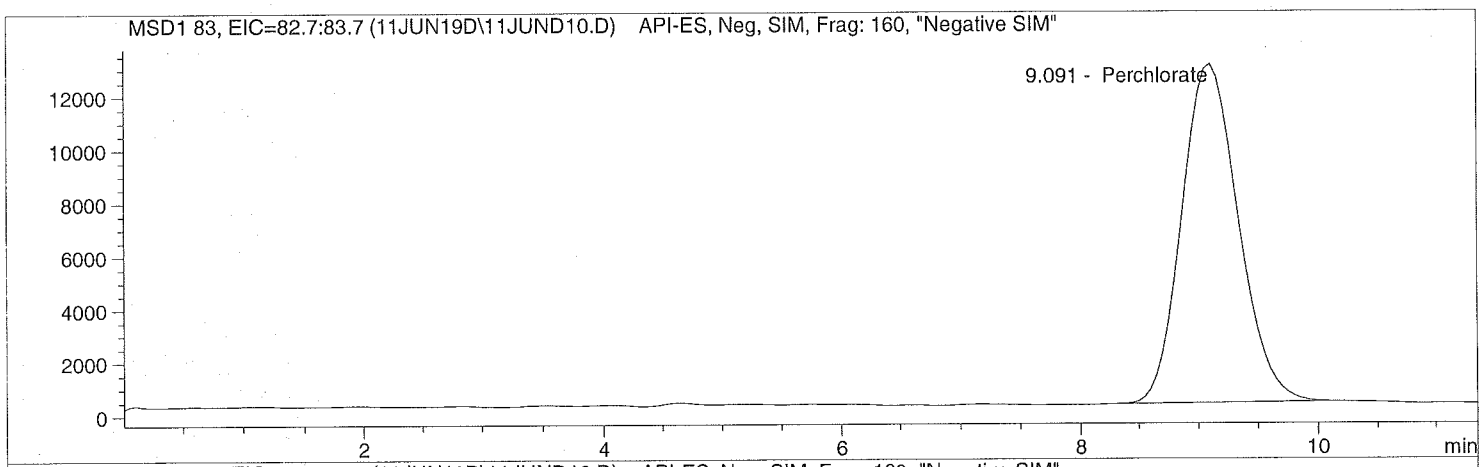
*** End of Report ***

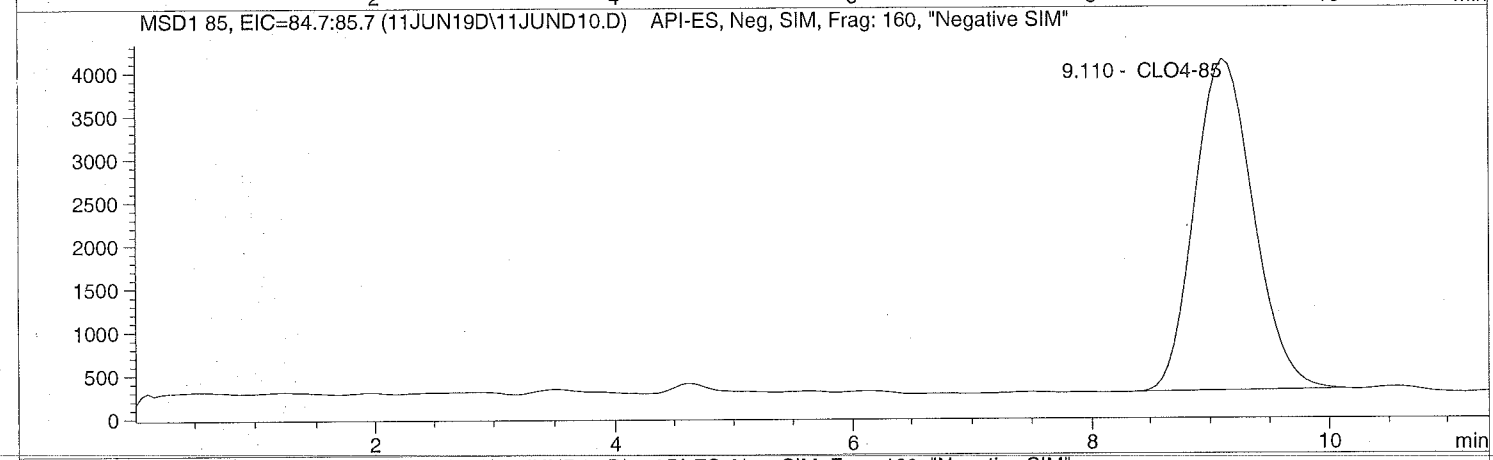
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

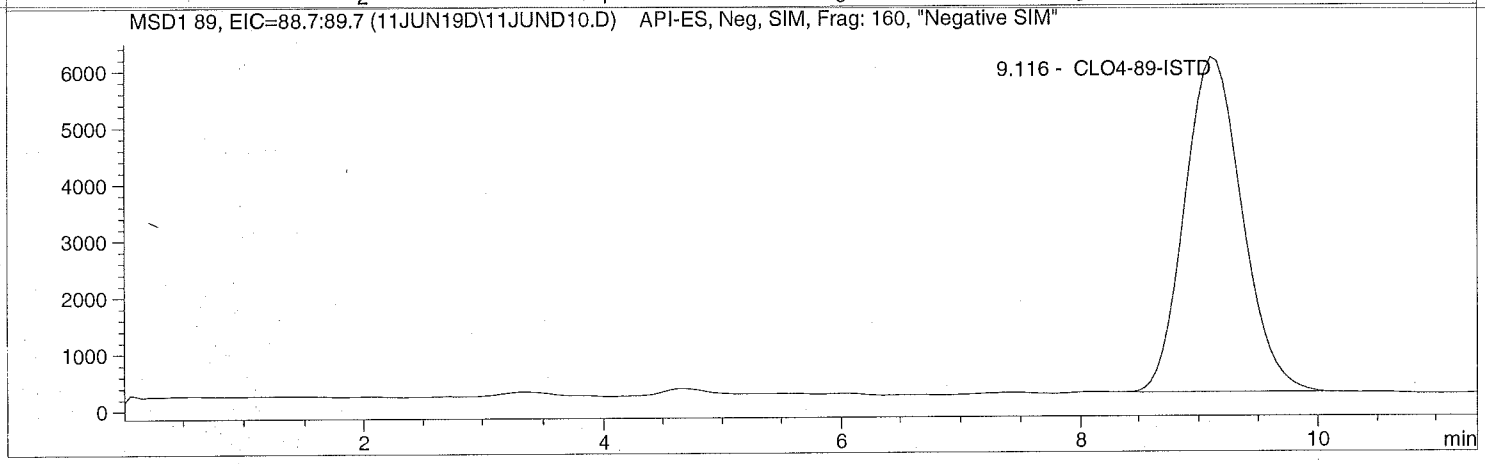
Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.091	BBA	413978.8	6820.0559	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.110	PBA	130297.0	7096.6957	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.116	BBA	195449.6	5000.0000	CLO4-89-ISTD

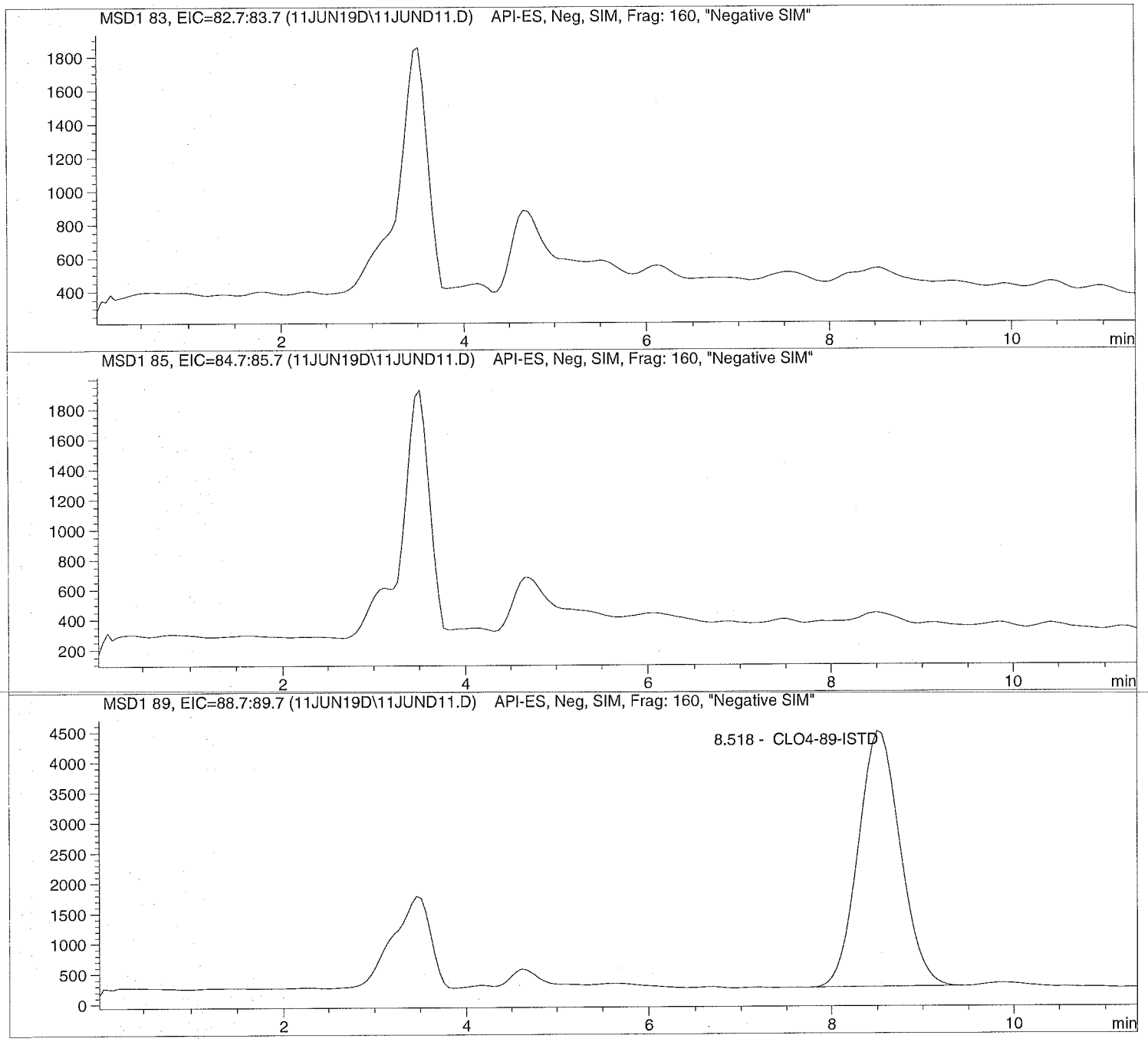
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.518	PBA	133827.9	5.0000	CLO4-89-ISTD

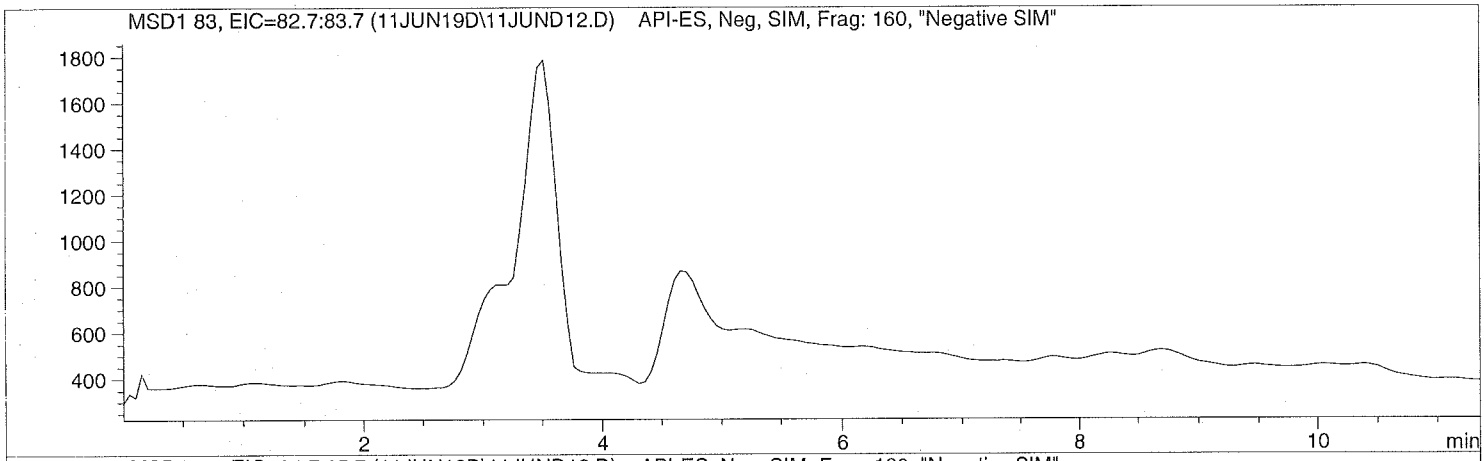
*** End of Report ***

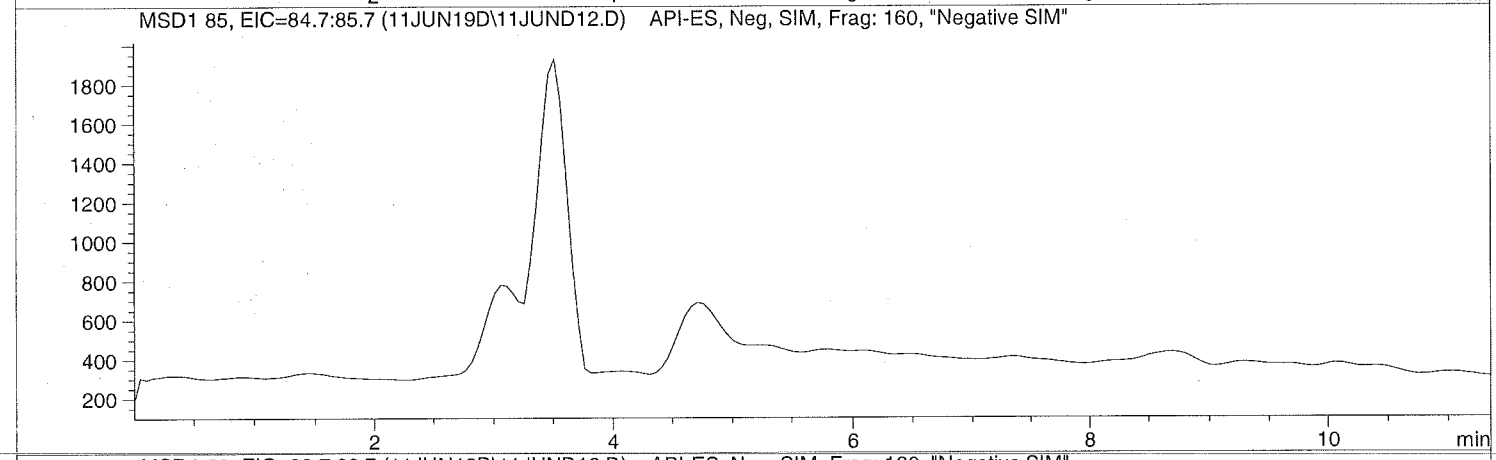
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

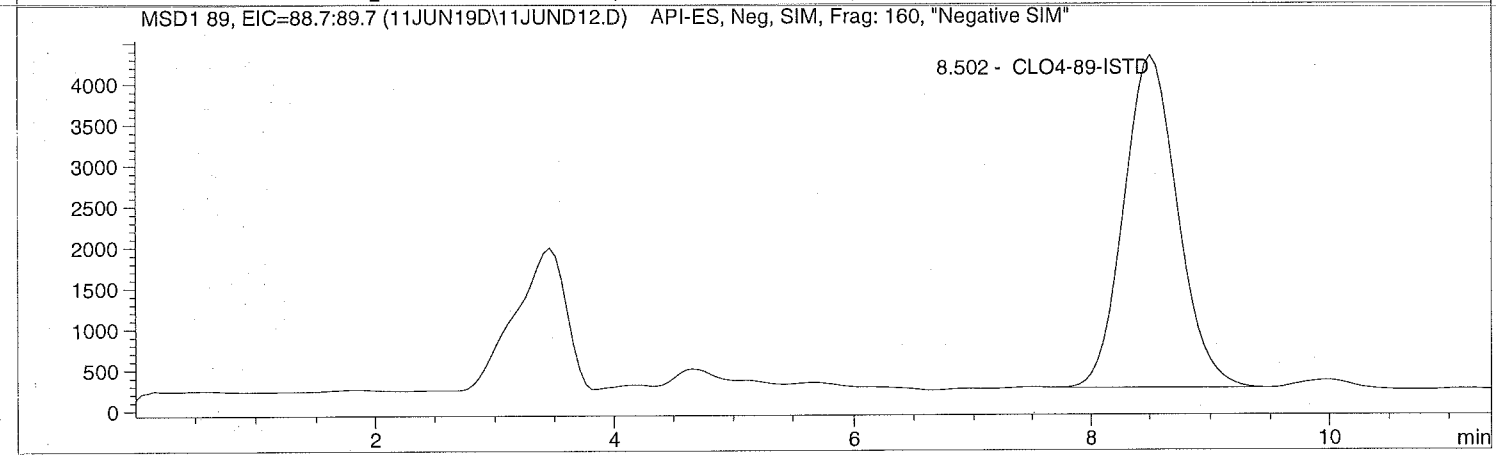
Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	BBA	127033.7	5.0000	CLO4-89-ISTD

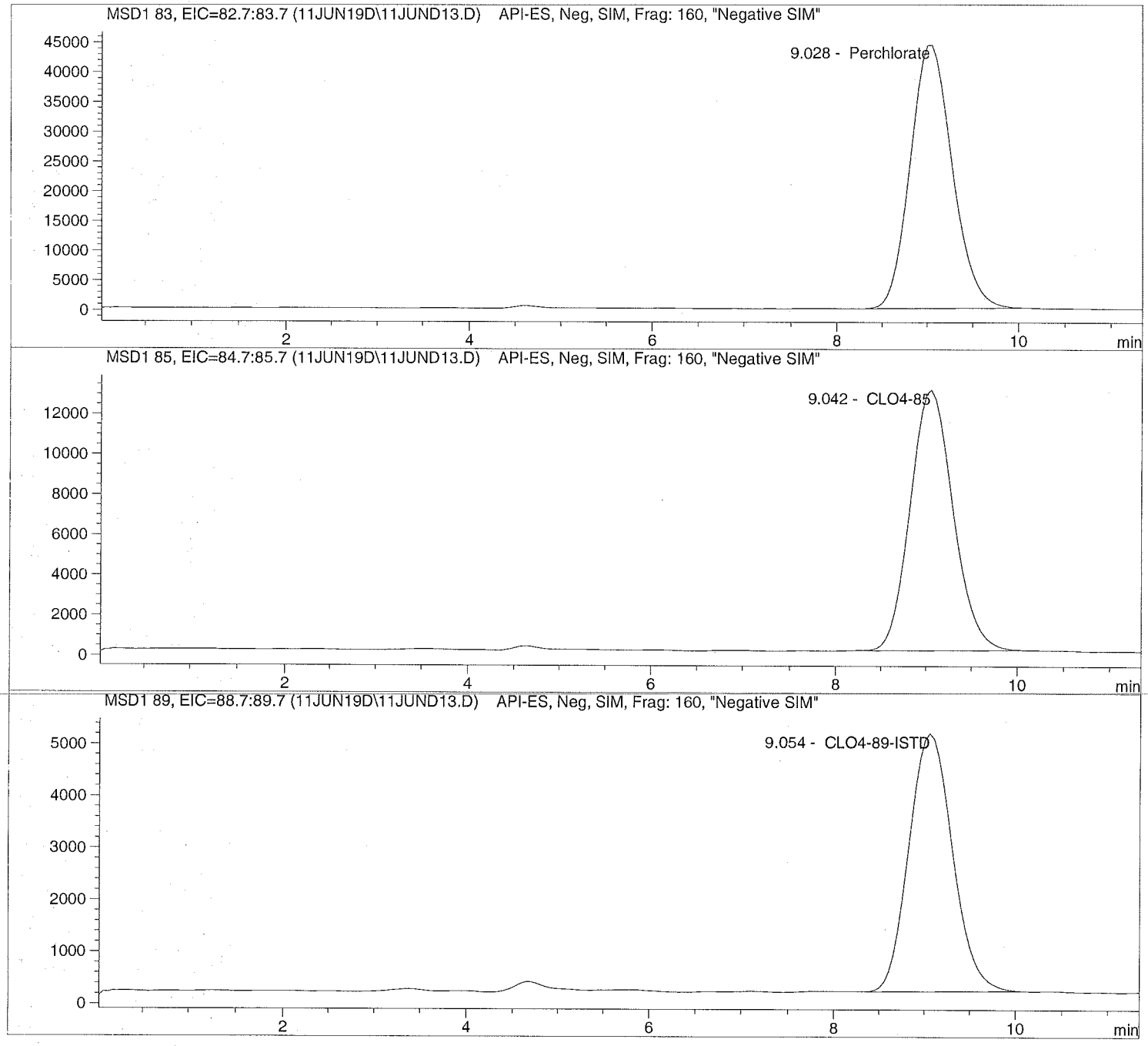
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.028	PBA	1423337.3	25.9807	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.042	BBA	426236.8	26.2061	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.054	BBA	166286.8	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

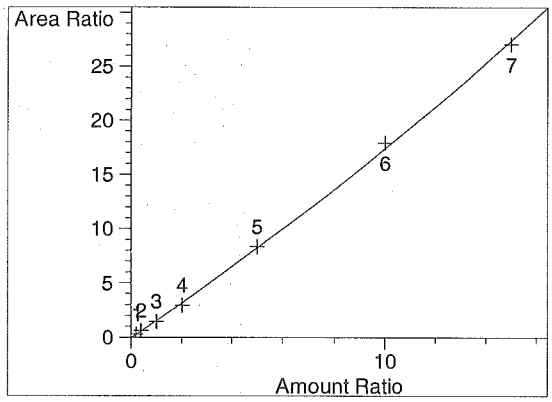
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

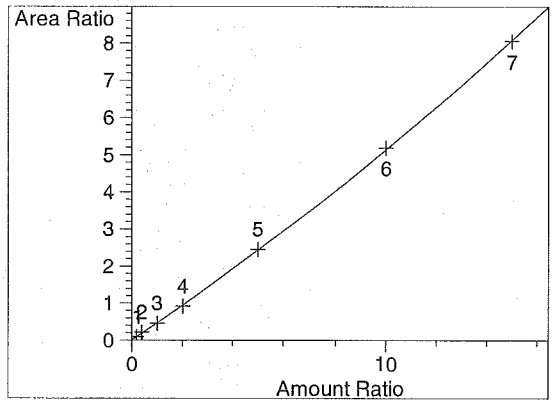
Peak Sum Table

No Entries in table

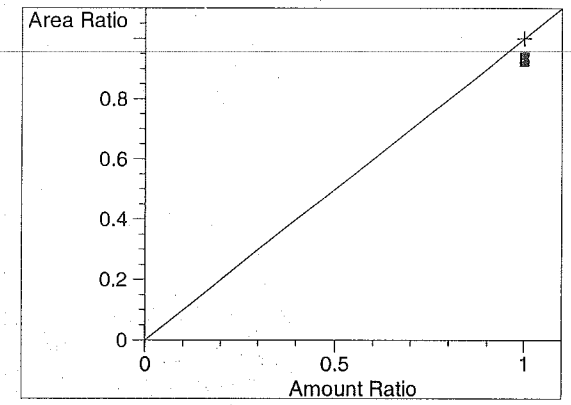
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

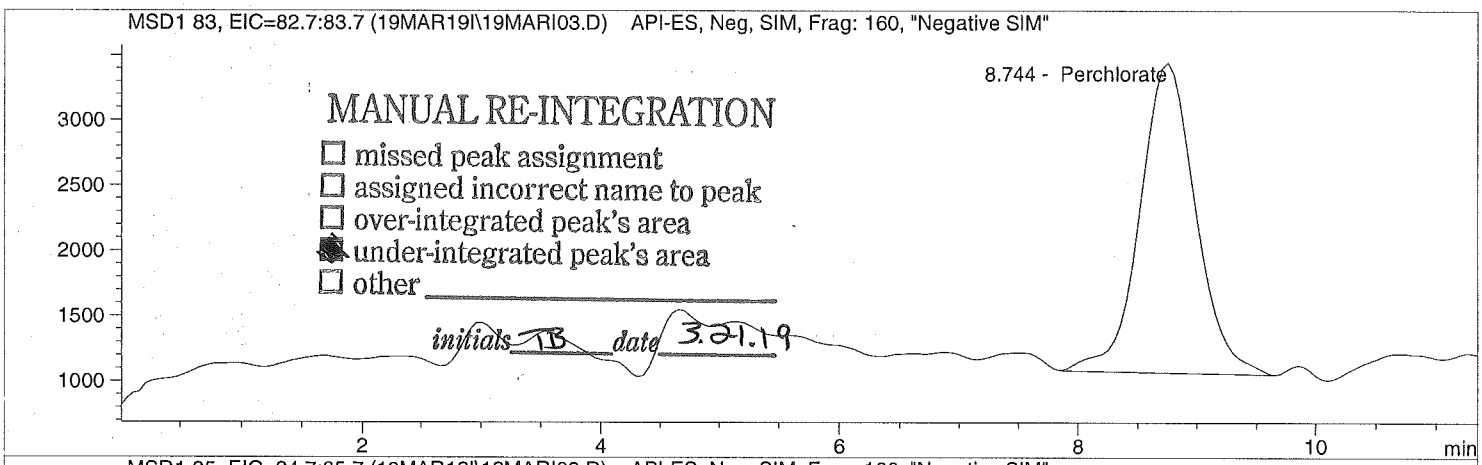
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

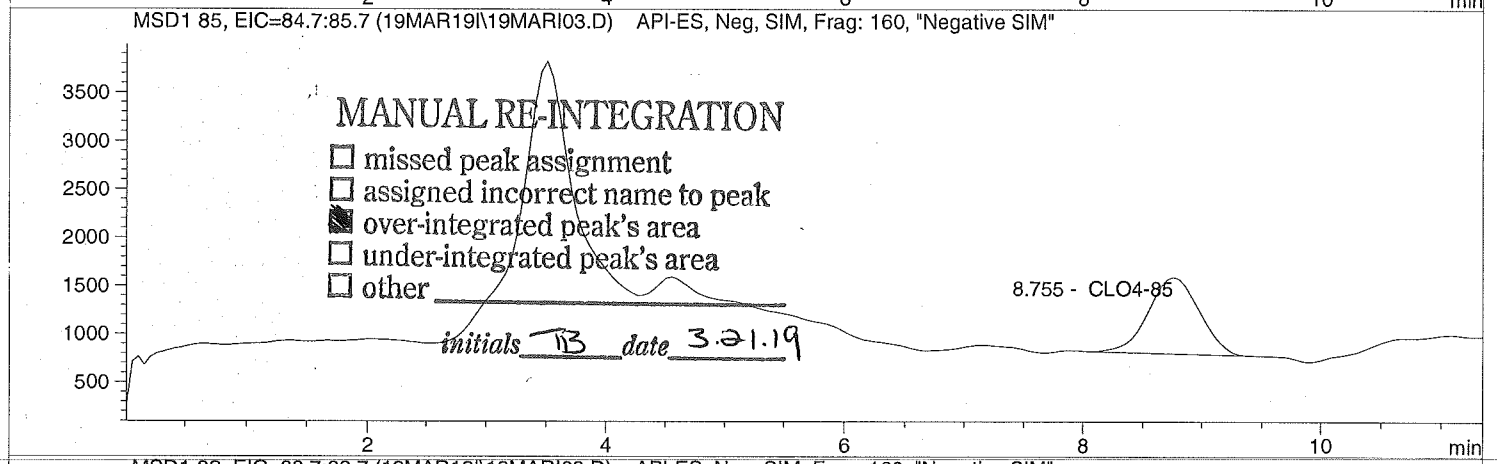
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

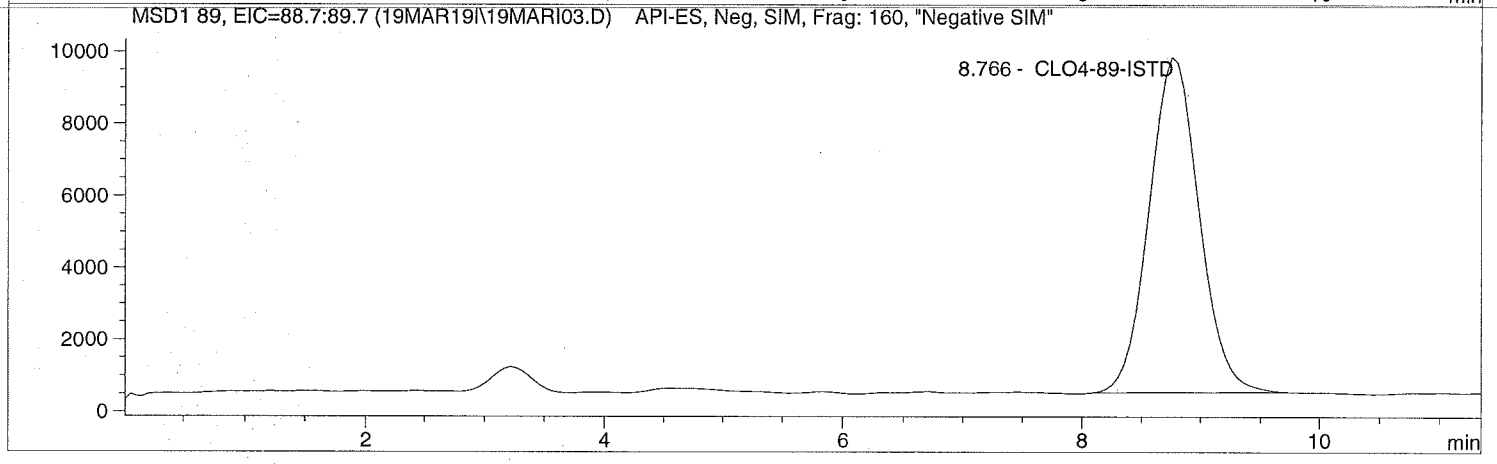
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

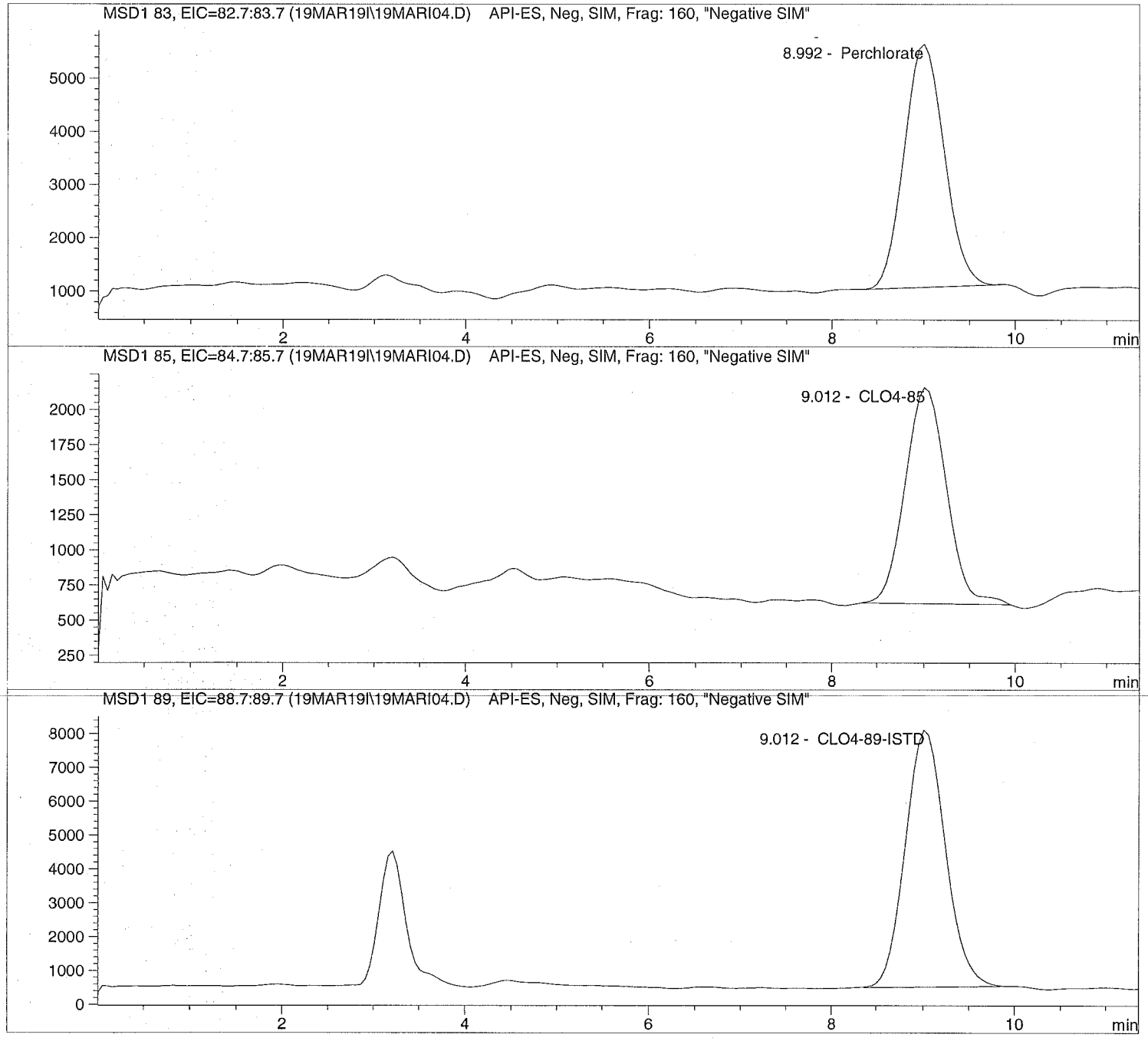
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

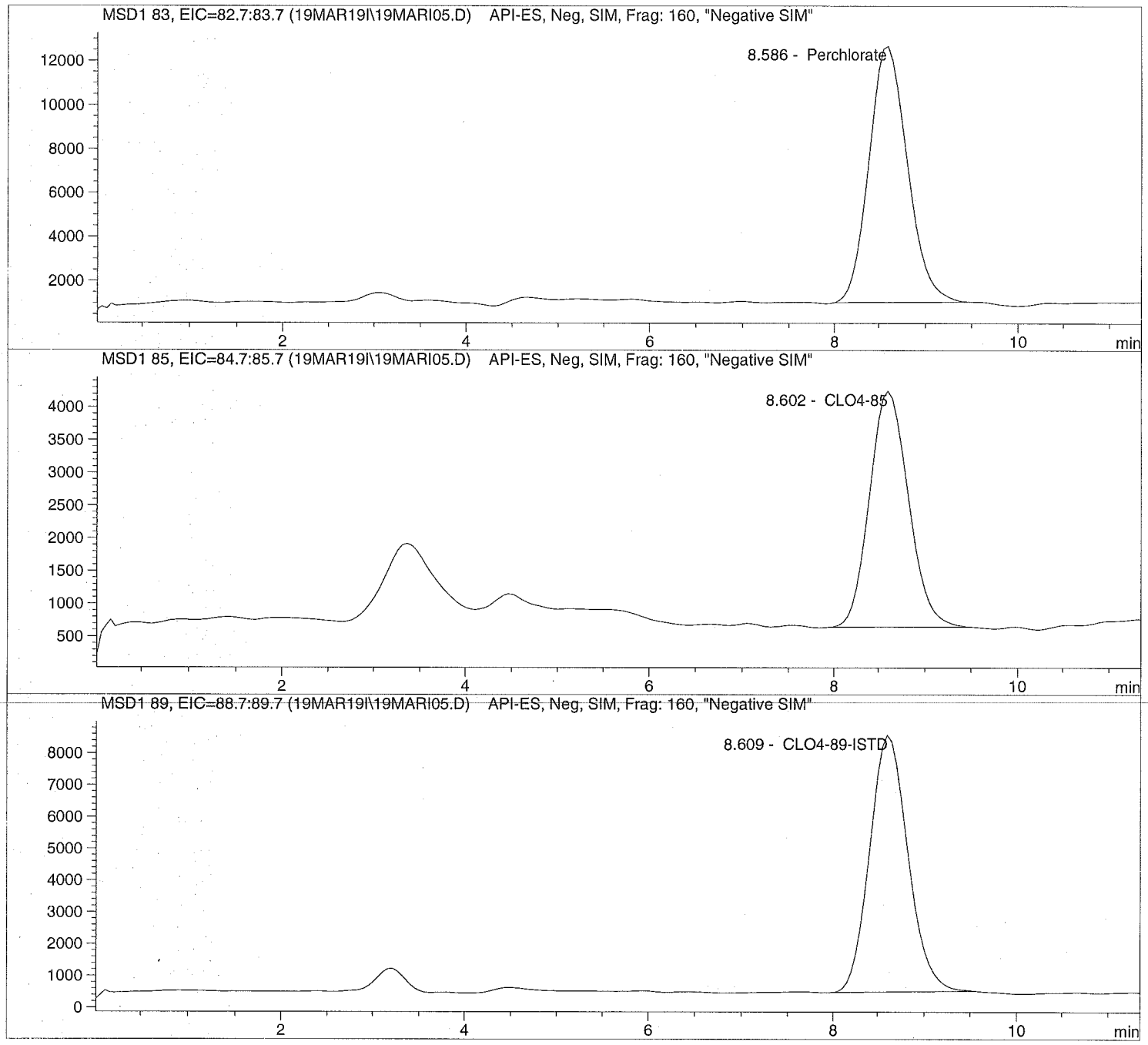
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

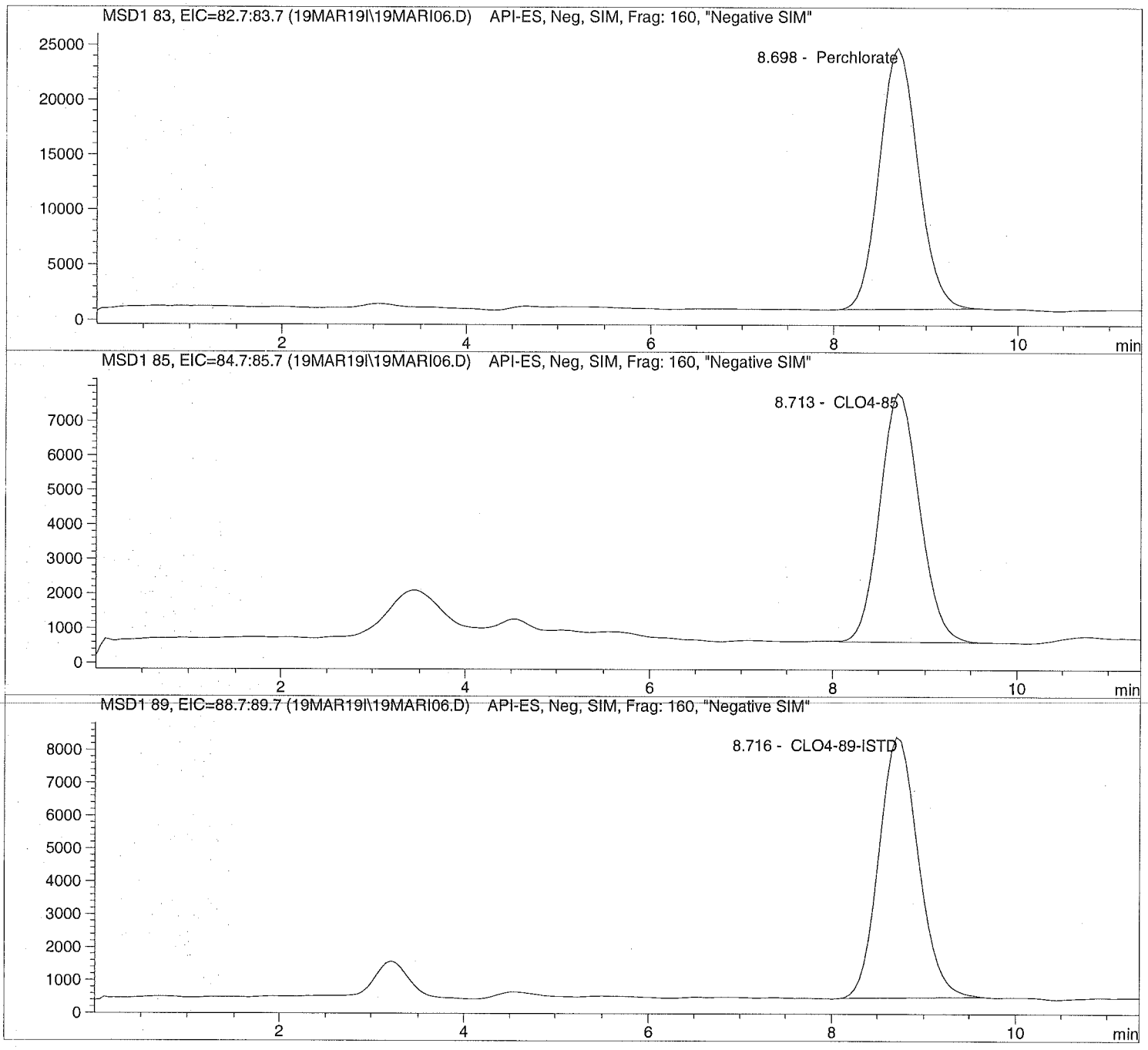
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

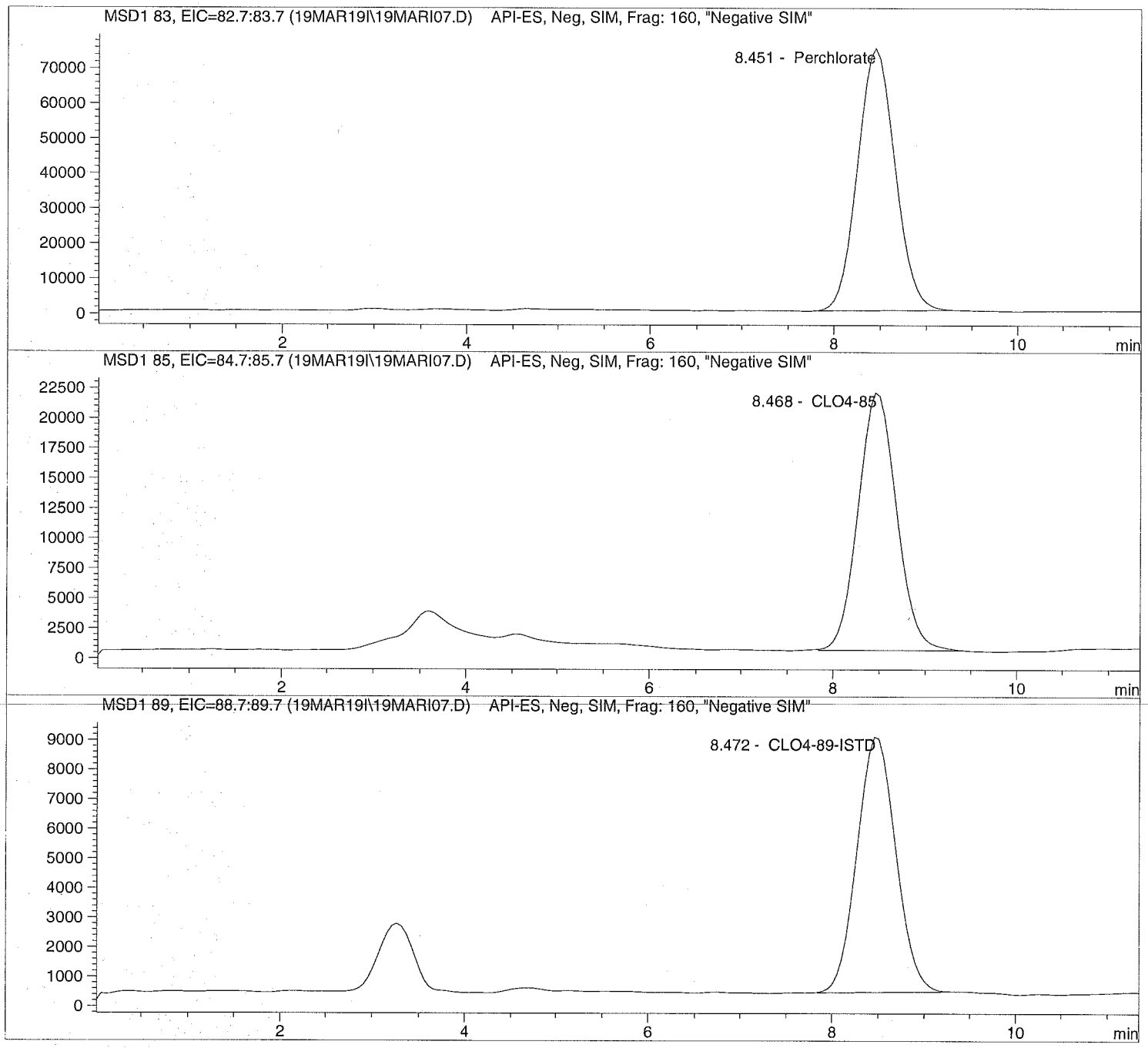
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

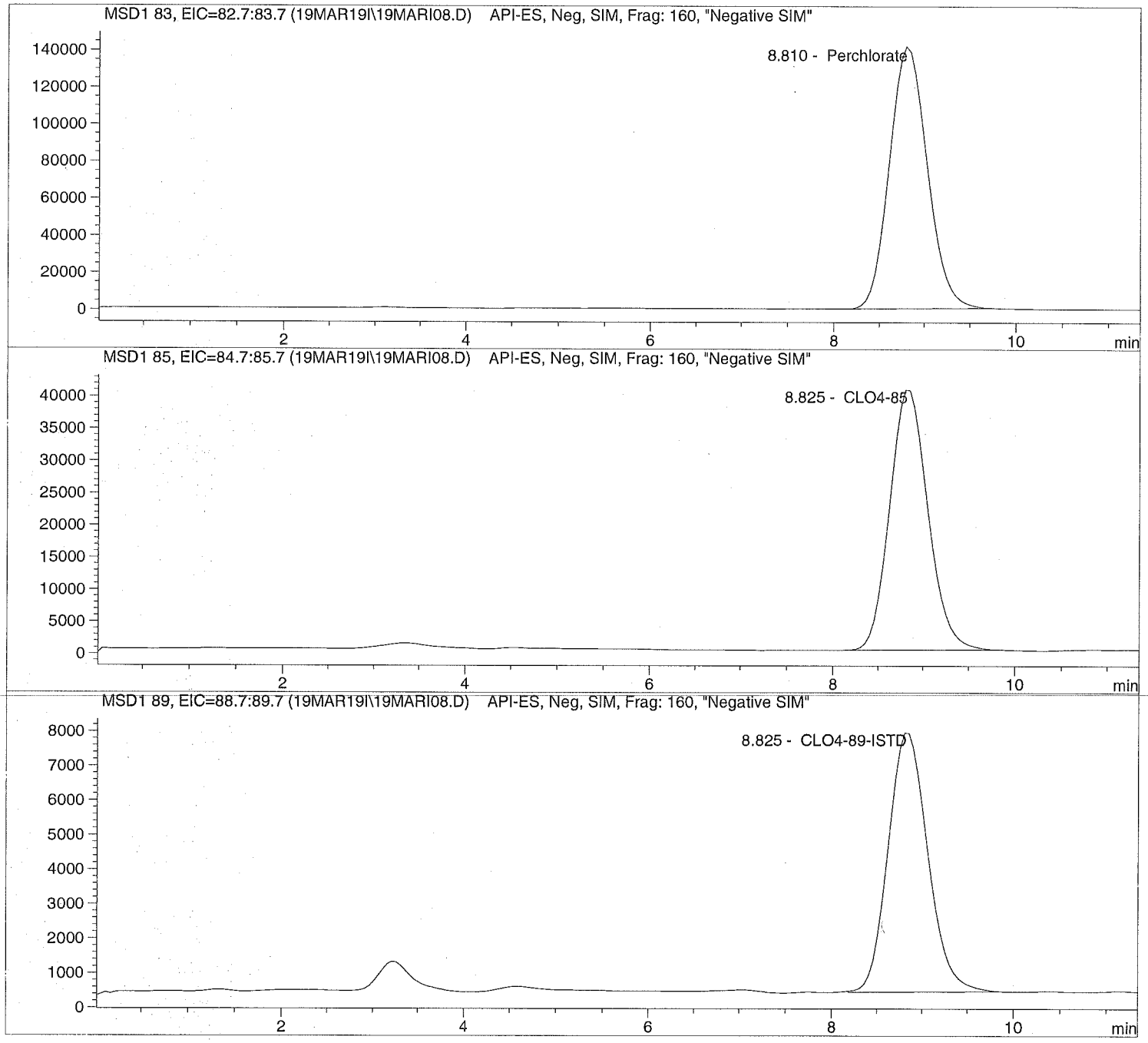
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

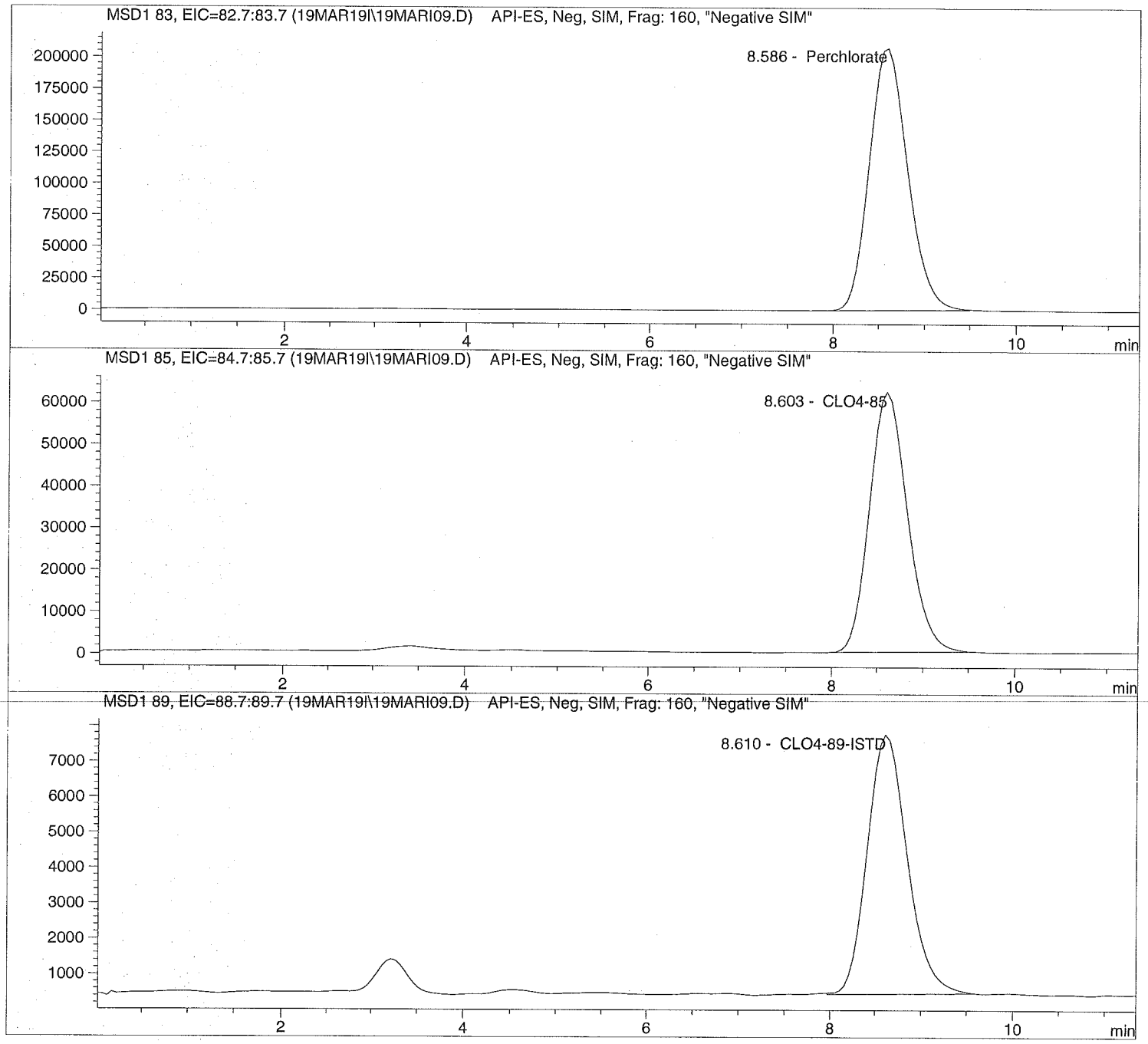
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

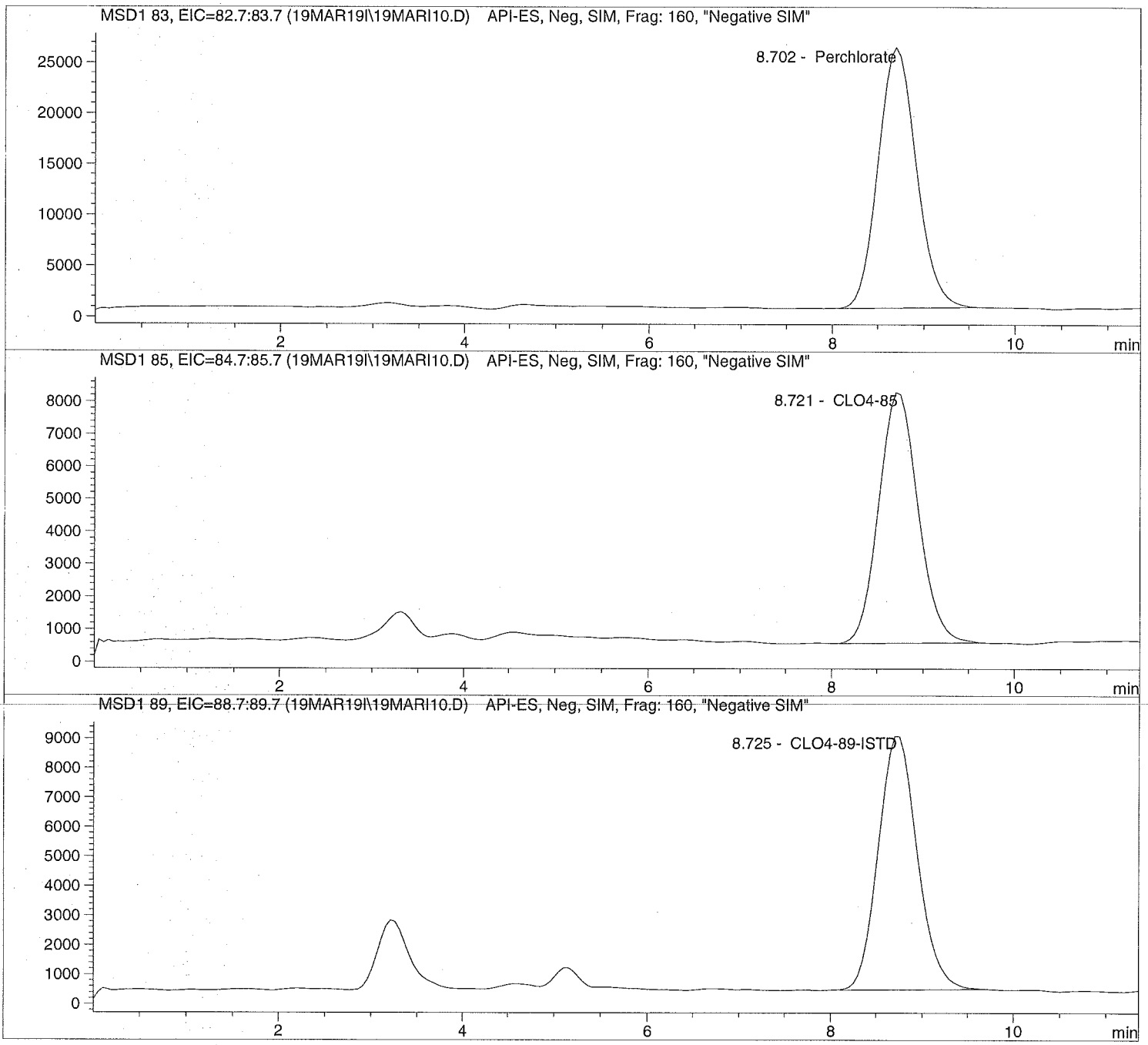
RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

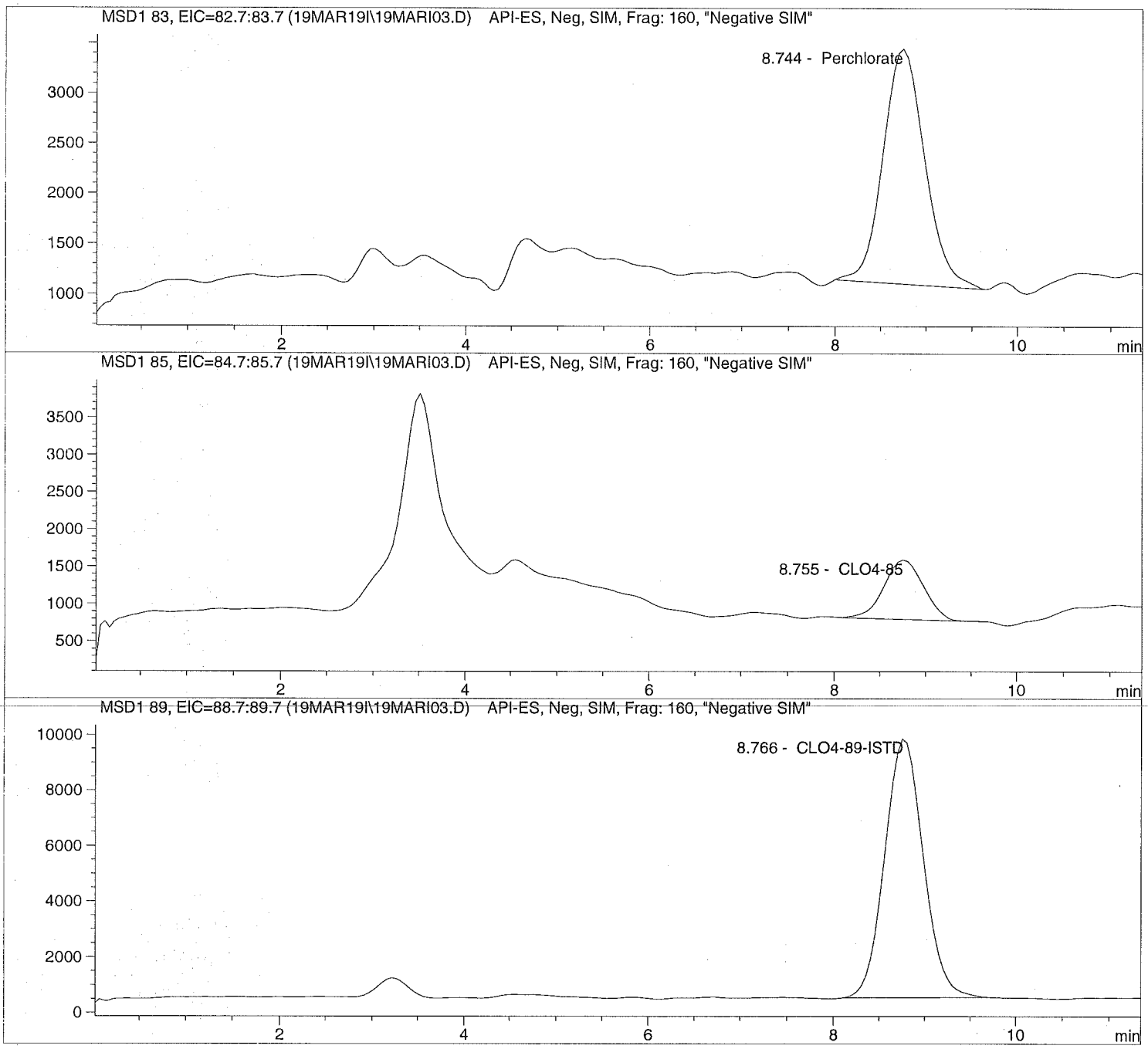
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Houston, US Date: 17-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19051856

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19051856-01	LH18/24-SP650_052919	Water		29-May-2019 14:00	31-May-2019 08:37	☐
HS19051856-02	LH18/24-SP650_052919_BIX	Water		29-May-2019 14:00	31-May-2019 08:37	☐

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order:

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Work Order Comments

• The analysis for TOC was subcontracted to ALS Kelso,WA. Final report attached.

Wet Chemistry by Method E350.3

Batch ID: R340032

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Wet Chemistry by Method E365.3

Batch ID: R339834

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19051856

Sample ID: LH18/24-SP650_052919 Lab ID:HS19051856-01

Collection Date: 29-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: RG
Nitrogen, Ammonia (As N)	**10.0**		**0.20**	**0.10**	**0.20**	**mg/L**	1	07-Jun-2019 10:45
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: KVL
Phosphorus, Total Orthophosphate (As P)	**2.21**		**0.100**	**0.200**	**0.250**	**mg/L**	10	31-May-2019 12:43
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	11-Jun-2019 09:29

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19051856

Sample ID: LH18/24-SP650_052919_BIX Lab ID:HS19051856-02

Collection Date: 29-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	**See Atttached**		**0**	**0**	**0**	**NA**	1	17-Jun-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19051856

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R339834	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3			**Matrix:** Water		
HS19051856-01	LH18/24-SP650_052919	29 May 2019 14:00			31 May 2019 12:43	10
Batch ID R340032	**Test Name :** AMMONIA AS N BY E350.3(ISE)			**Matrix:** Water		
HS19051856-01	LH18/24-SP650_052919	29 May 2019 14:00			07 Jun 2019 10:45	1
Batch ID R340200	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS			**Matrix:** Water		
HS19051856-01	LH18/24-SP650_052919	29 May 2019 14:00			11 Jun 2019 09:29	1
Batch ID R340666	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19051856-02	LH18/24-SP650_052919_BIX	29 May 2019 14:00			17 Jun 2019 18:06	1

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19051856

QC BATCH REPORT

Batch ID: R339834 (0) **Instrument: UV-2450** **Method: ORTHO PHOSPHATE (PO4) AS P BY E365.3**

MBLK Sample ID: **MBLK-339834** Units: **mg/L** Analysis Date: **31-May-2019 12:43**
Client ID: Run ID: **UV-2450_339834** SeqNo: **5107837** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0200	0.0250								U

LCS Sample ID: **LCS-339834** Units: **mg/L** Analysis Date: **31-May-2019 12:43**
Client ID: Run ID: **UV-2450_339834** SeqNo: **5107838** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.247	0.0250	0.25	0	98.8	85 - 115				

MS Sample ID: **HS19051856-01MS** Units: **mg/L** Analysis Date: **31-May-2019 12:43**
Client ID: **LH18/24-SP650_052919** Run ID: **UV-2450_339834** SeqNo: **5107840** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	4.8	0.250	2.5	2.21	104	80 - 120				

MSD Sample ID: **HS19051856-01MSD** Units: **mg/L** Analysis Date: **31-May-2019 12:43**
Client ID: **LH18/24-SP650_052919** Run ID: **UV-2450_339834** SeqNo: **5107841** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	4.71	0.250	2.5	2.21	100	80 - 120	4.8	1.89	20	

The following samples were analyzed in this batch: HS19051856-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19051856

QC BATCH REPORT

Batch ID: R340032 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R340032** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111522** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R340032** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111521** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.54	0.20	10	0	105	80 - 120				

MS Sample ID: **HS19051885-01MS** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111524** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.69	0.20	10	0.2668	104	80 - 120				

MSD Sample ID: **HS19051885-01MSD** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111523** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.64	0.20	10	0.2668	104	80 - 120	10.69	0.469	20	

The following samples were analyzed in this batch: HS19051856-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS19051856**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 17-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19051856

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19051856-01	LH18/24-SP650_052919	Login	31/05/2019 11:02:42	PMG	WET161
HS19051856-01	LH18/24-SP650_052919	Login	31/05/2019 11:02:42	PMG	WET161
HS19051856-01	LH18/24-SP650_052919	Login	31/05/2019 11:02:42	PMG	Sub
HS19051856-02	LH18/24-SP650_052919_BIX	Login	31/05/2019 11:02:42	PMG	Sub

ALS Houston, US Date: 17-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19051856
Date/Time Received: **31-May-2019 08:37**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 31-May-2019 Date
Reviewed by: *RJ Modashia* eSignature 31-May-2019 Date

Matrices: **Water**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.3c U/C	IR11
Cooler(s)/Kit(s):	44407	
Date/Time sample(s) sent to storage:	5/31/19 11:15	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modshia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. NWO1312.0150.0 16.0001

Job: GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

Prepared By: Scott Beesinger

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_052919	Water	05/29/19 / 14:00		2	X	X			H2SO4	
LH18/24-SP650_052919	Water	05/29/19 / 14:00		1			X		NONE	
LH18/24-SP650_052919_BIX	Water	05/29/19 / 14:00		1					NONE	

HS19051856

Bhate Environmental Associates, Inc.
18/24 Longhorn GW Treatment Plant Weekly Sampl

Additional Remarks: **Standard TAT on all parameters**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	05/29/19	14:30									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Hansard	5/31/19	08:37							

Remarks: Cooler 44407
Temp 2.3
1211 CFO.0

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44407

CUSTODY SEAL

Date: 5/29/19 Time: 1400
Name: Scott Beesinger
Company: Bhate

Seal Broken By:
Date: 05/31/19

44407 MAY 31 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

44407

RT 917
Z B03
1
10:30
A

ORIGIN ID: 8200 930-6193
SCOTT BEESI
BHATE ENVIRON ASSOCIATES
1203-B EAST GR AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 21SEP18
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530--5656
REF: LHAAP 58 - RJ
RMA:

FedEx Express

TRK# 4380 9532 8290
RETURNS MON-SAT
PRIORITY OVERNIGHT

77099

FedEx
TRK# 4380 9532 8290
FRI 31 MAY 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

ALS Environmental
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www.alsglobal.com

June 10, 2019

Analytical Report for Service Request No: K1905066

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS19051856

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory June 01, 2019
For your reference, these analyses have been assigned our service request number **K1905066.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
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1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client: ALS Environmental - US
Project: HS19051856
Sample Matrix: Water

Service Request: K1905066
Date Received: 06/01/2019

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 06/01/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 06/10/2019

Chain of Custody

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
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10450 Stancliff Rd, Ste 210
Houston, TX 77099
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F: +1 281 530 5887
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Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **11496**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

KL90506b

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19051856
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19051856-01**	**LH18/24-SP650_052919**	**Water**	**29 May 2019 14:00**
	TOC Analysis for DOD Level IV			10 Jun 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 5/31/19 1800

Received By: _____ Date/Time: 6/1/19 1010

Cooler ID(s): _____ Temperature(s): _____

00939220

PC KV

Cooler Receipt and Preservation Form

Client ALS / Houston Service Request *K19* 1905060

Received: 6/1/19 Opened: 6/1/19 By: [signature] Unloaded: 6/1/19 By: [signature]

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2, front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.5	-0.4	1.2	1.3	+0.1	360	11496	4809 7834 6662	

4. Packing material: *Inserts* (*Baggies*) (*Bubble Wrap*) *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

General Chemistry

ALS Environmental—Kelso Laboratory
1317 South 13th Avenue, Kelso, WA 98626
Phone (360)577- 7222 Fax (360)636-1 068
www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1905066
Project:	HS19051856	**Date Collected:**	05/29/19
Sample Matrix:	Water	**Date Received:**	06/1/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_052919	K1905066-001	**2.12**	0.50	0.20	0.07	1	06/04/19 18:18	
Method Blank	K1905066-MB	ND U	0.50	0.20	0.07	1	06/04/19 13:46	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1905066
Project	HS19051856	**Date Collected:**	05/29/19
Sample Matrix:	Water	**Date Received:**	06/01/19
		Date Analyzed:	06/04/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_052919	**Units:**	mg/L
Lab Code:	K1905066-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K1905066-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	2.12	2.14	2.13	<1	10

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1905066
Project:	HS19051856	**Date Analyzed:**	06/04/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	638040

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1905066-LCS	25.2	25.0	101	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1905066
Project: HS19051856

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	638040	KQ1907639-01	06/04/19 13:17	25.0	24.6	98	90-110
CCV2	638040	KQ1907639-02	06/04/19 17:20	25.0	24.6	99	90-110
CCV3	638040	KQ1907639-03	06/04/19 22:30	25.0	24.2	97	90-110
CCV4	638040	KQ1907639-04	06/05/19 03:14	25.0	24.4	98	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1905066
Project: HS19051856

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	638040	KQ1907639-05	06/04/19 13:32	0.50	0.20	0.07	ND	U
CCB2	638040	KQ1907639-06	06/04/19 17:34	0.50	0.20	0.07	ND	U
CCB3	638040	KQ1907639-07	06/04/19 22:45	0.50	0.20	0.07	ND	U
CCB4	638040	KQ1907639-08	06/05/19 03:28	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

ALS Environmental—Kelso Laboratory
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Work Request # Original (K190) 5047, 5066, 4844, 4850, 4848, 4853, 4986, 5084, 5062, 5063, 5032, II

Tier: II IV I I IV IV I II III IV 5029, I

Date Analyzed: 6/4/19 TOC: 638040, 638042, 638044

Analyst: HLM Run # DOC: 638047

Analysis: TOC/DOC 5050 I

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	yes/no/NA
2.	Holding times met for all analyses and for all samples?	yes/no/NA
3.	Are calculations correct?	yes/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/NA
5.	All quality control criteria met?	yes/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	yes/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	yes/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	yes/no/NA
9.	Are results for methods blanks all ND?	yes/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/no/NA
11.	Are all exceptions explained?	yes/no/NA
12.	Have all applicable service requests been reviewed?	yes/no/NA
13.	Are all samples labeled correctly?	yes/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	yes/no/NA
15.	Are detection limits and units reported correctly?	yes/no/NA
16.	Is the unused space on the benchsheet crossed out?	yes/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/no/NA

COMMENTS:
K1904853-1/1dup present a high RPD of 24%. however, sample concentration is less than 5x MRL.

Final Approved by: _____ Date: 06/07/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** HMIRENTA **Analysis Lot:** 638040 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1904848-001	Carbon, Total Organic	N/A		Surface Water	1.29 mg/L	10 mL	1.29 mg/L	1	0.07	0.50			6/5/19 00:53:00	N	IV
K1904848-002	Carbon, Total Organic	N/A		Surface Water	0.63 mg/L	10 mL	0.63 mg/L	1	0.07	0.50			6/5/19 01:22:00	N	IV
K1904849-001	Carbon, Total Organic	N/A		Water	2.22 mg/L	10 mL	2.22 mg/L	1	0.07	0.50			6/4/19 18:46:00	N	I
K1904849-002	Carbon, Total Organic	N/A		Water	2.76 mg/L	10 mL	2.76 mg/L	1	0.07	0.50			6/4/19 19:14:00	N	I
K1904849-003	Carbon, Total Organic	N/A		Water	4.33 mg/L	10 mL	4.33 mg/L	1	0.07	0.50			6/4/19 19:42:00	N	I
K1904849-004	Carbon, Total Organic	N/A		Water	8.74 mg/L	10 mL	34.9 mg/L	4	0.3	2.0			6/4/19 20:10:00	N	I
K1904849-005	Carbon, Total Organic	N/A		Water	0.74 mg/L	10 mL	0.74 mg/L	1	0.07	0.50			6/4/19 20:38:00	N	I
K1904849-006	Carbon, Total Organic	N/A		Water	9.01 mg/L	10 mL	9.01 mg/L	1	0.07	0.50			6/4/19 21:06:00	N	I
K1904850-001	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 21:34:00	N	I
K1904850-002	Carbon, Total Organic	N/A		Water	0.20 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 22:02:00	N	I
K1904850-003	Carbon, Total Organic	N/A		Water	0.30 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 23:29:00	N	I
K1904850-004	Carbon, Total Organic	N/A		Water	3.09 mg/L	10 mL	3.09 mg/L	1	0.07	0.50			6/4/19 23:57:00	N	I
K1904850-005	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 00:25:00	N	I
K1905047-001	Carbon, Total Organic	N/A		Water	1.54 mg/L	10 mL	1.54 mg/L	1	0.07	0.50			6/4/19 14:30:00	N	II
K1905047-002	Carbon, Total Organic	N/A		Water	2.64 mg/L	10 mL	2.64 mg/L	1	0.07	0.50			6/4/19 15:28:00	N	II
K1905047-003	Carbon, Total Organic	N/A		Water	1.92 mg/L	10 mL	1.92 mg/L	1	0.07	0.50			6/4/19 15:56:00	N	II
K1905047-004	Carbon, Total Organic	N/A		Water	2.23 mg/L	10 mL	2.23 mg/L	1	0.07	0.50			6/4/19 16:24:00	N	II
K1905047-005	Carbon, Total Organic	N/A		Water	1.36 mg/L	10 mL	1.36 mg/L	1	0.07	0.50			6/4/19 16:52:00	N	II
K1905047-006	Carbon, Total Organic	N/A		Water	1.63 mg/L	10 mL	1.63 mg/L	1	0.07	0.50			6/4/19 17:49:00	N	II
K1905066-001	Carbon, Total Organic	N/A		Water	2.12 mg/L	10 mL	2.12 mg/L	1	0.07	0.50			6/4/19 18:18:00	N	IV
KQ1907639-01	Carbon, Total Organic	CCV		Water	24.56 mg/L	10 mL	24.6 mg/L	1					6/4/19 13:17:00	N	II
KQ1907639-02	Carbon, Total Organic	CCV		Water	24.65 mg/L	10 mL	24.6 mg/L	1					6/4/19 17:20:00	N	II
KQ1907639-03	Carbon, Total Organic	CCV		Water	24.21 mg/L	10 mL	24.2 mg/L	1					6/4/19 22:30:00	N	II
KQ1907639-04	Carbon, Total Organic	CCV		Water	24.43 mg/L	10 mL	24.4 mg/L	1					6/5/19 03:14:00	N	II
KQ1907639-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 13:32:00	N	II
KQ1907639-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 17:34:00	N	II
KQ1907639-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 22:45:00	N	II
KQ1907639-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 03:28:00	N	II
KQ1907639-09	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 13:46:00	N	II
KQ1907639-10	Carbon, Total Organic	LCS		Water	25.20 mg/L	10 mL	25.2 mg/L	1	0.07	0.50	101		6/4/19 14:01:00	N	II
KQ1907639-11	Carbon, Total Organic	MS	K1905047-001	Water	26.56 mg/L	10 mL	26.6 mg/L	1	0.07	0.50	100		6/4/19 14:59:00	N	II
KQ1907639-12	Carbon, Total Organic	DUP	K1905047-001	Water	1.53 mg/L	10 mL	1.53 mg/L	1	0.07	0.50		1	6/4/19 14:30:00	N	II
KQ1907639-13	Carbon, Total Organic	DUP	K1905047-002	Water	2.71 mg/L	10 mL	2.71 mg/L	1	0.07	0.50		3	6/4/19 15:28:00	N	II
KQ1907639-14	Carbon, Total Organic	DUP	K1905047-003	Water	1.89 mg/L	10 mL	1.89 mg/L	1	0.07	0.50		1	6/4/19 15:56:00	N	II
KQ1907639-15	Carbon, Total Organic	DUP	K1905047-004	Water	2.28 mg/L	10 mL	2.28 mg/L	1	0.07	0.50		2	6/4/19 16:24:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

06/07/19

HLM 6/7/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** HMIRENTA **Analysis Lot:** 638040 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1907639-16	Carbon, Total Organic	DUP	K1905047-005	Water	1.37 mg/L	10 mL	1.37 mg/L	1	0.07	0.50		1	6/4/19 16:52:00	N	II
KQ1907639-17	Carbon, Total Organic	DUP	K1905047-006	Water	1.60 mg/L	10 mL	1.60 mg/L	1	0.07	0.50		1	6/4/19 17:49:00	N	II
KQ1907639-18	Carbon, Total Organic	DUP	K1905066-001	Water	2.14 mg/L	10 mL	2.14 mg/L	1	0.07	0.50		<1	6/4/19 18:18:00	N	IV
KQ1907639-19	Carbon, Total Organic	DUP	K1904849-001	Water	2.17 mg/L	10 mL	2.17 mg/L	1	0.07	0.50		2	6/4/19 18:46:00	N	I
KQ1907639-20	Carbon, Total Organic	DUP	K1904849-002	Water	2.88 mg/L	10 mL	2.88 mg/L	1	0.07	0.50		4	6/4/19 19:14:00	N	I
KQ1907639-21	Carbon, Total Organic	DUP	K1904849-003	Water	4.31 mg/L	10 mL	4.31 mg/L	1	0.07	0.50		<1	6/4/19 19:42:00	N	I
KQ1907639-22	Carbon, Total Organic	DUP	K1904849-004	Water	8.90 mg/L	10 mL	35.6 mg/L	4	0.3	2.0		2	6/4/19 20:10:00	N	I
KQ1907639-23	Carbon, Total Organic	DUP	K1904849-005	Water	0.69 mg/L	10 mL	0.69 mg/L	1	0.07	0.50		7	6/4/19 20:38:00	N	I
KQ1907639-24	Carbon, Total Organic	DUP	K1904849-006	Water	8.93 mg/L	10 mL	8.93 mg/L	1	0.07	0.50		<1	6/4/19 21:06:00	N	I
KQ1907639-25	Carbon, Total Organic	DUP	K1904850-001	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/4/19 21:34:00	N	I
KQ1907639-26	Carbon, Total Organic	DUP	K1904850-002	Water	0.22 mg/L	10 mL	0.22 mg/L J	1	0.07	0.50		NC	6/4/19 22:02:00	N	I
KQ1907639-27	Carbon, Total Organic	DUP	K1904850-003	Water	0.19 mg/L	10 mL	0.19 mg/L J	1	0.07	0.50		NC	6/4/19 23:29:00	N	I
KQ1907639-28	Carbon, Total Organic	DUP	K1904850-004	Water	3.12 mg/L	10 mL	3.12 mg/L	1	0.07	0.50		1	6/4/19 23:57:00	N	I
KQ1907639-29	Carbon, Total Organic	DUP	K1904850-005	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/5/19 00:25:00	N	I
KQ1907639-30	Carbon, Total Organic	DUP	K1904848-001	Surface Water	1.31 mg/L	10 mL	1.31 mg/L	1	0.07	0.50		2	6/5/19 00:53:00	N	IV
KQ1907639-31	Carbon, Total Organic	DUP	K1904848-002	Surface Water	0.60 mg/L	10 mL	0.60 mg/L	1	0.07	0.50		6	6/5/19 01:22:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

HLM 6/7/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** HMIRENTA **Analysis Lot:** 638042 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1904848-003	Carbon, Total Organic	N/A		Surface Water	3.55 mg/L	10 mL	3.55 mg/L	1	0.07	0.50			6/5/19 01:50:00	N	IV
K1904848-004	Carbon, Total Organic	N/A		Surface Water	10.98 mg/L	10 mL	11.0 mg/L	1	0.07	0.50			6/5/19 02:18:00	N	IV
K1904848-005	Carbon, Total Organic	N/A		Surface Water	4.90 mg/L	10 mL	9.8 mg/L	2	0.2	1.0			6/5/19 02:46:00	N	IV
K1904848-006	Carbon, Total Organic	N/A		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 03:43:00	N	IV
K1904848-007	Carbon, Total Organic	N/A		Surface Water	4.37 mg/L	10 mL	8.7 mg/L	2	0.2	1.0			6/5/19 04:40:00	N	IV
K1904848-008	Carbon, Total Organic	N/A		Surface Water	9.38 mg/L	10 mL	9.38 mg/L	1	0.07	0.50			6/5/19 05:09:00	N	IV
K1904853-001	Carbon, Total Organic	N/A		Water	0.17 mg/L	10 mL	0.17 mg/L J	1	0.07	0.50			6/5/19 05:37:00	N	IV
K1904986-001	Carbon, Total Organic	N/A		Ground Water	8.80 mg/L	10 mL	8.80 mg/L	1	0.07	0.50			6/5/19 06:05:00	N	I
K1904986-002	Carbon, Total Organic	N/A		Ground Water	15.46 mg/L	10 mL	15.5 mg/L	1	0.07	0.50			6/5/19 06:33:00	N	I
K1904986-003	Carbon, Total Organic	N/A		Ground Water	18.27 mg/L	10 mL	18.3 mg/L	1	0.07	0.50			6/5/19 07:01:00	N	I
K1904986-004	Carbon, Total Organic	N/A		Ground Water	21.12 mg/L	10 mL	21.1 mg/L	1	0.07	0.50			6/5/19 07:29:00	N	I
K1904986-005	Carbon, Total Organic	N/A		Ground Water	11.46 mg/L	10 mL	45.8 mg/L	4	0.3	2.0			6/5/19 08:56:00	N	I
K1905062-001	Carbon, Total Organic	N/A		Surface Water	2.91 mg/L	10 mL	2.91 mg/L	1	0.07	0.50			6/5/19 09:52:00	N	III
K1905062-002	Carbon, Total Organic	N/A		Surface Water	2.71 mg/L	10 mL	2.71 mg/L	1	0.07	0.50			6/5/19 10:20:00	N	III
K1905062-003	Carbon, Total Organic	N/A		Surface Water	2.76 mg/L	10 mL	2.76 mg/L	1	0.07	0.50			6/5/19 10:48:00	N	III
K1905062-004	Carbon, Total Organic	N/A		Surface Water	2.61 mg/L	10 mL	2.61 mg/L	1	0.07	0.50			6/5/19 11:16:00	N	III
K1905062-005	Carbon, Total Organic	N/A		Surface Water	2.86 mg/L	10 mL	2.86 mg/L	1	0.07	0.50			6/5/19 11:44:00	N	III
K1905062-006	Carbon, Total Organic	N/A		Surface Water	0.54 mg/L	10 mL	0.54 mg/L	1	0.07	0.50			6/5/19 12:12:00	N	III
K1905062-007	Carbon, Total Organic	N/A		Surface Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50			6/5/19 13:10:00	N	III
K1905084-001	Carbon, Total Organic	N/A		Water	6.13 mg/L	10 mL	613 mg/L	100	7	50			6/5/19 09:24:00	N	II
KQ1907640-01	Carbon, Total Organic	CCV		Surface Water	24.21 mg/L	10 mL	24.2 mg/L	1					6/4/19 22:30:00	N	IV
KQ1907640-02	Carbon, Total Organic	CCV		Surface Water	24.43 mg/L	10 mL	24.4 mg/L	1					6/5/19 03:14:00	N	IV
KQ1907640-03	Carbon, Total Organic	CCV		Surface Water	24.47 mg/L	10 mL	24.5 mg/L	1					6/5/19 07:57:00	N	IV
KQ1907640-04	Carbon, Total Organic	CCV		Surface Water	24.37 mg/L	10 mL	24.4 mg/L	1					6/5/19 12:40:00	N	IV

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06/07/19

HLM 6/7/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** HMIRENTA **Analysis Lot:** 638042 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1907640-05	Carbon, Total Organic	CCV		Surface Water	24.97 mg/L	10 mL	25.0 mg/L	1					6/5/19 17:37:00	N	IV
KQ1907640-06	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 22:45:00	N	IV
KQ1907640-07	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 03:28:00	N	IV
KQ1907640-08	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 08:12:00	N	IV
KQ1907640-09	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 12:55:00	N	IV
KQ1907640-10	Carbon, Total Organic	CCB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 17:52:00	N	IV
KQ1907640-11	Carbon, Total Organic	MB		Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/4/19 23:00:00	N	IV
KQ1907640-12	Carbon, Total Organic	LCS		Surface Water	25.09 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/4/19 23:14:00	N	IV
KQ1907640-14	Carbon, Total Organic	DUP	K1904848-003	Surface Water	3.51 mg/L	10 mL	3.51 mg/L	1	0.07	0.50		1	6/5/19 01:50:00	N	IV
KQ1907640-15	Carbon, Total Organic	DUP	K1904848-004	Surface Water	11.05 mg/L	10 mL	11.1 mg/L	1	0.07	0.50		<1	6/5/19 02:18:00	N	IV
KQ1907640-16	Carbon, Total Organic	DUP	K1904848-005	Surface Water	4.74 mg/L	10 mL	9.5 mg/L	2	0.2	1.0		3	6/5/19 02:46:00	N	IV
KQ1907640-17	Carbon, Total Organic	DUP	K1904848-006	Surface Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/5/19 03:43:00	N	IV
KQ1907640-18	Carbon, Total Organic	DUP	K1904848-007	Surface Water	4.27 mg/L	10 mL	8.5 mg/L	2	0.2	1.0		2	6/5/19 04:40:00	N	IV
KQ1907640-19	Carbon, Total Organic	DUP	K1904848-008	Surface Water	9.41 mg/L	10 mL	9.41 mg/L	1	0.07	0.50		<1	6/5/19 05:09:00	N	IV
KQ1907640-20	Carbon, Total Organic	DUP	K1904853-001	Water	0.14 mg/L	10 mL	0.14 mg/L J	1	0.07	0.50		24*	6/5/19 05:37:00	N	IV
KQ1907640-21	Carbon, Total Organic	DUP	K1904986-001	Ground Water	8.70 mg/L	10 mL	8.70 mg/L	1	0.07	0.50		1	6/5/19 06:05:00	N	I
KQ1907640-22	Carbon, Total Organic	DUP	K1904986-002	Ground Water	15.58 mg/L	10 mL	15.6 mg/L	1	0.07	0.50		<1	6/5/19 06:33:00	N	I
KQ1907640-23	Carbon, Total Organic	DUP	K1904986-003	Ground Water	18.12 mg/L	10 mL	18.1 mg/L	1	0.07	0.50		<1	6/5/19 07:01:00	N	I
KQ1907640-24	Carbon, Total Organic	DUP	K1904986-004	Ground Water	20.83 mg/L	10 mL	20.8 mg/L	1	0.07	0.50		1	6/5/19 07:29:00	N	I
KQ1907640-25	Carbon, Total Organic	DUP	K1904986-005	Ground Water	11.34 mg/L	10 mL	45.4 mg/L	4	0.3	2.0		1	6/5/19 08:56:00	N	I
KQ1907640-26	Carbon, Total Organic	DUP	K1905084-001	Water	6.26 mg/L	10 mL	626 mg/L	100	7	50		2	6/5/19 09:24:00	N	II
KQ1907640-27	Carbon, Total Organic	DUP	K1905062-001	Water	2.83 mg/L	10 mL	2.83 mg/L	1	0.07	0.50		3	6/5/19 09:52:00	N	III
KQ1907640-28	Carbon, Total Organic	DUP	K1905062-002	Water	2.74 mg/L	10 mL	2.74 mg/L	1	0.07	0.50		<1	6/5/19 10:20:00	N	III
KQ1907640-29	Carbon, Total Organic	DUP	K1905062-003	Water	2.71 mg/L	10 mL	2.71 mg/L	1	0.07	0.50		2	6/5/19 10:48:00	N	III
KQ1907640-30	Carbon, Total Organic	DUP	K1905062-004	Water	2.70 mg/L	10 mL	2.70 mg/L	1	0.07	0.50		3	6/5/19 11:16:00	N	III
KQ1907640-31	Carbon, Total Organic	DUP	K1905062-005	Water	2.84 mg/L	10 mL	2.84 mg/L	1	0.07	0.50		<1	6/5/19 11:44:00	N	III

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

HLM 6/7/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** HMIRENTA **Analysis Lot:** 638042 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1907640-32	Carbon, Total Organic	DUP	K1905062-006	Water	0.59 mg/L	10 mL	0.59 mg/L	1	0.07	0.50		9	6/5/19 12:12:00	N	III
KQ1907640-33	Carbon, Total Organic	DUP	K1905062-007	Water	0.49 mg/L	10 mL	0.49 mg/L J	1	0.07	0.50		8	6/5/19 13:10:00	N	III
KQ1907640-34	Carbon, Total Organic	MS	K1904848-006	Surface Water	25.05 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/5/19 04:11:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

HCM 6/7/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** HMIRENTA **Analysis Lot:** 638044 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1905062-008	Carbon, Total Organic	N/A		Surface Water	0.61 mg/L	10 mL	0.61 mg/L	1	0.07	0.50			6/5/19 13:38:00	N	III
K1905062-009	Carbon, Total Organic	N/A		Surface Water	0.51 mg/L	10 mL	0.51 mg/L	1	0.07	0.50			6/5/19 14:06:00	N	III
K1905063-001	Carbon, Total Organic	N/A		Surface Water	0.44 mg/L	10 mL	0.44 mg/L J	1	0.07	0.50			6/5/19 14:34:00	N	IV
K1905063-002	Carbon, Total Organic	N/A		Surface Water	0.27 mg/L	10 mL	0.27 mg/L J	1	0.07	0.50			6/5/19 15:02:00	N	IV
KQ1907641-01	Carbon, Total Organic	CCV		Water	24.37 mg/L	10 mL	24.4 mg/L	1					6/5/19 12:40:00	N	III
KQ1907641-02	Carbon, Total Organic	CCV		Water	24.97 mg/L	10 mL	25.0 mg/L	1					6/5/19 17:37:00	N	III
KQ1907641-03	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 12:55:00	N	III
KQ1907641-04	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 17:52:00	N	III
KQ1907641-05	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 08:26:00	N	III
KQ1907641-06	Carbon, Total Organic	LCS		Water	24.71 mg/L	10 mL	24.7 mg/L	1	0.07	0.50	99		6/5/19 08:41:00	N	III
KQ1907641-07	Carbon, Total Organic	DUP	K1905062-008	Water	0.55 mg/L	10 mL	0.55 mg/L	1	0.07	0.50		10	6/5/19 13:38:00	N	III
KQ1907641-08	Carbon, Total Organic	DUP	K1905062-009	Water	0.55 mg/L	10 mL	0.55 mg/L	1	0.07	0.50		7	6/5/19 14:06:00	N	III
KQ1907641-09	Carbon, Total Organic	DUP	K1905063-001	Water	0.42 mg/L	10 mL	0.42 mg/L J	1	0.07	0.50		3	6/5/19 14:34:00	N	III
KQ1907641-10	Carbon, Total Organic	MS	K1905063-002	Water	26.28 mg/L	10 mL	26.3 mg/L	1	0.07	0.50	104		6/5/19 15:30:00	N	III
KQ1907641-11	Carbon, Total Organic	DUP	K1905063-002	Water	0.25 mg/L	10 mL	0.25 mg/L J	1	0.07	0.50		7	6/5/19 15:02:00	N	III

06/07/19

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

HLM 6/7/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** HMIRENTA **Analysis Lot:** 638047 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1905029-001	Carbon, Dissolved Organic (DOC)	N/A		Water	12.51 mg/L	10 mL	12.5 mg/L	1	0.07	0.50			6/5/19 19:34:00	N	I
K1905030-001	Carbon, Dissolved Organic (DOC)	N/A		Water	10.17 mg/L	10 mL	10.2 mg/L	1	0.07	0.50			6/5/19 20:02:00	N	I
K1905030-002	Carbon, Dissolved Organic (DOC)	N/A		Water	4.35 mg/L	10 mL	4.35 mg/L	1	0.07	0.50			6/5/19 20:30:00	N	I
K1905032-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.26 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 16:13:00	N	II
K1905032-002	Carbon, Dissolved Organic (DOC)	N/A		Water	2.07 mg/L	10 mL	2.07 mg/L	1	0.07	0.50			6/5/19 16:41:00	N	II
K1905032-003	Carbon, Dissolved Organic (DOC)	N/A		Water	2.42 mg/L	10 mL	2.42 mg/L	1	0.07	0.50			6/5/19 17:09:00	N	II
KQ1907643-01	Carbon, Dissolved Organic (DOC)	CCV		Water	24.37 mg/L	10 mL	24.4 mg/L	1					6/5/19 12:40:00	N	II
KQ1907643-02	Carbon, Dissolved Organic (DOC)	CCV		Water	24.97 mg/L	10 mL	25.0 mg/L	1					6/5/19 17:37:00	N	II
KQ1907643-03	Carbon, Dissolved Organic (DOC)	CCV		Water	24.16 mg/L	10 mL	24.2 mg/L	1					6/5/19 21:26:00	N	II
KQ1907643-04	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 12:55:00	N	II
KQ1907643-05	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 17:52:00	N	II
KQ1907643-06	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 21:41:00	N	II
KQ1907643-07	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/5/19 18:07:00	N	II
KQ1907643-08	Carbon, Dissolved Organic (DOC)	LCS		Water	25.47 mg/L	10 mL	25.5 mg/L	1	0.07	0.50	102		6/5/19 18:21:00	N	II
KQ1907643-09	Carbon, Dissolved Organic (DOC)	DUP	K1905032-001	Water	0.43 mg/L	10 mL	0.43 mg/L J	1	0.07	0.50		NC	6/5/19 16:13:00	N	II
KQ1907643-10	Carbon, Dissolved Organic (DOC)	DUP	K1905032-002	Water	2.29 mg/L	10 mL	2.29 mg/L	1	0.07	0.50		10	6/5/19 16:41:00	N	II
KQ1907643-11	Carbon, Dissolved Organic (DOC)	DUP	K1905032-003	Water	2.37 mg/L	10 mL	2.37 mg/L	1	0.07	0.50		2	6/5/19 17:09:00	N	II
KQ1907643-12	Carbon, Dissolved Organic (DOC)	DUP	K1905029-001	Water	12.59 mg/L	10 mL	12.6 mg/L	1	0.07	0.50		<1	6/5/19 19:34:00	N	I
KQ1907643-13	Carbon, Dissolved Organic (DOC)	DUP	K1905030-001	Water	9.97 mg/L	10 mL	9.97 mg/L	1	0.07	0.50		2	6/5/19 20:02:00	N	I
KQ1907643-14	Carbon, Dissolved Organic (DOC)	DUP	K1905030-002	Water	4.33 mg/L	10 mL	4.33 mg/L	1	0.07	0.50		<1	6/5/19 20:30:00	N	I
KQ1907643-15	Carbon, Dissolved Organic (DOC)	MS	K1905032-003	Water	27.55 mg/L	10 mL	27.5 mg/L	1	0.07	0.50	101		6/5/19 18:36:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

06/07/19

Printed 6/7/19 13:40

Results Summary

HLM 6/7/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	24.558	0.0000	24.5583	24.5583	24.6	6/4/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
4	MB1	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
5	[TOC] LCS [24ppm]	1	25.202	0.0000	25.2021	25.2021	25.2	6/4/2019
6	K1905047-001	1	1.545	0.0000	1.5446	1.5446	1.54	6/4/2019
7	K1905047-001d	1	1.525	0.0000	1.5251	1.5251	1.5	6/4/2019
8	K1905047-001ms	1	26.559	0.0000	26.5592	26.5592	27	6/4/2019
9	K1905047-002	1	2.638	0.0000	2.6379	2.6379	2.64	6/4/2019
10	K1905047-002d	1	2.714	0.0000	2.7144	2.7144	2.71	6/4/2019
11	K1905047-003	1	1.918	0.0000	1.9180	1.918	1.9	6/4/2019
12	K1905047-003d	1	1.893	0.0000	1.8928	1.8928	1.89	6/4/2019
13	K1905047-004	1	2.227	0.0000	2.2269	2.2269	2.23	6/4/2019
14	K1905047-004d	1	2.282	0.0000	2.2817	2.2817	2.28	6/4/2019
15	K1905047-005	1	1.355	0.0000	1.3550	1.355	1.4	6/4/2019
16	K1905047-005d	1	1.374	0.0000	1.3739	1.3739	1.4	6/4/2019
17	C] CCV 25 ppm [25 p	1	24.645	0.0000	24.6454	24.6454	24.65	6/4/2019
18	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
19	K1905047-006	1	1.626	0.0000	1.6263	1.6263	1.6	6/4/2019
20	K1905047-006d	1	1.603	0.0000	1.6025	1.6025	1.60	6/4/2019
21	K1905066-001	1	2.120	0.0000	2.1198	2.1198	2.12	6/4/2019
22	K1905066-001d	1	2.137	0.0000	2.1373	2.1373	2.1	6/4/2019
23	K1904849-001	1	2.218	0.0000	2.2180	2.218	2.2	6/4/2019
24	K1904849-001d	1	2.166	0.0000	2.1663	2.1663	2.17	6/4/2019
25	K1904849-002	1	2.760	0.0000	2.7600	2.76	2.76	6/4/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: HLM	Date Analyzed	6/4/19	
Reviewed By:	Date Reviewed	06/07/19	

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1904849-002d	1	2.875	0.0000	2.8752	2.8752	2.88	6/4/2019
27	K1904849-003	1	4.328	0.0000	4.3284	4.3284	4.33	6/4/2019
28	K1904849-003d	1	4.312	0.0000	4.3119	4.3119	4.3	6/4/2019
29	K1904849-004	4	8.736	0.0000	8.7359	34.9436	34.9	6/4/2019
30	K1904849-004d	4	8.898	0.0000	8.8983	35.5932	35.6	6/4/2019
31	K1904849-005	1	0.737	0.0000	0.7369	0.7369	0.7	6/4/2019
32	K1904849-005d	1	0.689	0.0000	0.6890	0.689	0.7	6/4/2019
33	K1904849-006	1	9.007	0.0000	9.0067	9.0067	9.0	6/4/2019
34	K1904849-006d	1	8.933	0.0000	8.9330	8.933	8.9	6/4/2019
35	K1904850-001	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
36	K1904850-001d	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
37	K1904850-002	1	0.198	0.0000	0.1983	0.1983	<0.5	6/4/2019
38	K1904850-002d	1	0.220	0.0000	0.2202	0.2202	<0.5	6/4/2019
39	C] CCV 25 ppm [25 p	1	24.214	0.0000	24.2136	24.2136	24.2	6/4/2019
40	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
41	K1904850-003	1	0.303	0.0000	0.3033	0.3033	<0.5	6/4/2019
42	K1904850-003d	1	0.191	0.0000	0.1914	0.1914	<0.5	6/4/2019
43	K1904850-004	1	3.089	0.0000	3.0889	3.0889	3.1	6/4/2019
44	K1904850-004d	1	3.124	0.0000	3.1235	3.1235	3.1	6/4/2019
45	K1904850-005	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
46	K1904850-005d	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
47	K1904848-001	1	1.286	0.0000	1.2857	1.2857	1.3	6/5/2019
48	K1904848-001d	1	1.307	0.0000	1.3073	1.3073	1.3	6/5/2019
49	K1904848-002	1	0.632	0.0000	0.6317	0.6317	0.6	6/5/2019
50	K1904848-002d	1	0.598	0.0000	0.5977	0.5977	0.6	6/5/2019

Analyzed By:	HLM	Date Analyzed	6/14/19
Reviewed By:		Date Reviewed	06/07/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	C] CCV 25 ppm [25 p	1	24.434	0.0000	24.4344	24.4344	24.43	6/5/2019
52	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
53		1		0.0000	0.0000	0	<0.5	
54		1		0.0000	0.0000	0	<0.5	
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By:	HLM	Date Analyzed	6/14/19
Reviewed By:		Date Reviewed	06/07/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	24.214	0.0000	24.2136	24.2136	24.2	6/4/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
4	MB2	1	0.000	0.0000	0.0000	0	<0.5	6/4/2019
5	[TOC] LCS [24ppm]	1	25.090	0.0000	25.0902	25.0902	25.1	6/4/2019
6	K1904848-003	1	3.545	0.0000	3.5453	3.5453	3.55	6/5/2019
7	K1904848-003d	1	3.507	0.0000	3.5071	3.5071	3.5	6/5/2019
8	K1904848-004	1	10.983	0.0000	10.9829	10.9829	11	6/5/2019
9	K1904848-004d	1	11.053	0.0000	11.0527	11.0527	11.05	6/5/2019
10	K1904848-005	2	4.898	0.0000	4.8977	9.7954	9.80	6/5/2019
11	K1904848-005d	2	4.737	0.0000	4.7369	9.4738	9.5	6/5/2019
12	C] CCV 25 ppm [25 p	1	24.434	0.0000	24.4344	24.4344	24.43	6/5/2019
13	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
14	K1904848-006	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
15	K1904848-006d	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
16	K1904848-006ms	1	25.055	0.0000	25.0547	25.0547	25.1	6/5/2019
17	K1904848-007	2	4.372	0.0000	4.3723	8.7446	8.74	6/5/2019
18	K1904848-007d	2	4.266	0.0000	4.2664	8.5328	8.5	6/5/2019
19	K1904848-008	1	9.384	0.0000	9.3843	9.3843	9.4	6/5/2019
20	K1904848-008d	1	9.409	0.0000	9.4090	9.409	9.41	6/5/2019
21	K1904853-001	1	0.174	0.0000	0.1743	0.1743	<0.5	6/5/2019
22	K1904853-001d	1	0.138	0.0000	0.1376	0.1376	<0.5	6/5/2019
23	K1904986-001	1	8.801	0.0000	8.8006	8.8006	8.8	6/5/2019
24	K1904986-001d	1	8.704	0.0000	8.7041	8.7041	8.70	6/5/2019
25	K1904986-002	1	15.461	0.0000	15.4606	15.4606	15.46	6/5/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By:	HLM	Date Analyzed	6/4/19
Reviewed By:	[signature]	Date Reviewed	06/07/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1904986-002d	1	15.579	0.0000	15.5788	15.5788	15.58	6/5/2019
27	K1904986-003	1	18.269	0.0000	18.2689	18.2689	18.27	6/5/2019
28	K1904986-003d	1	18.123	0.0000	18.1227	18.1227	18.1	6/5/2019
29	K1904986-004	1	21.118	0.0000	21.1180	21.118	21.1	6/5/2019
30	K1904986-004d	1	20.827	0.0000	20.8272	20.8272	20.8	6/5/2019
31	C] CCV 25 ppm [25 p	1	24.466	0.0000	24.4664	24.4664	24.5	6/5/2019
32	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
33	K1904986-005	4	11.462	0.0000	11.4621	45.8484	45.8	6/5/2019
34	K1904986-005d	4	11.338	0.0000	11.3376	45.3504	45.4	6/5/2019
35	K1905084-001	100	6.135	0.0000	6.1348	613.48	613.5	6/5/2019
36	K1905084-001d	100	6.261	0.0000	6.2611	626.11	626.1	6/5/2019
37	K1905062-001	1	2.907	0.0000	2.9065	2.9065	2.9	6/5/2019
38	K1905062-001d	1	2.830	0.0000	2.8297	2.8297	2.8	6/5/2019
39	K1905062-002	1	2.711	0.0000	2.7110	2.711	2.7	6/5/2019
40	K1905062-002d	1	2.737	0.0000	2.7369	2.7369	2.7	6/5/2019
41	K1905062-003	1	2.757	0.0000	2.7569	2.7569	2.8	6/5/2019
42	K1905062-003d	1	2.712	0.0000	2.7119	2.7119	2.7	6/5/2019
43	K1905062-004	1	2.612	0.0000	2.6123	2.6123	2.6	6/5/2019
44	K1905062-004d	1	2.697	0.0000	2.6973	2.6973	2.7	6/5/2019
45	K1905062-005	1	2.862	0.0000	2.8618	2.8618	2.9	6/5/2019
46	K1905062-005d	1	2.836	0.0000	2.8358	2.8358	2.8	6/5/2019
47	K1905062-006	1	0.545	0.0000	0.5445	0.5445	0.5	6/5/2019
48	K1905062-006d	1	0.595	0.0000	0.5946	0.5946	0.6	6/5/2019
49	C] CCV 25 ppm [25 p	1	24.369	0.0000	24.3689	24.3689	24.4	6/5/2019
50	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019

Analyzed By: HLu	Date Analyzed 6/4/19
Reviewed By:	Date Reviewed 06/07/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	K1905062-007	1	0.528	0.0000	0.5284	0.5284	0.53	6/5/2019
52	K1905062-007d	1	0.489	0.0000	0.4894	0.4894	<0.5	6/5/2019
53	C] CCV 25 ppm [25 p	1	24.965	0.0000	24.9651	24.9651	25.0	6/5/2019
54	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By: HLM	Date Analyzed 6/4/19
Reviewed By:	Date Reviewed 06/07/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	MB3	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
3	[TOC] LCS [25ppm]	1	24.707	0.0000	24.7068	24.7068	24.7	6/5/2019
4	C] CCV 25 ppm [25 p	1	24.369	0.0000	24.3689	24.3689	24.4	6/5/2019
5	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
6	K1905062-008	1	0.613	0.0000	0.6134	0.6134	0.61	6/5/2019
7	K1905062-008d	1	0.552	0.0000	0.5523	0.5523	0.6	6/5/2019
8	K1905062-009	1	0.511	0.0000	0.5113	0.5113	1	6/5/2019
9	K1905062-009d	1	0.547	0.0000	0.5467	0.5467	0.55	6/5/2019
10	K1905063-001	1	0.437	0.0000	0.4372	0.4372	<0.5	6/5/2019
11	K1905063-001d	1	0.423	0.0000	0.4227	0.4227	<0.5	6/5/2019
12	K1905063-002	1	0.275	0.0000	0.2745	0.2745	<0.5	6/5/2019
13	K1905063-002d	1	0.255	0.0000	0.2547	0.2547	<0.5	6/5/2019
14	K1905063-002ms	1	26.279	0.0000	26.2787	26.2787	26.28	6/5/2019
15	C] CCV 25 ppm [25 p	1	24.965	0.0000	24.9651	24.9651	25.0	6/5/2019
16	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
17		1		0.0000	0.0000	0	<0.5	
18		1		0.0000	0.0000	0	<0.5	
19		1		0.0000	0.0000	0	<0.5	
20		1		0.0000	0.0000	0	<0.5	
21		1		0.0000	0.0000	0	<0.5	
22		1		0.0000	0.0000	0	<0.5	
23		1		0.0000	0.0000	0	<0.5	
24		1		0.0000	0.0000	0	<0.5	
25		1		0.0000	0.0000	0	<0.5	

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: HLM	Date Analyzed	6/4/19	
Reviewed By: [signature]	Date Reviewed	06/07/19	

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	24.369	0.0000	24.3689	24.3689	24.4	6/5/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
4	K1905032-001	1	0.264	0.0000	0.2638	0.2638	<0.5	6/5/2019
5	K1905032-001d	1	0.428	0.0000	0.4275	0.4275	<0.5	6/5/2019
6	K1905032-002	1	2.072	0.0000	2.0719	2.0719	2.07	6/5/2019
7	K1905032-002d	1	2.290	0.0000	2.2902	2.2902	2.3	6/5/2019
8	K1905032-003	1	2.418	0.0000	2.4181	2.4181	2	6/5/2019
9	K1905032-003d	1	2.374	0.0000	2.3742	2.3742	2.37	6/5/2019
10	C] CCV 25 ppm [25 p	1	24.965	0.0000	24.9651	24.9651	24.97	6/5/2019
11	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
12	MB4	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
13	[TOC] LCS [25ppm]	1	25.469	0.0000	25.4694	25.4694	25.47	6/5/2019
14	K1905032-003ms	1	27.545	0.0000	27.5452	27.5452	27.55	6/5/2019
15	K1905029-001	1	12.505	0.0000	12.5053	12.5053	12.5	6/5/2019
16	K1905029-001d	1	12.587	0.0000	12.5867	12.5867	12.6	6/5/2019
17	K1905030-001	1	10.167	0.0000	10.1666	10.1666	10.17	6/5/2019
18	K1905030-001d	1	9.966	0.0000	9.9661	9.9661	10.0	6/5/2019
19	K1905030-002	1	4.347	0.0000	4.3468	4.3468	4.3	6/5/2019
20	K1905030-002d	1	4.325	0.0000	4.3253	4.3253	4.33	6/5/2019
21	C] CCV 25 ppm [25 p	1	24.157	0.0000	24.1573	24.1573	24.16	6/5/2019
22	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/5/2019
23		1		0.0000	0.0000	0	<0.5	
24		1		0.0000	0.0000	0	<0.5	
25		1		0.0000	0.0000	0	<0.5	

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: HLM	Date Analyzed	6/4/19	
Reviewed By:	Date Reviewed	06/07/19	

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

Schedule: 06042019

Version: 8
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/06/04 13:11 - Tuesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1905047-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1905047-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1905047-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1905047-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1905047-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1905047-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1905047-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1905066-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1904849-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1904849-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1904849-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1904849-004.01 4x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1904849-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1904849-006.17	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1904850-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1904850-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1904850-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1904850-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1904850-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1904848-001.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1904848-002.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1904848-003.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1904848-004.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1904848-005.08 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1904848-006.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1904848-006.08 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
31	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
32	Sample	K1904848-007.08 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K1904848-008.08	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1904853-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1904986-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1904986-002.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1904986-003.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1904986-004.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Schedule: 06042019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K1904986-005.03 4x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1905084-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1905062-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1905062-002.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1905062-003.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1905062-004.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1905062-005.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1905062-006.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	K1905062-007.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K1905062-008.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	K1905062-009.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	K1905063-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K1905063-002.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	K1905063-002.03 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
54	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	K1905032-001.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K1905032-002.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K1905032-003.04 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
58	Sample	MB4	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
59	Sample	K1905032-003.04 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
60	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	FB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
62	Sample	K1905029-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	K1905030-001.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
64	Sample	K1905030-002.01 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

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Fusion Report - 06042019
Tuesday, June 04, 2019 10:57 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/06/06 10:17 - Thursday

Report Summary Information

Company Location: Gen Chem Lab
Schedule Name: 06042019
Instrument Name: Fusion1
Report Version: 1 of 1
Report Creation by Operators (schedule version): Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v8)
Comment:

Engine Version: 1.1.5.1
Firmware Version: 1.2.0696
Connection: RS232 COM1

Report Results

06/07/19

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/06/04 10:57

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.97	17.20	4.23	49.37	05:21
2	TC Clean	11.40	14.53	3.13	50.25	04:04
3	TC Clean	2.83	5.96	3.13	50.43	03:54
4	TC Clean	1.74	4.85	3.11	50.18	03:55

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/06/04 11:19

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.52	14.72	3.20	49.80	05:23
2	TC Clean	4.01	7.19	3.18	50.27	04:05

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3	TC Clean	1.63	4.83	3.20	50.33	03:49
4	TC Clean	1.19	4.25	3.06	50.42	03:52

Sample Type: Clean — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◈	(clean)		Clean	2019/06/04 11:42

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.19	14.27	3.08	49.76	05:22
2	TC Clean	3.43	6.63	3.20	50.41	04:02
3	TC Clean	1.53	4.62	3.09	50.25	03:46
4	TC Clean	1.18	4.42	3.24	50.27	03:53

Sample Type: Blank (Creating v1263) — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◈	(blank)		Reagent/Acid Blank	2019/06/04 12:10

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.16	14.15	2.99	49.43	05:17
2	TC Clean	3.42	6.64	3.22	50.21	04:04
3	TC Clean	1.60	4.60	3.01	50.39	03:55
4	TC Clean	1.02	4.13	3.11	50.16	03:51
5	Reagent Blank	3.90	7.02	3.12	50.32	05:05
6	Acid Blank	1.28	4.41	3.13	49.86	05:27

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/04 13:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.28	11.19	2.91	50.18	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.5583 ppm (PASS)	0.0000 ppm	0%	2019/06/04 13:17

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5583	245.5833	176.16	179.39	3.22	50.11	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/04 13:32

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.14	10.26	3.13	50.10	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/04 13:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.22	9.21	2.99	50.01	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.2021 ppm (PASS)	0.0000 ppm	0%	2019/06/04 14:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.2021	252.0212	180.53	183.65	3.11	50.01	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	2	TOC	ICS	0.0821 ppm	0.0000 ppm	0.0000%	2019/06/04 14:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0821	0.8205	9.33	12.54	3.20	49.92	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	3	TOC	K1905047-001.01	1.5348 ppm	0.0139 ppm	0.9000%	2019/06/04 14:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5446	15.4465	19.26	22.35	3.09	49.96	10:29
2	TOC	1.5251	15.2505	19.13	22.24	3.12	50.00	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	4	TOC	K1905047-001.01 ms	26.5592 ppm	0.0000 ppm	0.0000%	2019/06/04 14:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.5592	265.5915	189.06	191.97	2.92	49.88	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/04 15:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.13	10.05	2.91	49.96	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC)	CAS_salt_010711	CAS_salt_010711

(v1263) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	6	TOC	K1905047-002.01	2.6761 ppm	0.0541 ppm	2.0200%	2019/06/04 15:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6379	26.3791	26.68	29.81	3.12	49.84	10:27
2	TOC	2.7144	27.1437	27.20	30.12	2.92	49.91	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	7	TOC	K1905047-003.01	1.9054 ppm	0.0178 ppm	0.9300%	2019/06/04 15:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.9180	19.1795	21.80	24.87	3.08	49.96	10:27
2	TOC	1.8928	18.9276	21.62	24.80	3.18	49.99	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	8	TOC	K1905047-004.01	2.2543 ppm	0.0388 ppm	1.7200%	2019/06/04 16:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2269	22.2688	23.89	26.98	3.09	49.97	10:24
2	TOC	2.2817	22.8169	24.26	27.45	3.18	49.96	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	9	TOC	K1905047-005.01	1.3645 ppm	0.0133 ppm	0.9800%	2019/06/04 16:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.3550	13.5504	17.97	21.08	3.11	49.99	10:27
2	TOC	1.3739	13.7390	18.10	21.21	3.11	50.02	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6454 ppm (PASS)	0.0000 ppm	0%	2019/06/04 17:20

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6454	246.4540	176.75	179.95	3.20	49.98	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/04 17:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.47	9.66	3.19	49.95	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K1905047-006.01	1.6144 ppm	0.0168 ppm	1.0400%	2019/06/04 17:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6263	16.2626	19.82	22.97	3.15	49.96	10:30
2	TOC	1.6025	16.0254	19.65	22.73	3.07	49.91	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K1905066-001.01	2.1285 ppm	0.0124 ppm	0.5800%	2019/06/04 18:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1198	21.1978	23.16	26.39	3.22	49.89	10:27
2	TOC	2.1373	21.3731	23.28	26.25	2.97	49.99	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	12	TOC	K1904849-001.01	2.1922 ppm	0.0366 ppm	1.6700%	2019/06/04 18:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2180	22.1805	23.83	26.92	3.09	49.95	10:26
2	TOC	2.1663	21.6634	23.48	26.68	3.20	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	13	TOC	K1904849-002.01	2.8176 ppm	0.0815 ppm	2.8900%	2019/06/04 19:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7600	27.6004	27.51	30.66	3.15	50.01	10:27
2	TOC	2.8752	28.7524	28.29	31.38	3.08	50.15	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	14	TOC	K1904849-003.01	4.3202 ppm	0.0117 ppm	0.2700%	2019/06/04 19:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.3284	43.2841	38.16	41.27	3.11	50.14	10:28
2	TOC	4.3119	43.1191	38.04	41.30	3.25	50.09	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	15	TOC	K1904849-004.01 4x	8.8171 ppm	0.1148 ppm	1.3000%	2019/06/04 20:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.7359	87.3593	68.08	71.20	3.12	50.19	10:29
2	TOC	8.8983	88.9827	69.18	72.20	3.03	50.25	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	16	TOC	K1904849-005.01	0.7129 ppm	0.0339 ppm	4.7500%	2019/06/04 20:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7369	7.3689	13.78	16.72	2.94	50.16	10:26

2	TOC	0.6890	6.8901	13.45	16.45	2.99	50.16	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	17	TOC	K1904849-006.17	8.9699 ppm	0.0521 ppm	0.5800%	2019/06/04 21:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.0067	90.0670	69.91	73.02	3.11	50.14	10:27
2	TOC	8.9330	89.3304	69.41	72.51	3.10	50.17	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	18	TOC	K1904850-001.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/04 21:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.66	10.52	2.87	50.11	10:26
2	TOC	0.0000	0.0000	7.19	10.20	3.01	50.10	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	19	TOC	K1904850-002.01	0.2093 ppm	0.0155 ppm	7.4200%	2019/06/04 22:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1983	1.9829	10.12	13.21	3.09	50.02	10:29
2	TOC	0.2202	2.2024	10.27	13.29	3.02	50.07	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.2136 ppm (PASS)	0.0000 ppm	0%	2019/06/04 22:30

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2136	242.1360	173.82	176.96	3.14	50.03	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/04 22:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.99	9.21	3.22	49.98	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/04 23:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.39	8.56	3.17	49.97	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.0902 ppm (PASS)	0.0000 ppm	0%	2019/06/04 23:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.0902	250.9016	179.77	182.90	3.12	49.95	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1904850-003.01	0.2473 ppm	0.0792 ppm	32.0100%	2019/06/04 23:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3033	3.0333	10.84	13.98	3.15	50.03	10:30
2	TOC	0.1914	1.9136	10.07	13.29	3.21	49.97	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1904850-004.01	3.1062 ppm	0.0245 ppm	0.7900%	2019/06/04 23:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.0889	30.8885	29.74	32.89	3.15	49.97	10:27
2	TOC	3.1235	31.2347	29.98	33.20	3.22	49.97	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1904850-005.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 00:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.20	10.38	3.18	49.99	10:25
2	TOC	0.0000	0.0000	6.89	10.11	3.22	49.99	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	24	TOC	K1904848-001.08	1.2965 ppm	0.0153 ppm	1.1800%	2019/06/05 00:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2857	12.8566	17.50	20.69	3.19	50.00	10:29
2	TOC	1.3073	13.0731	17.65	20.72	3.07	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	25	TOC	K1904848-002.08	0.6147 ppm	0.0241 ppm	3.9100%	2019/06/05 01:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6317	6.3170	13.06	15.94	2.87	50.03	10:28

2	TOC	0.5977	5.9767	12.83	15.98	3.14	50.07	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	26	TOC	K1904848-003.08	3.5262 ppm	0.0270 ppm	0.7700%	2019/06/05 01:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.5453	35.4525	32.84	35.92	3.08	50.06	10:28
2	TOC	3.5071	35.0710	32.58	35.68	3.10	50.05	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	27	TOC	K1904848-004.08	11.0178 ppm	0.0494 ppm	0.4500%	2019/06/05 02:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.9829	109.8285	83.33	86.40	3.07	50.04	10:27
2	TOC	11.0527	110.5268	83.80	86.85	3.05	50.04	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	28	TOC	K1904848-005.08 2x	4.8173 ppm	0.1137 ppm	2.3600%	2019/06/05 02:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.8977	48.9765	42.02	45.07	3.05	50.05	10:27
2	TOC	4.7369	47.3692	40.93	44.10	3.17	50.06	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.4344 ppm (PASS)	0.0000 ppm	0%	2019/06/05 03:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4344	244.3444	175.32	178.45	3.13	50.07	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/05 03:28

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.17	9.26	3.08	50.06	10:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	29	TOC	K1904848-006.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 03:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.37	9.50	3.14	50.06	10:30
2	TOC	0.0000	0.0000	6.44	9.74	3.29	50.09	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	30	TOC	K1904848-006.08 ms	25.0547 ppm	0.0000 ppm	0.0000%	2019/06/05 04:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.0547	250.5472	178.85	182.00	3.15	50.08	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	31	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 04:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.83	8.99	3.17	50.09	10:31

Dilution	Blank Contribution	Method	Calibration

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	32	TOC	K1904848-007.08 2x	4.3193 ppm	0.0749 ppm	1.7300%	2019/06/05 04:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.3723	43.7231	38.46	41.52	3.07	50.08	10:28
2	TOC	4.2664	42.6638	37.74	40.75	3.02	50.08	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	33	TOC	K1904848-008.08	9.3967 ppm	0.0175 ppm	0.1900%	2019/06/05 05:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.3843	93.8428	72.48	75.50	3.02	50.10	10:29
2	TOC	9.4090	94.0903	72.64	75.65	3.01	50.09	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	34	TOC	K1904853-001.01	0.1559 ppm	0.0259 ppm	16.6300%	2019/06/05 05:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1743	1.7427	9.96	12.99	3.03	50.11	10:26
2	TOC	0.1376	1.3759	9.71	12.67	2.96	50.15	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	35	TOC	K1904986-001.03	8.7524 ppm	0.0682 ppm	0.7800%	2019/06/05 06:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.8006	88.0060	68.51	71.54	3.03	50.10	10:29
2	TOC	8.7041	87.0411	67.86	70.92	3.07	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	36	TOC	K1904986-002.03	15.5197 ppm	0.0835 ppm	0.5400%	2019/06/05 06:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.4606	154.6065	113.72	116.87	3.15	50.15	10:26
2	TOC	15.5788	155.7880	114.52	117.66	3.13	50.13	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	37	TOC	K1904986-003.03	18.1958 ppm	0.1033 ppm	0.5700%	2019/06/05 07:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	18.2689	182.6886	132.78	135.76	2.98	50.13	10:26
2	TOC	18.1227	181.2272	131.79	134.78	2.99	50.12	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	38	TOC	K1904986-004.03	20.9726 ppm	0.2056 ppm	0.9800%	2019/06/05 07:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.1180	211.1803	152.12	155.04	2.92	50.10	10:30
2	TOC	20.8272	208.2722	150.15	153.26	3.11	50.12	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.4664 ppm (PASS)	0.0000 ppm	0%	2019/06/05 07:57

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4664	244.6641	175.54	178.75	3.21	50.12	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

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◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/05 08:12

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.10	9.05	2.95	50.12	10:36

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 08:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.78	8.68	2.90	50.08	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	24.7068 ppm (PASS)	0.0000 ppm	0%	2019/06/05 08:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.7068	247.0683	177.17	180.37	3.19	50.08	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	40	TOC	K1904986-005.03 4x	11.3998 ppm	0.0880 ppm	0.7700%	2019/06/05 08:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.4621	114.6209	86.58	89.75	3.17	50.06	10:25
2	TOC	11.3376	113.3760	85.74	88.85	3.12	50.11	10:27

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	41	TOC	K1905084-001.01 100x	6.1980 ppm	0.0893 ppm	1.4400%	2019/06/05 09:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.1348	61.3484	50.42	53.74	3.32	50.11	10:29
2	TOC	6.2611	62.6110	51.28	54.41	3.13	50.03	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	42	TOC	K1905062-001.03	2.8681 ppm	0.0543 ppm	1.8900%	2019/06/05 09:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9065	29.0647	28.51	31.48	2.98	50.02	10:30
2	TOC	2.8297	28.2972	27.98	31.00	3.02	50.00	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	43	TOC	K1905062-002.03	2.7239 ppm	0.0183 ppm	0.6700%	2019/06/05 10:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7110	27.1098	27.18	30.24	3.06	49.98	10:27
2	TOC	2.7369	27.3691	27.35	30.34	2.98	49.97	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	44	TOC	K1905062-003.03	2.7344 ppm	0.0319 ppm	1.1700%	2019/06/05 10:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7569	27.5694	27.49	30.38	2.89	49.96	10:27
2	TOC	2.7119	27.1186	27.18	30.31	3.13	49.96	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	45	TOC	K1905062-004.03	2.6548 ppm	0.0601 ppm	2.2600%	2019/06/05 11:16

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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6123	26.1227	26.51	29.68	3.17	49.94	10:25
2	TOC	2.6973	26.9728	27.08	30.06	2.98	49.93	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1905062-005.03	2.8488 ppm	0.0184 ppm	0.6500%	2019/06/05 11:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8618	28.6183	28.20	31.39	3.18	49.96	10:31
2	TOC	2.8358	28.3576	28.02	31.05	3.03	49.90	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	47	TOC	K1905062-006.03	0.5695 ppm	0.0354 ppm	6.2200%	2019/06/05 12:12

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5445	5.4449	12.47	15.55	3.08	49.85	10:26
2	TOC	0.5946	5.9458	12.81	15.71	2.90	49.83	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.3689 ppm (PASS)	0.0000 ppm	0%	2019/06/05 12:40

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.3689	243.6888	174.88	177.91	3.03	49.81	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/05 12:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.65	8.74	3.09	49.79	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	48	TOC	K1905062-007.03	0.5089 ppm	0.0276 ppm	5.4200%	2019/06/05 13:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5284	5.2843	12.36	15.37	3.01	49.79	10:28
2	TOC	0.4894	4.8939	12.10	15.10	3.00	49.77	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	49	TOC	K1905062-008.03	0.5829 ppm	0.0432 ppm	7.4200%	2019/06/05 13:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6134	6.1343	12.94	15.89	2.95	49.83	10:26
2	TOC	0.5523	5.5230	12.52	15.53	3.01	49.85	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	50	TOC	K1905062-009.03	0.5290 ppm	0.0250 ppm	4.7300%	2019/06/05 14:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5113	5.1134	12.25	15.23	2.99	49.81	10:27
2	TOC	0.5467	5.4670	12.49	15.50	3.02	49.79	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	K1905063-001.03	0.4299 ppm	0.0103 ppm	2.4000%	2019/06/05 14:34

00939265

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4372	4.3724	11.74	14.76	3.01	49.78	10:28
2	TOC	0.4227	4.2266	11.64	14.70	3.06	49.75	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	52	TOC	K1905063-002.03	0.2646 ppm	0.0140 ppm	5.2800%	2019/06/05 15:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2745	2.7445	10.64	13.58	2.94	49.85	10:31
2	TOC	0.2547	2.5471	10.50	13.52	3.02	49.83	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	53	TOC	K1905063-002.03 ms	26.2787 ppm	0.0000 ppm	0.0000%	2019/06/05 15:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.2787	262.7866	187.15	190.02	2.87	49.78	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	54	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 15:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.77	9.85	3.07	49.78	10:30
2	TOC	0.0000	0.0000	6.31	9.42	3.11	49.77	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	55	TOC	K1905032-001.04 doc	0.3457 ppm	0.1157 ppm	33.4800%	2019/06/05 16:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2638	2.6384	10.57	13.60	3.04	49.74	10:32
2	TOC	0.4275	4.2752	11.68	14.67	3.00	49.81	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

00939266

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	56	TOC	K1905032-002.04 doc	2.1811 ppm	0.1544 ppm	7.0800%	2019/06/05 16:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0719	20.7190	22.84	26.00	3.16	49.79	10:29
2	TOC	2.2902	22.9023	24.32	27.19	2.87	49.79	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	57	TOC	K1905032-003.04 doc	2.3962 ppm	0.0310 ppm	1.3000%	2019/06/05 17:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.4181	24.1811	25.19	28.27	3.08	49.76	10:27
2	TOC	2.3742	23.7420	24.89	28.06	3.17	49.76	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.9651 ppm (PASS)	0.0000 ppm	0%	2019/06/05 17:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9651	249.6508	178.92	181.86	2.93	49.71	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/05 17:52

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.34	10.40	3.06	49.77	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D

00939267

Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 18:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.10	9.15	3.05	49.77	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	25.4694 ppm (PASS)	0.0000 ppm	0%	2019/06/05 18:21

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.4694	254.6936	182.35	185.59	3.24	49.77	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	59	TOC	K1905032-003.04 ms doc	27.5452 ppm	0.0000 ppm	0.0000%	2019/06/05 18:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.5452	275.4517	195.75	198.82	3.07	49.81	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	60	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 18:51

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	0.0000	0.0000	7.06	10.17	3.11	49.76	10:26
2	TOC	0.0000	0.0000	5.92	9.05	3.13	49.74	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	61	TOC	FB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 19:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.03	8.95	2.92	49.73	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	62	TOC	K1905029-001.01 doc	12.5460 ppm	0.0576 ppm	0.4600%	2019/06/05 19:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.5053	125.0526	93.66	96.93	3.27	49.72	10:29
2	TOC	12.5867	125.8673	94.21	97.33	3.11	49.73	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	63	TOC	K1905030-001.01 doc	10.0663 ppm	0.1418 ppm	1.4100%	2019/06/05 20:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.1666	101.6655	77.79	80.75	2.96	49.75	10:32
2	TOC	9.9661	99.6605	76.42	79.64	3.21	49.77	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	64	TOC	K1905030-002.01 doc	4.3361 ppm	0.0152 ppm	0.3500%	2019/06/05 20:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.3468	43.4682	38.28	41.23	2.95	49.79	10:31
2	TOC	4.3253	43.2531	38.14	41.05	2.92	49.81	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

◈	65	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/05 20:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.53	8.51	2.98	49.83	10:31
2	TOC	0.0000	0.0000	5.66	8.71	3.05	49.84	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7760 (IC) (v1263)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.1573 ppm (PASS)	0.0000 ppm	0%	2019/06/05 21:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1573	241.5733	173.44	176.35	2.90	49.90	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/05 21:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.59	8.73	3.14	49.91	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator

v1262	2.1970	2.1280	0.0000	0.0000	0.0000	2019/05/31 14:34	Fusion1 (Fusion1)
v1263	1.2990	1.2790	0.0000	0.0000	0.0000	2019/06/04 12:44	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version: v30
Calibration curve formula: TOC: y = 6.788x + 9.463
Ver Creation: 2019/03/05 17:42
r^2 value: TOC: r^2 = 0.99963
Comment:
Operator: Fusion1 (Fusion1)
Basic Analysis Type: TOC

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version: v4
Operator: Fusion1 (Fusion1)
Ver Creation: 2019/02/21 17:57
Comment:

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5

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SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/06/05 21:58

ALS Environmental

StarLIMS Run: 638040, 638042, 638044, 638047

Analysis: TOC/DOC

Method: 415.1, SM 5310 C, 9060, 9060A

CCV: 11-GEN-05-77K 50 ppm LCS: 11-GEN-05-77D 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-78E

21 % H3PO4: 11-GEN-05-78D

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: FE1165 5/31/19

Analyzed By: HLM	Date Analyzed: 6/14/19
Reviewed By:	Date Reviewed: 06/07/19

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1915802, 1915803, 1915852, 1916229; 1916231; 1916232

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2261 (241120)

General Set Information: There were six field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 657797) was less than 1/2 the CRDL. The recovery for the LCS (657798) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Thomas Bosch June 12, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: June 13, 2019

RJ Modashia
ALS Environmental (Houston)
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E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1915802**
Project ID: HS19051856
Purchase Order: HS19051856
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_052919_BIX	1915802001	05/29/19	06/01/19	

ANALYTICAL REPORT

Workorder: 34-1915802
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_052919_BIX** | Sampling Site: NA | Collected: 05/29/2019
Lab ID: 1915802001 | Media: 125 mL Nalgene | Received: 06/01/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2261 (HBN: 241120) | **Percent Solid:** NA
Analyzed: 06/11/2019 09:45 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 06/12/2019 12:46	/S/ Stephen Brose 06/13/2019 10:59

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1915802
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1915802

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2261 (HBN: 241120)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 657797
Analyzed: 06/11/2019 09:31
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 657798
Analyzed: 06/11/2019 09:04
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.34	4.00	109	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1915802001	**MS:**	657799	**MSD:**	657800
Analyzed:	06/11/2019 09:45	**Analyzed:**	06/11/2019 09:58	**Analyzed:**	06/11/2019 10:12
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.57	4	114	78.8	123.8	4.78	120	4.65	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 06/12/2019 12:47	/S/ Stephen Brose 06/13/2019 10:59

Symbols and Definitions

✱ - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense**

COC ID: **11497**

18698/#3
1915802

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19051856
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19051856-02**	**LH18/24-SP650_052919_BIX**	**Water**	**29 May 2019 14:00**
	SUB_Perch-6850			10 Jun 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 5/31/19 1800

Received By: _____ Date/Time: 6/1/19 0852

Cooler ID(s): 9459 Temperature(s): 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19051856	***Split:***	**Workorder ID:** 1915802	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	05/29/2019 14:00	LH18/24-SP650_052919_BIX	1915802001		Water	A	1	A
2								
3								
4								
5								
6								
7								
8								
9								
10								

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Coates, Gayleen	06/01/2019 08:52	ALS Sample Receiving	Sample Login
R.33.1	6-3-19 10:15	13B	Storage
	6-11-19 08:00	T. Bush	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ **Lab Notebook No.:** _____

Prepared / Analyzed by: _____ **Date / Time:** _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00939280

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Hanson

Project/Task/Site: 191802

Date/Time of Receipt: 6/1/19 852

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:					
Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9459	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [signature] (Signature) Meredith Adams (Printed Name) 6/1/19 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 156007-01 REV 0 0/20

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

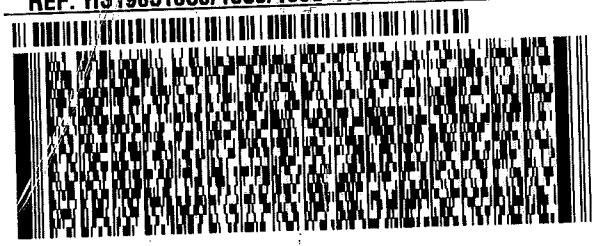
SHIP DATE: 31MAY19
ACTWGT: 8.90 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

551C1/D66C/104C

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19051856/1859/1863 - RJ



FedEx
Express

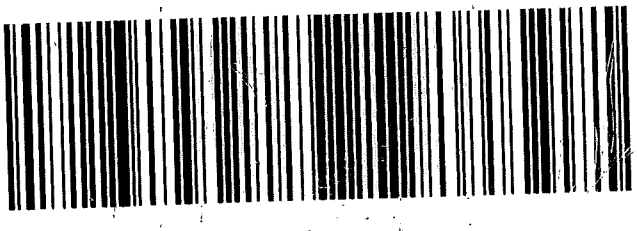
J181118060501uv

SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 0201 **4809 7834 6651**

XO BTFA

84123
UT-US **SLC**



Batch Worklist

Batch: ELMS/ 2261 **Created:** 6/11/2019 07:45 **Instrument:** **HBN:** 241120

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1915802 [ENV_LVL4]
Workorder: 1915803 [ENV_LVL4]
Workorder: 1915852 [ENV_LVL4]
Workorder: 1916229 [ENV_LVL4]
Workorder: 1916231 [ENV_LVL4]
Workorder: 1916232 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	657794	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	
2	657795	RLVS for HBN 241120 [ELMS/2261				RLVS	3		E685041C3Q	5311		6/13/2019	
3	657796	ICS for HBN 241120 [ELMS/2261]				ICS	3		E6850..D3Q	5311		6/13/2019	
4	657797	LMB for HBN 241120 [ELMS/2261]				LMB	3		E6850Q413Q	5311		6/13/2019	
5	657798	LCS for HBN 241120 [ELMS/2261]				LCS	3		E6850Q413Q	5311		6/13/2019	
6	1915802001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915802001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
7	657799	LH18/24-SP650...(1915802001MS)				MS	3		E6850Q413Q	5311		6/13/2019	
8	657800	LH18/24-SP65...(1915802001MSD)				MSD	3		E6850Q413Q	5311		6/13/2019	
9	1915803001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915803001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
10	1915852001	LH18/24-SP140_052919				SAMPLE	3	1915852001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
11	1916229001	LH18/24-SP140_060419				SAMPLE	3	1916229001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
12	1916231001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916231001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
13	1916232001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916232001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
14	657801	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1915802 (001), 1915803 (001), 1915852 (001), 1916229 (001); 1916231 (001); 1916232 (001) ELMS Batch/HBN ID: 2261 (241120)
Prep Date: 06/11/2019 Analysis Date: 06/11/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\11JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 657798; Target = 4.0µg/L. ASTM type II water was used for LMB 657797.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\241120-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2261 HBN: 241120 1915802/1915803/1915852 Sample Set IDs if Applicable: 1916229/1916231/1916232	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109		Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House		Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided			Usable: Yes
Part ID: Not Provided			Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED TESTING LABORATORY

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: JCC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

USstandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	657794 CCV@25	Vial 71	1	Control	1	1.90258e6	8.986	26.94929
*	657798 QC@4.0	Vial 72	1	Control	2	3.85542e5	8.884	4.34115
*	657796 ICS@4.0	Vial 73	1	Control	3	2.32261e5	8.623	3.98229
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	1.46622e5	8.522	4.56740
*	657800 158021D	Vial 77	1	Sample	7	1.54646e5	8.528	4.78474
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	3.32187e5	9.077	4885.02369
*	1916229001 1K	Vial 80	1	Sample	10	4.13979e5	9.091	6820.05588
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.42334e6	9.028	25.98075

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	657794 CCV@25	Vial 71	1	Control	1	5.56917e5	9.003	26.60911
*	657798 QC@4.0	Vial 72	1	Control	2	1.22598e5	8.893	4.50107
*	657796 ICS@4.0	Vial 73	1	Control	3	7.62920e4	8.637	4.24932
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	5.01097e4	8.545	5.09575
*	657800 158021D	Vial 77	1	Sample	7	5.24358e4	8.548	5.30516
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	1.07205e5	9.093	5161.49233
*	1916229001 1K	Vial 80	1	Sample	10	1.30297e5	9.110	7096.69575
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	4.26237e5	9.042	26.20612

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	657794 CCV@25	Vial 71	1	Control	1	2.13798e5	9.004	5.00000
*	657798 QC@4.0	Vial 72	1	Control	2	2.91481e5	8.904	5.00000
*	657796 ICS@4.0	Vial 73	1	Control	3	1.92225e5	8.645	5.00000
*	657797 LMB	Vial 74	1	Control	4	3.01884e5	9.082	5.00000
*	1915802001	Vial 75	1	Sample	5	1.12941e5	8.589	5.00000
*	657799 158021S	Vial 76	1	Sample	6	1.05110e5	8.545	5.00000
*	657800 158021D	Vial 77	1	Sample	7	1.05604e5	8.552	5.00000
*	1915803001	Vial 78	1	Sample	8	1.14182e5	8.546	5.00000
*	1915852001 1K	Vial 79	1	Sample	9	2.21981e5	9.097	5000.00000
*	1916229001 1K	Vial 80	1	Sample	10	1.95450e5	9.116	5000.00000
*	1916231001	Vial 81	1	Sample	11	1.33828e5	8.518	5.00000
*	1916232001	Vial 82	1	Sample	12	1.27034e5	8.502	5.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.66287e5	9.054	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

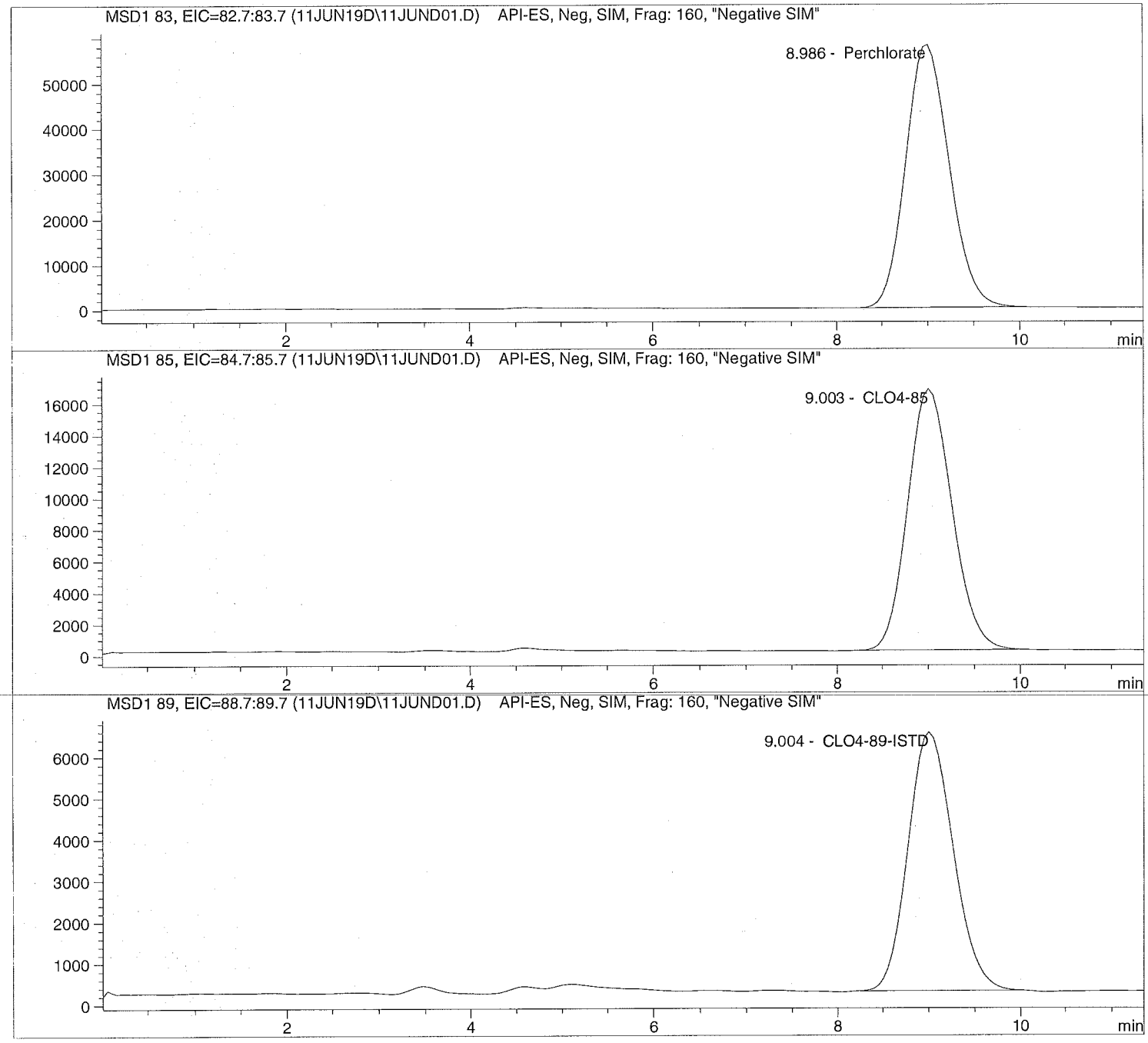
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	657794 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	657798 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	657796 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	657797 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1915802001	CLO4-AQN	1	Sample		
6	Vial 76	657799 158021S	CLO4-AQN	1	Sample		
7	Vial 77	657800 158021D	CLO4-AQN	1	Sample		
8	Vial 78	1915803001	CLO4-AQN	1	Sample		
9	Vial 79	1915852001 1K	CLO4-AQN	1	Sample		
10	Vial 80	1916229001 1K	CLO4-AQN	1	Sample		
11	Vial 81	1916231001	CLO4-AQN	1	Sample		
12	Vial 82	1916232001	CLO4-AQN	1	Sample		
13	Vial 71	657801 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.986	PBA	1902575.4	26.9493	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.003	PBA	556916.8	26.6091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.004	PBA	213798.0	5.0000	CLO4-89-ISTD

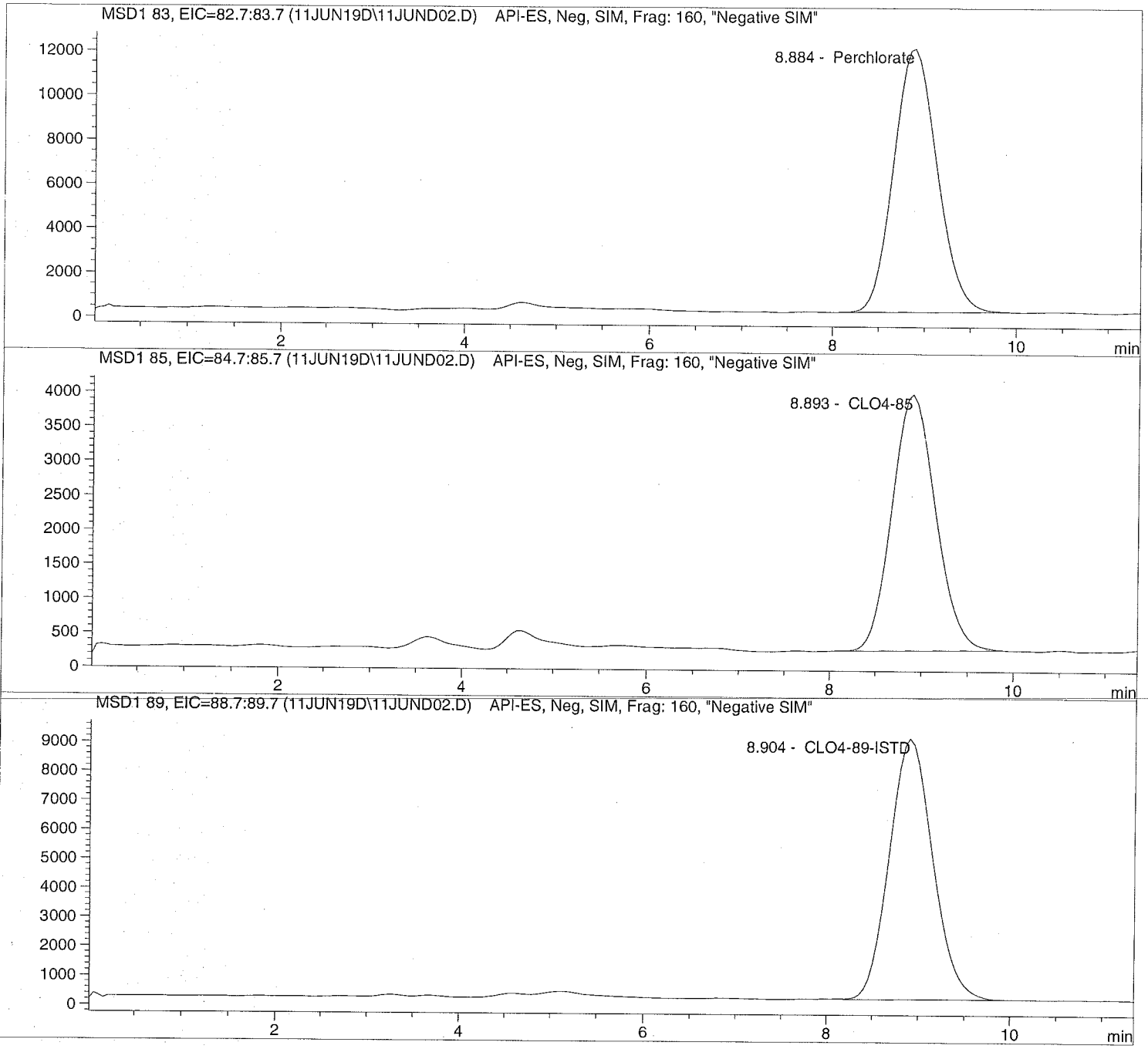
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.884	PBA	385541.7	4.3412	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.893	BBA	122598.4	4.5011	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.904	BBA	291480.6	5.0000	CLO4-89-ISTD

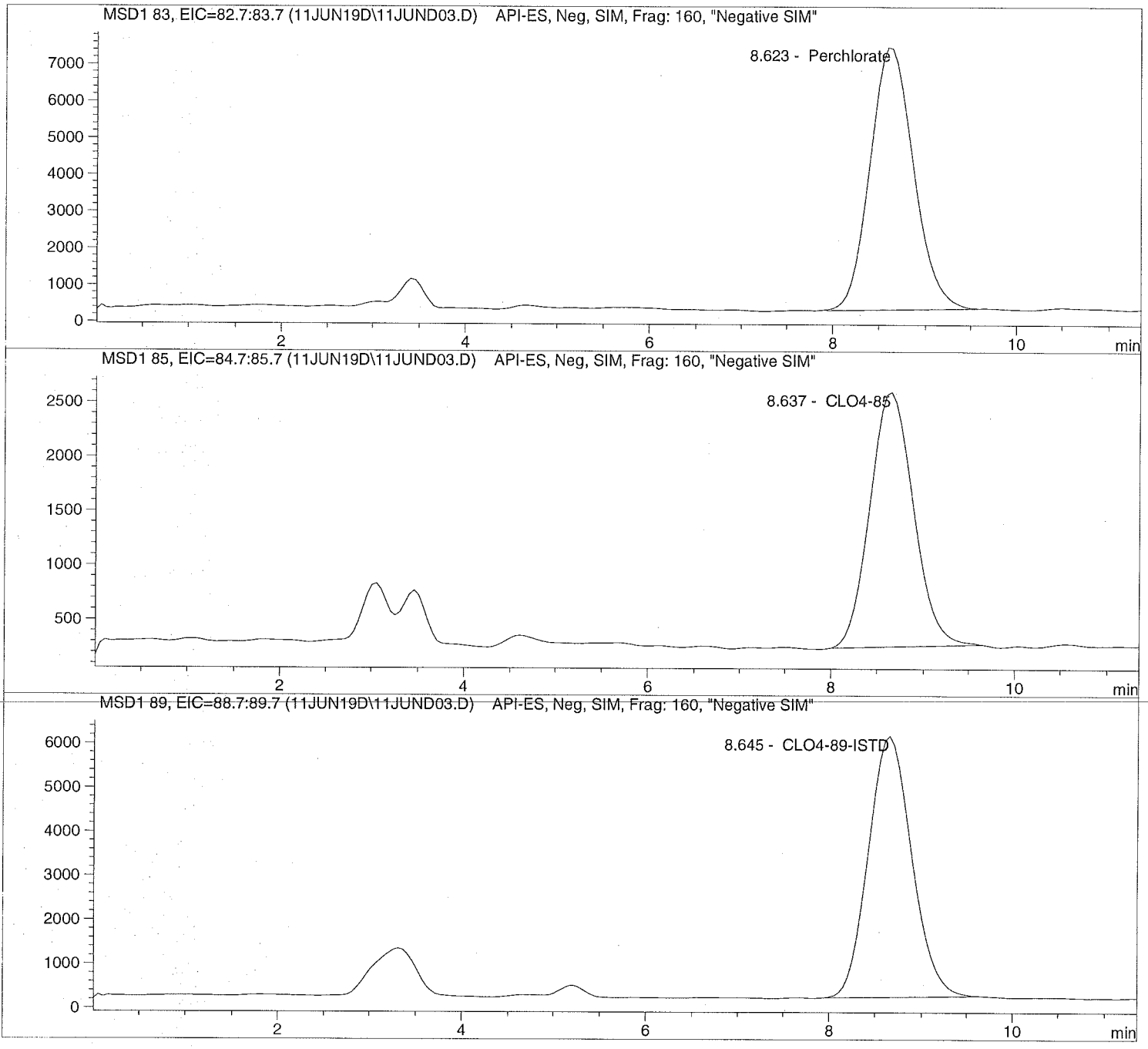
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.623	PBA	232261.2	3.9823	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.637	PBA	76292.0	4.2493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.645	PBA	192224.9	5.0000	CLO4-89-ISTD

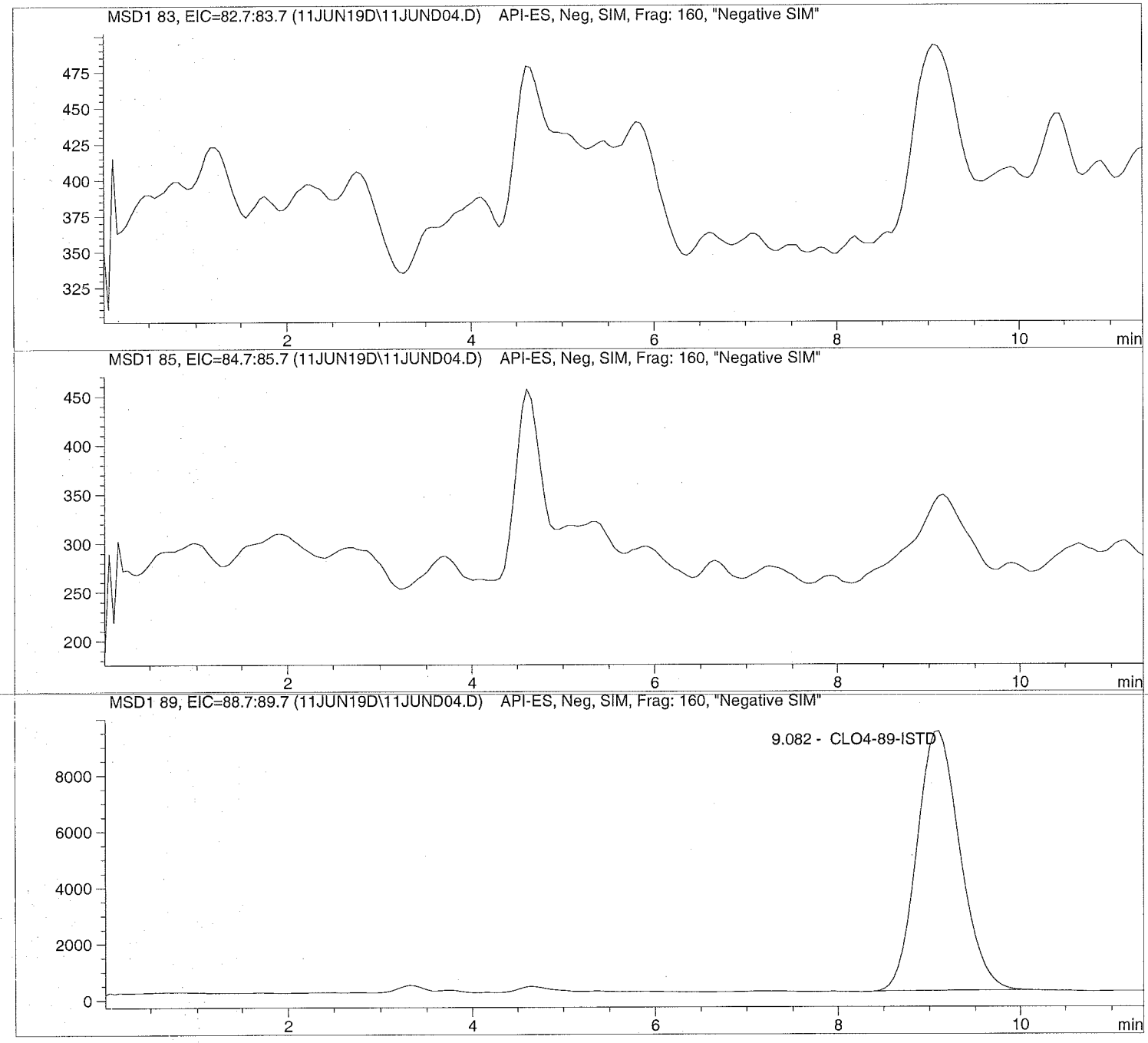
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.082	PBA	301883.5	5.0000	CLO4-89-ISTD

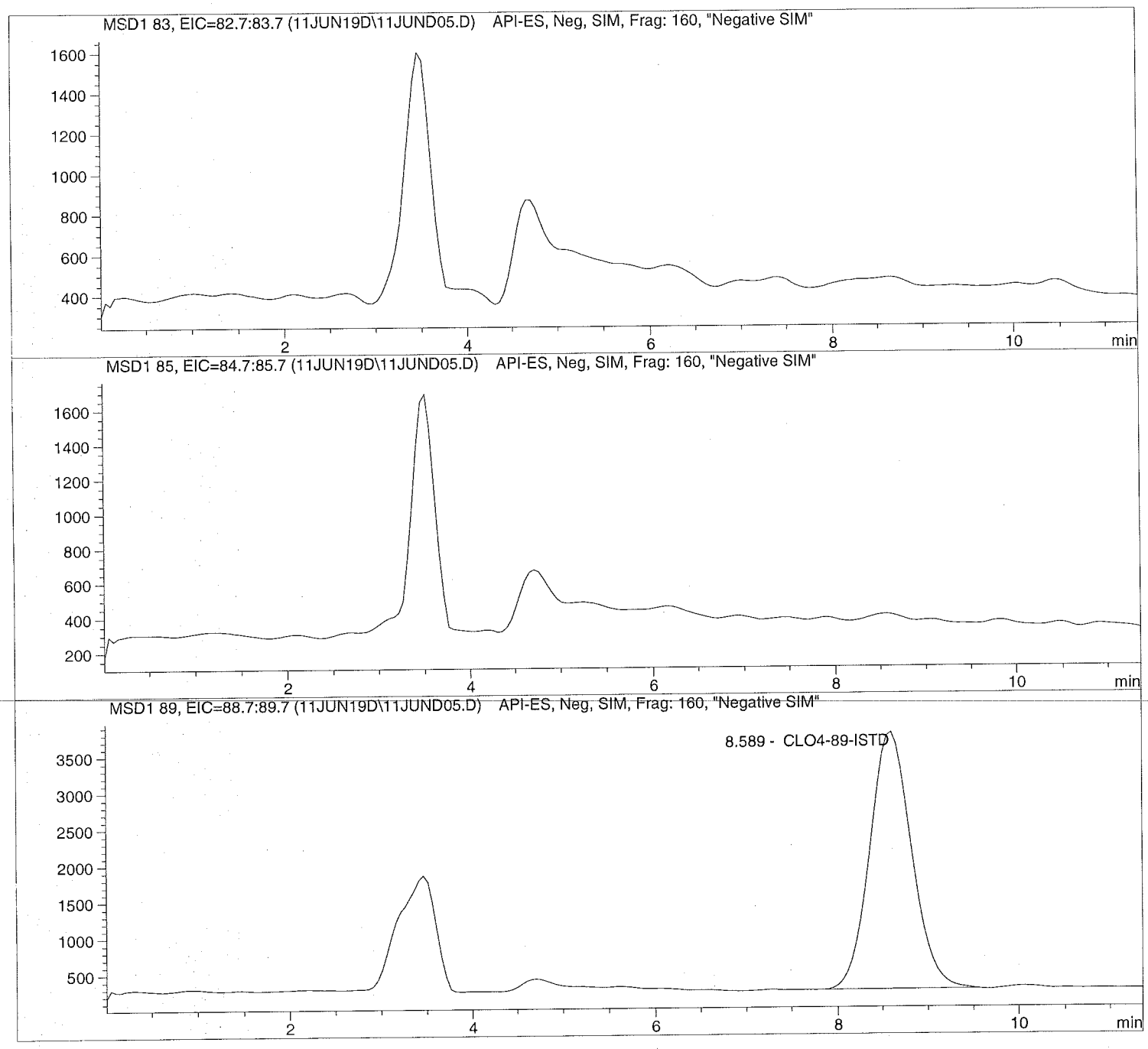
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.589	PBA	112941.5	5.0000	CLO4-89-ISTD

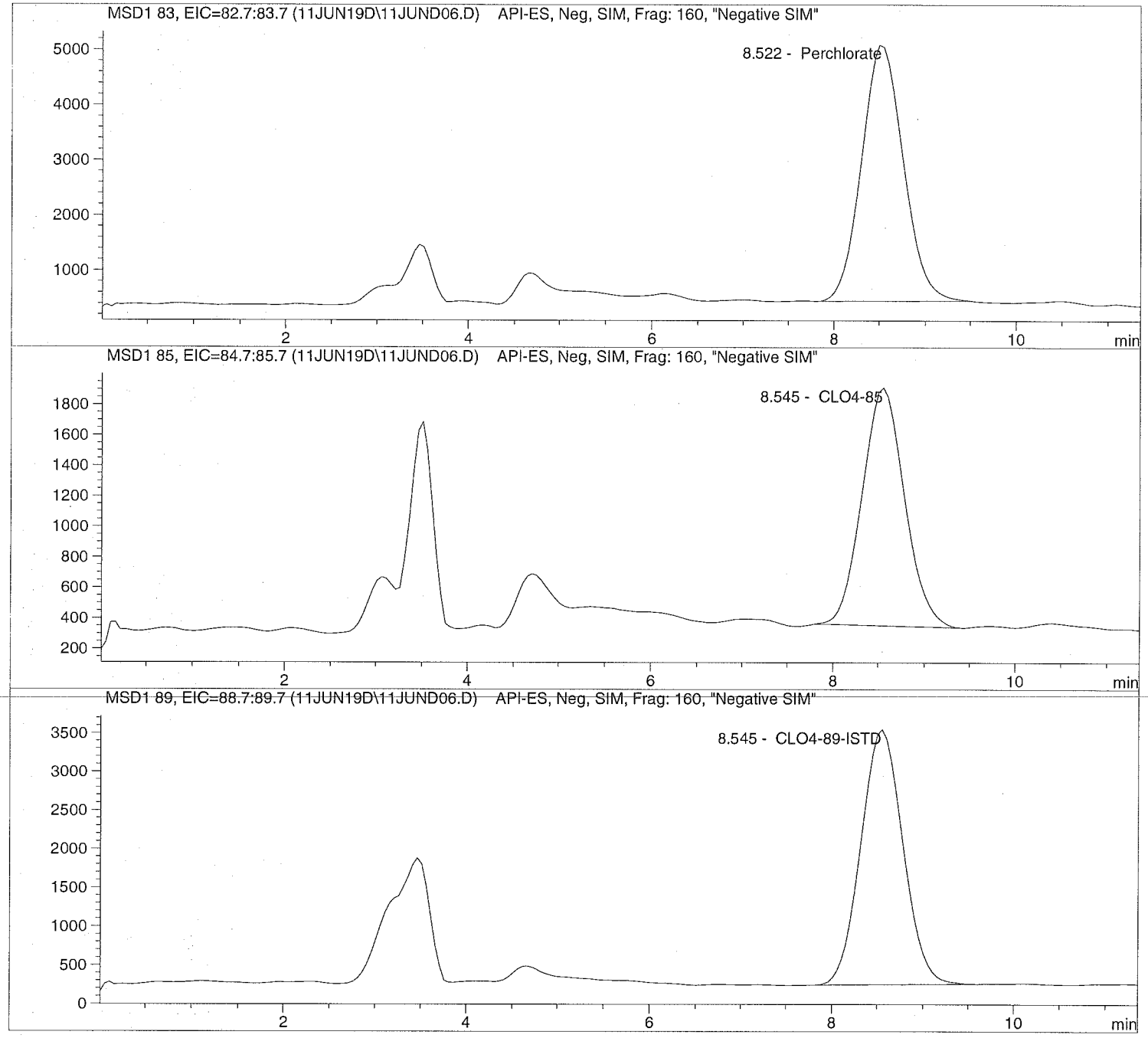
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.522	BBA	146622.1	4.5674	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	50109.7	5.0958	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	105110.4	5.0000	CLO4-89-ISTD

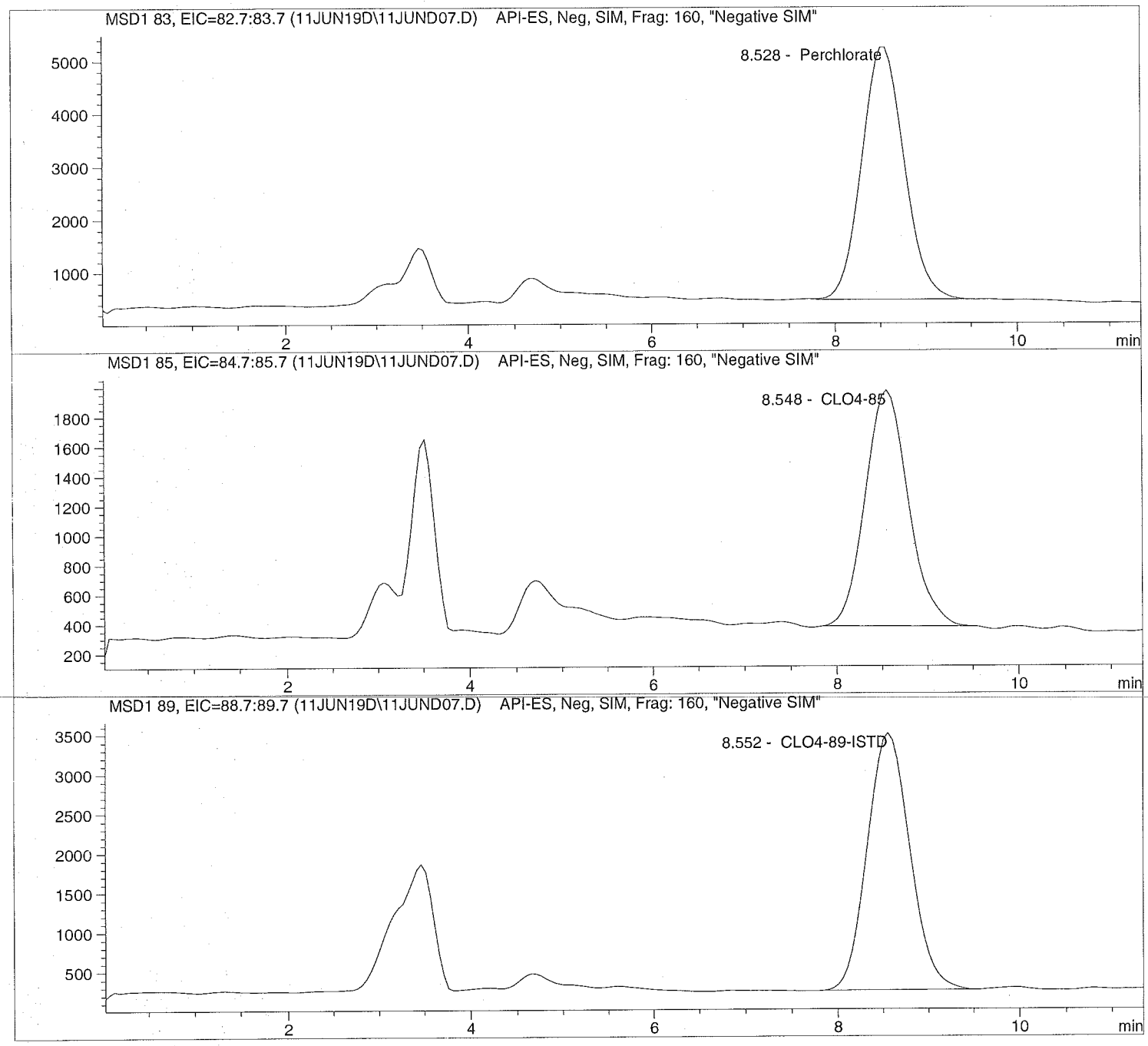
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND07.D Sample Name: 657800 158021D

Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND07.D Sample Name: 657800 158021D

Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.528	BBA	154645.8	4.7847	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.548	PBA	52435.8	5.3052	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.552	PBA	105604.1	5.0000	CLO4-89-ISTD

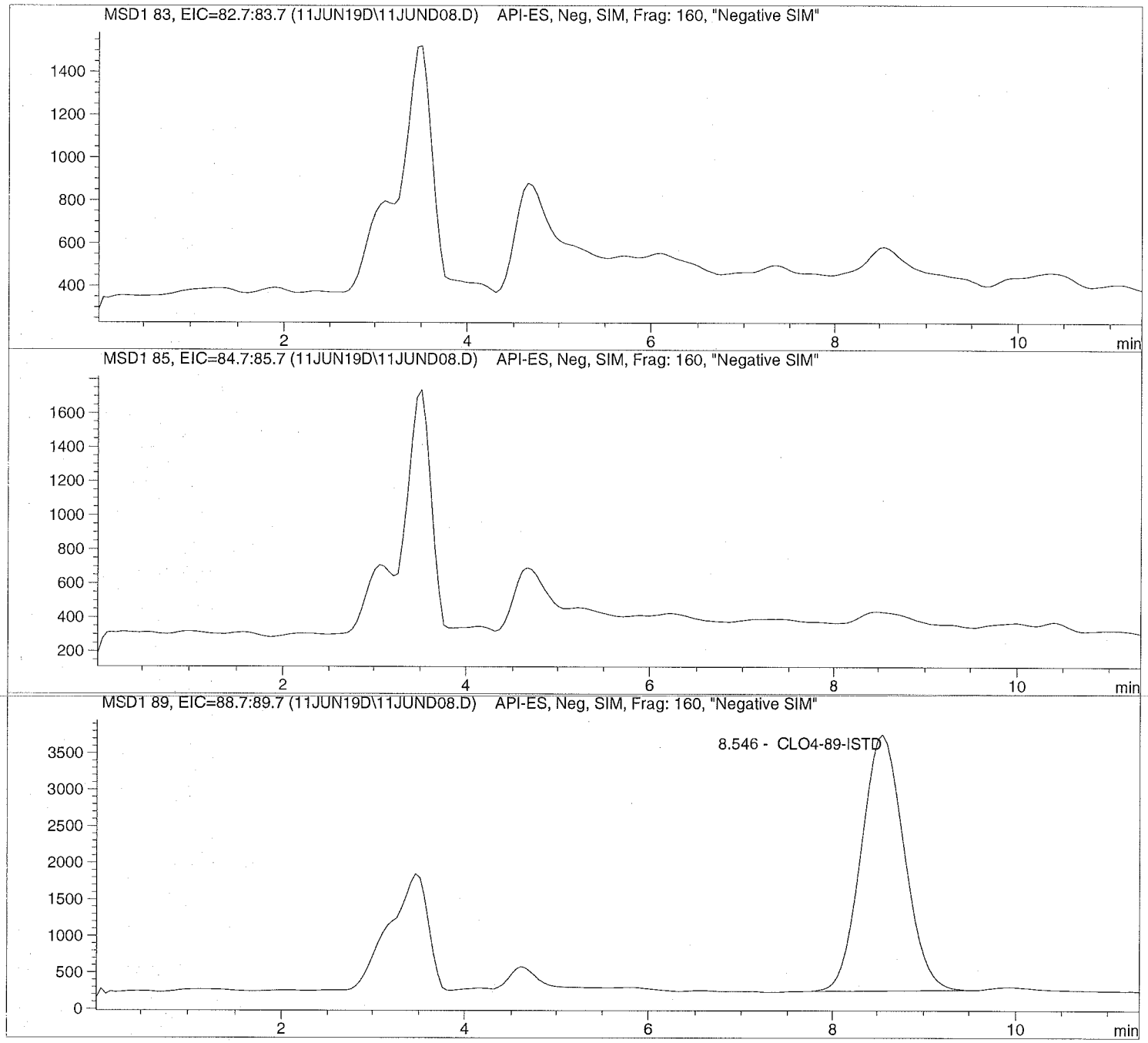
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.546	BBA	114182.4	5.0000	CLO4-89-ISTD

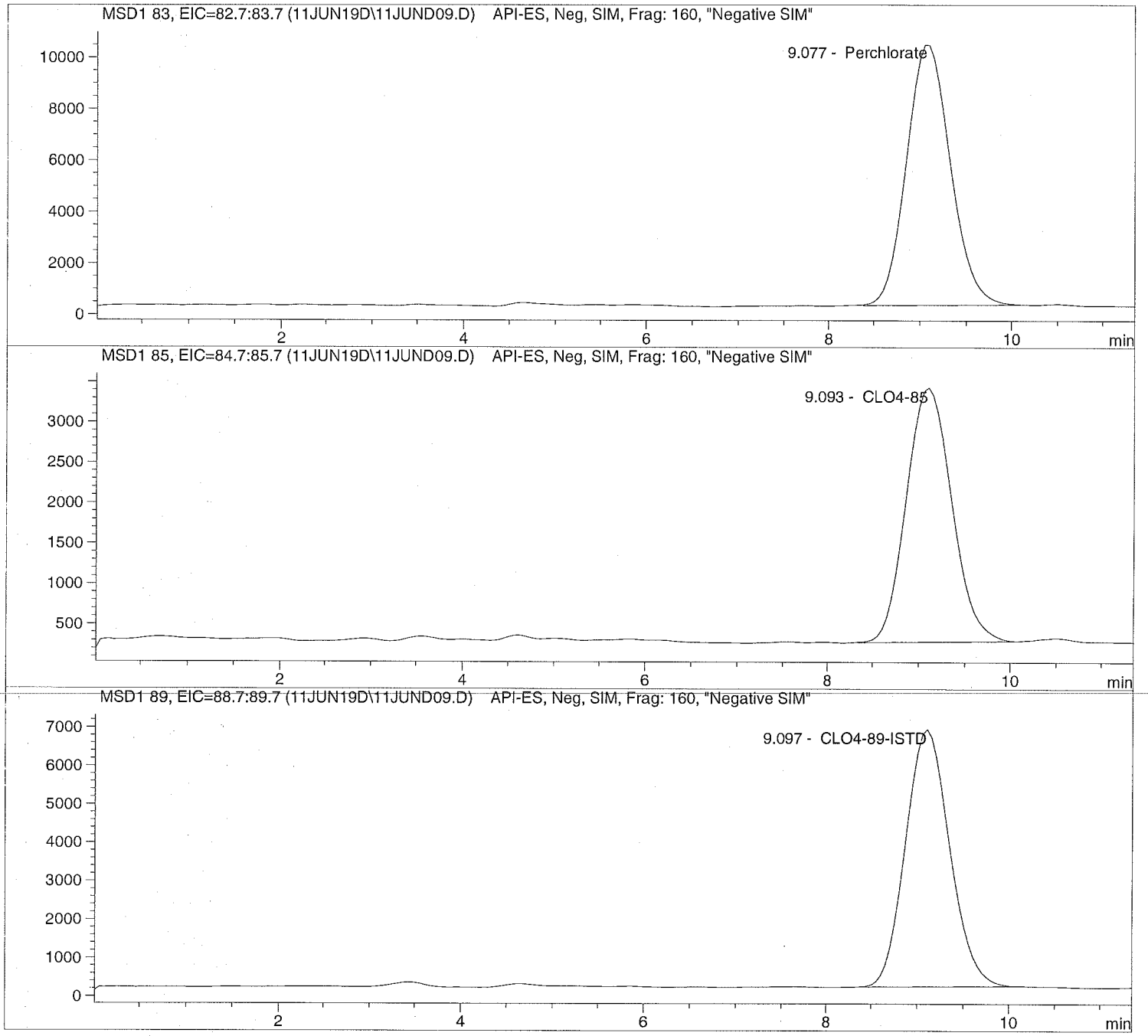
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.077	BBA	332187.1	4885.0237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.093	PBA	107205.2	5161.4923	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.097	PBA	221981.4	5000.0000	CLO4-89-ISTD

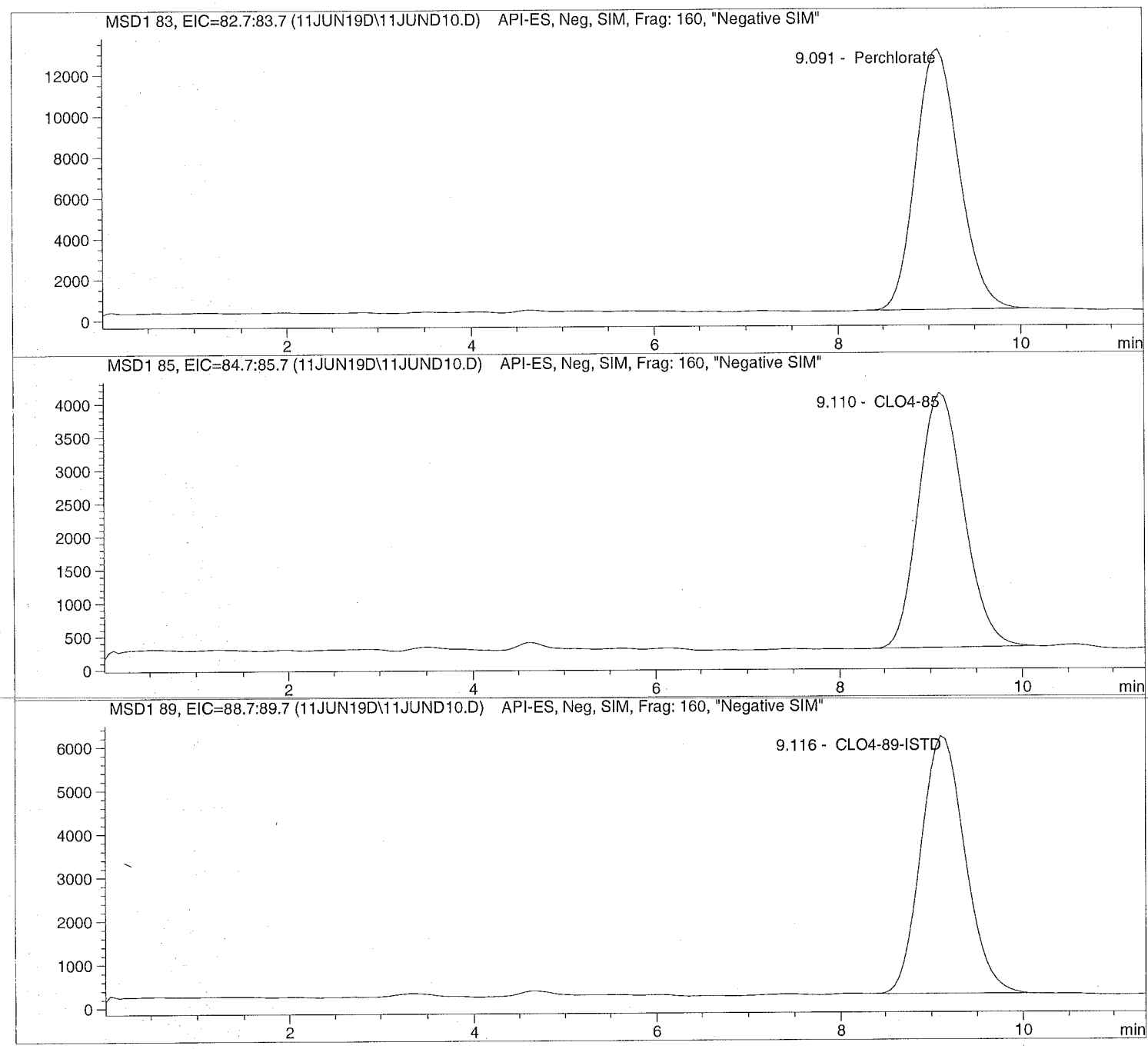
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.091	BBA	413978.8	6820.0559	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.110	PBA	130297.0	7096.6957	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.116	BBA	195449.6	5000.0000	CLO4-89-ISTD

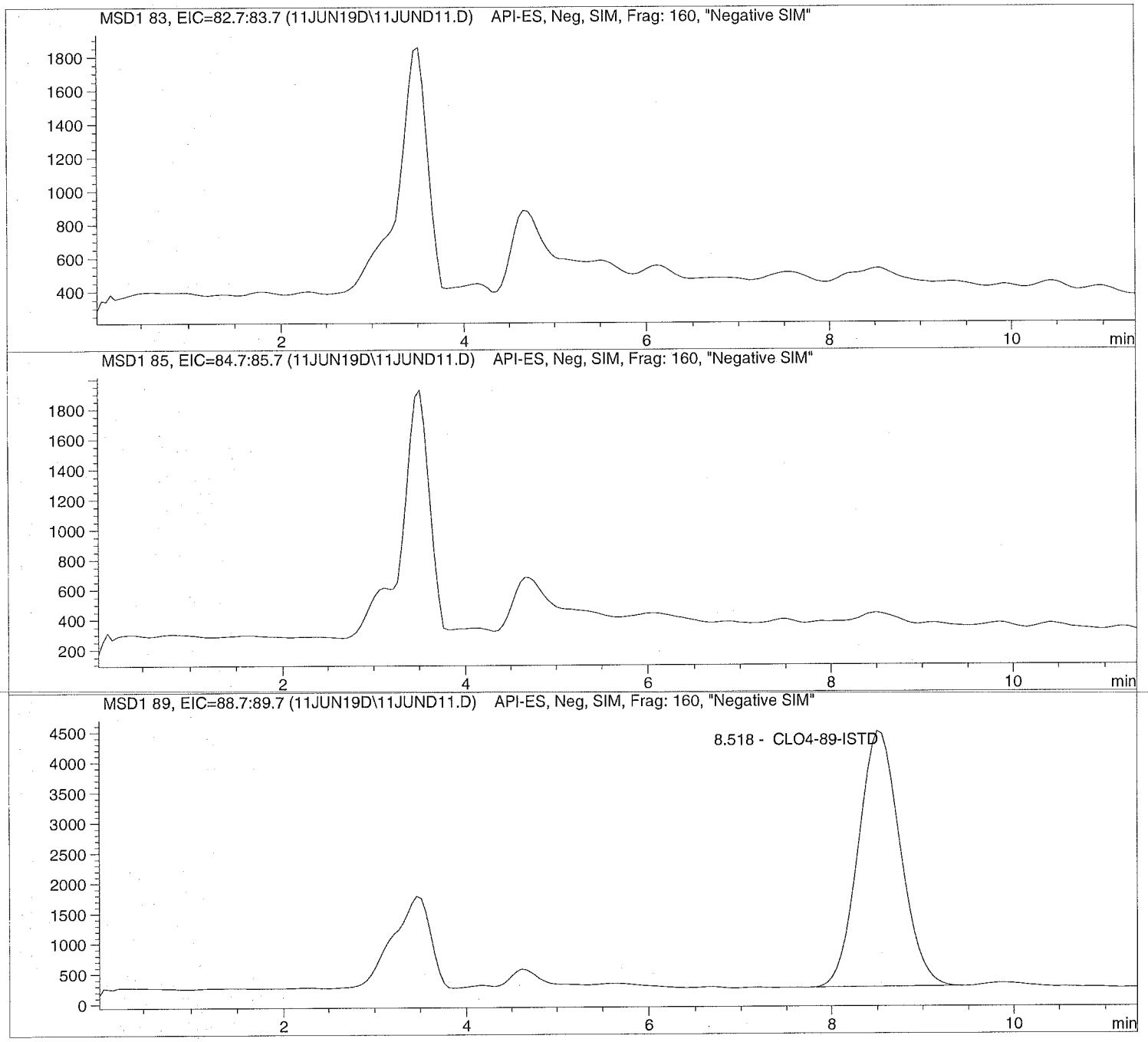
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.518	PBA	133827.9	5.0000	CLO4-89-ISTD

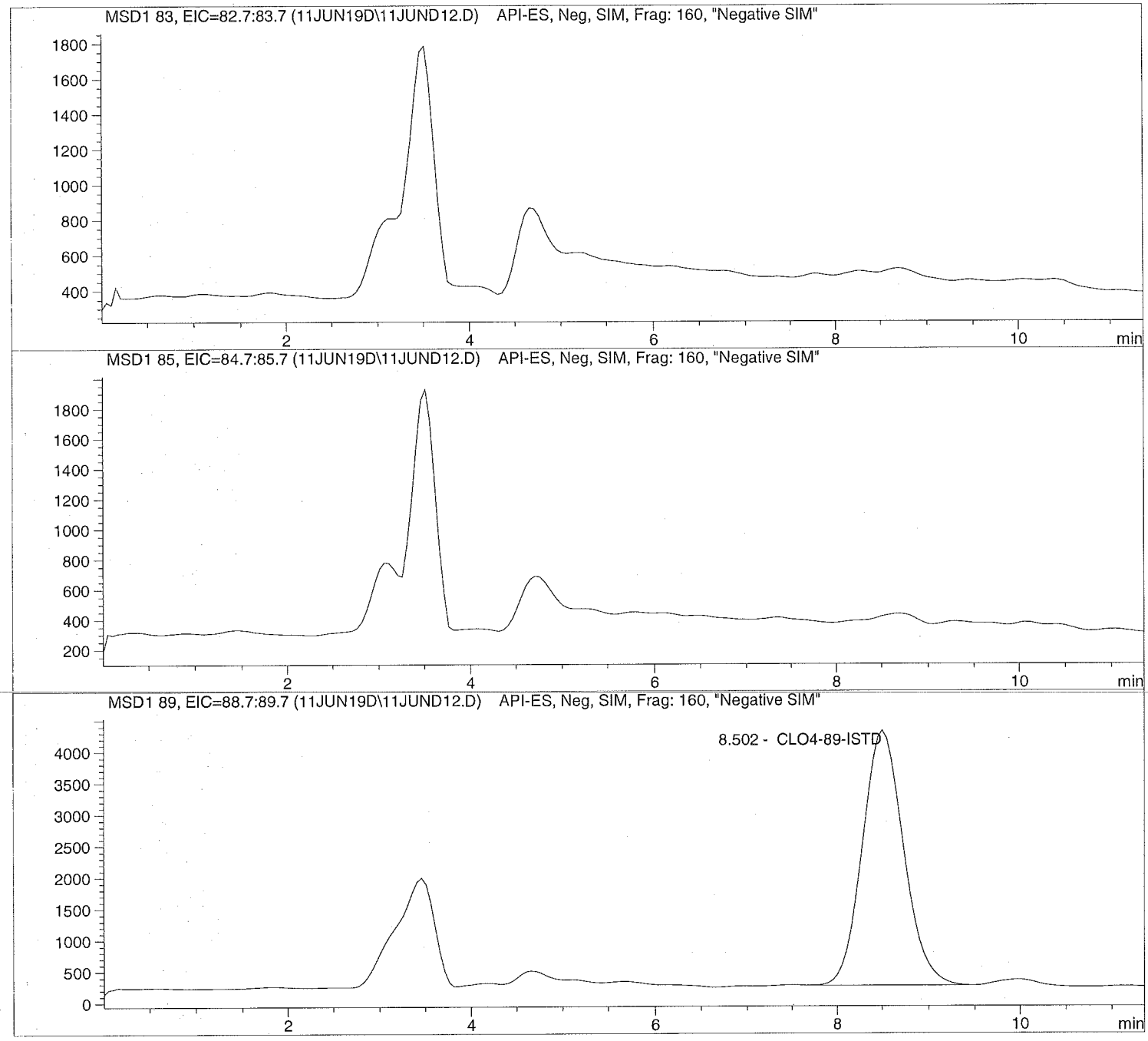
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	BBA	127033.7	5.0000	CLO4-89-ISTD

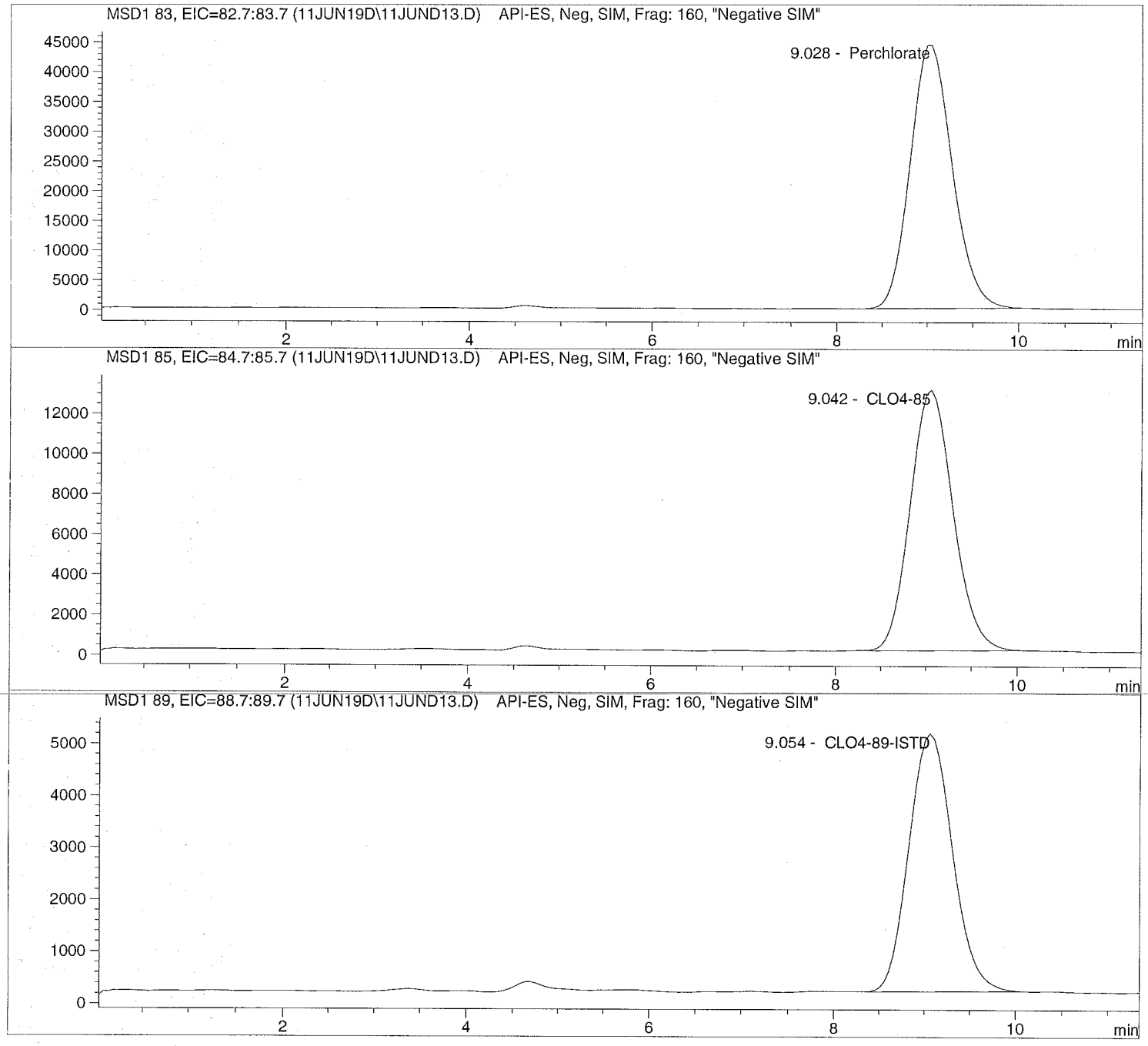
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.028	PBA	1423337.3	25.9807	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.042	BBA	426236.8	26.2061	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.054	BBA	166286.8	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

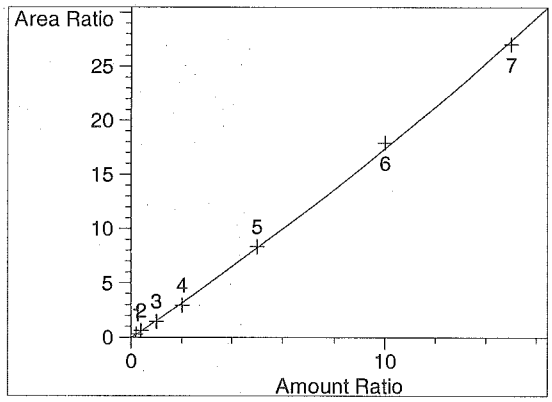
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

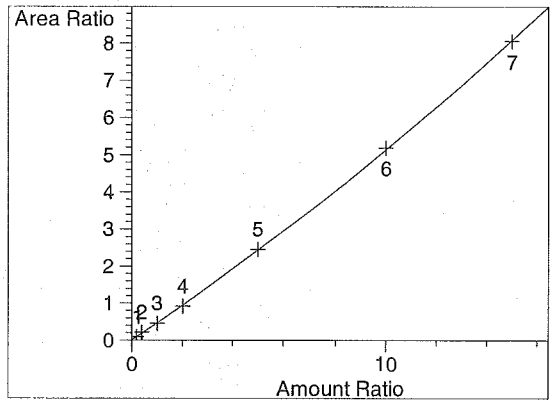
Peak Sum Table

No Entries in table

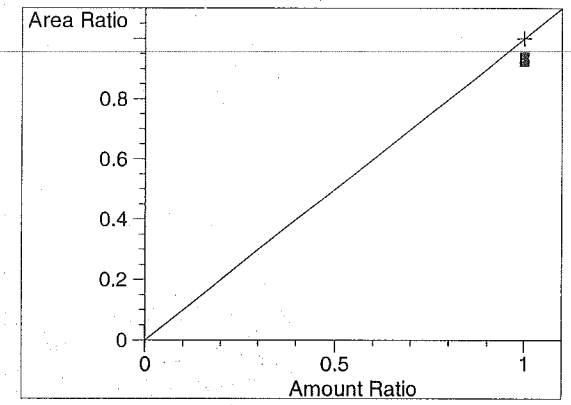
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

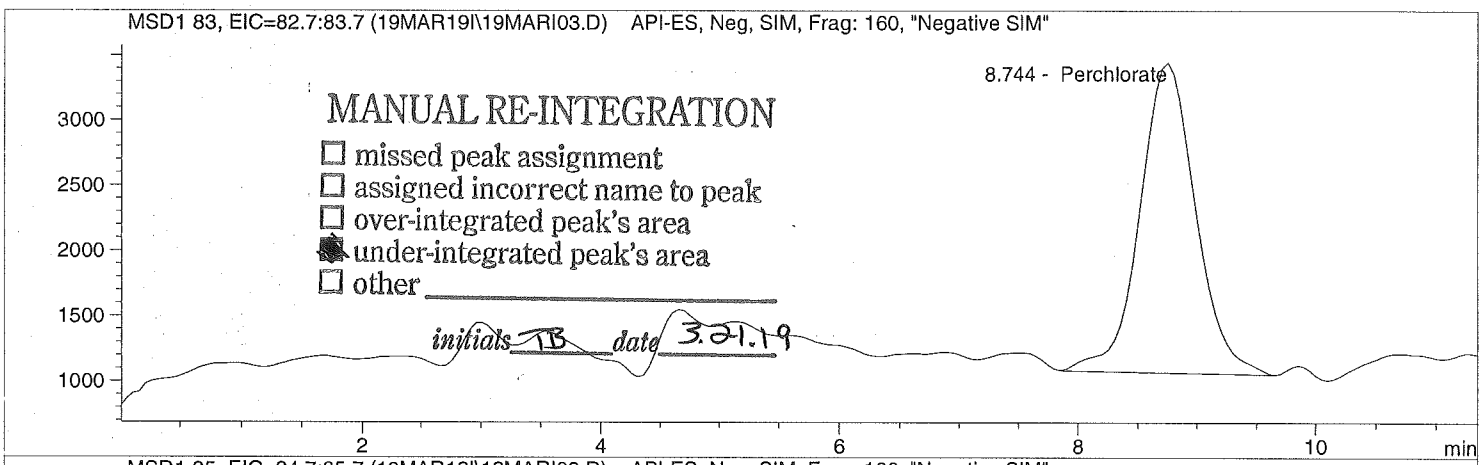
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

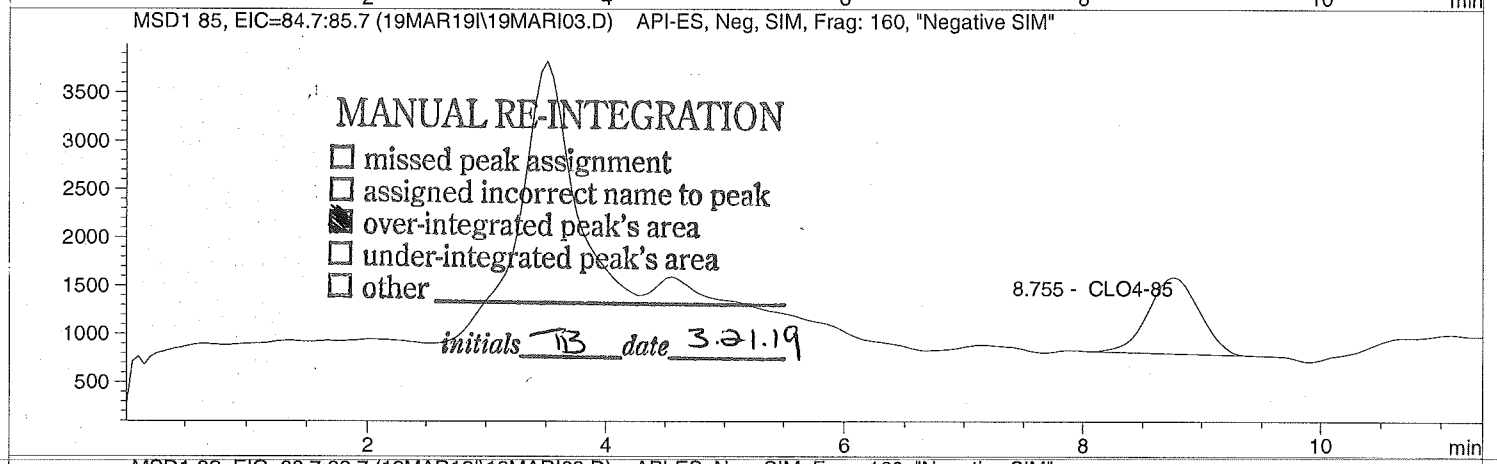
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

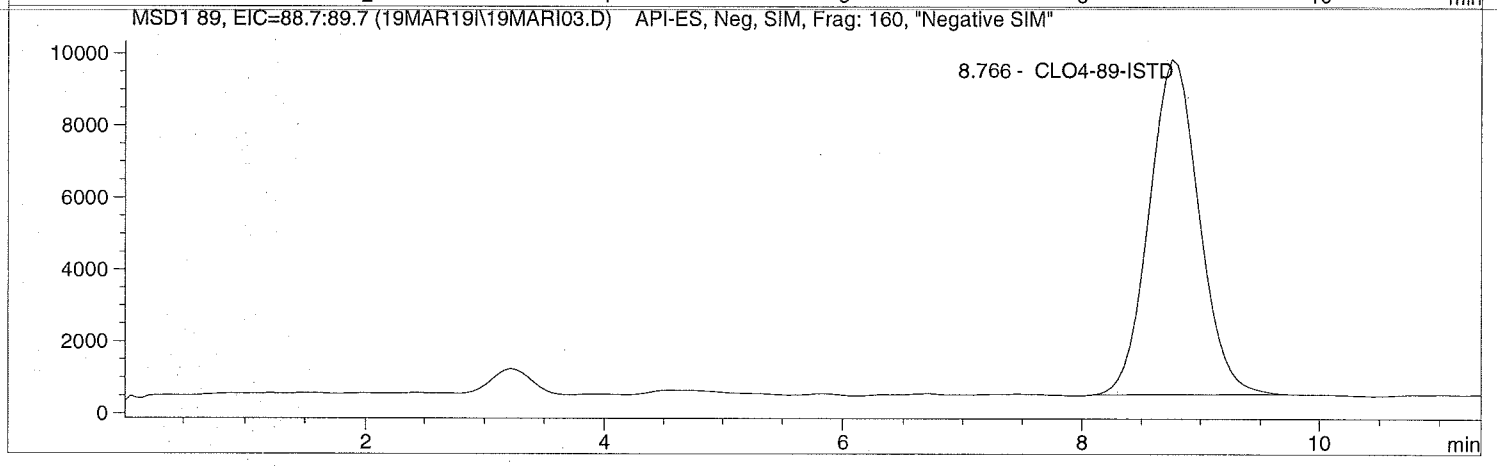
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

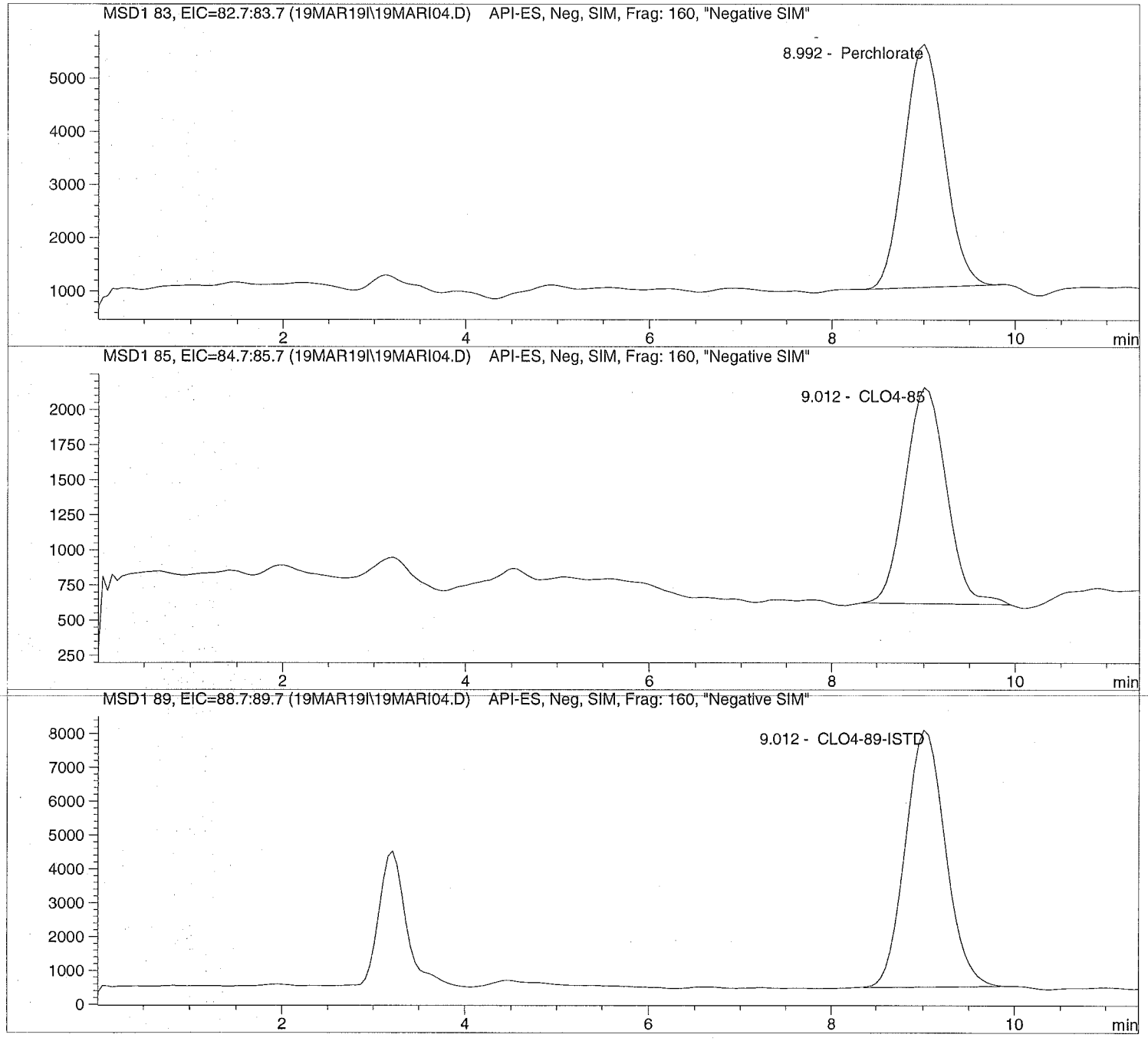
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

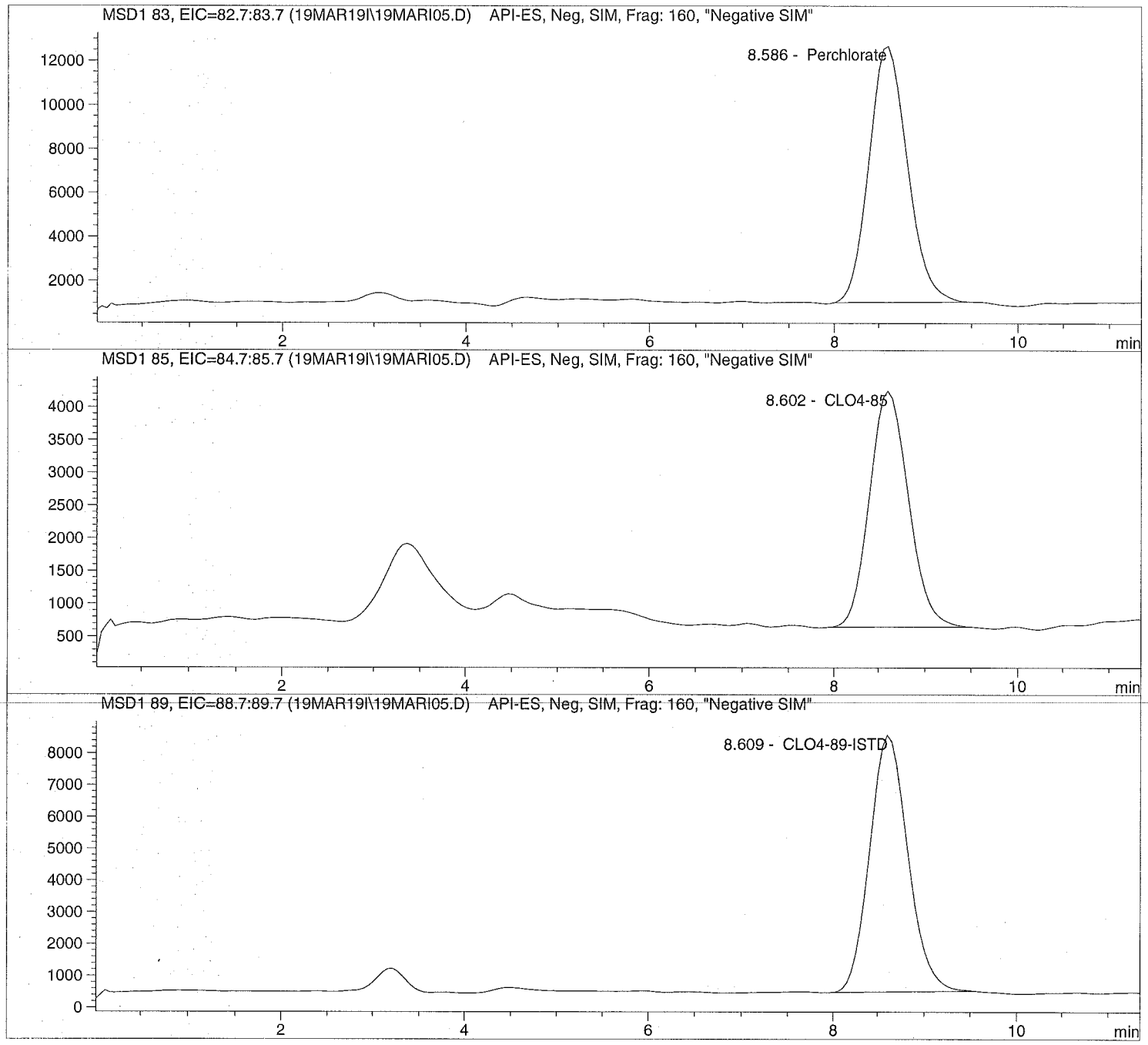
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

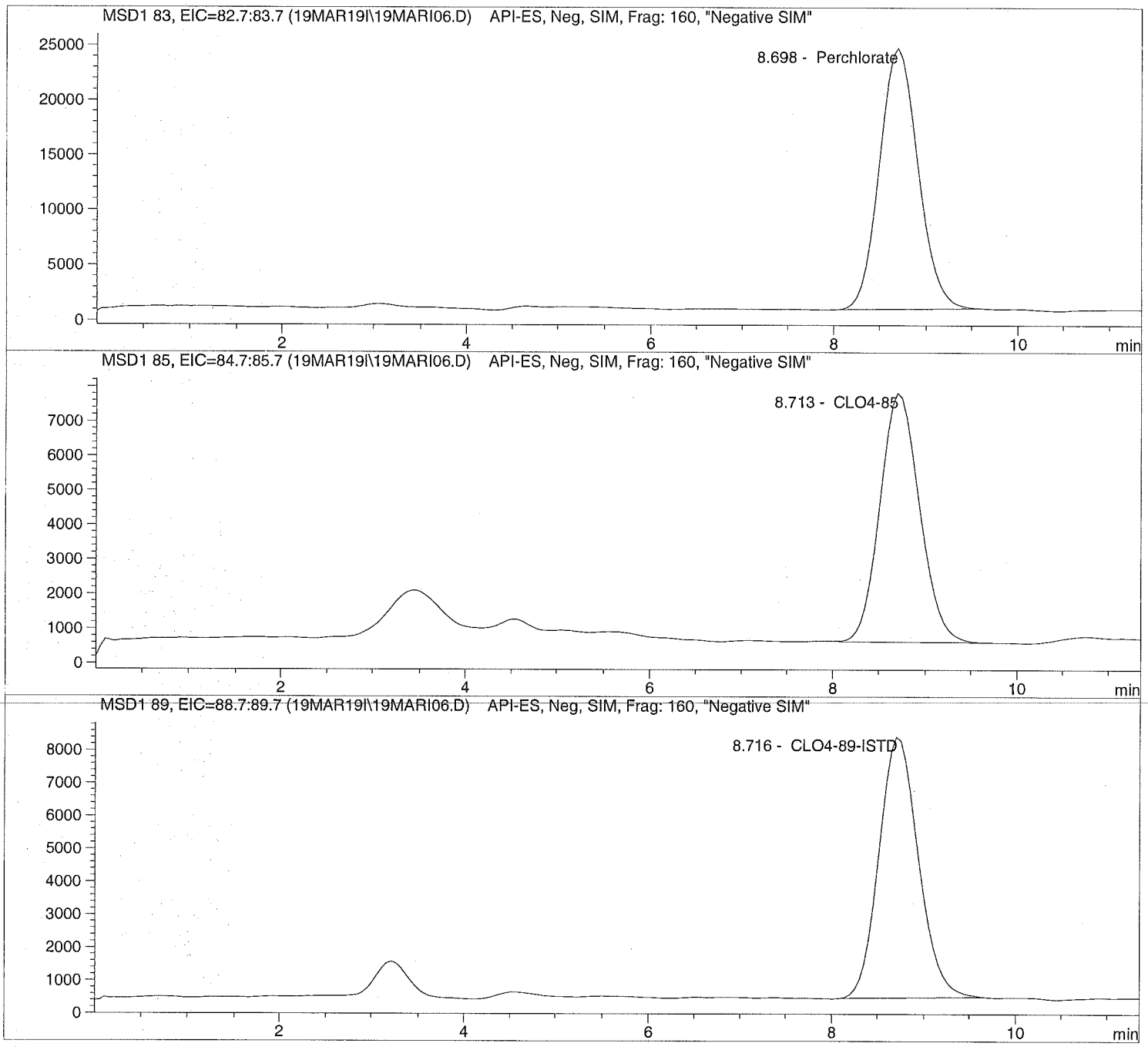
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

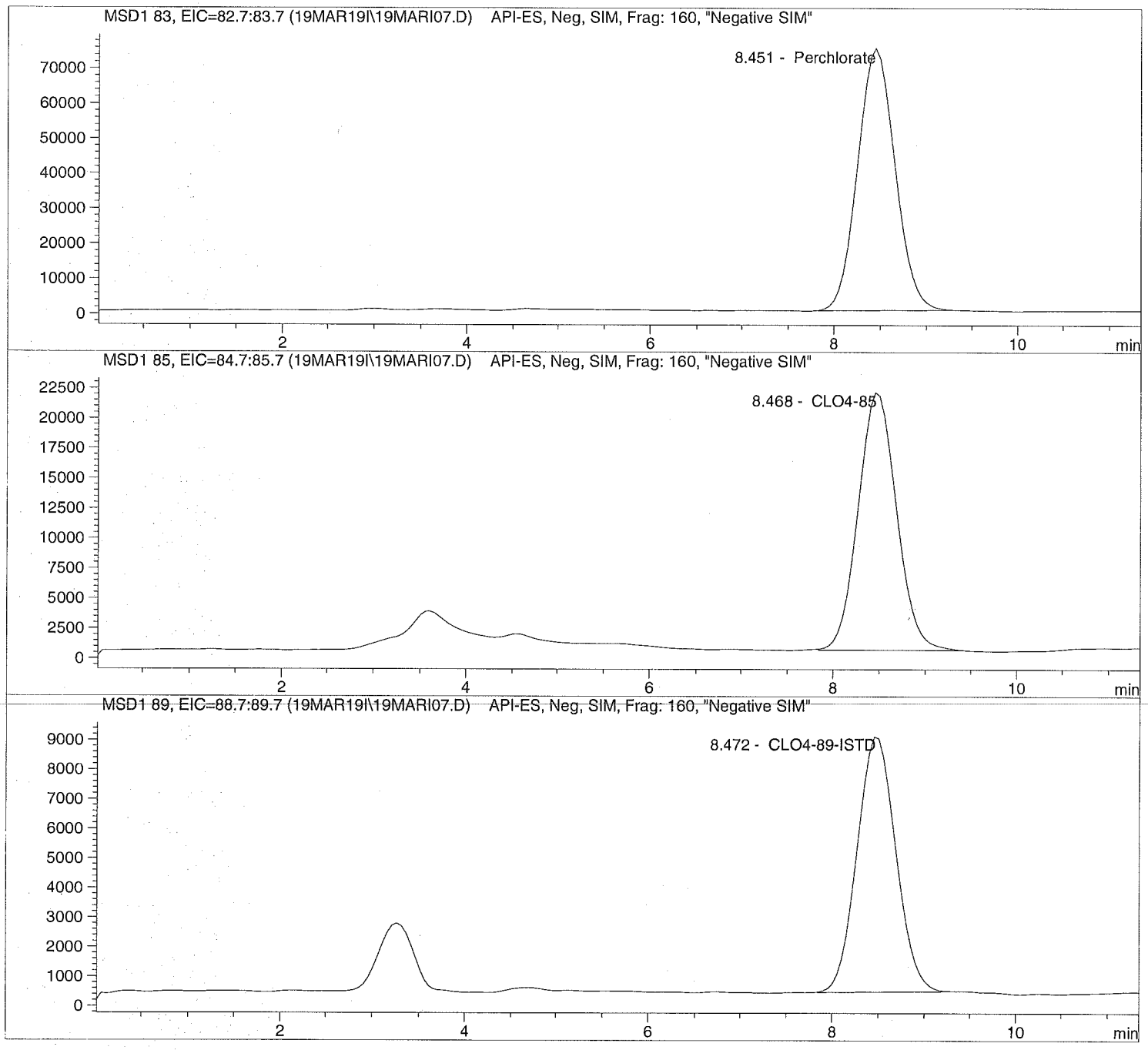
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

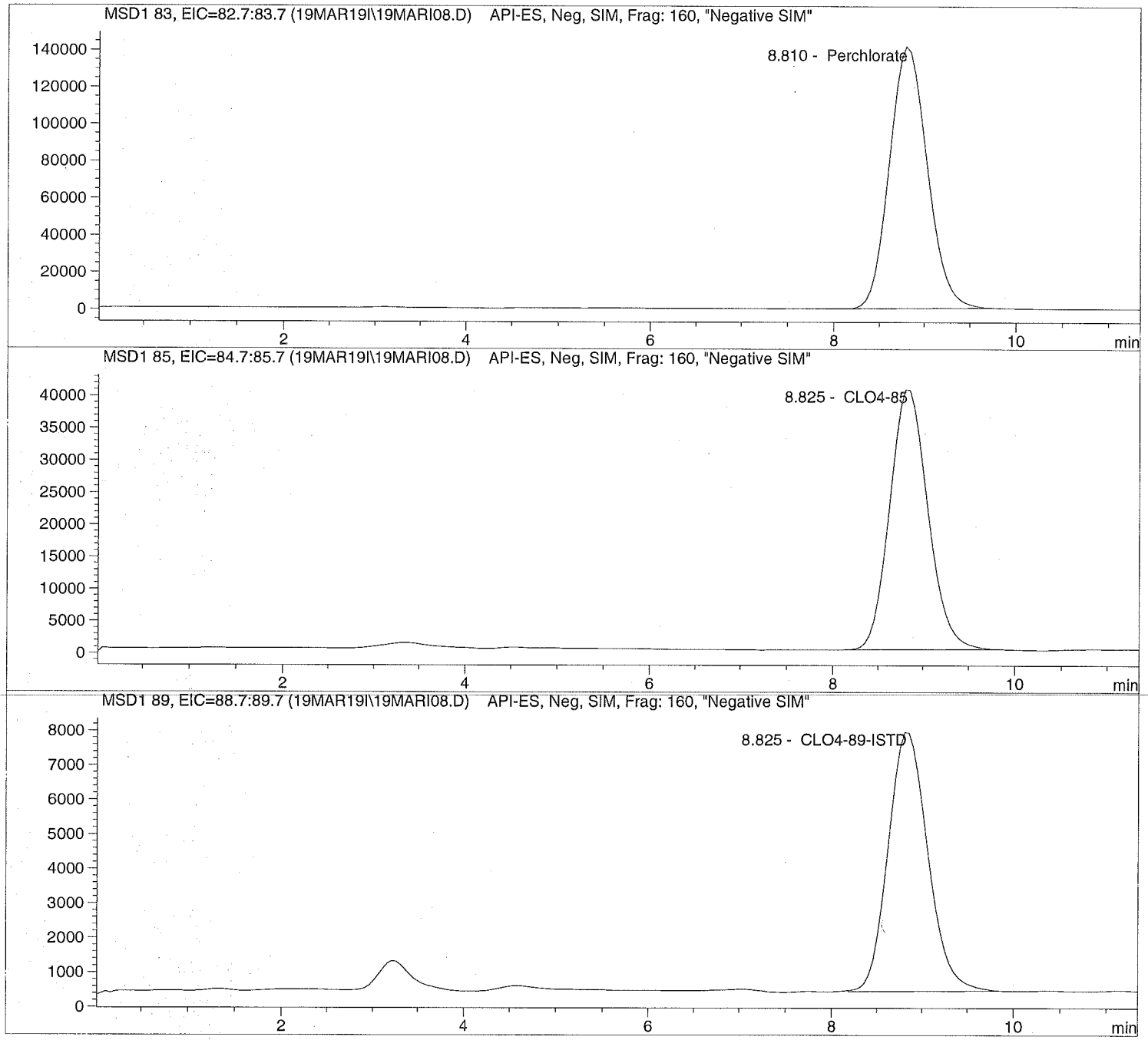
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

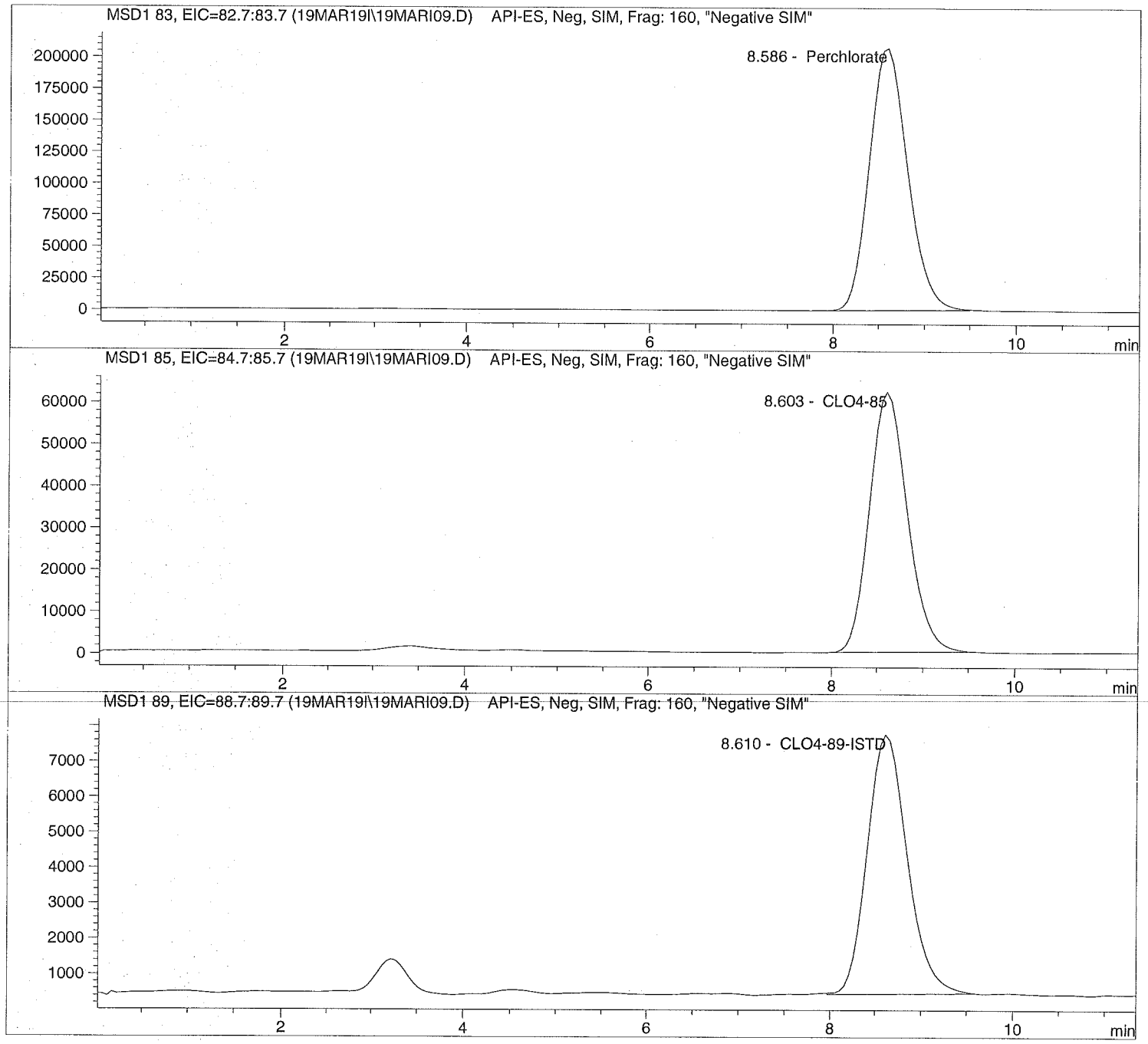
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

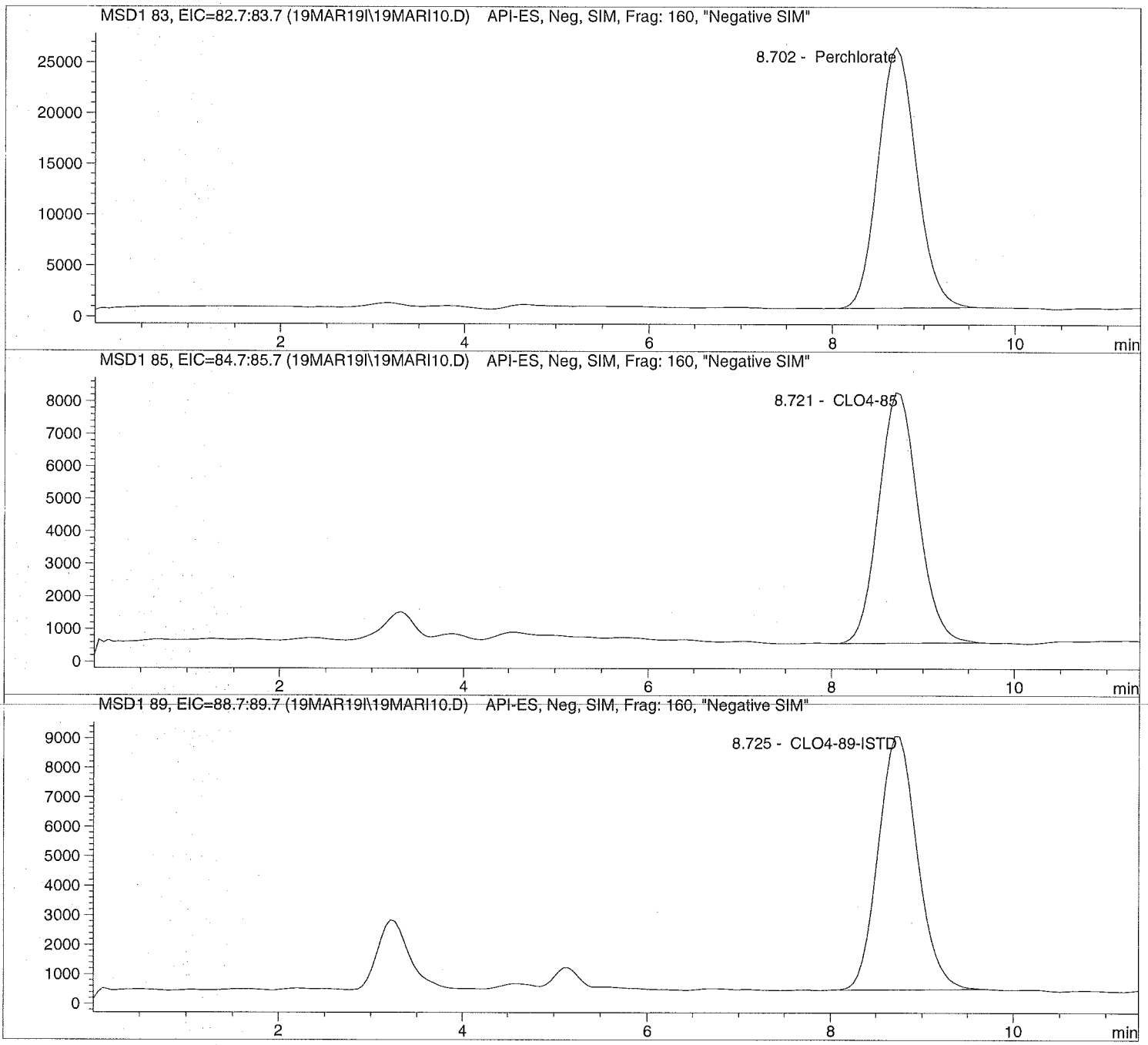
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L 00939350

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

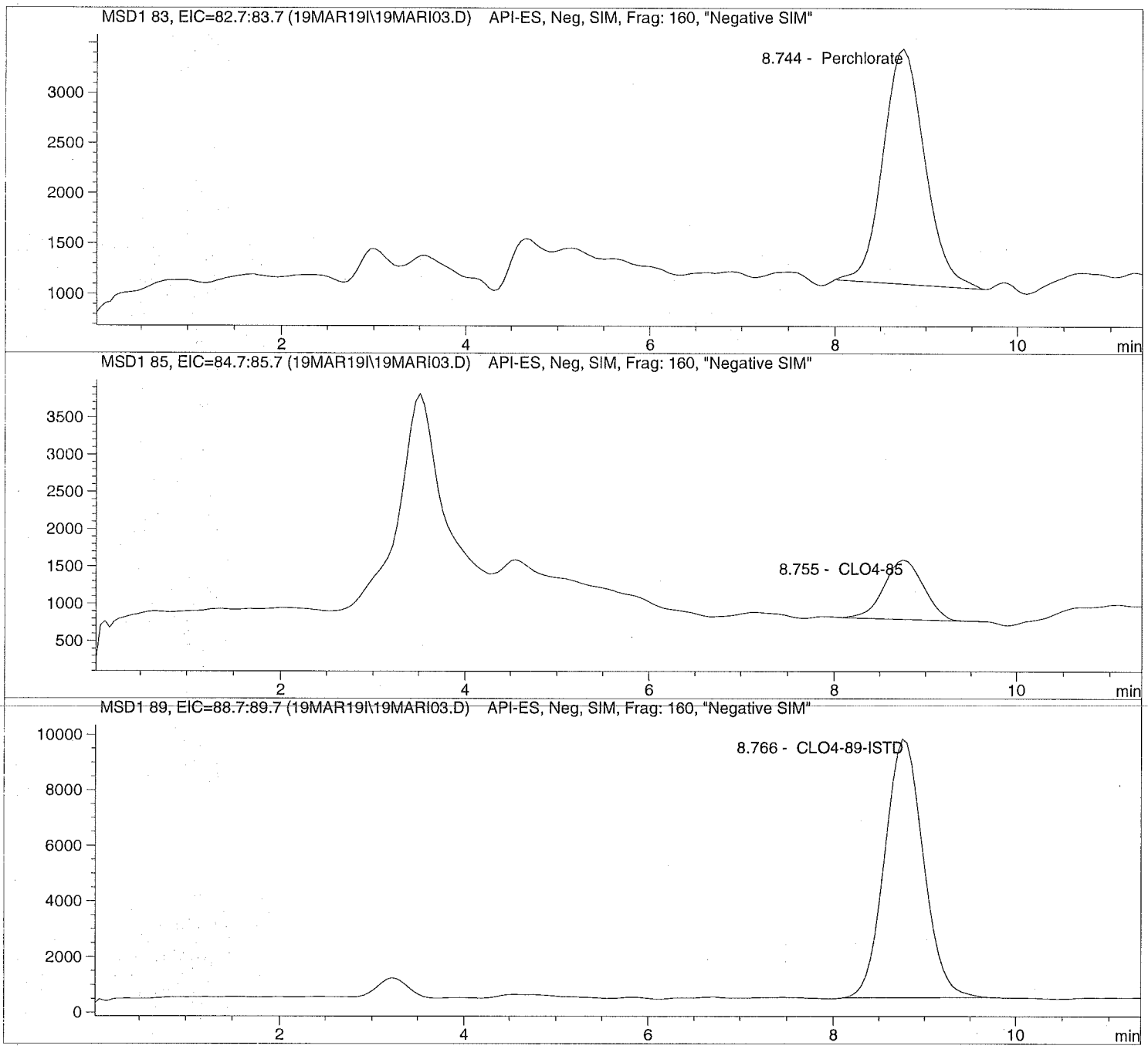
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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June 17, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19051863**

Laboratory Results for: **LHAAP 18/24 GWTP Quaterly Influent**

Dear Marcia,

ALS Environmental received 2 sample(s) on May 31, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 17-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
Work Order: HS19051863

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19051863-01	LH18/24-SP140_052919	Groundwater		29-May-2019 14:00	31-May-2019 08:37	☐
HS19051863-02	Trip Blank	Water	ALS-012519-98	29-May-2019 14:00	31-May-2019 08:37	☐

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18/24 GWTP Quaterly Influent
Work Order:

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 141538

Sample ID: LSCD-141538

- LCS/LCSD RPD exceeded the laboratory acceptance limit for surrogate Nitrobenzene-d5. The individual recoveries met acceptance criteria.

GCMS Volatiles by Method SW8260

Batch ID: R339874

Sample ID: HS19051779-01MS

- MS and MSD are for an unrelated sample

Sample ID: LH18/24-SP140_052919 (HS19051863-01)

- Lowest practical dilution for sample HS19051863-01 due to high concentration of non-target compounds.

Metals by Method SW7470

Batch ID: 141540

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 141478

Sample ID: HS19051850-03MS

- MS and MSD are for an unrelated sample

WetChemistry by Method SW9056

Batch ID: R340350

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E1664A

Batch ID: R340065

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E410.4

Batch ID: R339595

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
Sample ID: LH18/24-SP140_052919
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051863
Lab ID:HS19051863-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
1,1,1-Trichloroethane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
1,1,2,2-Tetrachloroethane	50	U	50	50	100	UG/L	100	04-Jun-2019 20:41
1,1,2-Trichloroethane	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
1,1-Dichloroethane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
1,1-Dichloroethene	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
1,1-Dichloropropene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
1,2,3-Trichlorobenzene	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
1,2,3-Trichloropropane	50	U	50	50	100	UG/L	100	04-Jun-2019 20:41
1,2,4-Trichlorobenzene	50	U	50	50	100	UG/L	100	04-Jun-2019 20:41
1,2,4-Trimethylbenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
1,2-Dibromo-3-chloropropane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
1,2-Dibromoethane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
1,2-Dichlorobenzene	50	U	50	50	100	UG/L	100	04-Jun-2019 20:41
1,2-Dichloroethane	**53**	J	**20**	**50**	**100**	**UG/L**	100	04-Jun-2019 20:41
1,2-Dichloropropane	50	U	50	50	100	UG/L	100	04-Jun-2019 20:41
1,3,5-Trimethylbenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
1,3-Dichlorobenzene	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
1,3-Dichloropropane	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
1,4-Dichlorobenzene	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
2,2-Dichloropropane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
2-Butanone	100	U	50	100	200	UG/L	100	04-Jun-2019 20:41
2-Chlorotoluene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
2-Hexanone	100	U	100	100	200	UG/L	100	04-Jun-2019 20:41
4-Chlorotoluene	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
4-Isopropyltoluene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
4-Methyl-2-pentanone	100	U	70	100	200	UG/L	100	04-Jun-2019 20:41
Acetone	100	U	40	100	200	UG/L	100	04-Jun-2019 20:41
Benzene	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
Bromobenzene	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
Bromochloromethane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
Bromodichloromethane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
Bromoform	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
Bromomethane	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
Carbon disulfide	100	U	60	100	200	UG/L	100	04-Jun-2019 20:41
Carbon tetrachloride	50	U	50	50	100	UG/L	100	04-Jun-2019 20:41
Chlorobenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Chloroethane	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Chloroform	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
Sample ID: LH18/24-SP140_052919
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051863
Lab ID:HS19051863-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
cis-1,2-Dichloroethene	**2,400**		**20**	**50**	**100**	**UG/L**	100	04-Jun-2019 20:41
cis-1,3-Dichloropropene	50	U	10	50	100	UG/L	100	04-Jun-2019 20:41
Dibromochloromethane	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Dibromomethane	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
Dichlorodifluoromethane	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Ethylbenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Hexachlorobutadiene	100	U	100	100	100	UG/L	100	04-Jun-2019 20:41
Isopropylbenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
m,p-Xylene	100	U	50	100	200	UG/L	100	04-Jun-2019 20:41
Methylene chloride	**3,900**		**40**	**100**	**200**	**UG/L**	100	04-Jun-2019 20:41
n-Butylbenzene	50	U	40	50	100	UG/L	100	04-Jun-2019 20:41
n-Propylbenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Naphthalene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
o-Xylene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
sec-Butylbenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Styrene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
tert-Butylbenzene	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Tetrachloroethene	**62**	J	**30**	**50**	**100**	**UG/L**	100	04-Jun-2019 20:41
Toluene	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
trans-1,2-Dichloroethene	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
trans-1,3-Dichloropropene	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
Trichloroethene	**5,600**		**20**	**50**	**100**	**UG/L**	100	04-Jun-2019 20:41
Trichlorofluoromethane	50	U	30	50	100	UG/L	100	04-Jun-2019 20:41
Vinyl chloride	50	U	20	50	100	UG/L	100	04-Jun-2019 20:41
Surr: 1,2-Dichloroethane-d4	*91.3*			**0**	*81-118*	*%REC*	*100*	*04-Jun-2019 20:41*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*100*	*04-Jun-2019 20:41*
Surr: Dibromofluoromethane	*93.8*			**0**	*80-119*	*%REC*	*100*	*04-Jun-2019 20:41*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*100*	*04-Jun-2019 20:41*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 03-Jun-2019		Analyst: LG
1,4-Dioxane	**8.6**		**0.20**	**0.20**	**0.20**	**ug/L**	20	05-Jun-2019 10:17
Surr: 2-Fluorobiphenyl	*92.5*			**0**	*40-140*	*%REC*	*20*	*05-Jun-2019 10:17*
Surr: 4-Terphenyl-d14	*94.2*			**0**	*40-140*	*%REC*	*20*	*05-Jun-2019 10:17*
Surr: Nitrobenzene-d5	*80.0*			**0**	*40-140*	*%REC*	*20*	*05-Jun-2019 10:17*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
Sample ID: LH18/24-SP140_052919
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051863
Lab ID:HS19051863-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
ICP-MS METALS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 31-May-2019		Analyst: JHD
Aluminum	**0.165**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	04-Jun-2019 16:34
Antimony	0.000500	U	0.000400	0.000500	0.00200	mg/L	1	04-Jun-2019 16:34
Arsenic	**0.00138**	J	**0.000400**	**0.000500**	**0.00200**	**mg/L**	1	04-Jun-2019 16:34
Barium	**0.448**		**0.00950**	**0.0125**	**0.0200**	**mg/L**	5	01-Jun-2019 00:30
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:34
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:34
Calcium	**22.2**		**0.170**	**0.250**	**2.50**	**mg/L**	5	01-Jun-2019 00:30
Chromium	**0.00112**	J	**0.000400**	**0.000500**	**0.00400**	**mg/L**	1	04-Jun-2019 16:34
Cobalt	**0.00904**		**0.000200**	**0.000500**	**0.00500**	**mg/L**	1	04-Jun-2019 16:34
Iron	**1.04**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	04-Jun-2019 16:34
Lead	0.00100	U	0.000600	0.00100	0.00200	mg/L	1	04-Jun-2019 16:34
Magnesium	**20.1**		**0.0500**	**0.250**	**1.00**	**mg/L**	5	01-Jun-2019 00:30
Manganese	**0.428**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	04-Jun-2019 16:34
Nickel	**0.00947**		**0.000600**	**0.00100**	**0.00200**	**mg/L**	1	04-Jun-2019 16:34
Potassium	**1.41**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	04-Jun-2019 16:34
Selenium	0.00250	U	0.00110	0.00250	0.00200	mg/L	1	04-Jun-2019 16:34
Silver	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:34
Sodium	**140**		**0.0700**	**0.250**	**1.00**	**mg/L**	5	01-Jun-2019 00:30
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	04-Jun-2019 16:34
Vanadium	**0.00202**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	04-Jun-2019 16:34
Zinc	**0.0260**		**0.00200**	**0.00200**	**0.00400**	**mg/L**	1	04-Jun-2019 16:34
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 03-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	03-Jun-2019 14:26
OIL & GREASE (HEM) BY E1664A		**Method:E1664A**						Analyst: KAH
Oil and Grease	**6.56**		**0.610**	**1.00**	**2.00**	**mg/L**	1	07-Jun-2019 14:45
CHEMICAL OXYGEN DEMAND BY E410.4		**Method:E410.4**						Analyst: AJA
Chemical Oxygen Demand	**15.0**		**5.00**	**15.0**	**15.0**	**mg/L**	1	31-May-2019 17:30
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**240**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jun-2019 22:46
Sulfate	**37.4**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jun-2019 22:46
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jun-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
Sample ID: Trip Blank
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051863
Lab ID:HS19051863-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 18:14
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	04-Jun-2019 18:14
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	04-Jun-2019 18:14
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 18:14
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	04-Jun-2019 18:14
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
Sample ID: Trip Blank
Collection Date: 29-May-2019 14:00

ANALYTICAL REPORT
WorkOrder:HS19051863
Lab ID:HS19051863-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	04-Jun-2019 18:14
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 18:14
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 18:14
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:14
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:14
Surr: 1,2-Dichloroethane-d4	*89.7*			**0**	*81-118*	*%REC*	*1*	*04-Jun-2019 18:14*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*04-Jun-2019 18:14*
Surr: Dibromofluoromethane	*93.1*			**0**	*80-119*	*%REC*	*1*	*04-Jun-2019 18:14*
Surr: Toluene-d8	*108*			**0**	*89-112*	*%REC*	*1*	*04-Jun-2019 18:14*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

Batch ID: 141478 **Method:** ICP-MS METALS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051863-01	1	10	10 (mL)	1

Batch ID: 141538 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051863-01	1	990	1 (mL)	0.00101

Batch ID: 141540 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19051863-01	1	10 (mL)	10 (mL)	1

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 141478	**Test Name :** ICP-MS METALS BY SW6020A			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00		31 May 2019 11:00	04 Jun 2019 16:34	1
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00		31 May 2019 11:00	01 Jun 2019 00:30	5
Batch ID 141538	**Test Name :** SEMIVOLATILES SIM			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00		03 Jun 2019 13:22	05 Jun 2019 10:17	20
Batch ID 141540	**Test Name :** MERCURY BY SW7470A			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00		03 Jun 2019 10:00	03 Jun 2019 14:26	1
Batch ID R339595	**Test Name :** CHEMICAL OXYGEN DEMAND BY E410.4			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00			31 May 2019 17:30	1
Batch ID R339874	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19051863-02	Trip Blank	29 May 2019 14:00			04 Jun 2019 18:14	1
Batch ID R339874	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00			04 Jun 2019 20:41	100
Batch ID R340065	**Test Name :** OIL & GREASE (HEM) BY E1664A			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00			07 Jun 2019 14:45	1
Batch ID R340350	**Test Name :** ANIONS BY SW9056A			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00			11 Jun 2019 22:46	10
Batch ID R340666	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Groundwater		
HS19051863-01	LH18/24-SP140_052919	29 May 2019 14:00			17 Jun 2019 18:06	1

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLKF1-141478** Units: **mg/L** Analysis Date: **31-May-2019 23:28**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102626** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.007575	0.0100								J
Antimony	0.000500	0.00200								U
Arsenic	0.000500	0.00200								U
Barium	0.00315	0.00400								J
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.04241	0.500								J
Chromium	0.000500	0.00400								U
Cobalt	0.000500	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00200								U
Magnesium	0.01861	0.200								J
Manganese	0.000746	0.00500								J
Nickel	0.00100	0.00200								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U
Sodium	0.1198	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.02232	0.00400								

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-141478** Units: **mg/L** Analysis Date: **31-May-2019 23:26**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102625** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.003227	0.0100								J
Antimony	0.000500	0.00200								U
Arsenic	0.000500	0.00200								U
Barium	0.00250	0.00400								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00400								U
Cobalt	0.000500	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00200								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00200								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00200	0.00400								U

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

LCS Sample ID: **LCS-141478** Units: **mg/L** Analysis Date: **31-May-2019 23:30**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102627** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09159	0.0100	0.1	0	91.6	80 - 120				
Antimony	0.04956	0.00200	0.05	0	99.1	80 - 120				
Arsenic	0.04876	0.00200	0.05	0	97.5	80 - 120				
Barium	0.04854	0.00400	0.05	0	97.1	80 - 120				
Beryllium	0.04803	0.00200	0.05	0	96.1	80 - 120				
Cadmium	0.04938	0.00200	0.05	0	98.8	80 - 120				
Calcium	4.702	0.500	5	0	94.0	80 - 120				
Chromium	0.04808	0.00400	0.05	0	96.2	80 - 120				
Cobalt	0.04631	0.00500	0.05	0	92.6	80 - 120				
Iron	4.869	0.200	5	0	97.4	80 - 120				
Lead	0.0475	0.00200	0.05	0	95.0	80 - 120				
Magnesium	4.706	0.200	5	0	94.1	80 - 120				
Manganese	0.04804	0.00500	0.05	0	96.1	80 - 120				
Nickel	0.04942	0.00200	0.05	0	98.8	80 - 120				
Potassium	4.811	0.200	5	0	96.2	80 - 120				
Selenium	0.0515	0.00200	0.05	0	103	80 - 120				
Silver	0.0546	0.00200	0.05	0	109	80 - 120				
Sodium	4.751	0.200	5	0	95.0	80 - 120				
Thallium	0.04748	0.00200	0.05	0	95.0	80 - 120				
Vanadium	0.04702	0.00500	0.05	0	94.0	80 - 120				
Zinc	0.05157	0.00400	0.05	0	103	80 - 120				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MS Sample ID: **HS19051850-03MS** Units: **mg/L** Analysis Date: **31-May-2019 23:39**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102632** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.143	0.0100	0.1	0.03095	112	80 - 120				
Antimony	0.04944	0.00200	0.05	-0.000554	100.0	80 - 120				
Arsenic	0.05055	0.00200	0.05	0.000794	99.5	80 - 120				
Barium	0.44	0.00400	0.05	0.3664	147	80 - 120				SO
Beryllium	0.04816	0.00200	0.05	0.000011	96.3	80 - 120				
Cadmium	0.05034	0.00200	0.05	0.000018	101	80 - 120				
Calcium	80.68	0.500	5	73.3	147	80 - 120				SO
Chromium	0.1352	0.00400	0.05	0.0279	215	80 - 120				S
Cobalt	0.05522	0.00500	0.05	0.006927	96.6	80 - 120				
Iron	5.781	0.200	5	0.6969	102	80 - 120				
Lead	0.05114	0.00200	0.05	0.000147	102	80 - 120				
Magnesium	25.76	0.200	5	20.51	105	80 - 120				O
Manganese	0.1893	0.00500	0.05	0.1059	167	80 - 120				S
Nickel	0.2741	0.00200	0.05	0.206	136	80 - 120				SO
Potassium	5.961	0.200	5	1.107	97.1	80 - 120				
Selenium	0.05099	0.00200	0.05	0.000467	101	80 - 120				
Silver	0.05342	0.00200	0.05	-0.000008	107	80 - 120				
Sodium	59.66	0.200	5	53.73	119	80 - 120				O
Thallium	0.05062	0.00200	0.05	-0.000018	101	80 - 120				
Vanadium	0.05114	0.00500	0.05	0.002713	96.9	80 - 120				
Zinc	0.05361	0.00400	0.05	0.003698	99.8	80 - 120				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19051850-03MSD** Units: **mg/L** Analysis Date: **31-May-2019 23:41**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102633** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.151	0.0100	0.1	0.03095	120	80 - 120	0.143	5.46	20	S
Antimony	0.05253	0.00200	0.05	-0.000554	106	80 - 120	0.04944	6.06	20	
Arsenic	0.05277	0.00200	0.05	0.000794	104	80 - 120	0.05055	4.3	20	
Barium	0.4384	0.00400	0.05	0.3664	144	80 - 120	0.44	0.368	20	SO
Beryllium	0.04972	0.00200	0.05	0.000011	99.4	80 - 120	0.04816	3.2	20	
Cadmium	0.0514	0.00200	0.05	0.000018	103	80 - 120	0.05034	2.08	20	
Calcium	84.17	0.500	5	73.3	217	80 - 120	80.68	4.24	20	SO
Chromium	0.1197	0.00400	0.05	0.0279	184	80 - 120	0.1352	12.2	20	S
Cobalt	0.05791	0.00500	0.05	0.006927	102	80 - 120	0.05522	4.74	20	
Iron	6.089	0.200	5	0.6969	108	80 - 120	5.781	5.19	20	
Lead	0.05042	0.00200	0.05	0.000147	101	80 - 120	0.05114	1.41	20	
Magnesium	27.04	0.200	5	20.51	131	80 - 120	25.76	4.87	20	SO
Manganese	0.2094	0.00500	0.05	0.1059	207	80 - 120	0.1893	10.1	20	S
Nickel	0.2818	0.00200	0.05	0.206	152	80 - 120	0.2741	2.77	20	SO
Potassium	6.227	0.200	5	1.107	102	80 - 120	5.961	4.35	20	
Selenium	0.05276	0.00200	0.05	0.000467	105	80 - 120	0.05099	3.42	20	
Silver	0.05362	0.00200	0.05	-0.000008	107	80 - 120	0.05342	0.362	20	
Sodium	62.68	0.200	5	53.73	179	80 - 120	59.66	4.93	20	SO
Thallium	0.05011	0.00200	0.05	-0.000018	100	80 - 120	0.05062	1.01	20	
Vanadium	0.05404	0.00500	0.05	0.002713	103	80 - 120	0.05114	5.52	20	
Zinc	0.05674	0.00400	0.05	0.003698	106	80 - 120	0.05361	5.68	20	

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19051850-03PDS** Units: **mg/L** Analysis Date: **31-May-2019 23:43**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102634** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1521	0.0100	0.1	0.03095	121	75 - 125				
Arsenic	0.1244	0.00200	0.1	0.000794	124	75 - 125				
Cadmium	0.1243	0.00200	0.1	0.000018	124	75 - 125				
Calcium	83.17	0.500	10	73.3	98.6	75 - 125				O
Cobalt	0.1211	0.00500	0.1	0.006927	114	75 - 125				
Iron	12.94	0.200	10	0.6969	122	75 - 125				
Lead	0.1242	0.00200	0.1	0.000147	124	75 - 125				
Magnesium	32.3	0.200	10	20.51	118	75 - 125				
Nickel	0.3242	0.00200	0.1	0.206	118	75 - 125				
Potassium	12.94	0.200	10	1.107	118	75 - 125				
Silver	0.1237	0.00200	0.1	-0.000008	124	75 - 125				
Sodium	64.04	0.200	10	53.73	103	75 - 125				O
Thallium	0.1233	0.00200	0.1	-0.000018	123	75 - 125				
Vanadium	0.122	0.00500	0.1	0.002713	119	75 - 125				
Zinc	0.1272	0.00400	0.1	0.003698	123	75 - 125				

PDS Sample ID: **HS19051850-03PDS** Units: **mg/L** Analysis Date: **03-Jun-2019 12:04**
Client ID: Run ID: **ICPMS04_339653** SeqNo: **5103542** PrepDate: **31-May-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09062	0.00200	0.1	0	90.6	75 - 125				
Barium	0.4529	0.00400	0.1	0.3664	86.4	75 - 125				
Beryllium	0.09399	0.00200	0.1	0	94.0	75 - 125				
Chromium	0.1265	0.00400	0.1	0.0279	98.6	75 - 125				
Manganese	0.2079	0.00500	0.1	0.1059	102	75 - 125				
Selenium	0.094	0.00200	0.1	0	94.0	75 - 125				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141478 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

SD Sample ID: **HS19051850-03SD** Units: **mg/L** Analysis Date: **31-May-2019 23:38**
Client ID: Run ID: **ICPMS06_339538** SeqNo: **5102631** PrepDate: **31-May-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.02554	0.0500					0.03095	0	10	J
Antimony	0.00250	0.0100					-0.000554	0	10	U
Arsenic	0.00250	0.0100					0.000794	0	10	U
Barium	0.3548	0.0200					0.3664	3.18	10	
Beryllium	0.00250	0.0100					0.000011	0	10	U
Cadmium	0.00250	0.0100					0.000018	0	10	U
Calcium	73.23	2.50					73.3	0.105	10	
Chromium	0.02755	0.0200					0.0279	1.26	10	
Cobalt	0.007246	0.0250					0.006927	0	10	J
Iron	0.6583	1.00					0.6969	0	10	J
Lead	0.00500	0.0100					0.000147	0	10	U
Magnesium	21.55	1.00					20.51	5.06	10	
Manganese	0.1139	0.0250					0.1059	7.61	10	
Nickel	0.2156	0.0100					0.206	4.67	10	
Potassium	1.116	1.00					1.107	0.792	10	
Selenium	0.0125	0.0100					0.000467	0	10	U
Silver	0.00250	0.0100					-0.000008	0	10	U
Sodium	55.55	1.00					53.73	3.38	10	
Thallium	0.00250	0.0100					-0.000018	0	10	U
Vanadium	0.008106	0.0250					0.002713	0	10	J
Zinc	0.0100	0.0200					0.003698	0	10	U

The following samples were analyzed in this batch: HS19051863-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141540 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-141540** Units: **mg/L** Analysis Date: **03-Jun-2019 13:52**
Client ID: Run ID: **HG03_339690** SeqNo: **5104033** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-141540** Units: **mg/L** Analysis Date: **03-Jun-2019 13:53**
Client ID: Run ID: **HG03_339690** SeqNo: **5104034** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00503	0.000200	0.005	0	101	80 - 120				

MS Sample ID: **HS19051859-01MS** Units: **mg/L** Analysis Date: **03-Jun-2019 13:57**
Client ID: Run ID: **HG03_339690** SeqNo: **5104036** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.005	0.000200	0.005	0.00009	98.2	75 - 125				

MSD Sample ID: **HS19051859-01MSD** Units: **mg/L** Analysis Date: **03-Jun-2019 13:58**
Client ID: Run ID: **HG03_339690** SeqNo: **5104037** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00502	0.000200	0.005	0.00009	98.6	75 - 125	0.005	0.399	20	

The following samples were analyzed in this batch: HS19051863-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: 141538 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-141538** Units: **ug/L** Analysis Date: **05-Jun-2019 09:15**
Client ID: Run ID: **SV-5_339895** SeqNo: **5108847** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.07056*	*0*	*0.08*	*0*	*88.2*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.06728*	*0*	*0.08*	*0*	*84.1*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07988*	*0*	*0.08*	*0*	*99.9*	*40 - 140*				

LCS Sample ID: **LCS-141538** Units: **ug/L** Analysis Date: **05-Jun-2019 08:33**
Client ID: Run ID: **SV-5_339895** SeqNo: **5108833** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.0845	0.010	0.08	0	106	40 - 140				
Surr: 2-Fluorobiphenyl	*0.08883*	*0*	*0.08*	*0*	*111*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.06752*	*0*	*0.08*	*0*	*84.4*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.06431*	*0*	*0.08*	*0*	*80.4*	*40 - 140*				

LCSD Sample ID: **LCSD-141538** Units: **ug/L** Analysis Date: **05-Jun-2019 08:54**
Client ID: Run ID: **SV-5_339895** SeqNo: **5108846** PrepDate: **03-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08994	0.010	0.08	0	112	40 - 140	0.0845	6.24	20	
Surr: 2-Fluorobiphenyl	*0.0828*	*0*	*0.08*	*0*	*104*	*40 - 140*	*0.08883*	*7.03*	*20*	
Surr: 4-Terphenyl-d14	*0.0602*	*0*	*0.08*	*0*	*75.2*	*40 - 140*	*0.06752*	*11.5*	*20*	
Surr: Nitrobenzene-d5	*0.08236*	*0*	*0.08*	*0*	*103*	*40 - 140*	*0.06431*	*24.6*	*20*	R

The following samples were analyzed in this batch: HS19051863-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 17:26**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108298** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 17:26**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108298** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.91*	*1.0*	*50*	*0*	*89.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.35*	*1.0*	*50*	*0*	*98.7*	*85 - 114*				
Surr: Dibromofluoromethane	*46.74*	*1.0*	*50*	*0*	*93.5*	*80 - 119*				
Surr: Toluene-d8	*53.5*	*1.0*	*50*	*0*	*107*	*89 - 112*				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 16:38**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108297** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.65	1.0	20	0	98.2	78 - 124				
1,1,1-Trichloroethane	19.34	1.0	20	0	96.7	74 - 131				
1,1,2,2-Tetrachloroethane	20.2	1.0	20	0	101	71 - 121				
1,1,2-Trichloroethane	20.99	1.0	20	0	105	80 - 119				
1,1-Dichloroethane	19.06	1.0	20	0	95.3	77 - 125				
1,1-Dichloroethene	18.87	1.0	20	0	94.4	71 - 131				
1,1-Dichloropropene	18.09	1.0	20	0	90.4	78 - 125				
1,2,3-Trichlorobenzene	24.79	1.0	20	0	124	69 - 129				
1,2,3-Trichloropropane	19.34	1.0	20	0	96.7	73 - 122				
1,2,4-Trichlorobenzene	23.55	1.0	20	0	118	69 - 130				
1,2,4-Trimethylbenzene	18.31	1.0	20	0	91.6	76 - 124				
1,2-Dibromo-3-chloropropane	20.72	1.0	20	0	104	62 - 128				
1,2-Dibromoethane	20.66	1.0	20	0	103	77 - 121				
1,2-Dichlorobenzene	19.72	1.0	20	0	98.6	80 - 119				
1,2-Dichloroethane	19.85	1.0	20	0	99.2	73 - 128				
1,2-Dichloropropane	20.15	1.0	20	0	101	78 - 122				
1,3,5-Trimethylbenzene	17.9	1.0	20	0	89.5	75 - 124				
1,3-Dichlorobenzene	18.94	1.0	20	0	94.7	80 - 119				
1,3-Dichloropropane	20.87	1.0	20	0	104	80 - 119				
1,4-Dichlorobenzene	18.66	1.0	20	0	93.3	79 - 118				
2,2-Dichloropropane	19.73	1.0	20	0	98.7	60 - 139				
2-Butanone	47.14	2.0	40	0	118	56 - 143				
2-Chlorotoluene	17.89	1.0	20	0	89.5	79 - 122				
2-Hexanone	44.83	2.0	40	0	112	57 - 139				
4-Chlorotoluene	18.29	1.0	20	0	91.4	78 - 122				
4-Isopropyltoluene	17.3	1.0	20	0	86.5	77 - 127				
4-Methyl-2-pentanone	41.57	2.0	40	0	104	67 - 130				
Acetone	49.02	2.0	40	0	123	39 - 160				
Benzene	19.02	1.0	20	0	95.1	79 - 120				
Bromobenzene	19.17	1.0	20	0	95.9	80 - 120				
Bromochloromethane	20.93	1.0	20	0	105	78 - 123				
Bromodichloromethane	19.64	1.0	20	0	98.2	79 - 125				
Bromoform	20.82	1.0	20	0	104	66 - 130				
Bromomethane	23.09	1.0	20	0	115	53 - 141				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 16:38**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108297** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	38.69	2.0	40	0	96.7	64 - 133				
Carbon tetrachloride	17.69	1.0	20	0	88.5	72 - 136				
Chlorobenzene	19.45	1.0	20	0	97.3	82 - 118				
Chloroethane	19.14	1.0	20	0	95.7	60 - 138				
Chloroform	20.04	1.0	20	0	100	79 - 124				
Chloromethane	15.66	1.0	20	0	78.3	50 - 139				
cis-1,2-Dichloroethene	19.81	1.0	20	0	99.1	78 - 123				
cis-1,3-Dichloropropene	20.05	1.0	20	0	100	75 - 124				
Dibromochloromethane	20.63	1.0	20	0	103	74 - 126				
Dibromomethane	20.31	1.0	20	0	102	79 - 123				
Dichlorodifluoromethane	18.37	1.0	20	0	91.8	32 - 152				
Ethylbenzene	18.95	1.0	20	0	94.8	79 - 121				
Hexachlorobutadiene	22.08	1.0	20	0	110	66 - 134				
Isopropylbenzene	17.97	1.0	20	0	89.9	72 - 131				
m,p-Xylene	37.67	2.0	40	0	94.2	80 - 121				
Methylene chloride	20.5	2.0	20	0	102	74 - 124				
Naphthalene	24.54	1.0	20	0	123	61 - 128				
n-Butylbenzene	17.48	1.0	20	0	87.4	75 - 128				
n-Propylbenzene	17.36	1.0	20	0	86.8	76 - 126				
o-Xylene	19.08	1.0	20	0	95.4	78 - 122				
sec-Butylbenzene	16.66	1.0	20	0	83.3	77 - 126				
Styrene	19.95	1.0	20	0	99.7	78 - 123				
tert-Butylbenzene	17.22	1.0	20	0	86.1	78 - 124				
Tetrachloroethene	18.71	1.0	20	0	93.5	74 - 129				
Toluene	19.64	1.0	20	0	98.2	80 - 121				
trans-1,2-Dichloroethene	19.19	1.0	20	0	96.0	75 - 124				
trans-1,3-Dichloropropene	20.51	1.0	20	0	103	73 - 127				
Trichloroethene	19.2	1.0	20	0	96.0	79 - 123				
Trichlorofluoromethane	18.09	1.0	20	0	90.5	65 - 141				
Vinyl chloride	18.75	1.0	20	0	93.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.33*	*1.0*	*50*	*0*	*107*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.97*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*53.7*	*1.0*	*50*	*0*	*107*	*80 - 119*				
Surr: Toluene-d8	*50.12*	*1.0*	*50*	*0*	*100*	*89 - 112*				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19051779-01MS** Units: **UG/L** Analysis Date: **04-Jun-2019 21:05**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108306** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	379.7	20	400	0	94.9	78 - 124				
1,1,1-Trichloroethane	352	20	400	0	88.0	74 - 131				
1,1,2,2-Tetrachloroethane	366.7	20	400	0	91.7	71 - 121				
1,1,2-Trichloroethane	380.6	20	400	0	95.2	80 - 119				
1,1-Dichloroethane	341.8	20	400	0	85.4	77 - 125				
1,1-Dichloroethene	356.6	20	400	0	89.2	71 - 131				
1,1-Dichloropropene	358.1	20	400	0	89.5	78 - 125				
1,2,3-Trichlorobenzene	347.8	20	400	0	86.9	69 - 129				
1,2,3-Trichloropropane	349.4	20	400	0	87.4	73 - 122				
1,2,4-Trichlorobenzene	373.2	20	400	0	93.3	69 - 130				
1,2,4-Trimethylbenzene	389.8	20	400	0	97.5	76 - 124				
1,2-Dibromo-3-chloropropane	336.5	20	400	0	84.1	62 - 128				
1,2-Dibromoethane	368.3	20	400	0	92.1	77 - 121				
1,2-Dichlorobenzene	382.4	20	400	0	95.6	80 - 119				
1,2-Dichloroethane	354.8	20	400	0	88.7	73 - 128				
1,2-Dichloropropane	375.8	20	400	0	94.0	78 - 122				
1,3,5-Trimethylbenzene	401.3	20	400	0	100	75 - 124				
1,3-Dichlorobenzene	384	20	400	0	96.0	80 - 119				
1,3-Dichloropropane	382.9	20	400	0	95.7	80 - 119				
1,4-Dichlorobenzene	373.9	20	400	0	93.5	79 - 118				
2,2-Dichloropropane	324.6	20	400	0	81.1	60 - 139				
2-Butanone	413.2	40	800	0	51.7	56 - 143				S
2-Chlorotoluene	378.8	20	400	0	94.7	79 - 122				
2-Hexanone	492.1	40	800	0	61.5	57 - 139				
4-Chlorotoluene	380.5	20	400	0	95.1	78 - 122				
4-Isopropyltoluene	397.3	20	400	0	99.3	77 - 127				
4-Methyl-2-pentanone	457.2	40	800	0	57.1	67 - 130				S
Acetone	465.2	40	800	0	58.2	39 - 160				
Benzene	361.9	20	400	0	90.5	79 - 120				
Bromobenzene	387.6	20	400	0	96.9	80 - 120				
Bromochloromethane	345.5	20	400	0	86.4	78 - 123				
Bromodichloromethane	354.6	20	400	0	88.7	79 - 125				
Bromoform	362.7	20	400	0	90.7	66 - 130				
Bromomethane	290.5	20	400	0	72.6	53 - 141				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19051779-01MS** Units: **UG/L** Analysis Date: **04-Jun-2019 21:05**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108306** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	549.2	40	800	0	68.6	64 - 133				
Carbon tetrachloride	364.1	20	400	0	91.0	72 - 136				
Chlorobenzene	376.7	20	400	0	94.2	82 - 118				
Chloroethane	332.8	20	400	0	83.2	60 - 138				
Chloroform	346.2	20	400	0	86.6	79 - 124				
Chloromethane	358	20	400	0	89.5	50 - 139				
cis-1,2-Dichloroethene	345.9	20	400	0	86.5	78 - 123				
cis-1,3-Dichloropropene	355	20	400	0	88.7	75 - 124				
Dibromochloromethane	377.7	20	400	0	94.4	74 - 126				
Dibromomethane	351.1	20	400	0	87.8	79 - 123				
Dichlorodifluoromethane	349.2	20	400	0	87.3	32 - 152				
Ethylbenzene	381.7	20	400	0	95.4	79 - 121				
Hexachlorobutadiene	413.2	20	400	0	103	66 - 134				
Isopropylbenzene	394.8	20	400	0	98.7	72 - 131				
m,p-Xylene	749.4	40	800	0	93.7	80 - 121				
Methylene chloride	414.4	40	400	0	104	74 - 124				
Naphthalene	328.1	20	400	0	82.0	61 - 128				
n-Butylbenzene	392.4	20	400	0	98.1	75 - 128				
n-Propylbenzene	390.4	20	400	0	97.6	76 - 126				
o-Xylene	376.8	20	400	0	94.2	78 - 122				
sec-Butylbenzene	395.7	20	400	0	98.9	77 - 126				
Styrene	377.9	20	400	0	94.5	78 - 123				
tert-Butylbenzene	398.9	20	400	0	99.7	78 - 124				
Tetrachloroethene	407.5	20	400	0	102	74 - 129				
Toluene	393.5	20	400	0	98.4	80 - 121				
trans-1,2-Dichloroethene	346.7	20	400	0	86.7	75 - 124				
trans-1,3-Dichloropropene	347.8	20	400	0	87.0	73 - 127				
Trichloroethene	367.7	20	400	0	91.9	79 - 123				
Trichlorofluoromethane	355.1	20	400	0	88.8	65 - 141				
Vinyl chloride	398.1	20	400	0	99.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*887.4*	*20*	*1000*	*0*	*88.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*1056*	*20*	*1000*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*955.1*	*20*	*1000*	*0*	*95.5*	*80 - 119*				
Surr: Toluene-d8	*1063*	*20*	*1000*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19051779-01MSD** Units: **UG/L** Analysis Date: **04-Jun-2019 21:29**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108307** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	367.2	20	400	0	91.8	78 - 124	379.7	3.34	20	
1,1,1-Trichloroethane	332.3	20	400	0	83.1	74 - 131	352	5.78	20	
1,1,2,2-Tetrachloroethane	360.3	20	400	0	90.1	71 - 121	366.7	1.76	20	
1,1,2-Trichloroethane	369.5	20	400	0	92.4	80 - 119	380.6	2.96	20	
1,1-Dichloroethane	325.1	20	400	0	81.3	77 - 125	341.8	5	20	
1,1-Dichloroethene	329.1	20	400	0	82.3	71 - 131	356.6	8.03	20	
1,1-Dichloropropene	337.5	20	400	0	84.4	78 - 125	358.1	5.92	20	
1,2,3-Trichlorobenzene	331.8	20	400	0	83.0	69 - 129	347.8	4.69	20	
1,2,3-Trichloropropane	343.3	20	400	0	85.8	73 - 122	349.4	1.76	20	
1,2,4-Trichlorobenzene	357.2	20	400	0	89.3	69 - 130	373.2	4.39	20	
1,2,4-Trimethylbenzene	377.3	20	400	0	94.3	76 - 124	389.8	3.28	20	
1,2-Dibromo-3-chloropropane	318.8	20	400	0	79.7	62 - 128	336.5	5.41	20	
1,2-Dibromoethane	362.9	20	400	0	90.7	77 - 121	368.3	1.47	20	
1,2-Dichlorobenzene	372.2	20	400	0	93.0	80 - 119	382.4	2.71	20	
1,2-Dichloroethane	338.6	20	400	0	84.6	73 - 128	354.8	4.68	20	
1,2-Dichloropropane	361	20	400	0	90.2	78 - 122	375.8	4.03	20	
1,3,5-Trimethylbenzene	383.3	20	400	0	95.8	75 - 124	401.3	4.61	20	
1,3-Dichlorobenzene	375	20	400	0	93.7	80 - 119	384	2.38	20	
1,3-Dichloropropane	377.7	20	400	0	94.4	80 - 119	382.9	1.36	20	
1,4-Dichlorobenzene	364	20	400	0	91.0	79 - 118	373.9	2.69	20	
2,2-Dichloropropane	300.4	20	400	0	75.1	60 - 139	324.6	7.75	20	
2-Butanone	406.9	40	800	0	50.9	56 - 143	413.2	1.53	20	S
2-Chlorotoluene	361.9	20	400	0	90.5	79 - 122	378.8	4.55	20	
2-Hexanone	486.1	40	800	0	60.8	57 - 139	492.1	1.24	20	
4-Chlorotoluene	368.9	20	400	0	92.2	78 - 122	380.5	3.1	20	
4-Isopropyltoluene	386.4	20	400	0	96.6	77 - 127	397.3	2.78	20	
4-Methyl-2-pentanone	457.6	40	800	0	57.2	67 - 130	457.2	0.0924	20	S
Acetone	450.9	40	800	0	56.4	39 - 160	465.2	3.12	20	
Benzene	344.2	20	400	0	86.0	79 - 120	361.9	5.03	20	
Bromobenzene	376.4	20	400	0	94.1	80 - 120	387.6	2.91	20	
Bromochloromethane	322.4	20	400	0	80.6	78 - 123	345.5	6.9	20	
Bromodichloromethane	345	20	400	0	86.2	79 - 125	354.6	2.76	20	
Bromoform	361.1	20	400	0	90.3	66 - 130	362.7	0.454	20	
Bromomethane	292.3	20	400	0	73.1	53 - 141	290.5	0.628	20	

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19051779-01MSD** Units: **UG/L** Analysis Date: **04-Jun-2019 21:29**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108307** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	437.5	40	800	0	54.7	64 - 133	549.2	22.6	20	SR
Carbon tetrachloride	345.2	20	400	0	86.3	72 - 136	364.1	5.33	20	
Chlorobenzene	359.3	20	400	0	89.8	82 - 118	376.7	4.73	20	
Chloroethane	298.2	20	400	0	74.5	60 - 138	332.8	11	20	
Chloroform	327.7	20	400	0	81.9	79 - 124	346.2	5.49	20	
Chloromethane	257.4	20	400	0	64.3	50 - 139	358	32.7	20	R
cis-1,2-Dichloroethene	330	20	400	0	82.5	78 - 123	345.9	4.71	20	
cis-1,3-Dichloropropene	340	20	400	0	85.0	75 - 124	355	4.3	20	
Dibromochloromethane	364.1	20	400	0	91.0	74 - 126	377.7	3.67	20	
Dibromomethane	343.3	20	400	0	85.8	79 - 123	351.1	2.23	20	
Dichlorodifluoromethane	290.4	20	400	0	72.6	32 - 152	349.2	18.4	20	
Ethylbenzene	367.9	20	400	0	92.0	79 - 121	381.7	3.7	20	
Hexachlorobutadiene	395.8	20	400	0	99.0	66 - 134	413.2	4.29	20	
Isopropylbenzene	382.6	20	400	0	95.6	72 - 131	394.8	3.14	20	
m,p-Xylene	717.3	40	800	0	89.7	80 - 121	749.4	4.39	20	
Methylene chloride	347.1	40	400	0	86.8	74 - 124	414.4	17.7	20	
Naphthalene	318.6	20	400	0	79.7	61 - 128	328.1	2.93	20	
n-Butylbenzene	379.9	20	400	0	95.0	75 - 128	392.4	3.24	20	
n-Propylbenzene	376.1	20	400	0	94.0	76 - 126	390.4	3.73	20	
o-Xylene	360.5	20	400	0	90.1	78 - 122	376.8	4.44	20	
sec-Butylbenzene	383.6	20	400	0	95.9	77 - 126	395.7	3.12	20	
Styrene	362.3	20	400	0	90.6	78 - 123	377.9	4.22	20	
tert-Butylbenzene	388.5	20	400	0	97.1	78 - 124	398.9	2.65	20	
Tetrachloroethene	385.4	20	400	0	96.4	74 - 129	407.5	5.57	20	
Toluene	373.9	20	400	0	93.5	80 - 121	393.5	5.13	20	
trans-1,2-Dichloroethene	326.7	20	400	0	81.7	75 - 124	346.7	5.92	20	
trans-1,3-Dichloropropene	332	20	400	0	83.0	73 - 127	347.8	4.67	20	
Trichloroethene	350	20	400	0	87.5	79 - 123	367.7	4.94	20	
Trichlorofluoromethane	333	20	400	0	83.2	65 - 141	355.1	6.44	20	
Vinyl chloride	325.9	20	400	0	81.5	58 - 137	398.1	20	20	
Surr: 1,2-Dichloroethane-d4	*879.9*	*20*	*1000*	*0*	*88.0*	*81 - 118*	*887.4*	*0.843*	*20*	
Surr: 4-Bromofluorobenzene	*1059*	*20*	*1000*	*0*	*106*	*85 - 114*	*1056*	*0.269*	*20*	
Surr: Dibromofluoromethane	*947.2*	*20*	*1000*	*0*	*94.7*	*80 - 119*	*955.1*	*0.821*	*20*	
Surr: Toluene-d8	*1055*	*20*	*1000*	*0*	*105*	*89 - 112*	*1063*	*0.745*	*20*	

ALS Houston, US Date: 17-Jun-19

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP 18/24 GWTP Quaterly Influent
WorkOrder:	HS19051863

QC BATCH REPORT

Batch ID:	**R339874 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19051863-01 HS19051863-02

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R339595 (0) **Instrument: WetChem_HS** **Method: CHEMICAL OXYGEN DEMAND BY E410.4**

MBLK Sample ID: **MBLK-R339595** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101809** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	15.0	15.0								U

LCS Sample ID: **LCS-R339595** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101808** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	103	15.0	100	0	103	85 - 115				

MS Sample ID: **HS19051880-02MS** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101810** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	88	15.0	50	34	108	80 - 120				

DUP Sample ID: **HS19051880-02DUP** Units: **mg/L** Analysis Date: **31-May-2019 17:30**
Client ID: Run ID: **WetChem_HS_339595** SeqNo: **5101811** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chemical Oxygen Demand	32	15.0					34	6.06	20	

The following samples were analyzed in this batch: HS19051863-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R340065 (0) **Instrument: Balance1** **Method: OIL & GREASE (HEM) BY E1664A**

MBLK Sample ID: **WBLKW-060719** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112440** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	1.00	2.00								U

LCS Sample ID: **WLCSW-060719** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112442** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	38.4	2.00	40	0	96.0	78 - 114				

LCSD Sample ID: **WLCSDW-060719** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112441** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	38	2.00	40	0	95.0	78 - 114	38.4	1.05	18	

MS Sample ID: **HS19060196-01MS** Units: **mg/L** Analysis Date: **07-Jun-2019 14:45**
Client ID: Run ID: **Balance1_340065** SeqNo: **5112436** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Oil and Grease	40.83	2.00	40	1.667	97.9	78 - 114				

The following samples were analyzed in this batch: HS19051863-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R340350 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 13:36**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118828** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 13:54**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118829** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.46	0.500	20	0	97.3	80 - 120				
Sulfate	19.67	0.500	20	0	98.4	80 - 120				

LCSD Sample ID: **WLCSDW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 14:12**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118830** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.46	0.500	20	0	97.3	80 - 120	19.46	0.0308	20	
Sulfate	19.63	0.500	20	0	98.2	80 - 120	19.67	0.189	20	

MS Sample ID: **HS19060226-01MS** Units: **mg/L** Analysis Date: **11-Jun-2019 16:35**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118835** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	490.6	25.0	500	13.25	95.5	80 - 120				
Sulfate	1634	25.0	500	1163	94.1	80 - 120				

MS Sample ID: **HS19060224-03MS** Units: **mg/L** Analysis Date: **11-Jun-2019 15:43**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118832** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	108.2	5.00	100	12.57	95.6	80 - 120				
Sulfate	337.8	5.00	100	245	92.8	80 - 120				

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: HS19051863

QC BATCH REPORT

Batch ID: R340350 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19060226-01MSD** Units: **mg/L** Analysis Date: **11-Jun-2019 17:28**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118838** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	489.3	25.0	500	13.25	95.2	80 - 120	490.6	0.255	20	
Sulfate	1631	25.0	500	1163	93.7	80 - 120	1634	0.13	20	

MSD Sample ID: **HS19060224-03MSD** Units: **mg/L** Analysis Date: **11-Jun-2019 16:00**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118833** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	108.4	5.00	100	12.57	95.8	80 - 120	108.2	0.157	20	
Sulfate	338.1	5.00	100	245	93.1	80 - 120	337.8	0.0846	20	

The following samples were analyzed in this batch: HS19051863-01

ALS Houston, US Date: 17-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
WorkOrder: **HS19051863**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 17-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18/24 GWTP Quaterly Influent
Work Order: HS19051863

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19051863-01	LH18/24-SP140_052919	Login	31/05/2019 11:51:34	PMG	Sub
HS19051863-01	LH18/24-SP140_052919	Login	31/05/2019 11:51:34	PMG	Disposed
HS19051863-01	LH18/24-SP140_052919	Login	31/05/2019 11:51:34	PMG	Disposed
HS19051863-01	LH18/24-SP140_052919	Login	31/05/2019 11:51:34	PMG	Disposed
HS19051863-01	LH18/24-SP140_052919	Login	31/05/2019 11:51:34	PMG	Disposed
HS19051863-01	LH18/24-SP140_052919	Login	31/05/2019 11:51:34	PMG	Disposed
HS19051863-01	LH18/24-SP140_052919	Login	31/05/2019 11:51:34	PMG	Disposed
HS19051863-02	Trip Blank	Login	31/05/2019 11:51:34	PMG	Disposed

ALS Houston, US Date: 17-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19051863
Date/Time Received: **31-May-2019 08:37**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 31-May-2019 Date
Reviewed by: *RJ Modashia* eSignature 31-May-2019 Date

Matrices: **Water**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:none
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.3c U/c	IR11
Cooler(s)/Kit(s):	44407	
Date/Time sample(s) sent to storage:	5/31/19 12:05	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, Tx. 77099 ATTN: RJ Modashia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No.
NWO1312.0150.0
16.0001

Job:
GROUNDWATER TREATMENT PLANT QUARTERLY INFLUENT SAMPLES

Prepared By:
Scott Beesinger

P. O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: ROD Volatiles	Total Metals	Oil & Grease	Chemical Oxygen Demand	Chloride & Sulfate	1, 4 - DIOXANE	Perchlorate				Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP140_052919	Water	05/29/19 / 14:00		4	3		1								HCL	
LH18/24-SP140_052919	Water	05/29/19 / 14:00		1		1									HNO3	
LH18/24-SP140_052919	Water	05/29/19 / 14:00		2					1	1					NONE	
LH18/24-SP140_052919	Water	05/29/19 / 14:00		1				1							H2SO4	
LH18/24-SP140_052919	Water	05/29/19 / 14:00		1							1				NONE	
Trip Blank	Water	05/29/19		2	2										HCL	

Additional Remarks: **STANDARD TURN AROUND TIME**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	05/29/19	14:30									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date
J. Macuna	5/31/19	08.37			

Remarks: Cooler 4407
Temp 2.3
VOA's CF-0.1

HS19051863
Bhate Environmental Associates, Inc.
LHAAP 18/24 GWTP Quaterly Influent

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44407

CUSTODY SEAL

Date: 5/24/19 Time: 1400
Name: Scott Beesinger
Company: BHATE

Seal Broken By: SM
Date: 05/31/19

44407 MAY 31 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

44407

917 B03 1 10:30 A

ORIGIN ID 8290 830-6193
SCOTT BEESI 05-31 ASSOCIATES
BHATE ENVIRO AVE. PM8202
1203-B EAST GR
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 21SEP18
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP 58 - RJ
RMA:

FedEx Express

TRK# 4380 9532 8290
RETURNS MON-SAT
PRIORITY OVERNIGHT

77099

FedEx
TRK# 4380 9532 8290
FRI 31 MAY 10:30A
PRIORITY OVERNIGHT

AB SGRA
77099
TX-US
IAH

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1915802, 1915803, 1915852, 1916229; 1916231; 1916232

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2261 (241120)

General Set Information: There were six field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 657797) was less than 1/2 the CRDL. The recovery for the LCS (657798) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Thomas Bosch June 12, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: June 13, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1915852**
Project ID: HS19051863
Purchase Order: HS19051863
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP140_052919	1915852001	05/29/19	06/01/19	

ANALYTICAL REPORT

Workorder: 34-1915852
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP140_052919**	Sampling Site: NA	Collected: 05/29/2019
Lab ID: 1915852001	Media: 125 mL Nalgene	Received: 06/01/2019
Matrix: Water	Sampling Parameter: NA	

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:** LCMS04
	Batch: ELMS/2261 (HBN: 241120)	**Percent Solid:** NA
	Analyzed: 06/11/2019 10:38	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**4900**	1000	2000	4000	1000	

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 06/12/2019 12:46	/S/ Stephen Brose 06/13/2019 10:59

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1915852
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1915852

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2261 (HBN: 241120)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 657797
Analyzed: 06/11/2019 09:31
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 657798
Analyzed: 06/11/2019 09:04
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.34	4.00	109	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1915802001	**MS:**	657799	**MSD:**	657800
Analyzed:	06/11/2019 09:45	**Analyzed:**	06/11/2019 09:58	**Analyzed:**	06/11/2019 10:12
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.57	4	114	78.8	123.8	4.78	120	4.65	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 06/12/2019 12:47	/S/ Stephen Brose 06/13/2019 10:59

Symbols and Definitions

✱ - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

10450 Stancliff Rd, Ste 210
Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Colorado**

COC ID: **11500**

18698/# 2 1915852

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19051863
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19051863-01**	**LH18/24-SP140_052919**	**Groundwater**	**29 May 2019 14:00**
	SUB_Perch-6850			14 Jun 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 5/31/19 1800

Received By: _____ Date/Time: 6/1/19 852

Cooler ID(s): 9459 Temperature(s): 2.

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19051863	***Split:***	**Workorder ID:** 1915852	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	05/29/2019 00:00	LH18/24-SP140_052919	1915852001		Water	A	1	A
2								
3								
4								
5								
6								
7								
8								
9								
10								

COOL

46 of 120

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Coates, Gayleen	06/01/2019 08:52	ALS Sample Receiving	Sample Login
R.33.1	6.3.19 1505	13B	STORAGE
	6.11.19/08.00	T. Bosch	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ **Lab Notebook No.:** _____

Prepared / Analyzed by: _____ **Date / Time:** _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00939400

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: _____

Date/Time of Receipt: 6/1/19 852

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Cooler/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9459	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: _____ (Signature) _____ (Printed Name) 6/1/19 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

Must Deliver Next Business Day
Time and Tempature Sensitive!

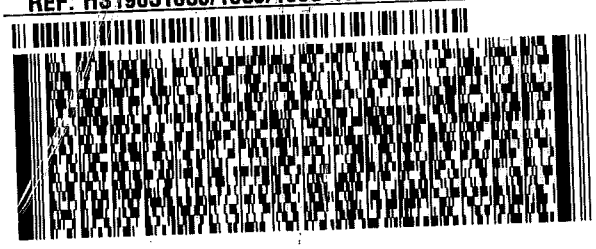
ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 31MAY19
ACTWGT: 8.90 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19051856/1859/1863 - RJ



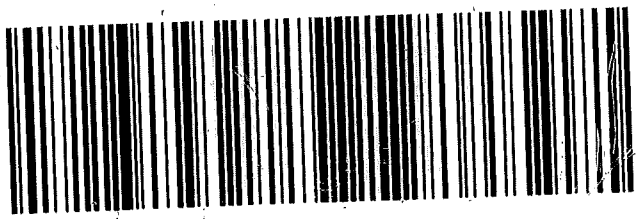
FedEx Express

SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 0201 4809 7834 6651

XO BTFA

84123
UT-US SLC



Batch Worklist

Batch: ELMS/ 2261 **Created:** 6/11/2019 07:45 **Instrument:** **HBN:** 241120

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1915802 [ENV_LVL4]
Workorder: 1915803 [ENV_LVL4]
Workorder: 1915852 [ENV_LVL4]
Workorder: 1916229 [ENV_LVL4]
Workorder: 1916231 [ENV_LVL4]
Workorder: 1916232 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	657794	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	
2	657795	RLVS for HBN 241120 [ELMS/2261				RLVS	3		E685041C3Q	5311		6/13/2019	
3	657796	ICS for HBN 241120 [ELMS/2261]				ICS	3		E6850..D3Q	5311		6/13/2019	
4	657797	LMB for HBN 241120 [ELMS/2261]				LMB	3		E6850Q413Q	5311		6/13/2019	
5	657798	LCS for HBN 241120 [ELMS/2261]				LCS	3		E6850Q413Q	5311		6/13/2019	
6	1915802001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915802001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
7	657799	LH18/24-SP650...(1915802001MS)				MS	3		E6850Q413Q	5311		6/13/2019	
8	657800	LH18/24-SP65...(1915802001MSD)				MSD	3		E6850Q413Q	5311		6/13/2019	
9	1915803001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915803001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
10	1915852001	LH18/24-SP140_052919				SAMPLE	3	1915852001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
11	1916229001	LH18/24-SP140_060419				SAMPLE	3	1916229001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
12	1916231001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916231001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
13	1916232001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916232001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
14	657801	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1915802 (001), 1915803 (001), 1915852 (001), 1916229 (001); 1916231 (001); 1916232 (001) ELMS Batch/HBN ID: 2261 (241120)
Prep Date: 06/11/2019 Analysis Date: 06/11/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\11JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 657798; Target = 4.0µg/L. ASTM type II water was used for LMB 657797.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\241120-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2261 HBN: 241120 Sample Set IDs if Applicable: 1915802/1915803/1915852 1916229/1916231/1916232	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	Created By: Thomas Bosch	Amount: 25 mL
MFG: ALS/SLC	Create Date: 09/20/2018 09:09AM	Expires: 09/20/2019
MFG Lot: TNB: 05/09/2018	Verified By: Thomas Bosch	Usable: Yes
Pipette ID: Not Provided	Verify Date:	Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED TESTING LABORATORY

ISO 9001 Registered Quality System – TUV USA

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: JCC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

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www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	657794 CCV@25	Vial 71	1	Control	1	1.90258e6	8.986	26.94929
*	657798 QC@4.0	Vial 72	1	Control	2	3.85542e5	8.884	4.34115
*	657796 ICS@4.0	Vial 73	1	Control	3	2.32261e5	8.623	3.98229
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	1.46622e5	8.522	4.56740
*	657800 158021D	Vial 77	1	Sample	7	1.54646e5	8.528	4.78474
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	3.32187e5	9.077	4885.02369
*	1916229001 1K	Vial 80	1	Sample	10	4.13979e5	9.091	6820.05588
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.42334e6	9.028	25.98075

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	657794 CCV@25	Vial 71	1	Control	1	5.56917e5	9.003	26.60911
*	657798 QC@4.0	Vial 72	1	Control	2	1.22598e5	8.893	4.50107
*	657796 ICS@4.0	Vial 73	1	Control	3	7.62920e4	8.637	4.24932
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	5.01097e4	8.545	5.09575
*	657800 158021D	Vial 77	1	Sample	7	5.24358e4	8.548	5.30516
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	1.07205e5	9.093	5161.49233
*	1916229001 1K	Vial 80	1	Sample	10	1.30297e5	9.110	7096.69575
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	4.26237e5	9.042	26.20612

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	657794 CCV@25	Vial 71	1	Control	1	2.13798e5	9.004	5.00000
*	657798 QC@4.0	Vial 72	1	Control	2	2.91481e5	8.904	5.00000
*	657796 ICS@4.0	Vial 73	1	Control	3	1.92225e5	8.645	5.00000
*	657797 LMB	Vial 74	1	Control	4	3.01884e5	9.082	5.00000
*	1915802001	Vial 75	1	Sample	5	1.12941e5	8.589	5.00000
*	657799 158021S	Vial 76	1	Sample	6	1.05110e5	8.545	5.00000
*	657800 158021D	Vial 77	1	Sample	7	1.05604e5	8.552	5.00000
*	1915803001	Vial 78	1	Sample	8	1.14182e5	8.546	5.00000
*	1915852001 1K	Vial 79	1	Sample	9	2.21981e5	9.097	5000.00000
*	1916229001 1K	Vial 80	1	Sample	10	1.95450e5	9.116	5000.00000
*	1916231001	Vial 81	1	Sample	11	1.33828e5	8.518	5.00000
*	1916232001	Vial 82	1	Sample	12	1.27034e5	8.502	5.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.66287e5	9.054	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

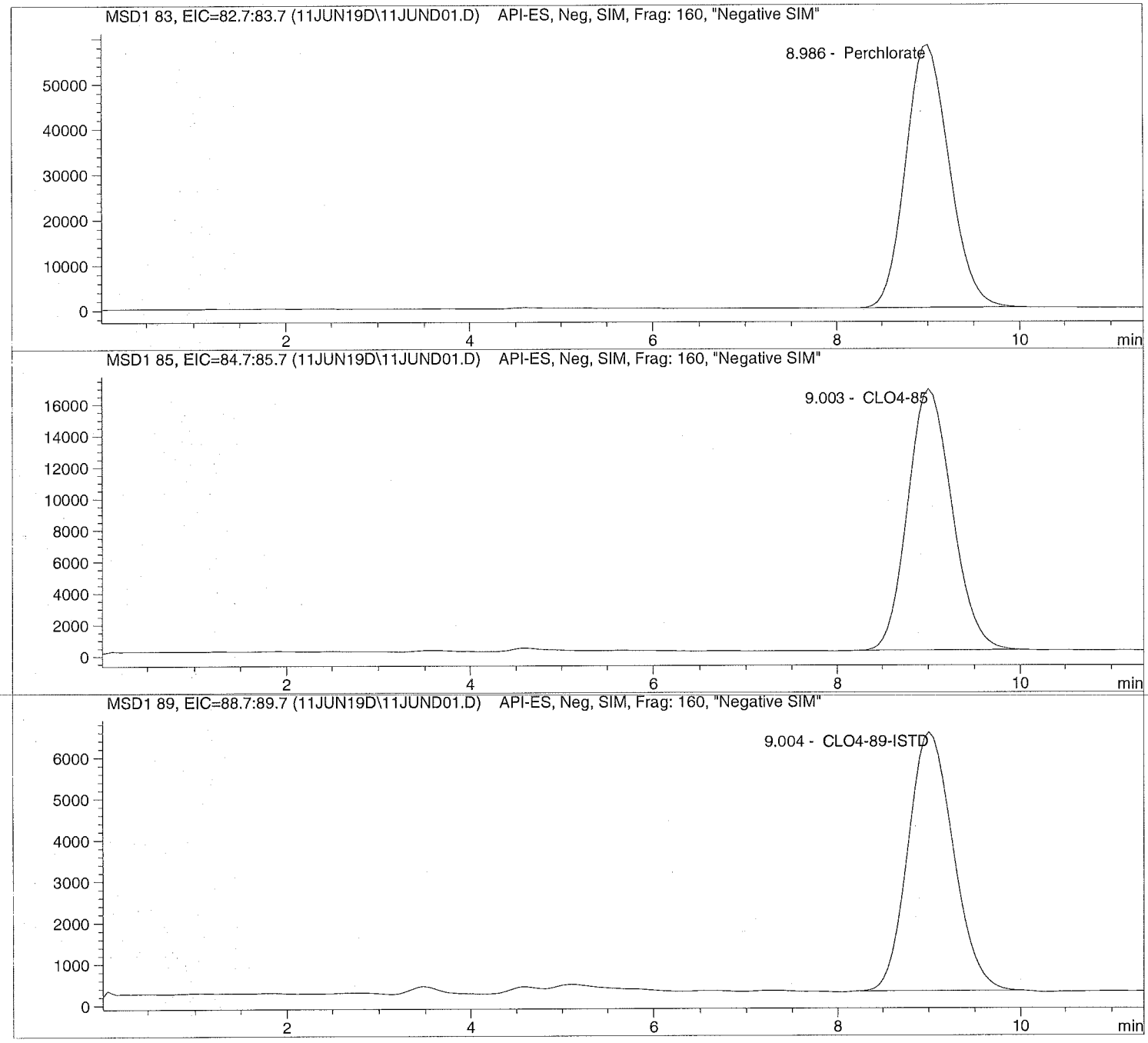
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	657794 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	657798 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	657796 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	657797 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1915802001	CLO4-AQN	1	Sample		
6	Vial 76	657799 158021S	CLO4-AQN	1	Sample		
7	Vial 77	657800 158021D	CLO4-AQN	1	Sample		
8	Vial 78	1915803001	CLO4-AQN	1	Sample		
9	Vial 79	1915852001 1K	CLO4-AQN	1	Sample		
10	Vial 80	1916229001 1K	CLO4-AQN	1	Sample		
11	Vial 81	1916231001	CLO4-AQN	1	Sample		
12	Vial 82	1916232001	CLO4-AQN	1	Sample		
13	Vial 71	657801 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.986	PBA	1902575.4	26.9493	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.003	PBA	556916.8	26.6091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.004	PBA	213798.0	5.0000	CLO4-89-ISTD

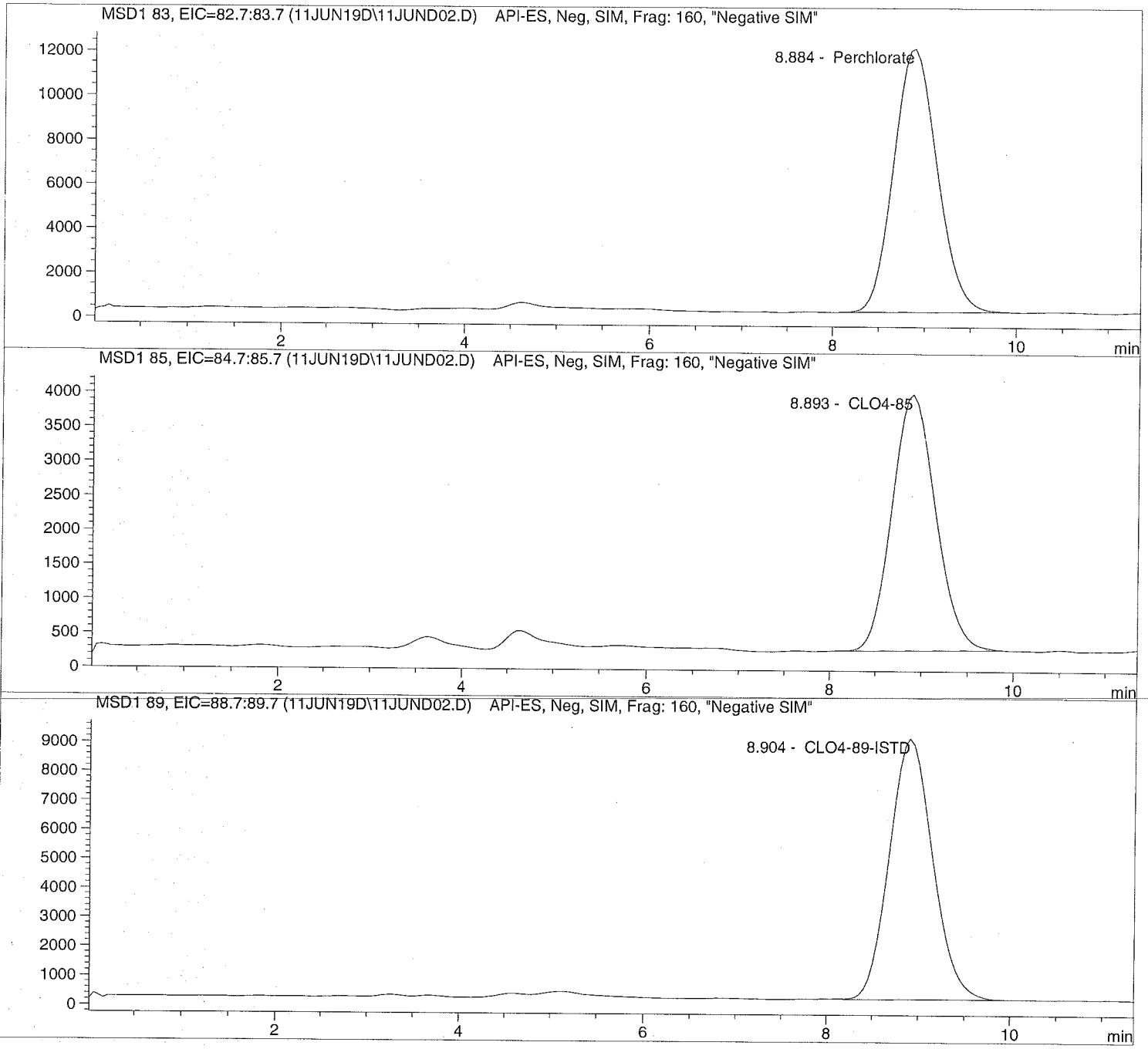
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.884	PBA	385541.7	4.3412	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.893	BBA	122598.4	4.5011	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.904	BBA	291480.6	5.0000	CLO4-89-ISTD

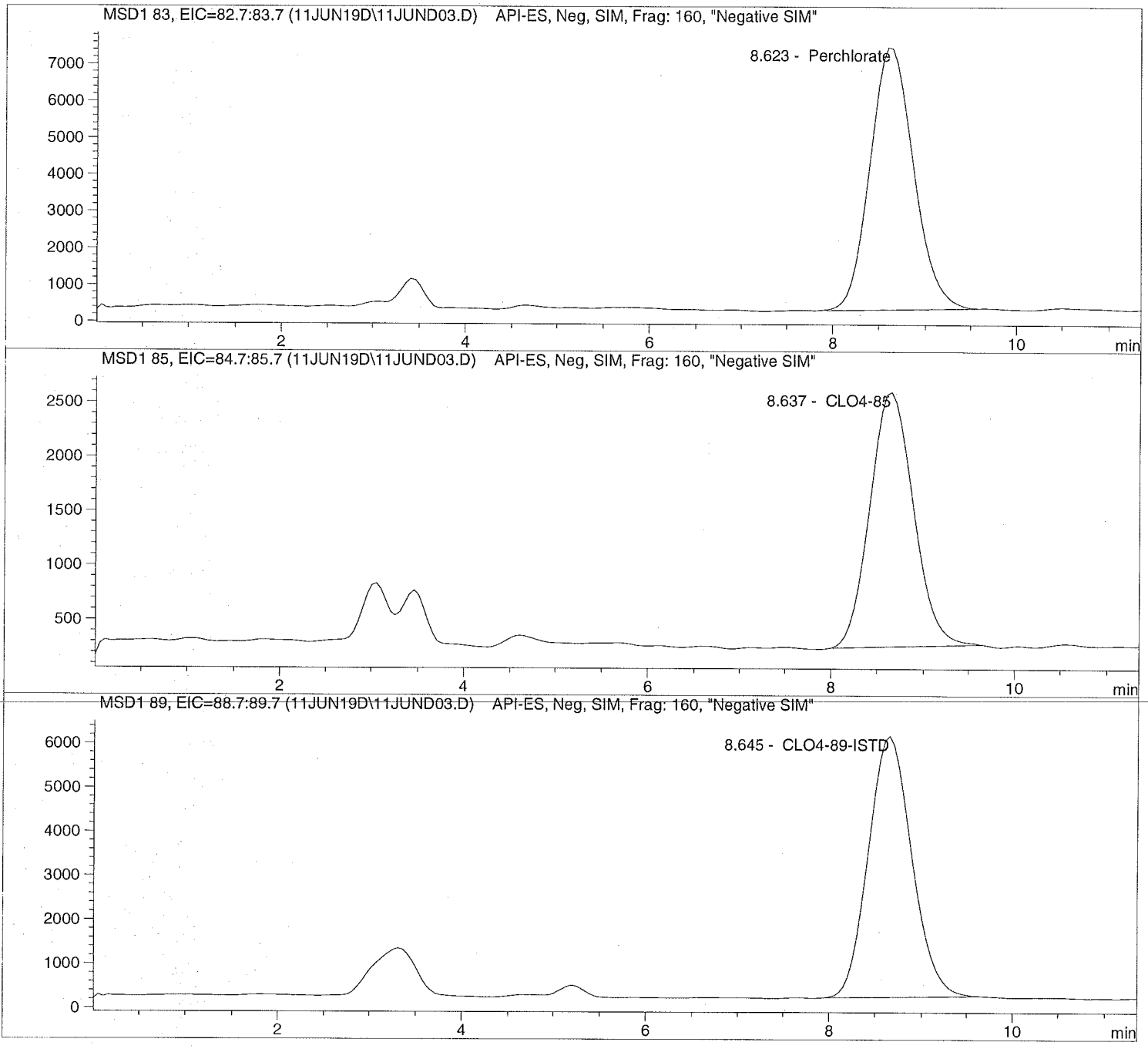
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.623	PBA	232261.2	3.9823	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.637	PBA	76292.0	4.2493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.645	PBA	192224.9	5.0000	CLO4-89-ISTD

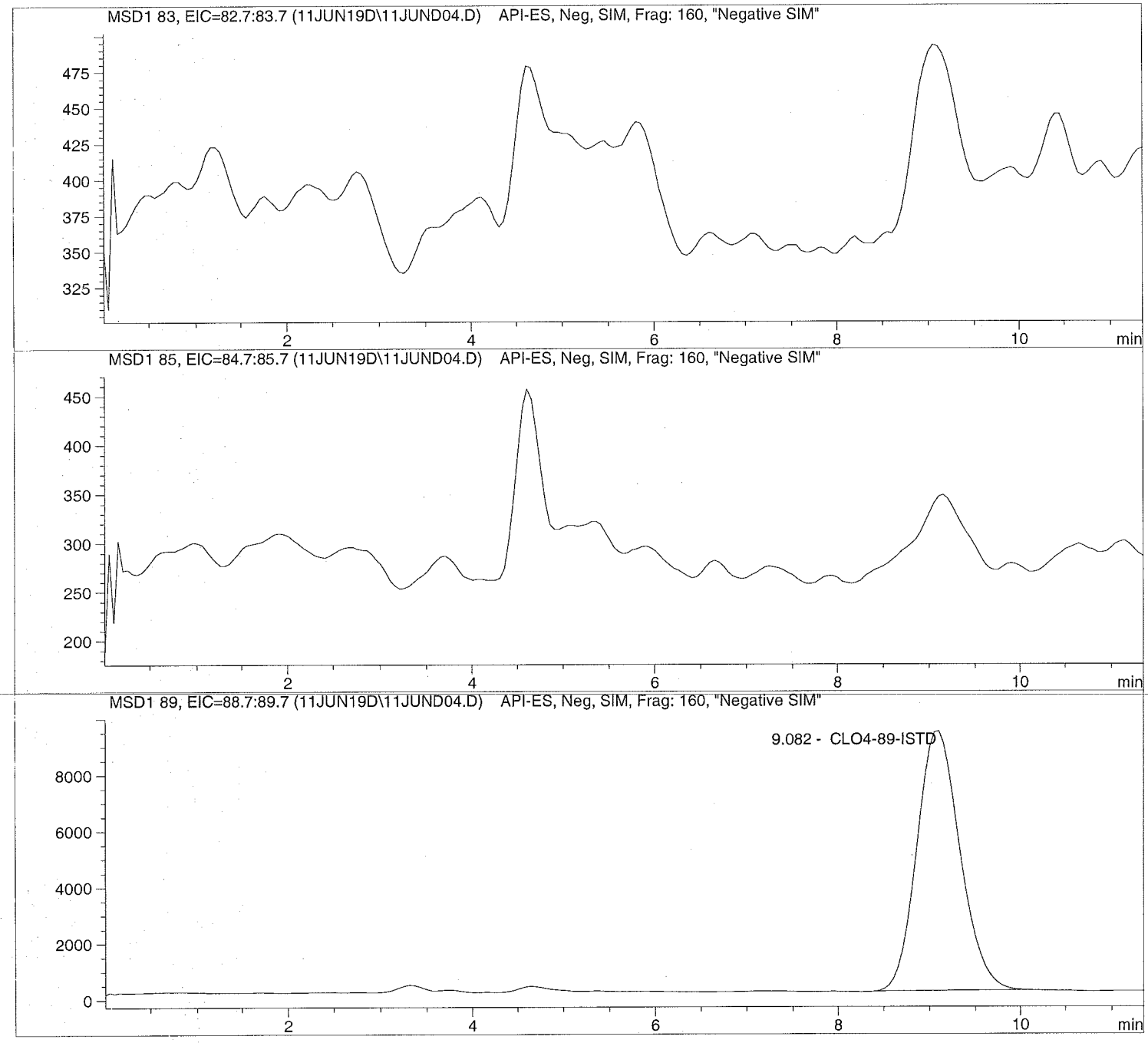
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.082	PBA	301883.5	5.0000	CLO4-89-ISTD

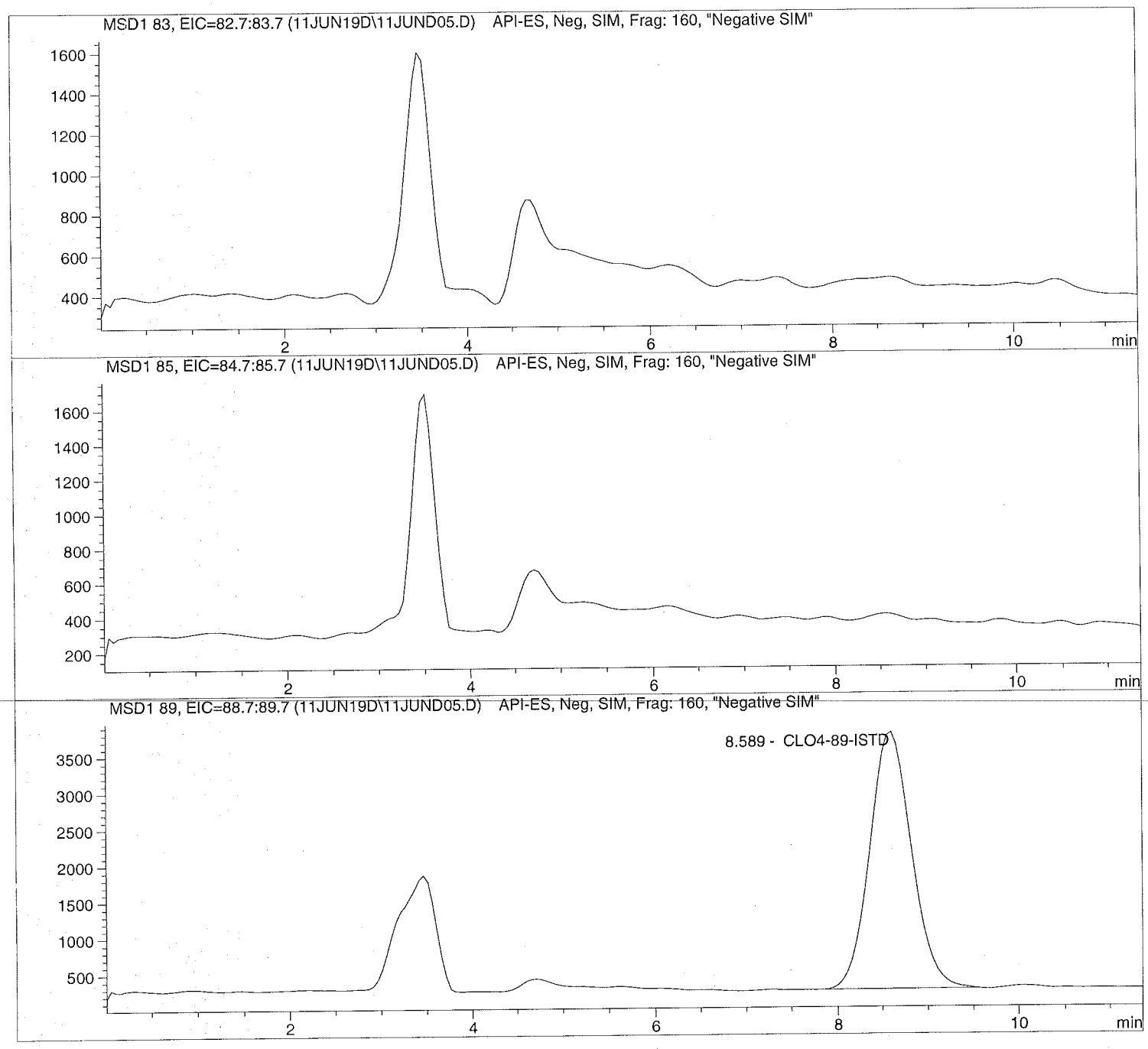
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.589	PBA	112941.5	5.0000	CLO4-89-ISTD

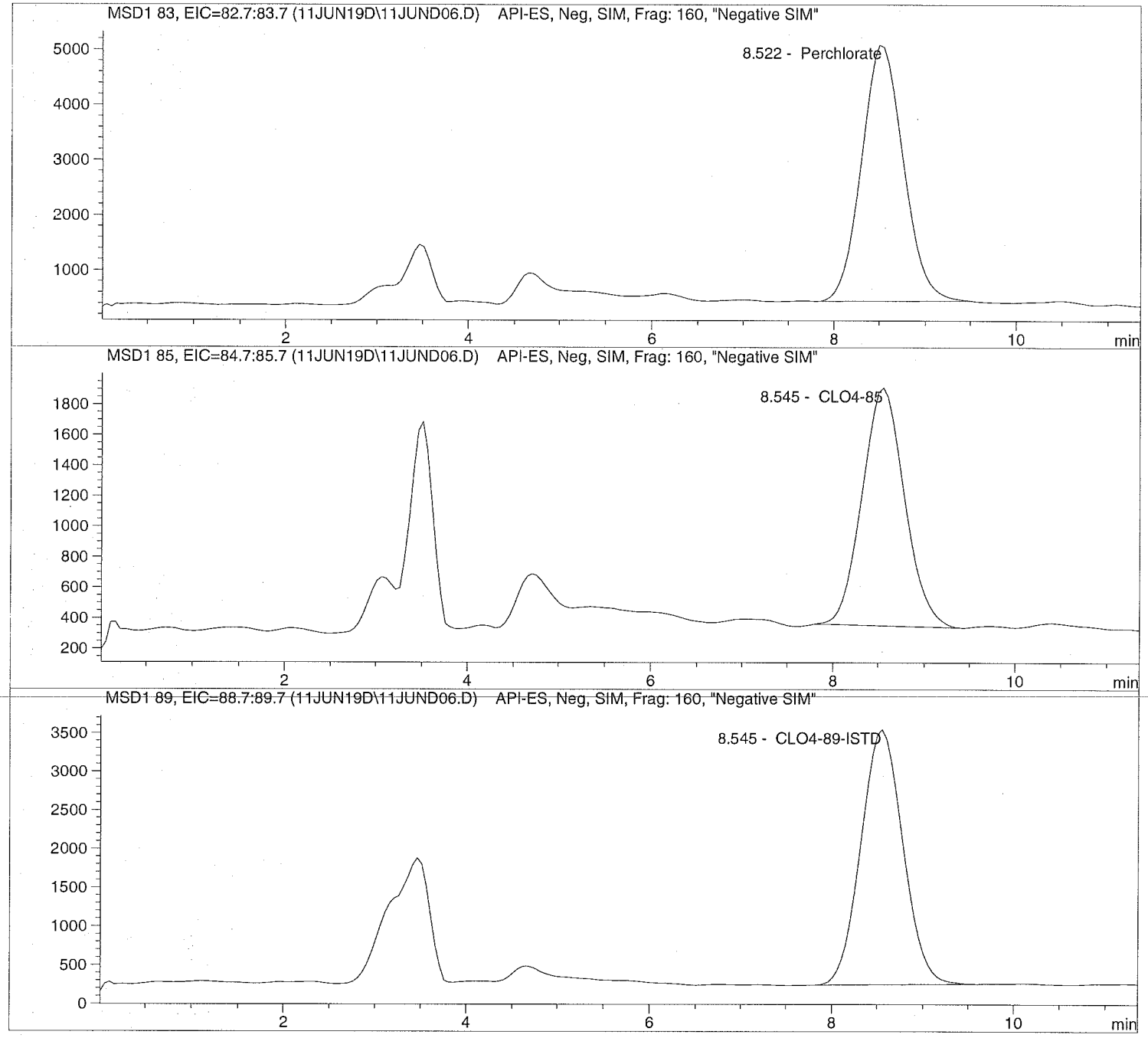
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.522	BBA	146622.1	4.5674	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	50109.7	5.0958	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	105110.4	5.0000	CLO4-89-ISTD

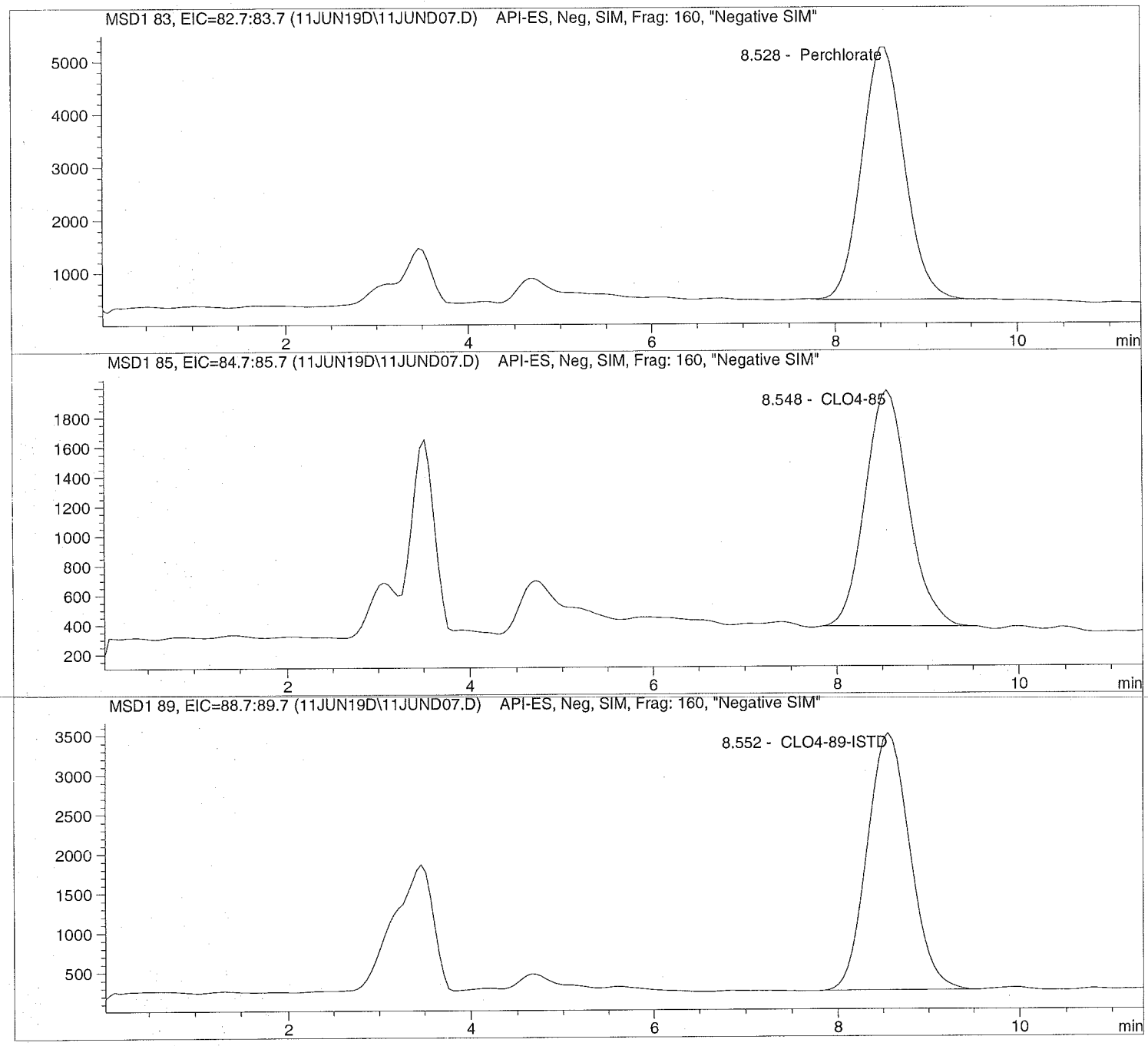
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND07.D Sample Name: 657800 158021D

Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date: 6/11/2019 10:12:09 Seq Line: 7
Sample Name: 657800 158021D Location: Vial 77
Acq Operator: TNB Inj. No.: 1
Inj. Vol.: 35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.528	BBA	154645.8	4.7847	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.548	PBA	52435.8	5.3052	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.552	PBA	105604.1	5.0000	CLO4-89-ISTD

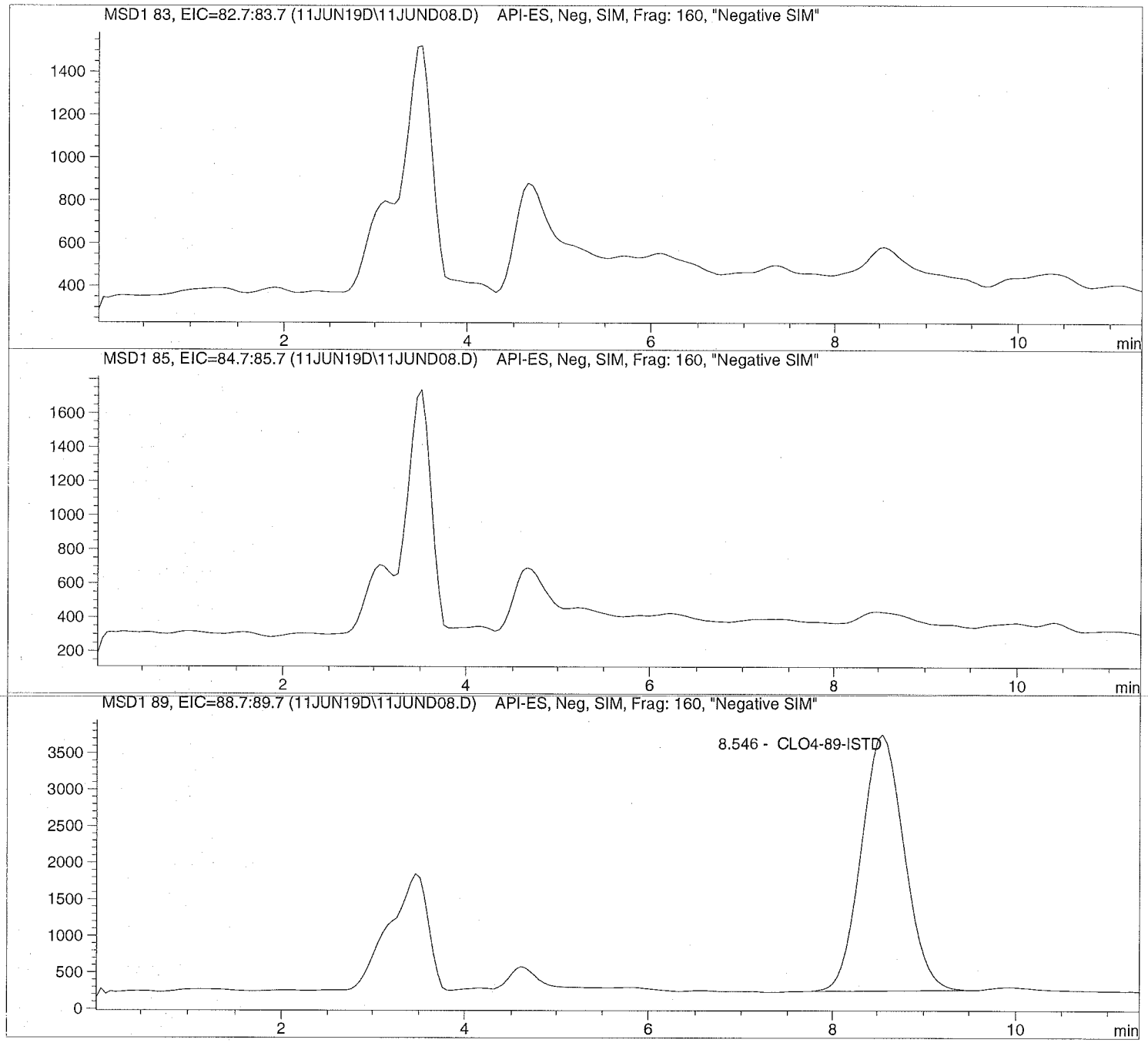
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.546	BBA	114182.4	5.0000	CLO4-89-ISTD

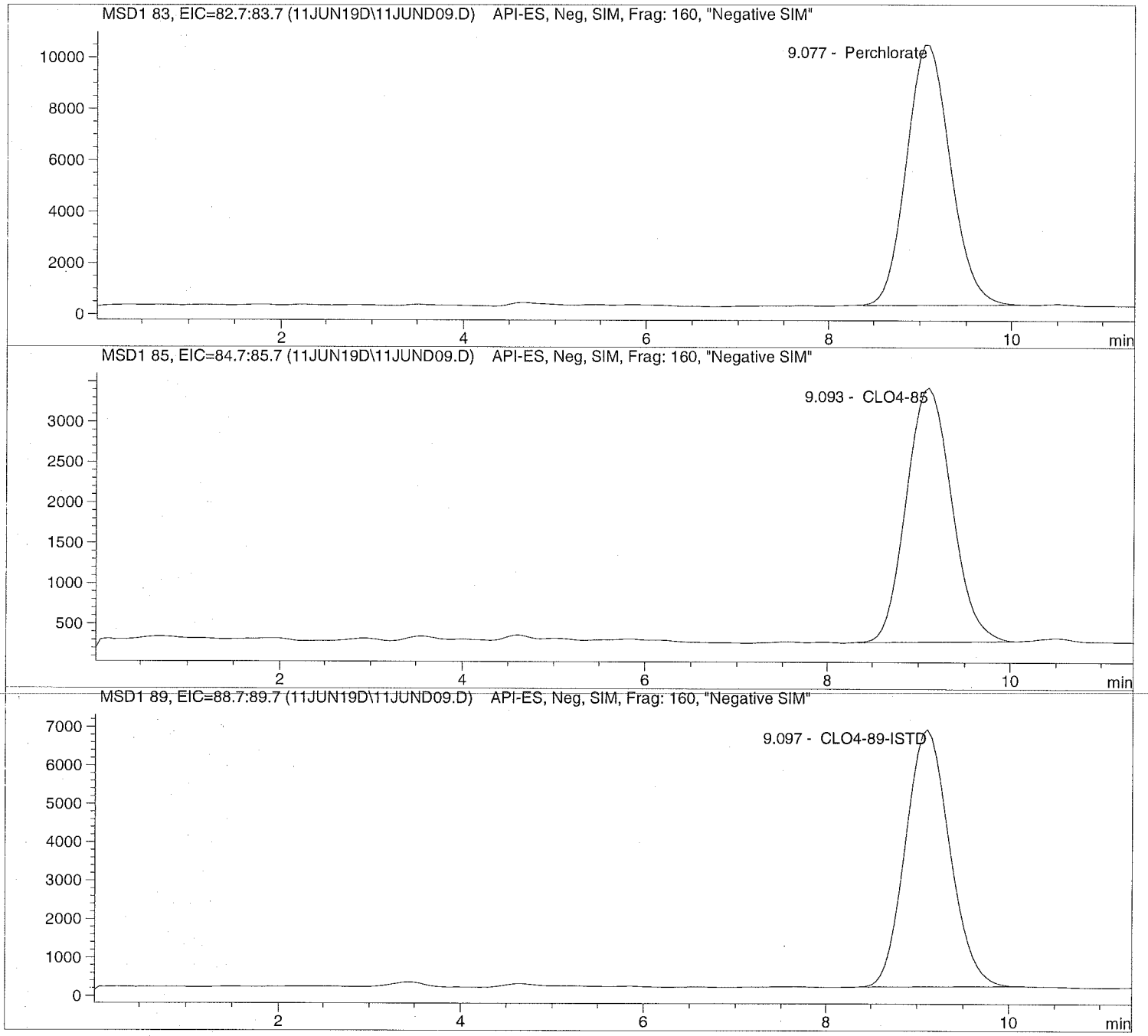
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.077	BBA	332187.1	4885.0237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.093	PBA	107205.2	5161.4923	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.097	PBA	221981.4	5000.0000	CLO4-89-ISTD

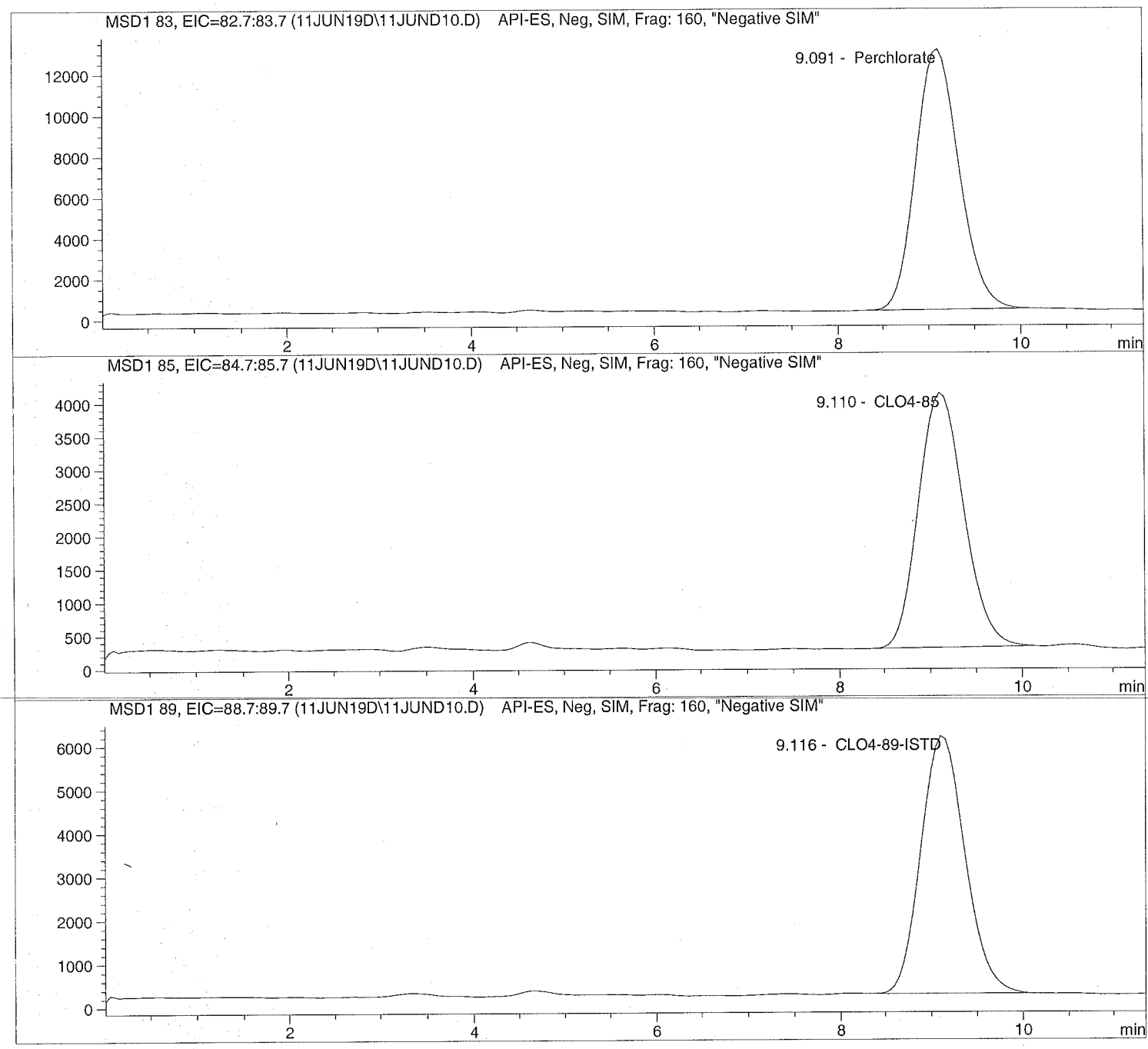
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.091	BBA	413978.8	6820.0559	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.110	PBA	130297.0	7096.6957	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.116	BBA	195449.6	5000.0000	CLO4-89-ISTD

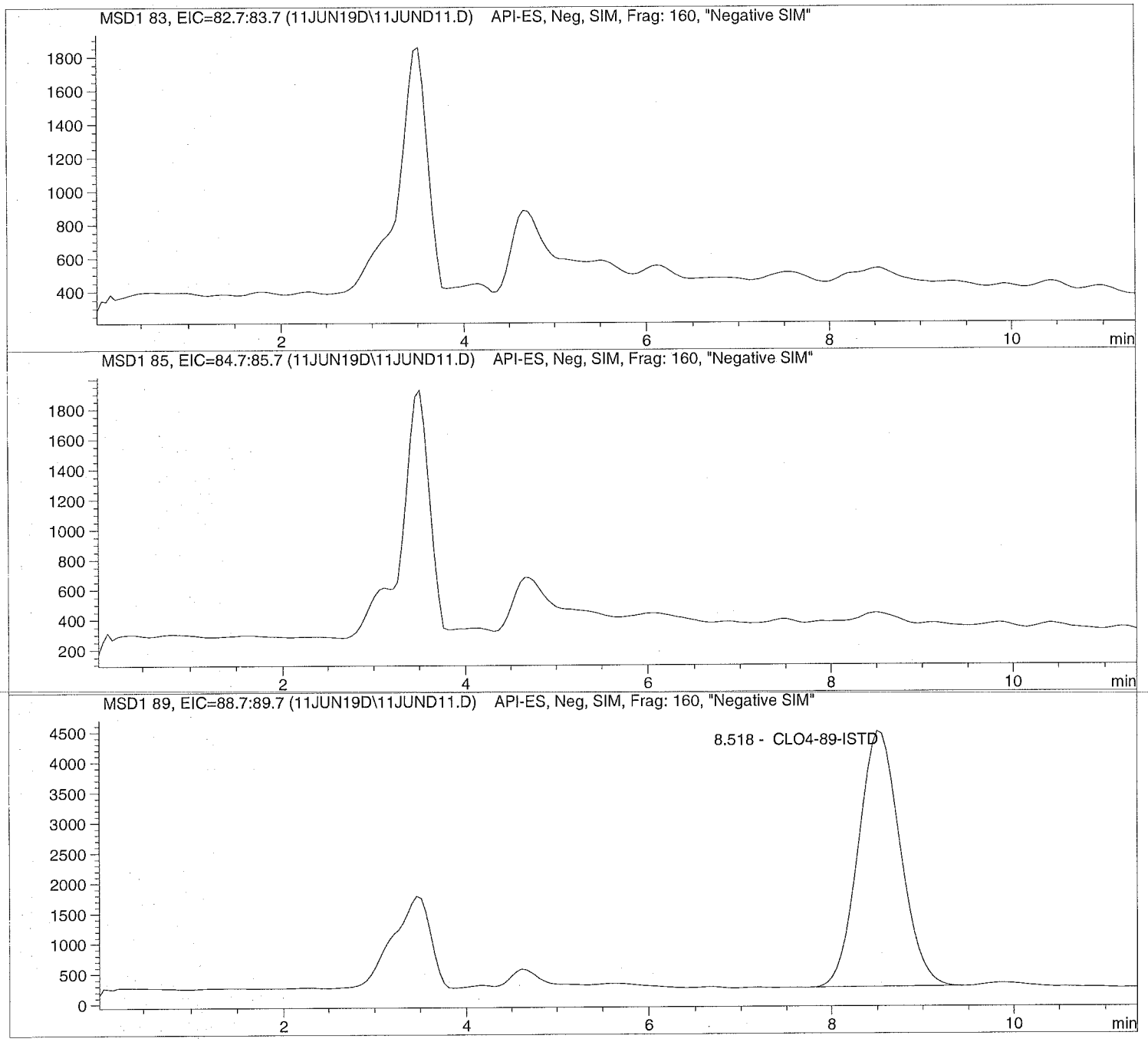
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.518	PBA	133827.9	5.0000	CLO4-89-ISTD

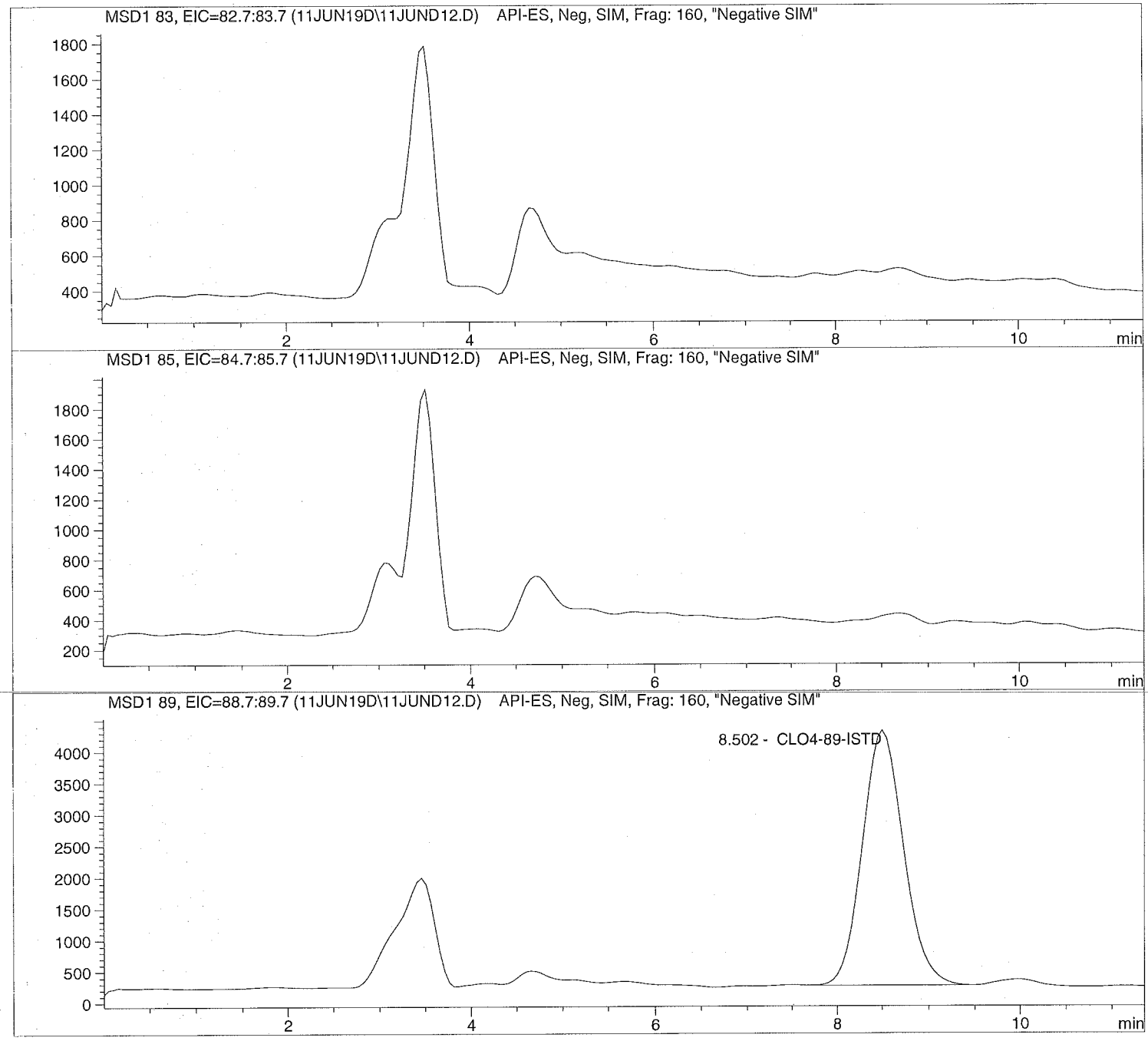
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	BBA	127033.7	5.0000	CLO4-89-ISTD

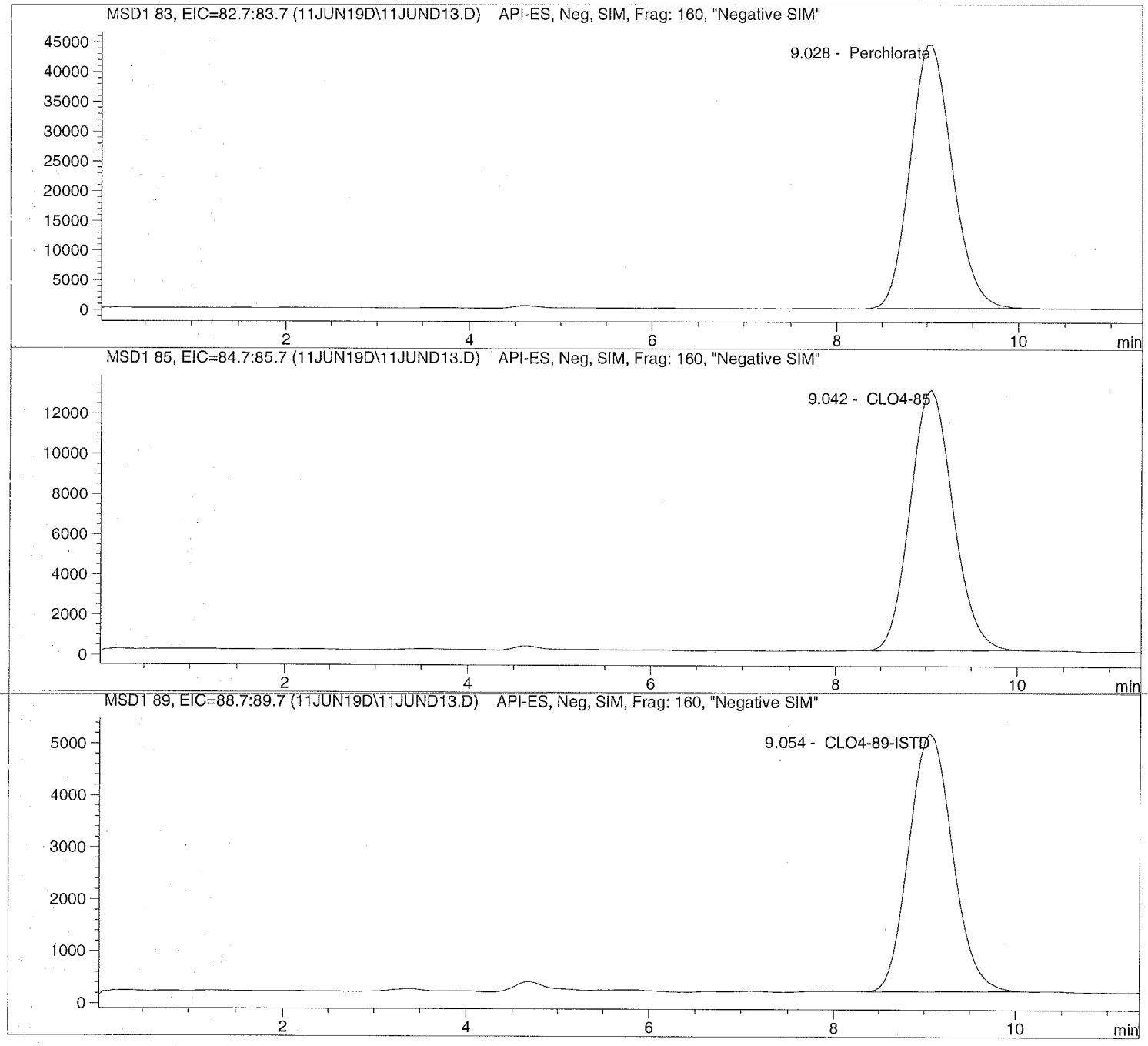
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.028	PBA	1423337.3	25.9807	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.042	BBA	426236.8	26.2061	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.054	BBA	166286.8	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

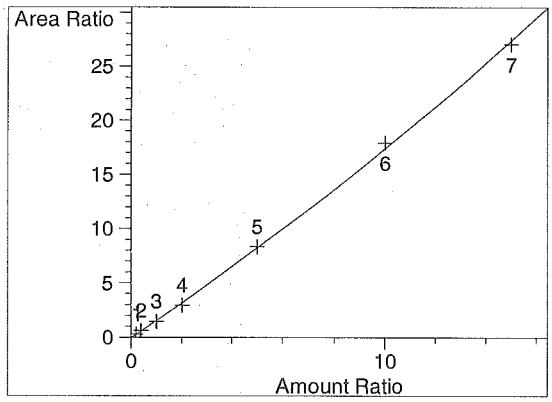
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

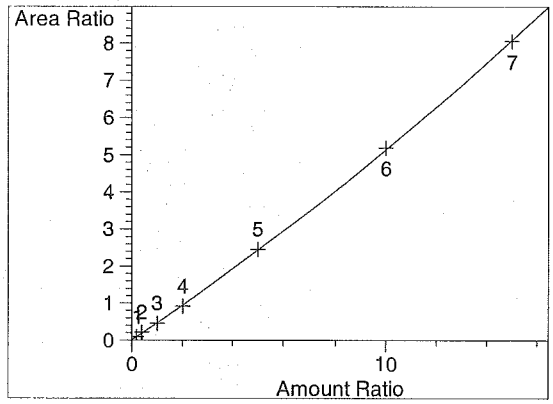
Peak Sum Table

No Entries in table

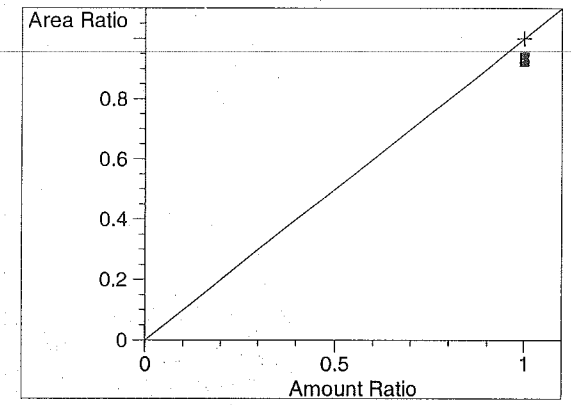
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

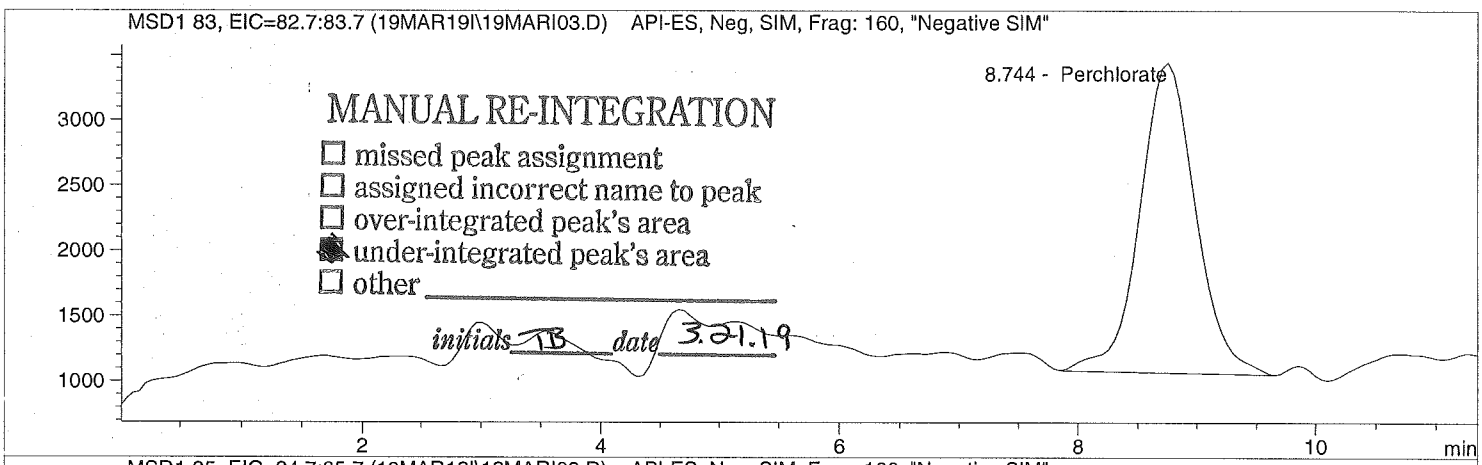
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

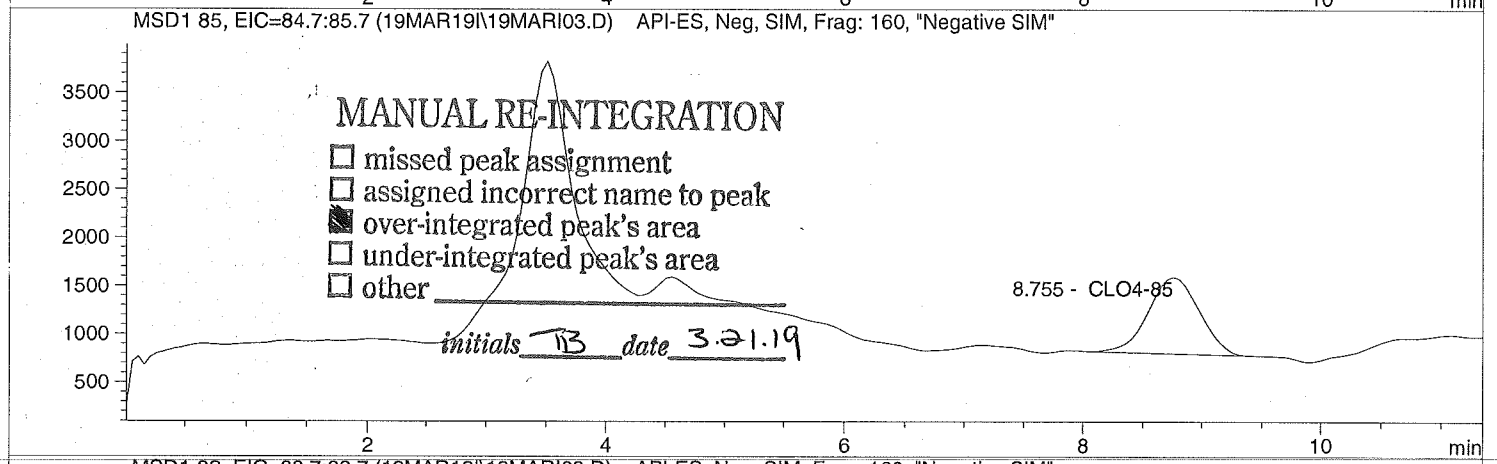
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

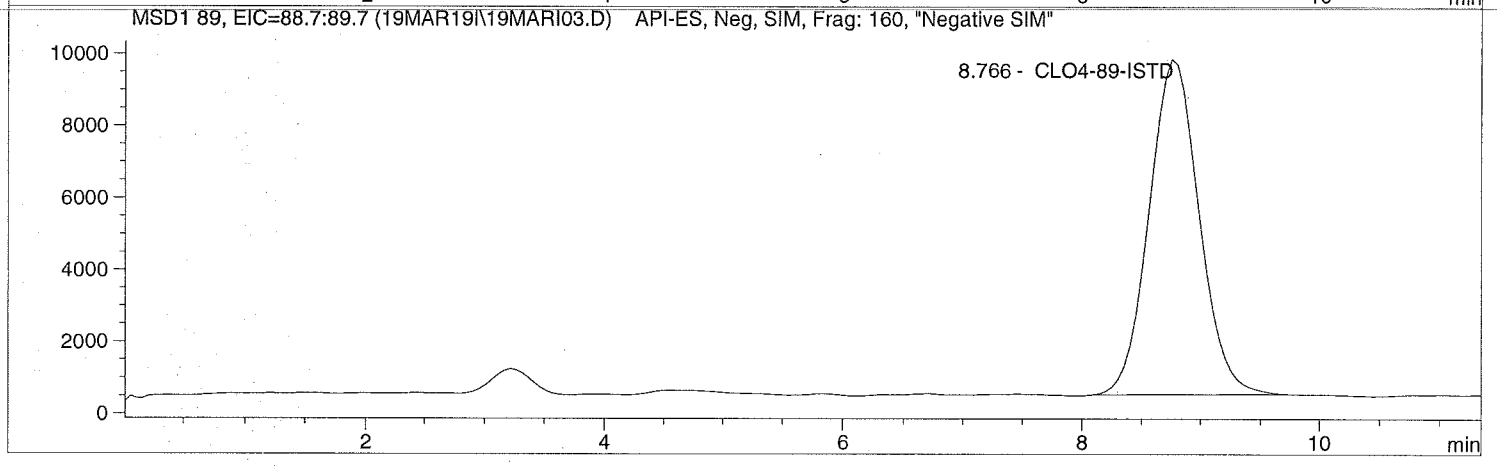
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

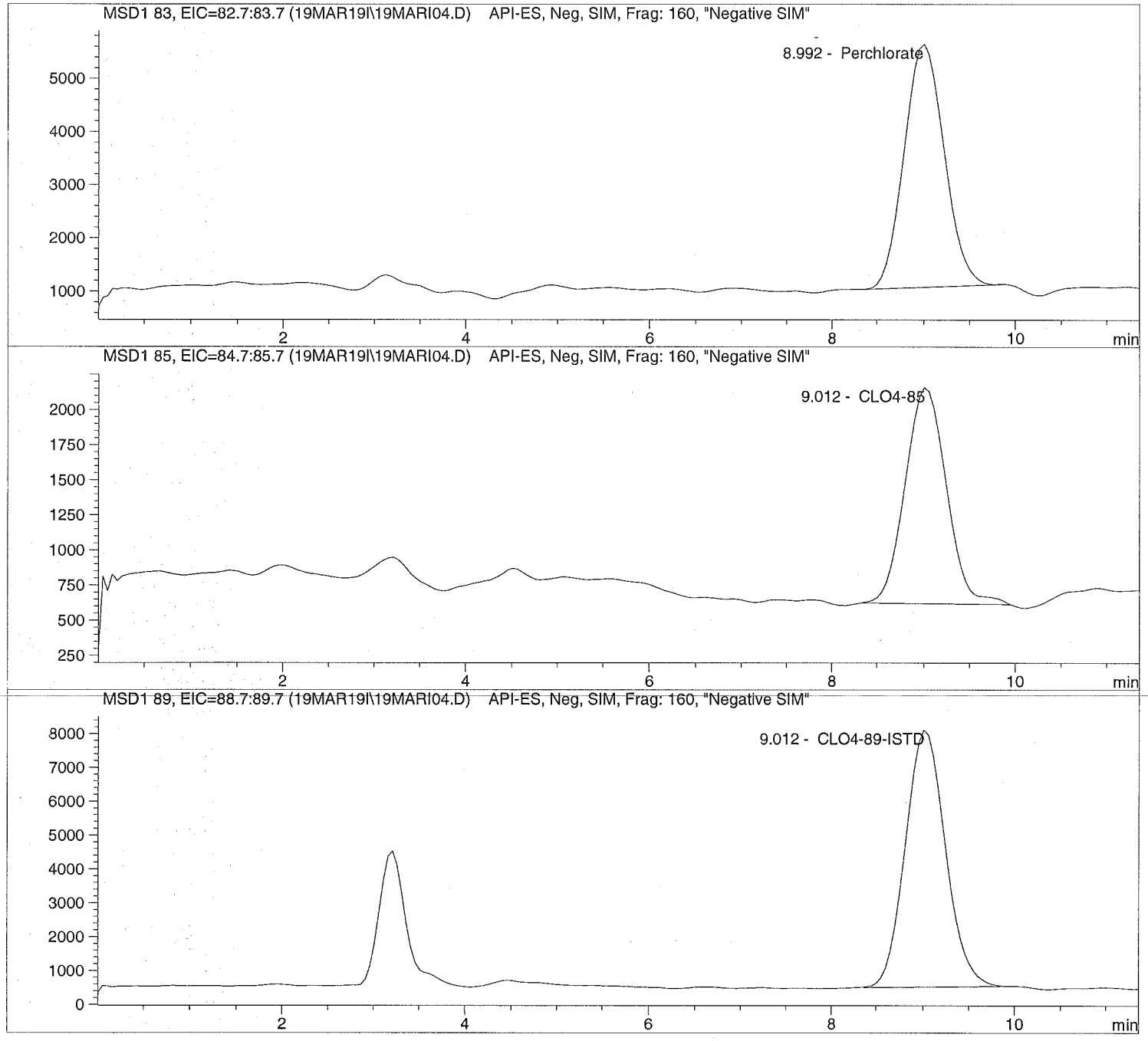
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

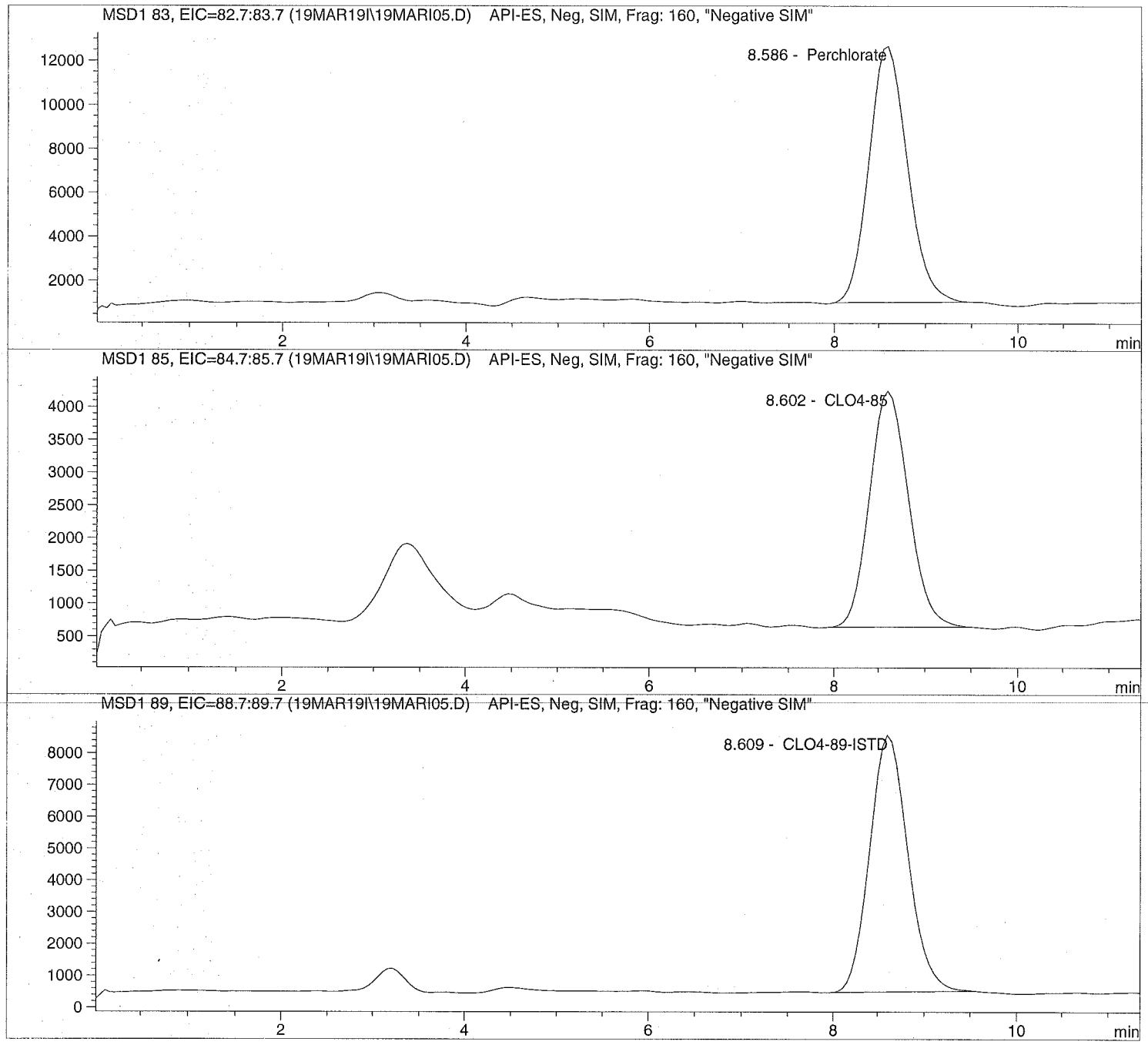
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

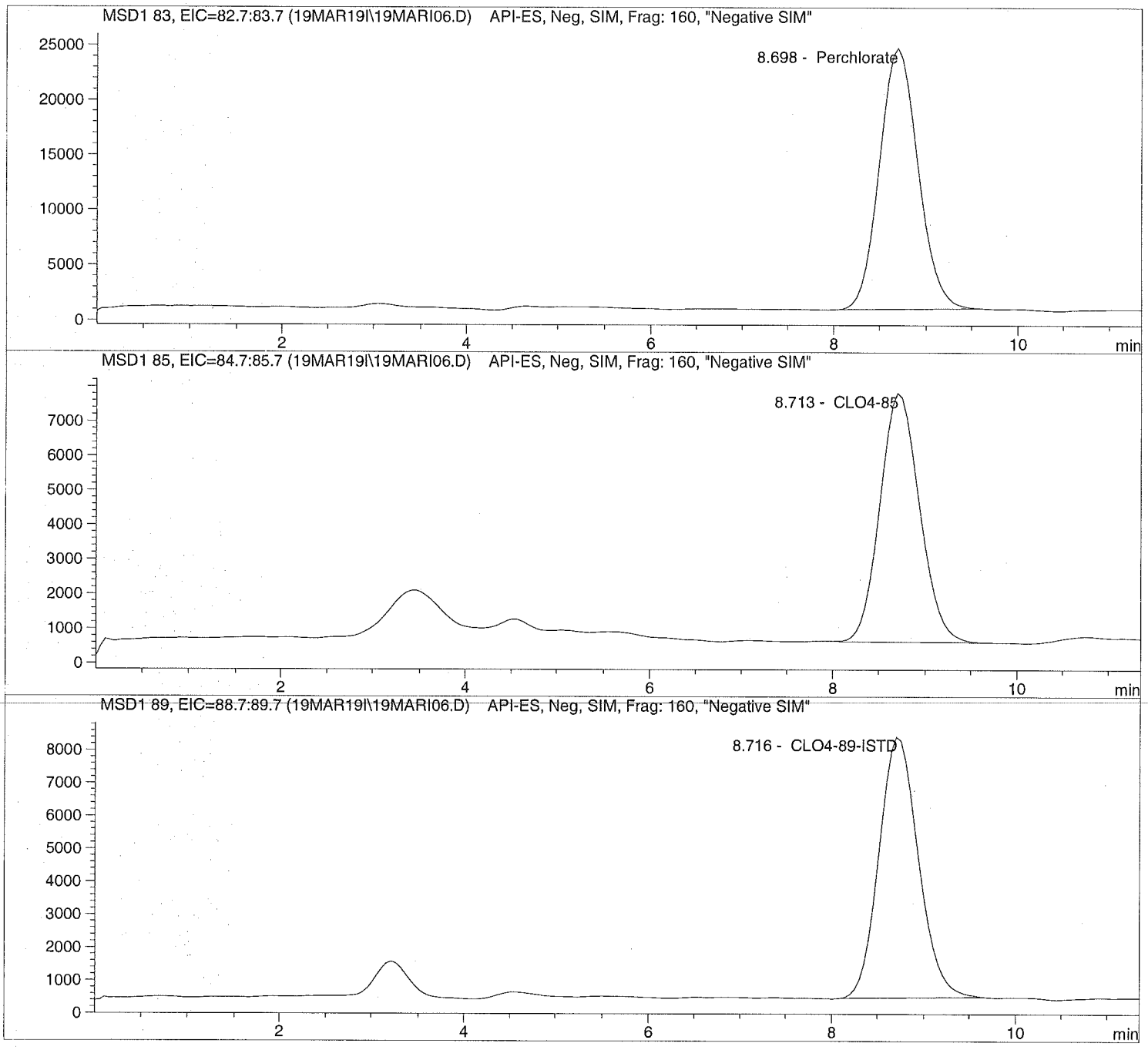
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

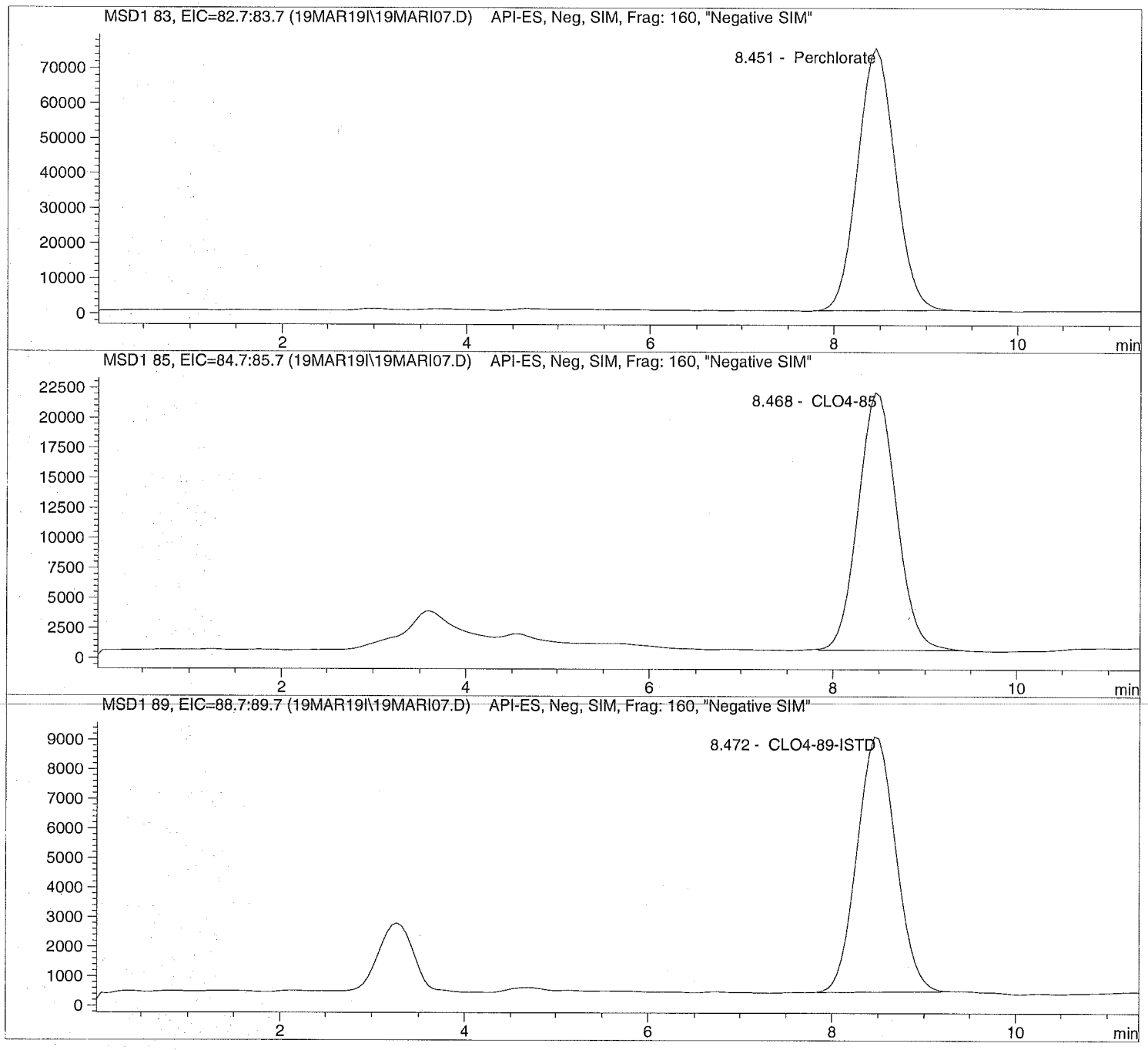
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

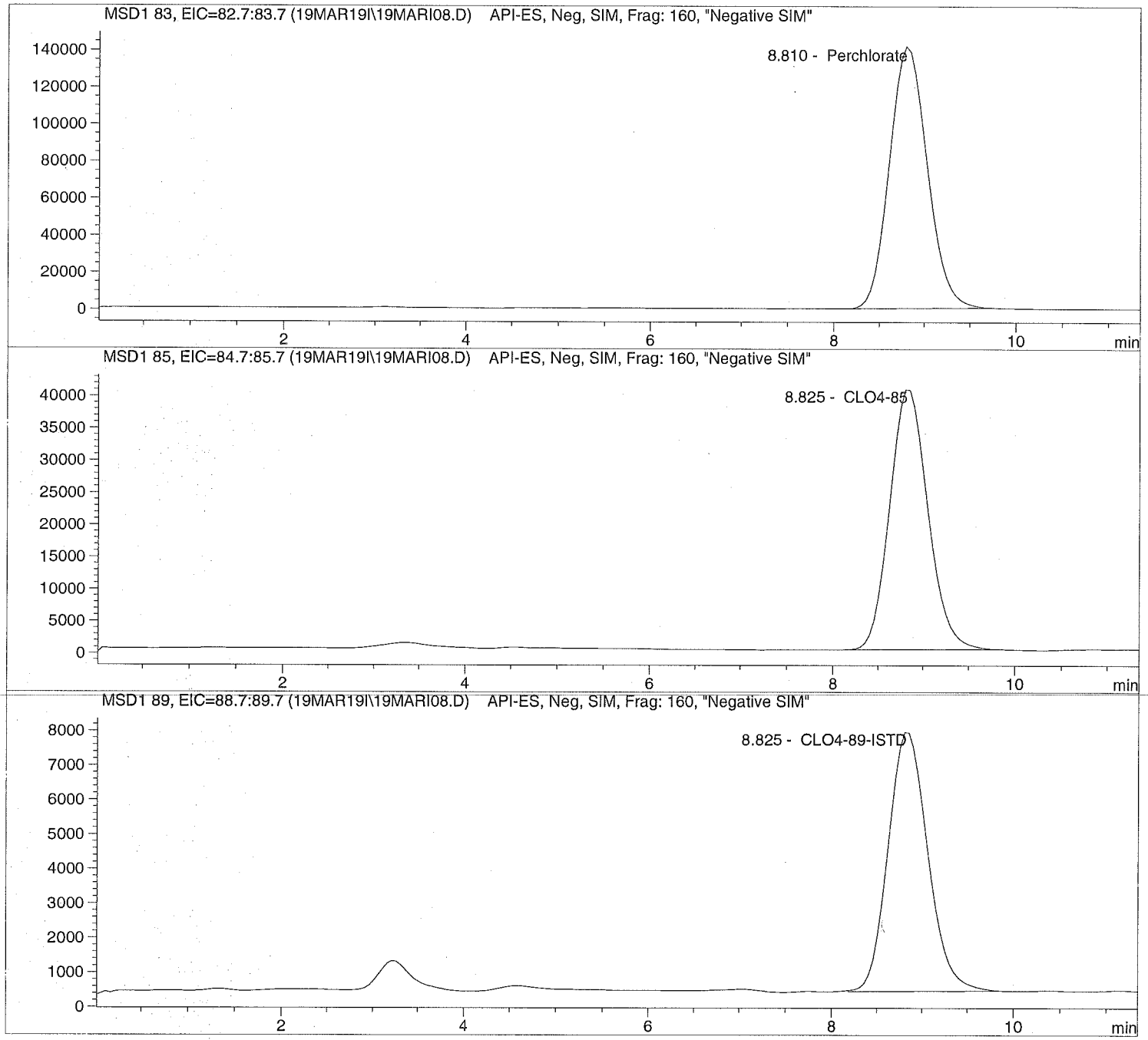
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

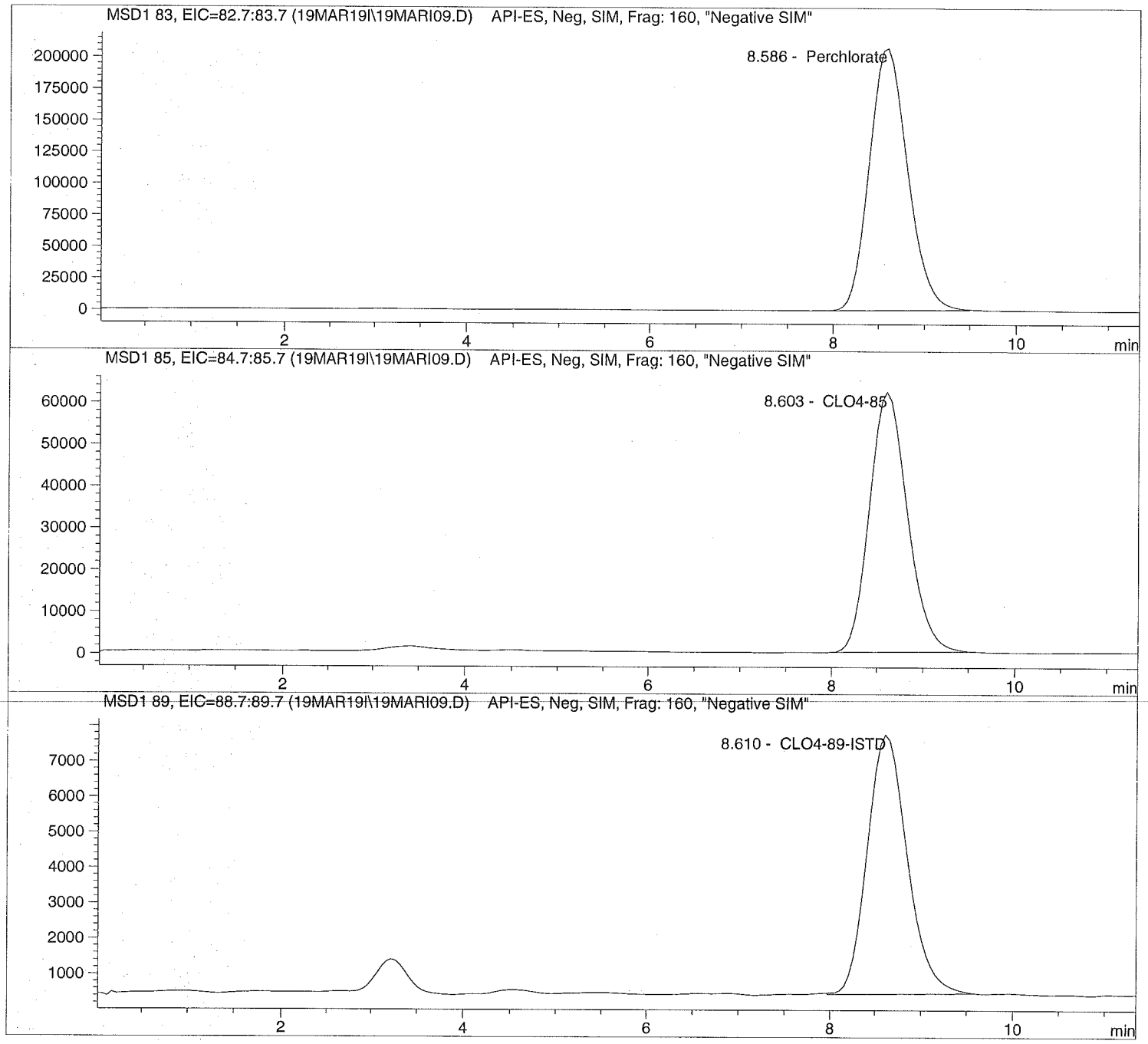
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

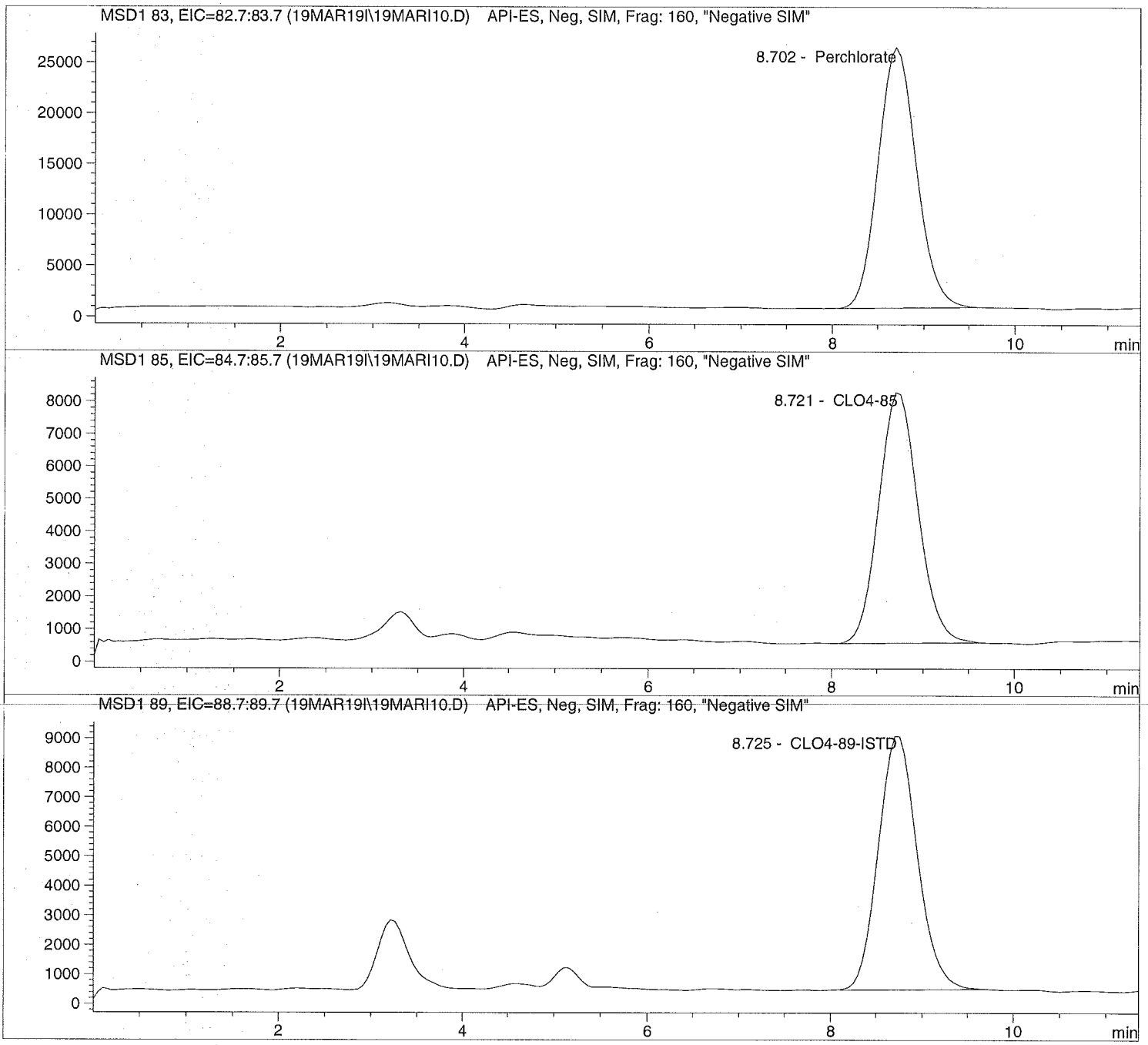
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

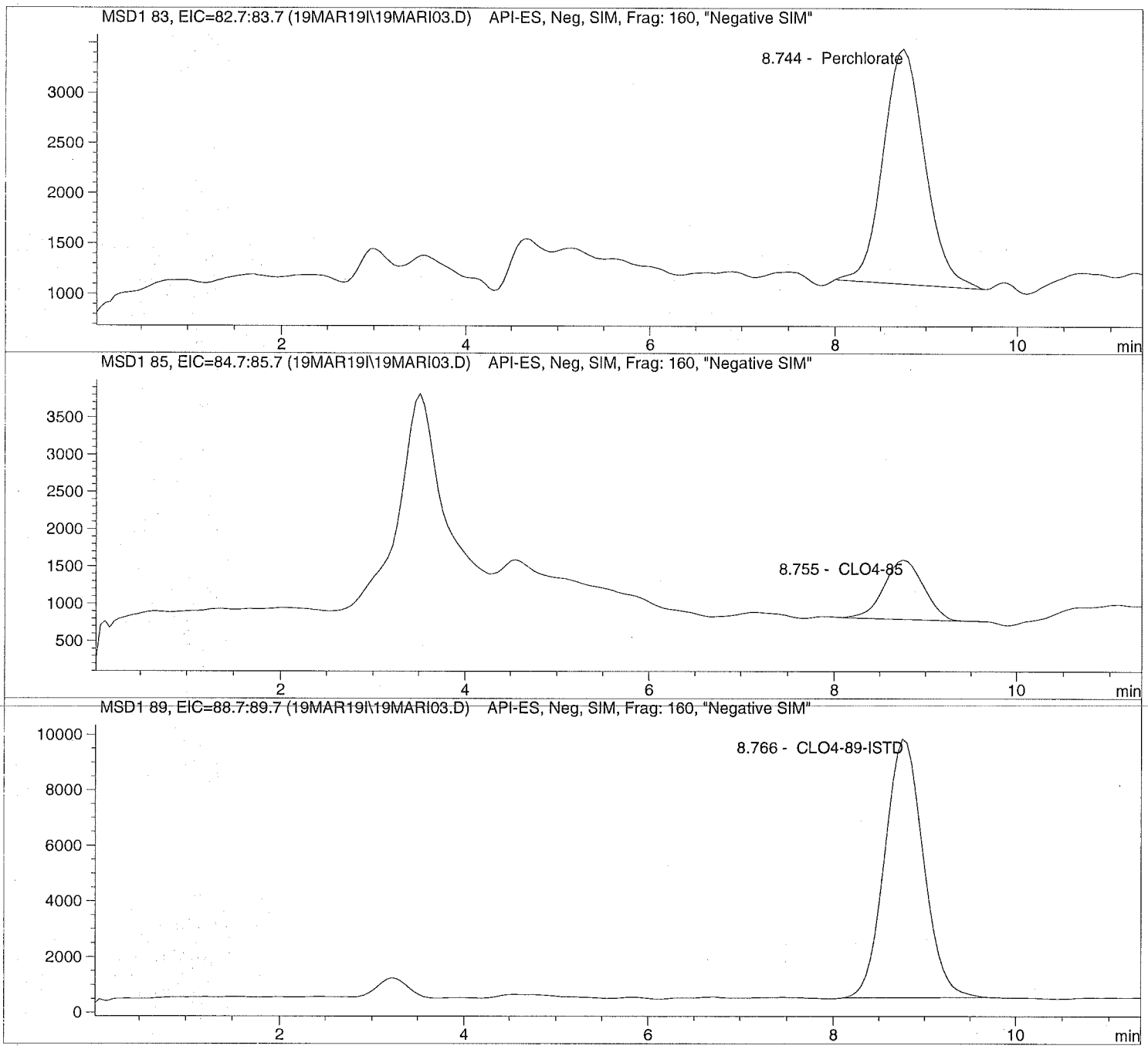
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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June 12, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19051866**

Laboratory Results for: **Longhorn GW Treatment Plant Bi-Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on May 31, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 12-jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19051866

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19051866-01	LH18/24-SP650_052919	Water		29-May-2019 14:00	31-May-2019 08:37	☐
HS19051866-02	Trip Blank	Water	ALS-112818-53	29-May-2019 00:00	31-May-2019 08:37	☐

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19051866

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R339874

Sample ID: HS19051779-01MS

- MS and MSD are for an unrelated sample

WetChemistry by Method SW9056

Batch ID: R340350

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19051866
Sample ID: LH18/24-SP650_052919 Lab ID:HS19051866-01
Collection Date: 29-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 20:15
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	04-Jun-2019 20:15
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	04-Jun-2019 20:15
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 20:15
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	04-Jun-2019 20:15
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19051866
Sample ID: LH18/24-SP650_052919 Lab ID:HS19051866-01
Collection Date: 29-May-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
cis-1,2-Dichloroethene	**2.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Jun-2019 20:15
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	04-Jun-2019 20:15
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 20:15
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 20:15
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 20:15
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Trichloroethene	**0.85**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	04-Jun-2019 20:15
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 20:15
Surr: 1,2-Dichloroethane-d4	*90.0*			**0**	*81-118*	*%REC*	*1*	*04-Jun-2019 20:15*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*04-Jun-2019 20:15*
Surr: Dibromofluoromethane	*93.7*			**0**	*80-119*	*%REC*	*1*	*04-Jun-2019 20:15*
Surr: Toluene-d8	*106*			**0**	*89-112*	*%REC*	*1*	*04-Jun-2019 20:15*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**252**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jun-2019 23:03
Sulfate	**34.0**		**2.00**	**5.00**	**5.00**	**mg/L**	10	11-Jun-2019 23:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19051866
Sample ID: Trip Blank Lab ID:HS19051866-02
Collection Date: 29-May-2019 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 18:38
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	04-Jun-2019 18:38
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	04-Jun-2019 18:38
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 18:38
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	04-Jun-2019 18:38
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19051866

Sample ID: Trip Blank Lab ID:HS19051866-02

Collection Date: 29-May-2019 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	04-Jun-2019 18:38
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jun-2019 18:38
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jun-2019 18:38
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jun-2019 18:38
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jun-2019 18:38
Surr: 1,2-Dichloroethane-d4	*88.6*			**0**	*81-118*	*%REC*	*1*	*04-Jun-2019 18:38*
Surr: 4-Bromofluorobenzene	*99.0*			**0**	*85-114*	*%REC*	*1*	*04-Jun-2019 18:38*
Surr: Dibromofluoromethane	*93.7*			**0**	*80-119*	*%REC*	*1*	*04-Jun-2019 18:38*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*04-Jun-2019 18:38*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R339874	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19051866-01	LH18/24-SP650_052919	29 May 2019 14:00			04 Jun 2019 20:15	1
HS19051866-02	Trip Blank	29 May 2019 00:00			04 Jun 2019 18:38	1
Batch ID R340350	**Test Name :** ANIONS BY SW9056A			**Matrix:** Water		
HS19051866-01	LH18/24-SP650_052919	29 May 2019 14:00			11 Jun 2019 23:03	10

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 17:26**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108298** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 17:26**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108298** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.91*	*1.0*	*50*	*0*	*89.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.35*	*1.0*	*50*	*0*	*98.7*	*85 - 114*				
Surr: Dibromofluoromethane	*46.74*	*1.0*	*50*	*0*	*93.5*	*80 - 119*				
Surr: Toluene-d8	*53.5*	*1.0*	*50*	*0*	*107*	*89 - 112*				

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 16:38**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108297** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.65	1.0	20	0	98.2	78 - 124				
1,1,1-Trichloroethane	19.34	1.0	20	0	96.7	74 - 131				
1,1,2,2-Tetrachloroethane	20.2	1.0	20	0	101	71 - 121				
1,1,2-Trichloroethane	20.99	1.0	20	0	105	80 - 119				
1,1-Dichloroethane	19.06	1.0	20	0	95.3	77 - 125				
1,1-Dichloroethene	18.87	1.0	20	0	94.4	71 - 131				
1,1-Dichloropropene	18.09	1.0	20	0	90.4	78 - 125				
1,2,3-Trichlorobenzene	24.79	1.0	20	0	124	69 - 129				
1,2,3-Trichloropropane	19.34	1.0	20	0	96.7	73 - 122				
1,2,4-Trichlorobenzene	23.55	1.0	20	0	118	69 - 130				
1,2,4-Trimethylbenzene	18.31	1.0	20	0	91.6	76 - 124				
1,2-Dibromo-3-chloropropane	20.72	1.0	20	0	104	62 - 128				
1,2-Dibromoethane	20.66	1.0	20	0	103	77 - 121				
1,2-Dichlorobenzene	19.72	1.0	20	0	98.6	80 - 119				
1,2-Dichloroethane	19.85	1.0	20	0	99.2	73 - 128				
1,2-Dichloropropane	20.15	1.0	20	0	101	78 - 122				
1,3,5-Trimethylbenzene	17.9	1.0	20	0	89.5	75 - 124				
1,3-Dichlorobenzene	18.94	1.0	20	0	94.7	80 - 119				
1,3-Dichloropropane	20.87	1.0	20	0	104	80 - 119				
1,4-Dichlorobenzene	18.66	1.0	20	0	93.3	79 - 118				
2,2-Dichloropropane	19.73	1.0	20	0	98.7	60 - 139				
2-Butanone	47.14	2.0	40	0	118	56 - 143				
2-Chlorotoluene	17.89	1.0	20	0	89.5	79 - 122				
2-Hexanone	44.83	2.0	40	0	112	57 - 139				
4-Chlorotoluene	18.29	1.0	20	0	91.4	78 - 122				
4-Isopropyltoluene	17.3	1.0	20	0	86.5	77 - 127				
4-Methyl-2-pentanone	41.57	2.0	40	0	104	67 - 130				
Acetone	49.02	2.0	40	0	123	39 - 160				
Benzene	19.02	1.0	20	0	95.1	79 - 120				
Bromobenzene	19.17	1.0	20	0	95.9	80 - 120				
Bromochloromethane	20.93	1.0	20	0	105	78 - 123				
Bromodichloromethane	19.64	1.0	20	0	98.2	79 - 125				
Bromoform	20.82	1.0	20	0	104	66 - 130				
Bromomethane	23.09	1.0	20	0	115	53 - 141				

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190604** Units: **UG/L** Analysis Date: **04-Jun-2019 16:38**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108297** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	38.69	2.0	40	0	96.7	64 - 133				
Carbon tetrachloride	17.69	1.0	20	0	88.5	72 - 136				
Chlorobenzene	19.45	1.0	20	0	97.3	82 - 118				
Chloroethane	19.14	1.0	20	0	95.7	60 - 138				
Chloroform	20.04	1.0	20	0	100	79 - 124				
Chloromethane	15.66	1.0	20	0	78.3	50 - 139				
cis-1,2-Dichloroethene	19.81	1.0	20	0	99.1	78 - 123				
cis-1,3-Dichloropropene	20.05	1.0	20	0	100	75 - 124				
Dibromochloromethane	20.63	1.0	20	0	103	74 - 126				
Dibromomethane	20.31	1.0	20	0	102	79 - 123				
Dichlorodifluoromethane	18.37	1.0	20	0	91.8	32 - 152				
Ethylbenzene	18.95	1.0	20	0	94.8	79 - 121				
Hexachlorobutadiene	22.08	1.0	20	0	110	66 - 134				
Isopropylbenzene	17.97	1.0	20	0	89.9	72 - 131				
m,p-Xylene	37.67	2.0	40	0	94.2	80 - 121				
Methylene chloride	20.5	2.0	20	0	102	74 - 124				
Naphthalene	24.54	1.0	20	0	123	61 - 128				
n-Butylbenzene	17.48	1.0	20	0	87.4	75 - 128				
n-Propylbenzene	17.36	1.0	20	0	86.8	76 - 126				
o-Xylene	19.08	1.0	20	0	95.4	78 - 122				
sec-Butylbenzene	16.66	1.0	20	0	83.3	77 - 126				
Styrene	19.95	1.0	20	0	99.7	78 - 123				
tert-Butylbenzene	17.22	1.0	20	0	86.1	78 - 124				
Tetrachloroethene	18.71	1.0	20	0	93.5	74 - 129				
Toluene	19.64	1.0	20	0	98.2	80 - 121				
trans-1,2-Dichloroethene	19.19	1.0	20	0	96.0	75 - 124				
trans-1,3-Dichloropropene	20.51	1.0	20	0	103	73 - 127				
Trichloroethene	19.2	1.0	20	0	96.0	79 - 123				
Trichlorofluoromethane	18.09	1.0	20	0	90.5	65 - 141				
Vinyl chloride	18.75	1.0	20	0	93.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.33*	*1.0*	*50*	*0*	*107*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.97*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*53.7*	*1.0*	*50*	*0*	*107*	*80 - 119*				
Surr: Toluene-d8	*50.12*	*1.0*	*50*	*0*	*100*	*89 - 112*				

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19051779-01MS** Units: **UG/L** Analysis Date: **04-Jun-2019 21:05**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108306** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	379.7	20	400	0	94.9	78 - 124				
1,1,1-Trichloroethane	352	20	400	0	88.0	74 - 131				
1,1,2,2-Tetrachloroethane	366.7	20	400	0	91.7	71 - 121				
1,1,2-Trichloroethane	380.6	20	400	0	95.2	80 - 119				
1,1-Dichloroethane	341.8	20	400	0	85.4	77 - 125				
1,1-Dichloroethene	356.6	20	400	0	89.2	71 - 131				
1,1-Dichloropropene	358.1	20	400	0	89.5	78 - 125				
1,2,3-Trichlorobenzene	347.8	20	400	0	86.9	69 - 129				
1,2,3-Trichloropropane	349.4	20	400	0	87.4	73 - 122				
1,2,4-Trichlorobenzene	373.2	20	400	0	93.3	69 - 130				
1,2,4-Trimethylbenzene	389.8	20	400	0	97.5	76 - 124				
1,2-Dibromo-3-chloropropane	336.5	20	400	0	84.1	62 - 128				
1,2-Dibromoethane	368.3	20	400	0	92.1	77 - 121				
1,2-Dichlorobenzene	382.4	20	400	0	95.6	80 - 119				
1,2-Dichloroethane	354.8	20	400	0	88.7	73 - 128				
1,2-Dichloropropane	375.8	20	400	0	94.0	78 - 122				
1,3,5-Trimethylbenzene	401.3	20	400	0	100	75 - 124				
1,3-Dichlorobenzene	384	20	400	0	96.0	80 - 119				
1,3-Dichloropropane	382.9	20	400	0	95.7	80 - 119				
1,4-Dichlorobenzene	373.9	20	400	0	93.5	79 - 118				
2,2-Dichloropropane	324.6	20	400	0	81.1	60 - 139				
2-Butanone	413.2	40	800	0	51.7	56 - 143				S
2-Chlorotoluene	378.8	20	400	0	94.7	79 - 122				
2-Hexanone	492.1	40	800	0	61.5	57 - 139				
4-Chlorotoluene	380.5	20	400	0	95.1	78 - 122				
4-Isopropyltoluene	397.3	20	400	0	99.3	77 - 127				
4-Methyl-2-pentanone	457.2	40	800	0	57.1	67 - 130				S
Acetone	465.2	40	800	0	58.2	39 - 160				
Benzene	361.9	20	400	0	90.5	79 - 120				
Bromobenzene	387.6	20	400	0	96.9	80 - 120				
Bromochloromethane	345.5	20	400	0	86.4	78 - 123				
Bromodichloromethane	354.6	20	400	0	88.7	79 - 125				
Bromoform	362.7	20	400	0	90.7	66 - 130				
Bromomethane	290.5	20	400	0	72.6	53 - 141				

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19051779-01MS** Units: **UG/L** Analysis Date: **04-Jun-2019 21:05**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108306** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	549.2	40	800	0	68.6	64 - 133				
Carbon tetrachloride	364.1	20	400	0	91.0	72 - 136				
Chlorobenzene	376.7	20	400	0	94.2	82 - 118				
Chloroethane	332.8	20	400	0	83.2	60 - 138				
Chloroform	346.2	20	400	0	86.6	79 - 124				
Chloromethane	358	20	400	0	89.5	50 - 139				
cis-1,2-Dichloroethene	345.9	20	400	0	86.5	78 - 123				
cis-1,3-Dichloropropene	355	20	400	0	88.7	75 - 124				
Dibromochloromethane	377.7	20	400	0	94.4	74 - 126				
Dibromomethane	351.1	20	400	0	87.8	79 - 123				
Dichlorodifluoromethane	349.2	20	400	0	87.3	32 - 152				
Ethylbenzene	381.7	20	400	0	95.4	79 - 121				
Hexachlorobutadiene	413.2	20	400	0	103	66 - 134				
Isopropylbenzene	394.8	20	400	0	98.7	72 - 131				
m,p-Xylene	749.4	40	800	0	93.7	80 - 121				
Methylene chloride	414.4	40	400	0	104	74 - 124				
Naphthalene	328.1	20	400	0	82.0	61 - 128				
n-Butylbenzene	392.4	20	400	0	98.1	75 - 128				
n-Propylbenzene	390.4	20	400	0	97.6	76 - 126				
o-Xylene	376.8	20	400	0	94.2	78 - 122				
sec-Butylbenzene	395.7	20	400	0	98.9	77 - 126				
Styrene	377.9	20	400	0	94.5	78 - 123				
tert-Butylbenzene	398.9	20	400	0	99.7	78 - 124				
Tetrachloroethene	407.5	20	400	0	102	74 - 129				
Toluene	393.5	20	400	0	98.4	80 - 121				
trans-1,2-Dichloroethene	346.7	20	400	0	86.7	75 - 124				
trans-1,3-Dichloropropene	347.8	20	400	0	87.0	73 - 127				
Trichloroethene	367.7	20	400	0	91.9	79 - 123				
Trichlorofluoromethane	355.1	20	400	0	88.8	65 - 141				
Vinyl chloride	398.1	20	400	0	99.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*887.4*	*20*	*1000*	*0*	*88.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*1056*	*20*	*1000*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*955.1*	*20*	*1000*	*0*	*95.5*	*80 - 119*				
Surr: Toluene-d8	*1063*	*20*	*1000*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19051779-01MSD** Units: **UG/L** Analysis Date: **04-Jun-2019 21:29**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108307** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	367.2	20	400	0	91.8	78 - 124	379.7	3.34	20	
1,1,1-Trichloroethane	332.3	20	400	0	83.1	74 - 131	352	5.78	20	
1,1,2,2-Tetrachloroethane	360.3	20	400	0	90.1	71 - 121	366.7	1.76	20	
1,1,2-Trichloroethane	369.5	20	400	0	92.4	80 - 119	380.6	2.96	20	
1,1-Dichloroethane	325.1	20	400	0	81.3	77 - 125	341.8	5	20	
1,1-Dichloroethene	329.1	20	400	0	82.3	71 - 131	356.6	8.03	20	
1,1-Dichloropropene	337.5	20	400	0	84.4	78 - 125	358.1	5.92	20	
1,2,3-Trichlorobenzene	331.8	20	400	0	83.0	69 - 129	347.8	4.69	20	
1,2,3-Trichloropropane	343.3	20	400	0	85.8	73 - 122	349.4	1.76	20	
1,2,4-Trichlorobenzene	357.2	20	400	0	89.3	69 - 130	373.2	4.39	20	
1,2,4-Trimethylbenzene	377.3	20	400	0	94.3	76 - 124	389.8	3.28	20	
1,2-Dibromo-3-chloropropane	318.8	20	400	0	79.7	62 - 128	336.5	5.41	20	
1,2-Dibromoethane	362.9	20	400	0	90.7	77 - 121	368.3	1.47	20	
1,2-Dichlorobenzene	372.2	20	400	0	93.0	80 - 119	382.4	2.71	20	
1,2-Dichloroethane	338.6	20	400	0	84.6	73 - 128	354.8	4.68	20	
1,2-Dichloropropane	361	20	400	0	90.2	78 - 122	375.8	4.03	20	
1,3,5-Trimethylbenzene	383.3	20	400	0	95.8	75 - 124	401.3	4.61	20	
1,3-Dichlorobenzene	375	20	400	0	93.7	80 - 119	384	2.38	20	
1,3-Dichloropropane	377.7	20	400	0	94.4	80 - 119	382.9	1.36	20	
1,4-Dichlorobenzene	364	20	400	0	91.0	79 - 118	373.9	2.69	20	
2,2-Dichloropropane	300.4	20	400	0	75.1	60 - 139	324.6	7.75	20	
2-Butanone	406.9	40	800	0	50.9	56 - 143	413.2	1.53	20	S
2-Chlorotoluene	361.9	20	400	0	90.5	79 - 122	378.8	4.55	20	
2-Hexanone	486.1	40	800	0	60.8	57 - 139	492.1	1.24	20	
4-Chlorotoluene	368.9	20	400	0	92.2	78 - 122	380.5	3.1	20	
4-Isopropyltoluene	386.4	20	400	0	96.6	77 - 127	397.3	2.78	20	
4-Methyl-2-pentanone	457.6	40	800	0	57.2	67 - 130	457.2	0.0924	20	S
Acetone	450.9	40	800	0	56.4	39 - 160	465.2	3.12	20	
Benzene	344.2	20	400	0	86.0	79 - 120	361.9	5.03	20	
Bromobenzene	376.4	20	400	0	94.1	80 - 120	387.6	2.91	20	
Bromochloromethane	322.4	20	400	0	80.6	78 - 123	345.5	6.9	20	
Bromodichloromethane	345	20	400	0	86.2	79 - 125	354.6	2.76	20	
Bromoform	361.1	20	400	0	90.3	66 - 130	362.7	0.454	20	
Bromomethane	292.3	20	400	0	73.1	53 - 141	290.5	0.628	20	

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R339874 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19051779-01MSD** Units: **UG/L** Analysis Date: **04-Jun-2019 21:29**
Client ID: Run ID: **VOA6_339874** SeqNo: **5108307** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	437.5	40	800	0	54.7	64 - 133	549.2	22.6	20	SR
Carbon tetrachloride	345.2	20	400	0	86.3	72 - 136	364.1	5.33	20	
Chlorobenzene	359.3	20	400	0	89.8	82 - 118	376.7	4.73	20	
Chloroethane	298.2	20	400	0	74.5	60 - 138	332.8	11	20	
Chloroform	327.7	20	400	0	81.9	79 - 124	346.2	5.49	20	
Chloromethane	257.4	20	400	0	64.3	50 - 139	358	32.7	20	R
cis-1,2-Dichloroethene	330	20	400	0	82.5	78 - 123	345.9	4.71	20	
cis-1,3-Dichloropropene	340	20	400	0	85.0	75 - 124	355	4.3	20	
Dibromochloromethane	364.1	20	400	0	91.0	74 - 126	377.7	3.67	20	
Dibromomethane	343.3	20	400	0	85.8	79 - 123	351.1	2.23	20	
Dichlorodifluoromethane	290.4	20	400	0	72.6	32 - 152	349.2	18.4	20	
Ethylbenzene	367.9	20	400	0	92.0	79 - 121	381.7	3.7	20	
Hexachlorobutadiene	395.8	20	400	0	99.0	66 - 134	413.2	4.29	20	
Isopropylbenzene	382.6	20	400	0	95.6	72 - 131	394.8	3.14	20	
m,p-Xylene	717.3	40	800	0	89.7	80 - 121	749.4	4.39	20	
Methylene chloride	347.1	40	400	0	86.8	74 - 124	414.4	17.7	20	
Naphthalene	318.6	20	400	0	79.7	61 - 128	328.1	2.93	20	
n-Butylbenzene	379.9	20	400	0	95.0	75 - 128	392.4	3.24	20	
n-Propylbenzene	376.1	20	400	0	94.0	76 - 126	390.4	3.73	20	
o-Xylene	360.5	20	400	0	90.1	78 - 122	376.8	4.44	20	
sec-Butylbenzene	383.6	20	400	0	95.9	77 - 126	395.7	3.12	20	
Styrene	362.3	20	400	0	90.6	78 - 123	377.9	4.22	20	
tert-Butylbenzene	388.5	20	400	0	97.1	78 - 124	398.9	2.65	20	
Tetrachloroethene	385.4	20	400	0	96.4	74 - 129	407.5	5.57	20	
Toluene	373.9	20	400	0	93.5	80 - 121	393.5	5.13	20	
trans-1,2-Dichloroethene	326.7	20	400	0	81.7	75 - 124	346.7	5.92	20	
trans-1,3-Dichloropropene	332	20	400	0	83.0	73 - 127	347.8	4.67	20	
Trichloroethene	350	20	400	0	87.5	79 - 123	367.7	4.94	20	
Trichlorofluoromethane	333	20	400	0	83.2	65 - 141	355.1	6.44	20	
Vinyl chloride	325.9	20	400	0	81.5	58 - 137	398.1	20	20	
Surr: 1,2-Dichloroethane-d4	*879.9*	*20*	*1000*	*0*	*88.0*	*81 - 118*	*887.4*	*0.843*	*20*	
Surr: 4-Bromofluorobenzene	*1059*	*20*	*1000*	*0*	*106*	*85 - 114*	*1056*	*0.269*	*20*	
Surr: Dibromofluoromethane	*947.2*	*20*	*1000*	*0*	*94.7*	*80 - 119*	*955.1*	*0.821*	*20*	
Surr: Toluene-d8	*1055*	*20*	*1000*	*0*	*105*	*89 - 112*	*1063*	*0.745*	*20*	

ALS Houston, US Date: 12-Jun-19

Client:	Bhate Environmental Associates, Inc.
Project:	Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder:	HS19051866

QC BATCH REPORT

Batch ID:	**R339874 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch:	HS19051866-01	HS19051866-02

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R340350 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 13:36**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118828** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 13:54**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118829** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.46	0.500	20	0	97.3	80 - 120				
Sulfate	19.67	0.500	20	0	98.4	80 - 120				

LCSD Sample ID: **WLCSDW1-061119** Units: **mg/L** Analysis Date: **11-Jun-2019 14:12**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118830** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	19.46	0.500	20	0	97.3	80 - 120	19.46	0.0308	20	
Sulfate	19.63	0.500	20	0	98.2	80 - 120	19.67	0.189	20	

MS Sample ID: **HS19060226-01MS** Units: **mg/L** Analysis Date: **11-Jun-2019 16:35**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118835** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	490.6	25.0	500	13.25	95.5	80 - 120				
Sulfate	1634	25.0	500	1163	94.1	80 - 120				

MS Sample ID: **HS19060224-03MS** Units: **mg/L** Analysis Date: **11-Jun-2019 15:43**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118832** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	108.2	5.00	100	12.57	95.6	80 - 120				
Sulfate	337.8	5.00	100	245	92.8	80 - 120				

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19051866

QC BATCH REPORT

Batch ID: R340350 (0) **Instrument: ICS-Integrion** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19060226-01MSD** Units: **mg/L** Analysis Date: **11-Jun-2019 17:28**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118838** PrepDate: DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	489.3	25.0	500	13.25	95.2	80 - 120	490.6	0.255	20	
Sulfate	1631	25.0	500	1163	93.7	80 - 120	1634	0.13	20	

MSD Sample ID: **HS19060224-03MSD** Units: **mg/L** Analysis Date: **11-Jun-2019 16:00**
Client ID: Run ID: **ICS-Integrion_340350** SeqNo: **5118833** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	108.4	5.00	100	12.57	95.8	80 - 120	108.2	0.157	20	
Sulfate	338.1	5.00	100	245	93.1	80 - 120	337.8	0.0846	20	

The following samples were analyzed in this batch: HS19051866-01

ALS Houston, US Date: 12-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: **HS19051866**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Illinois	004438	29-Jun-2019
Louisiana	03087	30-Jun-2019
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Oklahoma	2018-156	31-Aug-2019
North Carolina	624-2019	31-Dec-2019
Maryland	343, 2018-2019	30-Jun-2019
Arkansas	19-028-0	27-Mar-2020
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 12-jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19051866

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19051866-01	LH18/24-SP650_052919	Login	31/05/2019 12:30:50	PMG	WET158
HS19051866-01	LH18/24-SP650_052919	Login	31/05/2019 12:30:50	PMG	VOA216
HS19051866-02	Trip Blank	Login	31/05/2019 12:30:50	PMG	VOA216

ALS Houston, US Date: 12-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19051866
Date/Time Received: **31-May-2019 08:37**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 31-May-2019 Date
Reviewed by: *RJ Modashia* eSignature 31-May-2019 Date

Matrices: **Water**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:none
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.3c U/c	IR11	
Cooler(s)/Kit(s):	44407		
Date/Time sample(s) sent to storage:	5/31/19 12:40		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☐	No ☐	N/A ☑
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210, Houston, Tx. 77099 ATTN: R.J. Modashia

Page 1 of 1

Project: BHATE LONGHORN ARMY AMMN. PLANT (LHAAP) GROUNDWATER TREATMENT PLANT (GWTP) KARNACK, TEXAS	Project No. NWO1312.0150.0 16.0001
Job: **GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES**	
Prepared By: Scott Beesinger	P.O Number

HS19051866

Bhate Environmental Associates. Inc.

onghorn GW Treatment Plant Bi-Weekly Samples

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC	Analyses: CHLORIDE, SULFATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_052919	Water	05/29/19 / 14:00		3	3		HCL	
LH18/24-SP650_052919	Water	05/29/19 / 14:00		1		1	NONE	
Trip Blank	Water	05/29/19		2	2		HCL	

Additional Remarks: **STANDARD TAT ON ALL PARAMETERS.**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	05/29/19	14:30									

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
J. Maynard	5/31/19	08:37							

Remarks: Cooler 44407
Temp 2.3
1121 CF0.0

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44407

CUSTODY SEAL

Date: 5/29/19 Time: 1400
Name: Scott Beesinger
Company: BHATE

Seal Broken By:
Date: 05/31/19

44407 MAY 31 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

44407

917 B03 1 10:30 A 8200 05 31

ORIGIN ID: 930 6193
SCOTT BEESI
BHATE ENVIRON ASSOCIATES
1203-B EAST GR. AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 21SEP18
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5856
REF: LHAAP 58 - RJ
RMA:

FedEx Express

TRK# (0221) 4380 9532 8290

RETURNS MON-SAT
PRIORITY OVERNIGHT

77099

FedEx.
TRK# (0221) 4380 9532 8290

FRI - 31 MAY 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

June 18, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19060168**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples**

Dear Marcia,

ALS Environmental received 3 sample(s) on Jun 05, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 18-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS19060168

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060168-01	LH18/24-SP650_060419	Water		04-Jun-2019 14:00	05-Jun-2019 09:50	☐
HS19060168-02	LH18/24-SP650_060419_BIX	Water		04-Jun-2019 14:00	05-Jun-2019 09:50	☐
HS19060168-03	Trip Blank	Water		04-Jun-2019 00:00	05-Jun-2019 09:50	☐

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order:

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 141868

Sample ID: LCSD-141868

• LCS/LCSD RPD exceeded the laboratory acceptance limit for 4-Terphenyl-d14. The individual recoveries met acceptance criteria.

GCMS Volatiles by Method SW8260

Batch ID: R339998

Sample ID: HS19060123-01MS

• MS and MSD were performed on unrelated sample

Metals by Method SW6020

Batch ID: 141628

Sample ID: LH18/24-SP650_060419 (HS19060168-01MS)

• Selenium failed on MS/MSD but passed on PDS.

WetChemistry by Method SW7196

Batch ID: R339853

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19060168

Sample ID: LH18/24-SP650_060419 Lab ID:HS19060168-01

Collection Date: 04-Jun-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	06-Jun-2019 14:33
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	06-Jun-2019 14:33
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	06-Jun-2019 14:33
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	06-Jun-2019 14:33
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	06-Jun-2019 14:33
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19060168

Sample ID: LH18/24-SP650_060419 Lab ID:HS19060168-01

Collection Date: 04-Jun-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
cis-1,2-Dichloroethene	**2.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Jun-2019 14:33
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	06-Jun-2019 14:33
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	06-Jun-2019 14:33
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	06-Jun-2019 14:33
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 14:33
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Trichloroethene	**0.76**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	06-Jun-2019 14:33
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 14:33
Surr: 1,2-Dichloroethane-d4	*94.7*			**0**	*81-118*	*%REC*	*1*	*06-Jun-2019 14:33*
Surr: 4-Bromofluorobenzene	*104*			**0**	*85-114*	*%REC*	*1*	*06-Jun-2019 14:33*
Surr: Dibromofluoromethane	*95.7*			**0**	*80-119*	*%REC*	*1*	*06-Jun-2019 14:33*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*06-Jun-2019 14:33*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 10-Jun-2019		Analyst: LG
1,4-Dioxane	**6.2**		**0.20**	**0.20**	**0.20**	**ug/L**	20	13-Jun-2019 13:43
Surr: 2-Fluorobiphenyl	*71.2*			**0**	*40-140*	*%REC*	*20*	*13-Jun-2019 13:43*
Surr: 4-Terphenyl-d14	*83.4*			**0**	*40-140*	*%REC*	*20*	*13-Jun-2019 13:43*
Surr: Nitrobenzene-d5	*98.4*			**0**	*40-140*	*%REC*	*20*	*13-Jun-2019 13:43*
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jun-2019		Analyst: JHD
Barium	**0.175**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jun-2019 22:09
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	05-Jun-2019 22:09
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jun-2019 22:09
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jun-2019 22:09

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19060168

Sample ID: LH18/24-SP650_060419 Lab ID:HS19060168-01

Collection Date: 04-Jun-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
HEXAVALENT CHROMIUM BY SW7196A		**Method:SW7196**						Analyst: MZD
Chromium, Hexavalent	0.0100	U	0.00600	0.0100	0.0100	mg/L	1	05-Jun-2019 12:00

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19060168

Sample ID: LH18/24-SP650_060419_BIX Lab ID:HS19060168-02

Collection Date: 04-Jun-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jun-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19060168

Sample ID: Trip Blank Lab ID:HS19060168-03

Collection Date: 04-Jun-2019 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	06-Jun-2019 13:45
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	06-Jun-2019 13:45
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	06-Jun-2019 13:45
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	06-Jun-2019 13:45
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	06-Jun-2019 13:45
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples WorkOrder:HS19060168

Sample ID: Trip Blank Lab ID:HS19060168-03

Collection Date: 04-Jun-2019 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	06-Jun-2019 13:45
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	06-Jun-2019 13:45
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	06-Jun-2019 13:45
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	06-Jun-2019 13:45
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	06-Jun-2019 13:45
Surr: 1,2-Dichloroethane-d4	*93.0*			**0**	*81-118*	*%REC*	*1*	*06-Jun-2019 13:45*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*06-Jun-2019 13:45*
Surr: Dibromofluoromethane	*94.2*			**0**	*80-119*	*%REC*	*1*	*06-Jun-2019 13:45*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*06-Jun-2019 13:45*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

Batch ID: 141628 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060168-01	1	10	10 (mL)	1

Batch ID: 141868 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060168-01	1	990	1 (mL)	0.00101

ALS Houston, US Date: 18-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 141628	**Test Name :** METALS BY ICPMS BY SW6020A			**Matrix:** Water		
HS19060168-01	LH18/24-SP650_060419	04 Jun 2019 14:00		05 Jun 2019 14:21	05 Jun 2019 22:09	1
Batch ID 141868	**Test Name :** SEMIVOLATILES SIM			**Matrix:** Water		
HS19060168-01	LH18/24-SP650_060419	04 Jun 2019 14:00		10 Jun 2019 06:54	13 Jun 2019 13:43	20
Batch ID R339853	**Test Name :** HEXAVALENT CHROMIUM BY SW7196A			**Matrix:** Water		
HS19060168-01	LH18/24-SP650_060419	04 Jun 2019 14:00			05 Jun 2019 12:00	1
Batch ID R339998	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19060168-01	LH18/24-SP650_060419	04 Jun 2019 14:00			06 Jun 2019 14:33	1
HS19060168-03	Trip Blank	04 Jun 2019 00:00			06 Jun 2019 13:45	1
Batch ID R340666	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19060168-02	LH18/24-SP650_060419_BIX	04 Jun 2019 14:00			17 Jun 2019 18:06	1

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: 141628 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-141628** Units: **mg/L** Analysis Date: **05-Jun-2019 22:04**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108740** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.00250	0.00400								U
Lead	0.00100	0.00200								U
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U

LCS Sample ID: **LCS-141628** Units: **mg/L** Analysis Date: **05-Jun-2019 22:05**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108741** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.0527	0.00400	0.05	0	105	80 - 120				
Lead	0.05321	0.00200	0.05	0	106	80 - 120				
Selenium	0.05646	0.00200	0.05	0	113	80 - 120				
Silver	0.04978	0.00200	0.05	0	99.6	80 - 120				

LCSD Sample ID: **LCSD-141628** Units: **mg/L** Analysis Date: **05-Jun-2019 22:07**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108742** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.05316	0.00400	0.05	0	106	80 - 120	0.0527	0.882	20	
Lead	0.05358	0.00200	0.05	0	107	80 - 120	0.05321	0.684	20	
Selenium	0.05732	0.00200	0.05	0	115	80 - 120	0.05646	1.52	20	
Silver	0.04954	0.00200	0.05	0	99.1	80 - 120	0.04978	0.491	20	

MS Sample ID: **HS19060168-01MS** Units: **mg/L** Analysis Date: **05-Jun-2019 22:13**
Client ID: **LH18/24-SP650_060419** Run ID: **ICPMS06_339849** SeqNo: **5108745** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.2325	0.00400	0.05	0.1747	116	80 - 120				
Lead	0.05364	0.00200	0.05	0.000107	107	80 - 120				
Selenium	0.02727	0.00200	0.05	0.00018	54.2	80 - 120				S
Silver	0.04571	0.00200	0.05	-0.000008	91.4	80 - 120				

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: 141628 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MSD Sample ID: **HS19060168-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2019 22:14**
Client ID: **LH18/24-SP650_060419** Run ID: **ICPMS06_339849** SeqNo: **5108746** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.233	0.00400	0.05	0.1747	117	80 - 120	0.2325	0.23	20	
Lead	0.05541	0.00200	0.05	0.000107	111	80 - 120	0.05364	3.23	20	
Selenium	0.02972	0.00200	0.05	0.00018	59.1	80 - 120	0.02727	8.59	20	S
Silver	0.04632	0.00200	0.05	-0.000008	92.6	80 - 120	0.04571	1.31	20	

PDS Sample ID: **HS19060168-01PDS** Units: **mg/L** Analysis Date: **05-Jun-2019 22:16**
Client ID: **LH18/24-SP650_060419** Run ID: **ICPMS06_339849** SeqNo: **5108747** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	0.275	0.00400	0.1	0.1747	100	75 - 125				
Lead	0.1028	0.00200	0.1	0.000107	103	75 - 125				
Selenium	0.1059	0.00200	0.1	0.00018	106	75 - 125				
Silver	0.08679	0.00200	0.1	-0.000008	86.8	75 - 125				

SD Sample ID: **HS19060168-01SD** Units: **mg/L** Analysis Date: **05-Jun-2019 22:11**
Client ID: **LH18/24-SP650_060419** Run ID: **ICPMS06_339849** SeqNo: **5108744** PrepDate: **05-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.1719	0.0200					0.1747	1.56	10	
Lead	0.00500	0.0100					0.000107	0	10	U
Selenium	0.0125	0.0100					0.00018	0	10	U
Silver	0.00250	0.0100					-0.000008	0	10	U

The following samples were analyzed in this batch: HS19060168-01

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: 141868 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-141868** Units: **ug/L** Analysis Date: **13-Jun-2019 11:58**
Client ID: Run ID: **SV-5_340404** SeqNo: **5120994** PrepDate: **10-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.06676*	*0*	*0.08*	*0*	*83.5*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.05034*	*0*	*0.08*	*0*	*62.9*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08606*	*0*	*0.08*	*0*	*108*	*40 - 140*				

LCS Sample ID: **LCS-141868** Units: **ug/L** Analysis Date: **13-Jun-2019 12:18**
Client ID: Run ID: **SV-5_340404** SeqNo: **5120995** PrepDate: **10-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.09236	0.010	0.08	0	115	40 - 140				
Surr: 2-Fluorobiphenyl	*0.06994*	*0*	*0.08*	*0*	*87.4*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.07525*	*0*	*0.08*	*0*	*94.1*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.09839*	*0*	*0.08*	*0*	*123*	*40 - 140*				

LCSD Sample ID: **LCSD-141868** Units: **ug/L** Analysis Date: **13-Jun-2019 12:39**
Client ID: Run ID: **SV-5_340404** SeqNo: **5120996** PrepDate: **10-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.09246	0.010	0.08	0	116	40 - 140	0.09236	0.109	20	
Surr: 2-Fluorobiphenyl	*0.06934*	*0*	*0.08*	*0*	*86.7*	*40 - 140*	*0.06994*	*0.867*	*20*	
Surr: 4-Terphenyl-d14	*0.06065*	*0*	*0.08*	*0*	*75.8*	*40 - 140*	*0.07525*	*21.5*	*20*	R
Surr: Nitrobenzene-d5	*0.09377*	*0*	*0.08*	*0*	*117*	*40 - 140*	*0.09839*	*4.81*	*20*	

The following samples were analyzed in this batch: HS19060168-01

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190606** Units: **UG/L** Analysis Date: **06-Jun-2019 12:57**
Client ID: Run ID: **VOA6_339998** SeqNo: **5110994** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190606** Units: **UG/L** Analysis Date: **06-Jun-2019 12:57**
Client ID: Run ID: **VOA6_339998** SeqNo: **5110994** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*45.27*	*1.0*	*50*	*0*	*90.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.82*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*46.66*	*1.0*	*50*	*0*	*93.3*	*80 - 119*				
Surr: Toluene-d8	*53.19*	*1.0*	*50*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190606** Units: **UG/L** Analysis Date: **06-Jun-2019 12:09**
Client ID: Run ID: **VOA6_339998** SeqNo: **5110993** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.6	1.0	20	0	98.0	78 - 124				
1,1,1-Trichloroethane	20.25	1.0	20	0	101	74 - 131				
1,1,2,2-Tetrachloroethane	18.44	1.0	20	0	92.2	71 - 121				
1,1,2-Trichloroethane	20.4	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.43	1.0	20	0	97.2	77 - 125				
1,1-Dichloroethene	19.42	1.0	20	0	97.1	71 - 131				
1,1-Dichloropropene	19.63	1.0	20	0	98.1	78 - 125				
1,2,3-Trichlorobenzene	17.18	1.0	20	0	85.9	69 - 129				
1,2,3-Trichloropropane	17.93	1.0	20	0	89.6	73 - 122				
1,2,4-Trichlorobenzene	18.84	1.0	20	0	94.2	69 - 130				
1,2,4-Trimethylbenzene	19.91	1.0	20	0	99.6	76 - 124				
1,2-Dibromo-3-chloropropane	17.46	1.0	20	0	87.3	62 - 128				
1,2-Dibromoethane	19.86	1.0	20	0	99.3	77 - 121				
1,2-Dichlorobenzene	19.41	1.0	20	0	97.0	80 - 119				
1,2-Dichloroethane	20.31	1.0	20	0	102	73 - 128				
1,2-Dichloropropane	21.15	1.0	20	0	106	78 - 122				
1,3,5-Trimethylbenzene	19.82	1.0	20	0	99.1	75 - 124				
1,3-Dichlorobenzene	19.66	1.0	20	0	98.3	80 - 119				
1,3-Dichloropropane	21.39	1.0	20	0	107	80 - 119				
1,4-Dichlorobenzene	19.4	1.0	20	0	97.0	79 - 118				
2,2-Dichloropropane	19.78	1.0	20	0	98.9	60 - 139				
2-Butanone	42.76	2.0	40	0	107	56 - 143				
2-Chlorotoluene	19.33	1.0	20	0	96.6	79 - 122				
2-Hexanone	41.93	2.0	40	0	105	57 - 139				
4-Chlorotoluene	19.88	1.0	20	0	99.4	78 - 122				
4-Isopropyltoluene	20.23	1.0	20	0	101	77 - 127				
4-Methyl-2-pentanone	40	2.0	40	0	100.0	67 - 130				
Acetone	45.22	2.0	40	0	113	39 - 160				
Benzene	20.3	1.0	20	0	102	79 - 120				
Bromobenzene	18.84	1.0	20	0	94.2	80 - 120				
Bromochloromethane	20.35	1.0	20	0	102	78 - 123				
Bromodichloromethane	19.68	1.0	20	0	98.4	79 - 125				
Bromoform	18.77	1.0	20	0	93.8	66 - 130				
Bromomethane	22.57	1.0	20	0	113	53 - 141				

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190606** Units: **UG/L** Analysis Date: **06-Jun-2019 12:09**
Client ID: Run ID: **VOA6_339998** SeqNo: **5110993** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	46.05	2.0	40	0	115	64 - 133				
Carbon tetrachloride	19.1	1.0	20	0	95.5	72 - 136				
Chlorobenzene	19.54	1.0	20	0	97.7	82 - 118				
Chloroethane	19.4	1.0	20	0	97.0	60 - 138				
Chloroform	20.61	1.0	20	0	103	79 - 124				
Chloromethane	17.27	1.0	20	0	86.3	50 - 139				
cis-1,2-Dichloroethene	19.72	1.0	20	0	98.6	78 - 123				
cis-1,3-Dichloropropene	20.52	1.0	20	0	103	75 - 124				
Dibromochloromethane	19.92	1.0	20	0	99.6	74 - 126				
Dibromomethane	19.98	1.0	20	0	99.9	79 - 123				
Dichlorodifluoromethane	18.99	1.0	20	0	95.0	32 - 152				
Ethylbenzene	19.69	1.0	20	0	98.5	79 - 121				
Hexachlorobutadiene	21.04	1.0	20	0	105	66 - 134				
Isopropylbenzene	20.27	1.0	20	0	101	72 - 131				
m,p-Xylene	39.34	2.0	40	0	98.4	80 - 121				
Methylene chloride	20.93	2.0	20	0	105	74 - 124				
Naphthalene	16.9	1.0	20	0	84.5	61 - 128				
n-Butylbenzene	20.45	1.0	20	0	102	75 - 128				
n-Propylbenzene	19.65	1.0	20	0	98.2	76 - 126				
o-Xylene	19.83	1.0	20	0	99.2	78 - 122				
sec-Butylbenzene	20.1	1.0	20	0	101	77 - 126				
Styrene	20.15	1.0	20	0	101	78 - 123				
tert-Butylbenzene	19.68	1.0	20	0	98.4	78 - 124				
Tetrachloroethene	19.96	1.0	20	0	99.8	74 - 129				
Toluene	20.51	1.0	20	0	103	80 - 121				
trans-1,2-Dichloroethene	19.57	1.0	20	0	97.9	75 - 124				
trans-1,3-Dichloropropene	20.06	1.0	20	0	100	73 - 127				
Trichloroethene	19.8	1.0	20	0	99.0	79 - 123				
Trichlorofluoromethane	19.03	1.0	20	0	95.2	65 - 141				
Vinyl chloride	17.4	1.0	20	0	87.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.35*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.64*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*52.92*	*1.0*	*50*	*0*	*106*	*80 - 119*				
Surr: Toluene-d8	*50.05*	*1.0*	*50*	*0*	*100*	*89 - 112*				

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19060123-01MS** Units: **UG/L** Analysis Date: **06-Jun-2019 17:22**
Client ID: Run ID: **VOA6_339998** SeqNo: **5111005** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.23	1.0	20	0	96.2	78 - 124				
1,1,1-Trichloroethane	18.32	1.0	20	0	91.6	74 - 131				
1,1,2,2-Tetrachloroethane	20.07	1.0	20	0	100	71 - 121				
1,1,2-Trichloroethane	19.28	1.0	20	0	96.4	80 - 119				
1,1-Dichloroethane	18.26	1.0	20	0.6532	88.0	77 - 125				
1,1-Dichloroethene	20.79	1.0	20	2.626	90.8	71 - 131				
1,1-Dichloropropene	18.92	1.0	20	0	94.6	78 - 125				
1,2,3-Trichlorobenzene	19.87	1.0	20	0	99.3	69 - 129				
1,2,3-Trichloropropane	19.78	1.0	20	0	98.9	73 - 122				
1,2,4-Trichlorobenzene	20.91	1.0	20	0	105	69 - 130				
1,2,4-Trimethylbenzene	21.06	1.0	20	0	105	76 - 124				
1,2-Dibromo-3-chloropropane	18.9	1.0	20	0	94.5	62 - 128				
1,2-Dibromoethane	19	1.0	20	0	95.0	77 - 121				
1,2-Dichlorobenzene	19.7	1.0	20	0	98.5	80 - 119				
1,2-Dichloroethane	18.95	1.0	20	1.07	89.4	73 - 128				
1,2-Dichloropropane	19.37	1.0	20	0	96.9	78 - 122				
1,3,5-Trimethylbenzene	21.09	1.0	20	0	105	75 - 124				
1,3-Dichlorobenzene	20.09	1.0	20	0	100	80 - 119				
1,3-Dichloropropane	20.01	1.0	20	0	100	80 - 119				
1,4-Dichlorobenzene	19.95	1.0	20	0	99.7	79 - 118				
2,2-Dichloropropane	18.73	1.0	20	0	93.6	60 - 139				
2-Butanone	23.81	2.0	40	0	59.5	56 - 143				
2-Chlorotoluene	20.36	1.0	20	0	102	79 - 122				
2-Hexanone	28.12	2.0	40	0	70.3	57 - 139				
4-Chlorotoluene	20.2	1.0	20	0	101	78 - 122				
4-Isopropyltoluene	21.86	1.0	20	0	109	77 - 127				
4-Methyl-2-pentanone	27.78	2.0	40	0	69.4	67 - 130				
Acetone	23.63	2.0	40	0	59.1	39 - 160				
Benzene	18.3	1.0	20	0	91.5	79 - 120				
Bromobenzene	19.74	1.0	20	0	98.7	80 - 120				
Bromochloromethane	17.4	1.0	20	0	87.0	78 - 123				
Bromodichloromethane	17.55	1.0	20	0	87.7	79 - 125				
Bromoform	18.81	1.0	20	0	94.0	66 - 130				
Bromomethane	13.86	1.0	20	0	69.3	53 - 141				

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19060123-01MS** Units: **UG/L** Analysis Date: **06-Jun-2019 17:22**
Client ID: Run ID: **VOA6_339998** SeqNo: **5111005** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	24.97	2.0	40	0	62.4	64 - 133				S
Carbon tetrachloride	18.6	1.0	20	0	93.0	72 - 136				
Chlorobenzene	19.12	1.0	20	0	95.6	82 - 118				
Chloroethane	18.53	1.0	20	0	92.7	60 - 138				
Chloroform	17.48	1.0	20	0	87.4	79 - 124				
Chloromethane	15.15	1.0	20	0	75.8	50 - 139				
cis-1,2-Dichloroethene	17.54	1.0	20	0	87.7	78 - 123				
cis-1,3-Dichloropropene	18.2	1.0	20	0	91.0	75 - 124				
Dibromochloromethane	19.19	1.0	20	0	95.9	74 - 126				
Dibromomethane	18.09	1.0	20	0	90.4	79 - 123				
Dichlorodifluoromethane	16.95	1.0	20	0	84.8	32 - 152				
Ethylbenzene	19.96	1.0	20	0	99.8	79 - 121				
Hexachlorobutadiene	22.14	1.0	20	0	111	66 - 134				
Isopropylbenzene	21.05	1.0	20	0	105	72 - 131				
m,p-Xylene	39.46	2.0	40	0	98.7	80 - 121				
Methylene chloride	17.85	2.0	20	0	89.3	74 - 124				
Naphthalene	19.51	1.0	20	0	97.5	61 - 128				
n-Butylbenzene	21.99	1.0	20	0	110	75 - 128				
n-Propylbenzene	21.93	1.0	20	0	110	76 - 126				
o-Xylene	19.69	1.0	20	0	98.4	78 - 122				
sec-Butylbenzene	21.68	1.0	20	0	108	77 - 126				
Styrene	19.76	1.0	20	0	98.8	78 - 123				
tert-Butylbenzene	21.36	1.0	20	0	107	78 - 124				
Tetrachloroethene	21.49	1.0	20	0	107	74 - 129				
Toluene	19.87	1.0	20	0	99.4	80 - 121				
trans-1,2-Dichloroethene	17.94	1.0	20	0	89.7	75 - 124				
trans-1,3-Dichloropropene	17.84	1.0	20	0	89.2	73 - 127				
Trichloroethene	18.93	1.0	20	0	94.6	79 - 123				
Trichlorofluoromethane	18.45	1.0	20	0	92.2	65 - 141				
Vinyl chloride	16.29	1.0	20	0	81.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.56*	*1.0*	*50*	*0*	*93.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.01*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*48.12*	*1.0*	*50*	*0*	*96.2*	*80 - 119*				
Surr: Toluene-d8	*52.79*	*1.0*	*50*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19060123-01MSD** Units: **UG/L** Analysis Date: **06-Jun-2019 17:46**
Client ID: Run ID: **VOA6_339998** SeqNo: **5111006** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.18	1.0	20	0	95.9	78 - 124	19.23	0.269	20	
1,1,1-Trichloroethane	17.98	1.0	20	0	89.9	74 - 131	18.32	1.89	20	
1,1,2,2-Tetrachloroethane	19.55	1.0	20	0	97.8	71 - 121	20.07	2.61	20	
1,1,2-Trichloroethane	19.48	1.0	20	0	97.4	80 - 119	19.28	1.07	20	
1,1-Dichloroethane	18.13	1.0	20	0.6532	87.4	77 - 125	18.26	0.715	20	
1,1-Dichloroethene	20.63	1.0	20	2.626	90.0	71 - 131	20.79	0.774	20	
1,1-Dichloropropene	18.82	1.0	20	0	94.1	78 - 125	18.92	0.492	20	
1,2,3-Trichlorobenzene	20.45	1.0	20	0	102	69 - 129	19.87	2.89	20	
1,2,3-Trichloropropane	18.73	1.0	20	0	93.7	73 - 122	19.78	5.48	20	
1,2,4-Trichlorobenzene	21.43	1.0	20	0	107	69 - 130	20.91	2.47	20	
1,2,4-Trimethylbenzene	20.23	1.0	20	0	101	76 - 124	21.06	4.02	20	
1,2-Dibromo-3-chloropropane	18.98	1.0	20	0	94.9	62 - 128	18.9	0.434	20	
1,2-Dibromoethane	19.16	1.0	20	0	95.8	77 - 121	19	0.856	20	
1,2-Dichlorobenzene	20.04	1.0	20	0	100	80 - 119	19.7	1.7	20	
1,2-Dichloroethane	19.18	1.0	20	1.07	90.5	73 - 128	18.95	1.22	20	
1,2-Dichloropropane	19.21	1.0	20	0	96.1	78 - 122	19.37	0.843	20	
1,3,5-Trimethylbenzene	20.82	1.0	20	0	104	75 - 124	21.09	1.28	20	
1,3-Dichlorobenzene	19.85	1.0	20	0	99.3	80 - 119	20.09	1.17	20	
1,3-Dichloropropane	19.84	1.0	20	0	99.2	80 - 119	20.01	0.838	20	
1,4-Dichlorobenzene	19.38	1.0	20	0	96.9	79 - 118	19.95	2.92	20	
2,2-Dichloropropane	17.93	1.0	20	0	89.6	60 - 139	18.73	4.38	20	
2-Butanone	23.77	2.0	40	0	59.4	56 - 143	23.81	0.164	20	
2-Chlorotoluene	19.2	1.0	20	0	96.0	79 - 122	20.36	5.91	20	
2-Hexanone	27.85	2.0	40	0	69.6	57 - 139	28.12	0.961	20	
4-Chlorotoluene	20.09	1.0	20	0	100	78 - 122	20.2	0.521	20	
4-Isopropyltoluene	21.3	1.0	20	0	106	77 - 127	21.86	2.64	20	
4-Methyl-2-pentanone	27.75	2.0	40	0	69.4	67 - 130	27.78	0.097	20	
Acetone	26.08	2.0	40	0	65.2	39 - 160	23.63	9.87	20	
Benzene	18.4	1.0	20	0	92.0	79 - 120	18.3	0.55	20	
Bromobenzene	19.31	1.0	20	0	96.6	80 - 120	19.74	2.21	20	
Bromochloromethane	17.07	1.0	20	0	85.3	78 - 123	17.4	1.95	20	
Bromodichloromethane	18.04	1.0	20	0	90.2	79 - 125	17.55	2.74	20	
Bromoform	18.98	1.0	20	0	94.9	66 - 130	18.81	0.91	20	
Bromomethane	14.73	1.0	20	0	73.7	53 - 141	13.86	6.06	20	

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339998 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19060123-01MSD** Units: **UG/L** Analysis Date: **06-Jun-2019 17:46**
Client ID: Run ID: **VOA6_339998** SeqNo: **5111006** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	26.56	2.0	40	0	66.4	64 - 133	24.97	6.14	20	
Carbon tetrachloride	18.54	1.0	20	0	92.7	72 - 136	18.6	0.321	20	
Chlorobenzene	19.02	1.0	20	0	95.1	82 - 118	19.12	0.541	20	
Chloroethane	15.64	1.0	20	0	78.2	60 - 138	18.53	16.9	20	
Chloroform	17.45	1.0	20	0	87.2	79 - 124	17.48	0.195	20	
Chloromethane	14.56	1.0	20	0	72.8	50 - 139	15.15	4.02	20	
cis-1,2-Dichloroethene	17.39	1.0	20	0	87.0	78 - 123	17.54	0.879	20	
cis-1,3-Dichloropropene	18.41	1.0	20	0	92.0	75 - 124	18.2	1.14	20	
Dibromochloromethane	19.11	1.0	20	0	95.6	74 - 126	19.19	0.387	20	
Dibromomethane	18.02	1.0	20	0	90.1	79 - 123	18.09	0.394	20	
Dichlorodifluoromethane	16.45	1.0	20	0	82.2	32 - 152	16.95	3.02	20	
Ethylbenzene	19.33	1.0	20	0	96.6	79 - 121	19.96	3.23	20	
Hexachlorobutadiene	22.88	1.0	20	0	114	66 - 134	22.14	3.31	20	
Isopropylbenzene	21.25	1.0	20	0	106	72 - 131	21.05	0.955	20	
m,p-Xylene	38.53	2.0	40	0	96.3	80 - 121	39.46	2.39	20	
Methylene chloride	17.48	2.0	20	0	87.4	74 - 124	17.85	2.11	20	
Naphthalene	20.11	1.0	20	0	101	61 - 128	19.51	3.06	20	
n-Butylbenzene	22.68	1.0	20	0	113	75 - 128	21.99	3.11	20	
n-Propylbenzene	20.87	1.0	20	0	104	76 - 126	21.93	4.97	20	
o-Xylene	20.2	1.0	20	0	101	78 - 122	19.69	2.56	20	
sec-Butylbenzene	21.08	1.0	20	0	105	77 - 126	21.68	2.77	20	
Styrene	20.2	1.0	20	0	101	78 - 123	19.76	2.22	20	
tert-Butylbenzene	21.09	1.0	20	0	105	78 - 124	21.36	1.3	20	
Tetrachloroethene	20.81	1.0	20	0	104	74 - 129	21.49	3.2	20	
Toluene	19.76	1.0	20	0	98.8	80 - 121	19.87	0.565	20	
trans-1,2-Dichloroethene	17.51	1.0	20	0	87.5	75 - 124	17.94	2.45	20	
trans-1,3-Dichloropropene	18.41	1.0	20	0	92.1	73 - 127	17.84	3.14	20	
Trichloroethene	18.87	1.0	20	0	94.3	79 - 123	18.93	0.321	20	
Trichlorofluoromethane	18.14	1.0	20	0	90.7	65 - 141	18.45	1.7	20	
Vinyl chloride	15.81	1.0	20	0	79.0	58 - 137	16.29	3.03	20	
Surr: 1,2-Dichloroethane-d4	*46.22*	*1.0*	*50*	*0*	*92.4*	*81 - 118*	*46.56*	*0.735*	*20*	
Surr: 4-Bromofluorobenzene	*53.76*	*1.0*	*50*	*0*	*108*	*85 - 114*	*53.01*	*1.41*	*20*	
Surr: Dibromofluoromethane	*48.02*	*1.0*	*50*	*0*	*96.0*	*80 - 119*	*48.12*	*0.217*	*20*	
Surr: Toluene-d8	*52.32*	*1.0*	*50*	*0*	*105*	*89 - 112*	*52.79*	*0.907*	*20*	

ALS Houston, US Date: 18-Jun-19

Client:	Bhate Environmental Associates, Inc.
Project:	LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder:	HS19060168

QC BATCH REPORT

Batch ID:	**R339998 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19060168-01 HS19060168-03

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: HS19060168

QC BATCH REPORT

Batch ID: R339853 (0) **Instrument: UV-2450** **Method: HEXAVALENT CHROMIUM BY SW7196A**

MBLK Sample ID: **MBLK-339853** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339853** SeqNo: **5107895** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.0100	0.0100								U

LCS Sample ID: **LCS-339853** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339853** SeqNo: **5107896** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.23	0.0100	0.25	0	92.0	80 - 120				

MS Sample ID: **HS19060177-01MS** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339853** SeqNo: **5107965** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.268	0.0100	0.25	-0.004	109	75 - 125				

MSD Sample ID: **HS19060177-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339853** SeqNo: **5107966** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.265	0.0100	0.25	-0.004	108	75 - 125	0.268	1.13	20	

The following samples were analyzed in this batch: HS19060168-01

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
WorkOrder: **HS19060168**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Illinois	004438	29-Jun-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Louisiana	03087	30-Jun-2019
Maryland	343, 2018-2019	30-Jun-2019
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 18-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Monthly Effluent Samples
Work Order: HS19060168

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19060168-01	LH18/24-SP650_060419	Login	05/06/2019 10:32:53	NDR	EXT189
HS19060168-01	LH18/24-SP650_060419	Login	05/06/2019 10:32:53	NDR	WET250
HS19060168-01	LH18/24-SP650_060419	Login	05/06/2019 10:32:53	NDR	MET053
HS19060168-01	LH18/24-SP650_060419	Login	05/06/2019 10:32:53	NDR	VOA061
HS19060168-02	LH18/24-SP650_060419_BIX	Login	05/06/2019 10:32:53	NDR	Sub
HS19060168-03	Trip Blank	Login	05/06/2019 10:32:53	NDR	VOA061

ALS Houston, US Date: 18-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060168
Date/Time Received: **05-Jun-2019 09:50**
Received by: **RPG**

Checklist completed by: *Nilesh D. Ranchod* eSignature 5-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature 5-Jun-2019 Date

Matrices: **water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	4.1c uc/c	IR 25
Cooler(s)/Kit(s):	43593	
Date/Time sample(s) sent to storage:	06/05/2019 11:30	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, TX 77099 (281) 530 – 5656 ATTN: RJ Modashia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. NWO1312.0150.0 16.0001

Job:
GROUNDWATER TREATMENT PLANT MONTHLY EFFLUENT SAMPLES

Prepared By: Scott Beesinger

P.O. Number

HS19060168

Bhate Environmental Associates, Inc.
18/24 Longhorn GW Treatment Plant Monthly Effluer

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOLATILES	SILVER, SELENIUM, LEAD, BARIUM	HEXAVALENT CHROMIUM	1, 4 - DIOXANE	PERCHLORATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_060419	Water	06/04/19 / 14:00		3	X					HCL	
LH18/24-SP650_060419	Water	06/04/19 / 14:00		2			X	X		NONE	
LH18/24-SP650_060419_BIX	Water	06/04/19 / 14:00		1					X	NONE	
LH18/24-SP650_060419	Water	06/04/19 / 14:00		1		X				HNO3	
Trip Blank	Water	06/04/19		2	X					HCL	

Additional Remarks: **STANDARD TURN AROUND TIME**

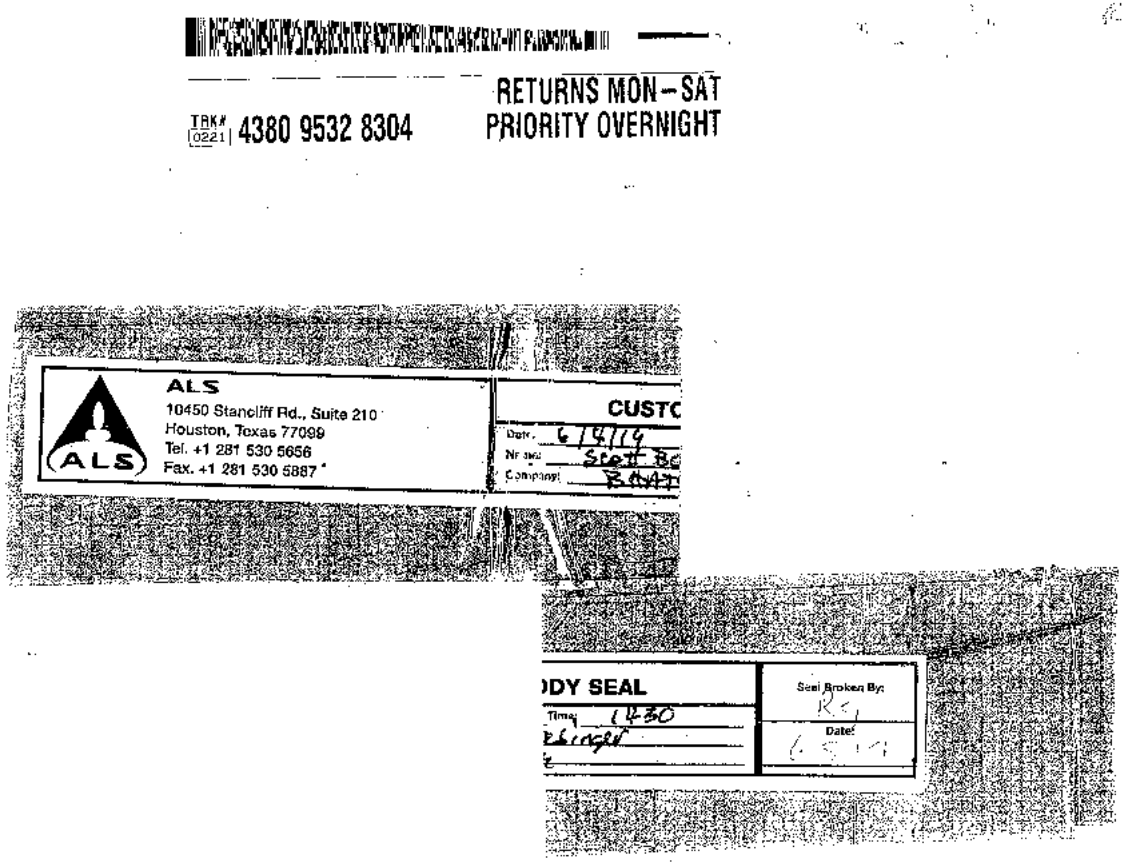
Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	06/04/19	14:30	R Ciga	6/5/19	07:30						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
				R Ciga	6/5/19	07:30	4°C	–	Cooler # 43593 IR #25 CF0

Remarks:

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly



TRK# (0221) 4380 9532 8304

RETURNS MON–SAT
PRIORITY OVERNIGHT

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTO
Date: 6/9/14
Sent Bo
Company: BGAT

DY SEAL
Time: 1430
Seal Broken By:
Date:

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1915802, 1915803, 1915852, 1916229; 1916231; 1916232

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2261 (241120)

General Set Information: There were six field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 657797) was less than 1/2 the CRDL. The recovery for the LCS (657798) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Thomas Bosch June 12, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: June 13, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1916231**
Project ID: HS19060168
Purchase Order: HS19060168
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_060419_BIX	1916231001	06/04/19	06/06/19	

ANALYTICAL REPORT

Workorder: 34-1916231
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_060419_BIX**	Sampling Site: NA	Collected: 06/04/2019
Lab ID: 1916231001	Media: 125 mL Nalgene	Received: 06/06/2019
Matrix: Water	Sampling Parameter: NA	

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:** LCMS04
	Batch: ELMS/2261 (HBN: 241120)	**Percent Solid:** NA
	Analyzed: 06/11/2019 11:05	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 06/12/2019 12:46	/S/ Stephen Brose 06/13/2019 10:59

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1916231
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1916231

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2261 (HBN: 241120)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 657797
Analyzed: 06/11/2019 09:31
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 657798
Analyzed: 06/11/2019 09:04
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.34	4.00	109	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1915802001	**MS:**	657799
Analyzed:	06/11/2019 09:45	**Analyzed:**	06/11/2019 09:58
Dilution:	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L

		MSD:	657800
		Analyzed:	06/11/2019 10:12
		Dilution:	1
		Units:	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.57	4	114	78.8	123.8	4.78	120	4.65	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 06/12/2019 12:47	/S/ Stephen Brose 06/13/2019 10:59

Symbols and Definitions

✱ - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

W 1916231

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18698/#2
1916231

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID: 11518**

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123 **Phone:** +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19060168
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060168-02**	**LH18/24-SP650_060419_BIX**	**Water**	**04 Jun 2019 14:00**
	SUB_Perch-6850			19 Jun 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 6/5/19 1800

Received By: _____ Date/Time: 6-6-19 0955

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19060168	***Split:***	**Workorder ID:** 1916231	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM	
1	06/04/2019 14:00	LH18/24-SP650_060419_BIX	1916231001		Water	A	1	A	
2									
3									
4									
5									
6									
7									
8									
9									
10									

38 of 112

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Coates, Gayleen	06/06/2019 09:55	ALS Sample Receiving	Sample Login
	6.6.19 1420	3B	STORAGE
R-33.1	6-11-19/08:00	T. Board	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ **Lab Notebook No.:** _____

Prepared / Analyzed by: _____ **Date / Time:** _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00939537

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS HOUSTON

Project/Task/Site:

Date/Time of Receipt: 6-6-19 0955

Number of Coolers Received: (1)

Condition of Coolers:	(Acceptable)/Unacceptable	Temperature Control:	(Present)/Not Included
Cooler Custody Seals:	(Present)/Absent/NA		
	(Intact)/Broken/NA	Location Temp Taken:	(Control)/Between Samples
Container Custody Seals:	Present/(Absent)/NA		
	Intact/Broken/(NA)	Are all temperatures within project specific guidelines?	(Yes)/No/NA
Ice Present:	(Yes)/No/NA		
	(Frozen)/Melted/NA	VOA Headspace Present?	Yes/No/(NA)

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9676	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [signature] GAYLEEN CORTES 6-6-19

Signature / Printed Name / Date

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018

Must Deliver Next Business Day
Time and Tempature Sensitive!

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 05JUN19
ACTWGT: 10.85 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19060168/172/174-RJ

SS1CL/0210/104C

FedEx Express

J181118066501ur

TRK# 0201 4809 7834 7670

THU - 06 JUN 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

Batch Worklist

Batch: ELMS/ 2261 **Created:** 6/11/2019 07:45 **Instrument:** **HBN:** 241120

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1915802 [ENV_LVL4]
Workorder: 1915803 [ENV_LVL4]
Workorder: 1915852 [ENV_LVL4]
Workorder: 1916229 [ENV_LVL4]
Workorder: 1916231 [ENV_LVL4]
Workorder: 1916232 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	657794	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	
2	657795	RLVS for HBN 241120 [ELMS/2261				RLVS	3		E685041C3Q	5311		6/13/2019	
3	657796	ICS for HBN 241120 [ELMS/2261]				ICS	3		E6850..D3Q	5311		6/13/2019	
4	657797	LMB for HBN 241120 [ELMS/2261]				LMB	3		E6850Q413Q	5311		6/13/2019	
5	657798	LCS for HBN 241120 [ELMS/2261]				LCS	3		E6850Q413Q	5311		6/13/2019	
6	1915802001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915802001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
7	657799	LH18/24-SP650...(1915802001MS)				MS	3		E6850Q413Q	5311		6/13/2019	
8	657800	LH18/24-SP65...(1915802001MSD)				MSD	3		E6850Q413Q	5311		6/13/2019	
9	1915803001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915803001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
10	1915852001	LH18/24-SP140_052919				SAMPLE	3	1915852001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
11	1916229001	LH18/24-SP140_060419				SAMPLE	3	1916229001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
12	1916231001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916231001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
13	1916232001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916232001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
14	657801	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1915802 (001), 1915803 (001), 1915852 (001), 1916229 (001); 1916231 (001); 1916232 (001) ELMS Batch/HBN ID: 2261 (241120)
Prep Date: 06/11/2019 Analysis Date: 06/11/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\11JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 657798; Target = 4.0µg/L. ASTM type II water was used for LMB 657797.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\241120-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2261 HBN: 241120 1915802/1915803/1915852 Sample Set IDs if Applicable: 1916229/1916231/1916232	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED TESTING LABORATORY

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

ANAB ACCREDITED REFERENCE MATERIAL

ANAB ACCREDITED TESTING LABORATORY

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	657794 CCV@25	Vial 71	1	Control	1	1.90258e6	8.986	26.94929
*	657798 QC@4.0	Vial 72	1	Control	2	3.85542e5	8.884	4.34115
*	657796 ICS@4.0	Vial 73	1	Control	3	2.32261e5	8.623	3.98229
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	1.46622e5	8.522	4.56740
*	657800 158021D	Vial 77	1	Sample	7	1.54646e5	8.528	4.78474
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	3.32187e5	9.077	4885.02369
*	1916229001 1K	Vial 80	1	Sample	10	4.13979e5	9.091	6820.05588
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.42334e6	9.028	25.98075

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	657794 CCV@25	Vial 71	1	Control	1	5.56917e5	9.003	26.60911
*	657798 QC@4.0	Vial 72	1	Control	2	1.22598e5	8.893	4.50107
*	657796 ICS@4.0	Vial 73	1	Control	3	7.62920e4	8.637	4.24932
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	5.01097e4	8.545	5.09575
*	657800 158021D	Vial 77	1	Sample	7	5.24358e4	8.548	5.30516
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	1.07205e5	9.093	5161.49233
*	1916229001 1K	Vial 80	1	Sample	10	1.30297e5	9.110	7096.69575
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	4.26237e5	9.042	26.20612

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	657794 CCV@25	Vial 71	1	Control	1	2.13798e5	9.004	5.00000
*	657798 QC@4.0	Vial 72	1	Control	2	2.91481e5	8.904	5.00000
*	657796 ICS@4.0	Vial 73	1	Control	3	1.92225e5	8.645	5.00000
*	657797 LMB	Vial 74	1	Control	4	3.01884e5	9.082	5.00000
*	1915802001	Vial 75	1	Sample	5	1.12941e5	8.589	5.00000
*	657799 158021S	Vial 76	1	Sample	6	1.05110e5	8.545	5.00000
*	657800 158021D	Vial 77	1	Sample	7	1.05604e5	8.552	5.00000
*	1915803001	Vial 78	1	Sample	8	1.14182e5	8.546	5.00000
*	1915852001 1K	Vial 79	1	Sample	9	2.21981e5	9.097	5000.00000
*	1916229001 1K	Vial 80	1	Sample	10	1.95450e5	9.116	5000.00000
*	1916231001	Vial 81	1	Sample	11	1.33828e5	8.518	5.00000
*	1916232001	Vial 82	1	Sample	12	1.27034e5	8.502	5.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.66287e5	9.054	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

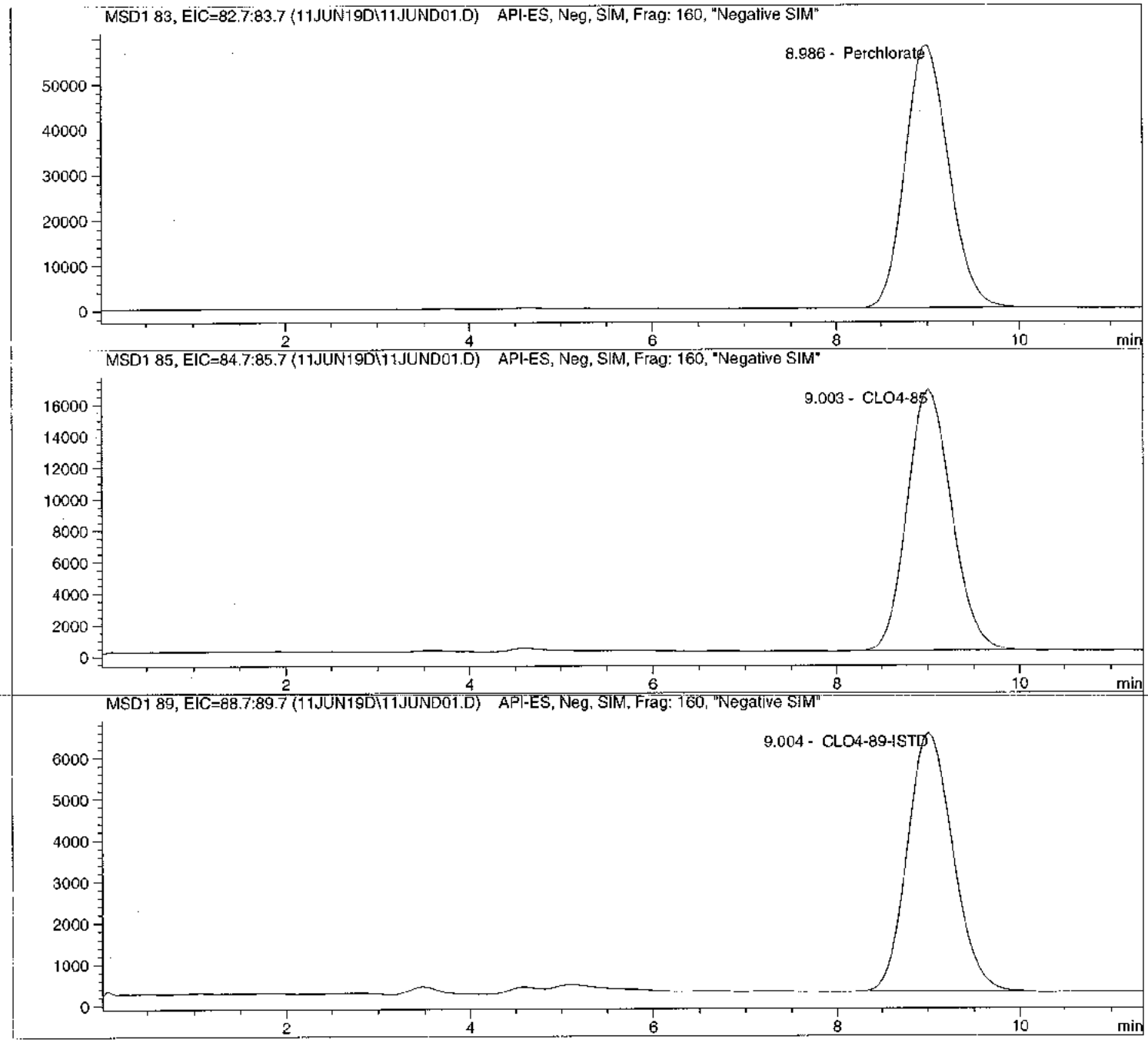
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	657794 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	657798 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	657796 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	657797 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1915802001	CLO4-AQN	1	Sample		
6	Vial 76	657799 158021S	CLO4-AQN	1	Sample		
7	Vial 77	657800 158021D	CLO4-AQN	1	Sample		
8	Vial 78	1915803001	CLO4-AQN	1	Sample		
9	Vial 79	1915852001 1K	CLO4-AQN	1	Sample		
10	Vial 80	1916229001 1K	CLO4-AQN	1	Sample		
11	Vial 81	1916231001	CLO4-AQN	1	Sample		
12	Vial 82	1916232001	CLO4-AQN	1	Sample		
13	Vial 71	657801 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.986	PBA	1902575.4	26.9493	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.003	PBA	556916.8	26.6091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.004	PBA	213798.0	5.0000	CLO4-89-ISTD

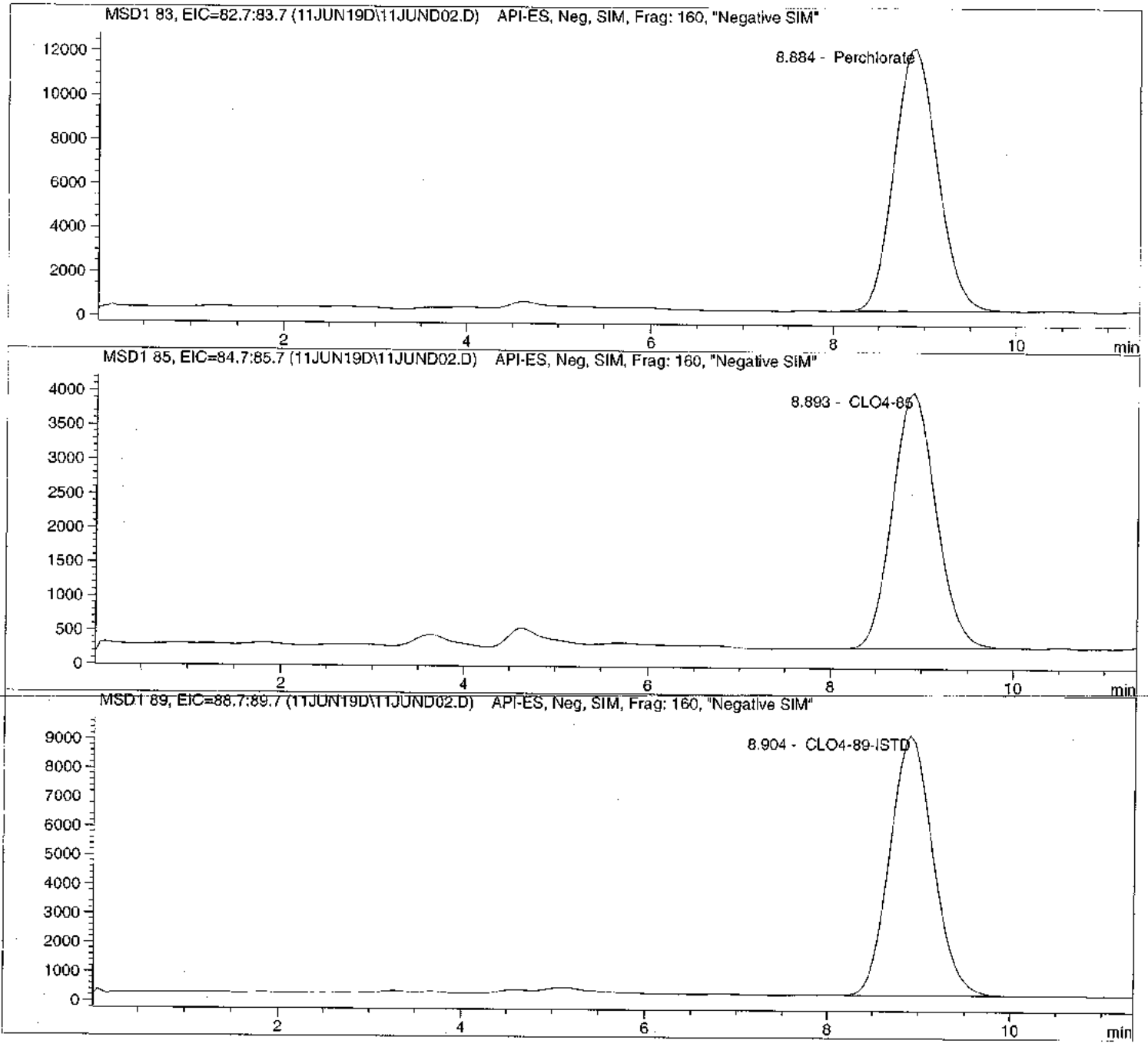
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.884	PBA	385541.7	4.3412	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.893	BBA	122598.4	4.5011	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.904	BBA	291480.6	5.0000	CLO4-89-ISTD

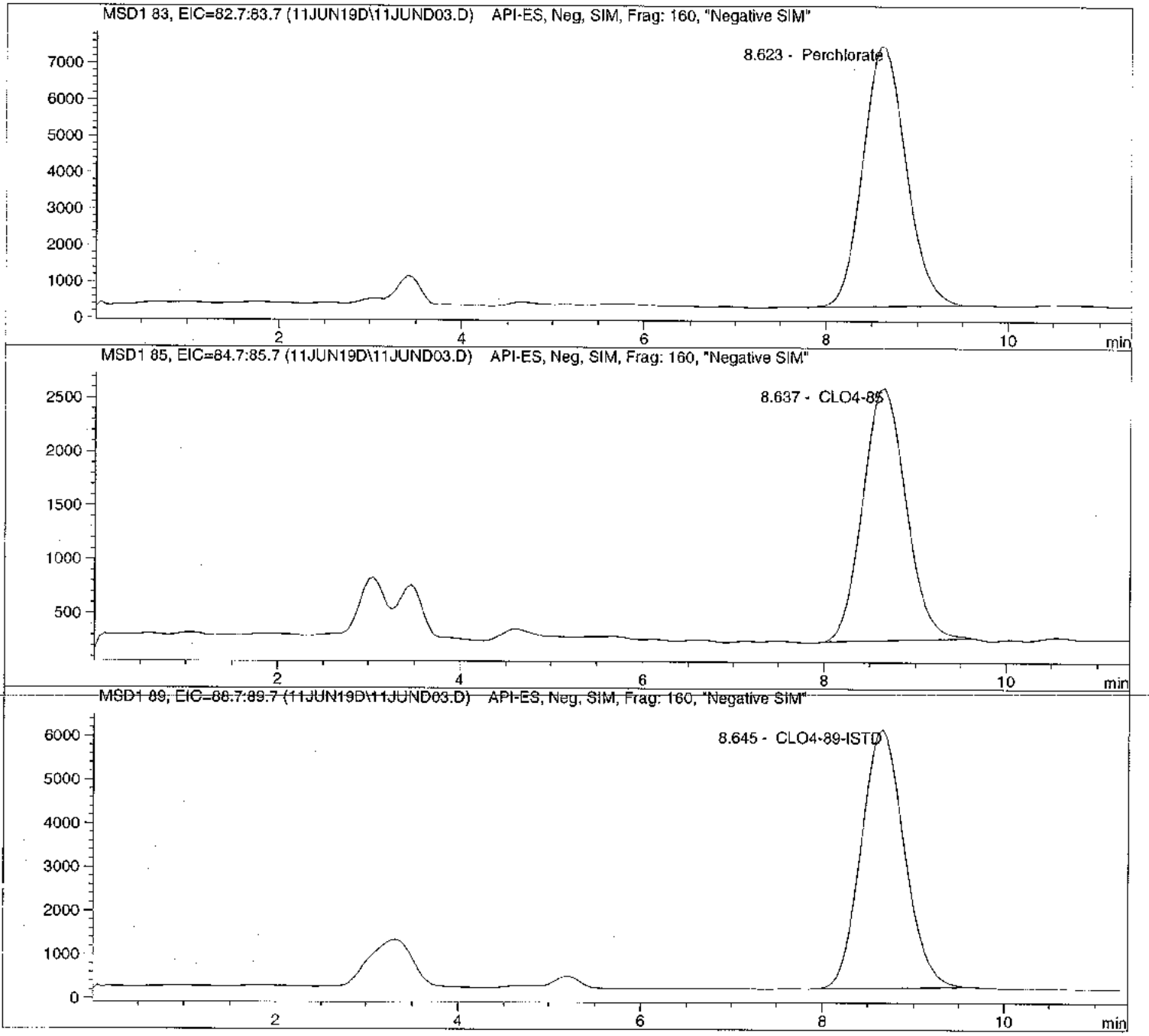
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.623	PBA	232261.2	3.9823	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.637	PBA	76292.0	4.2493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.645	PBA	192224.9	5.0000	CLO4-89-ISTD

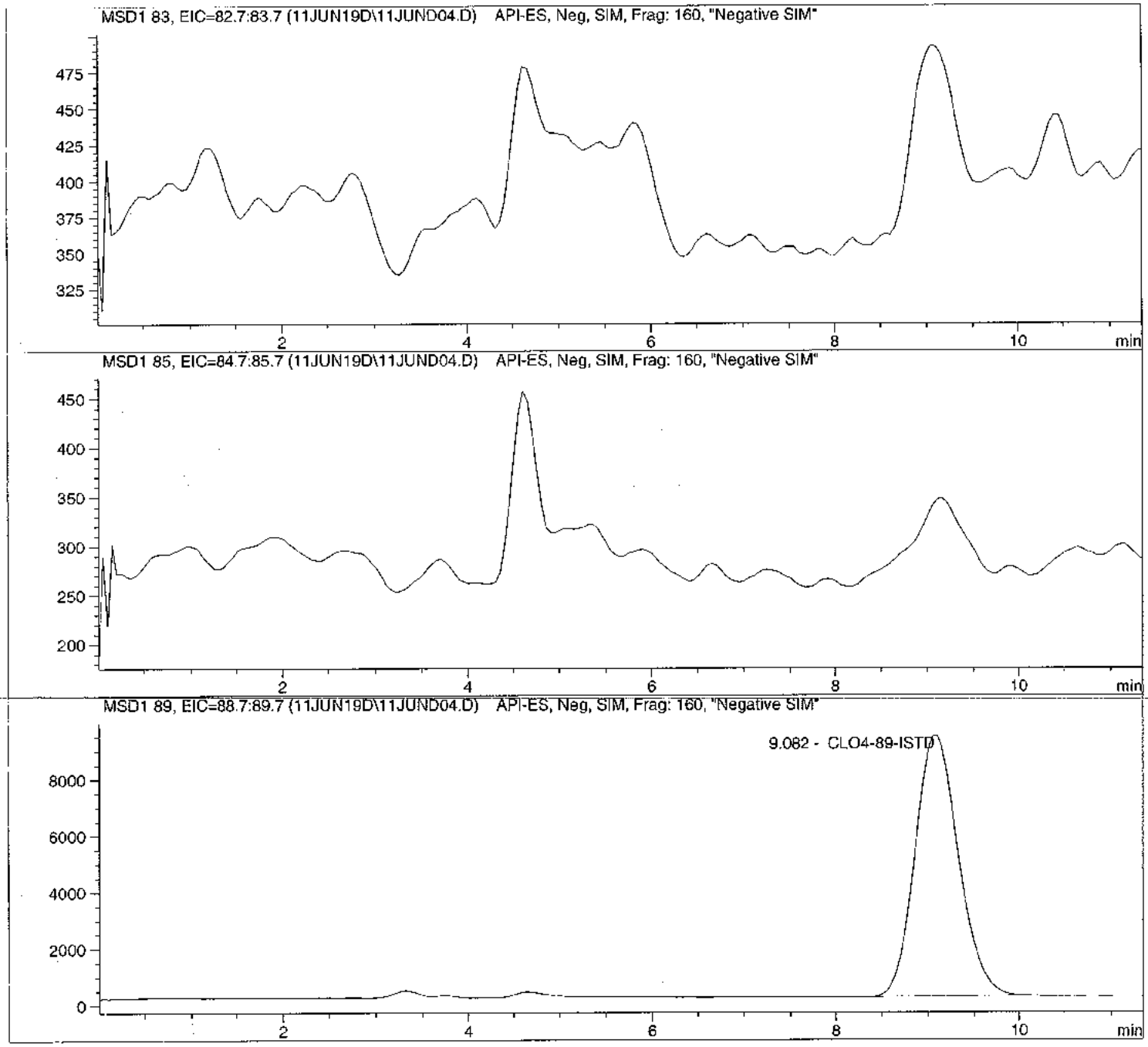
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.082	PBA	301883.5	5.0000	CLO4-89-ISTD

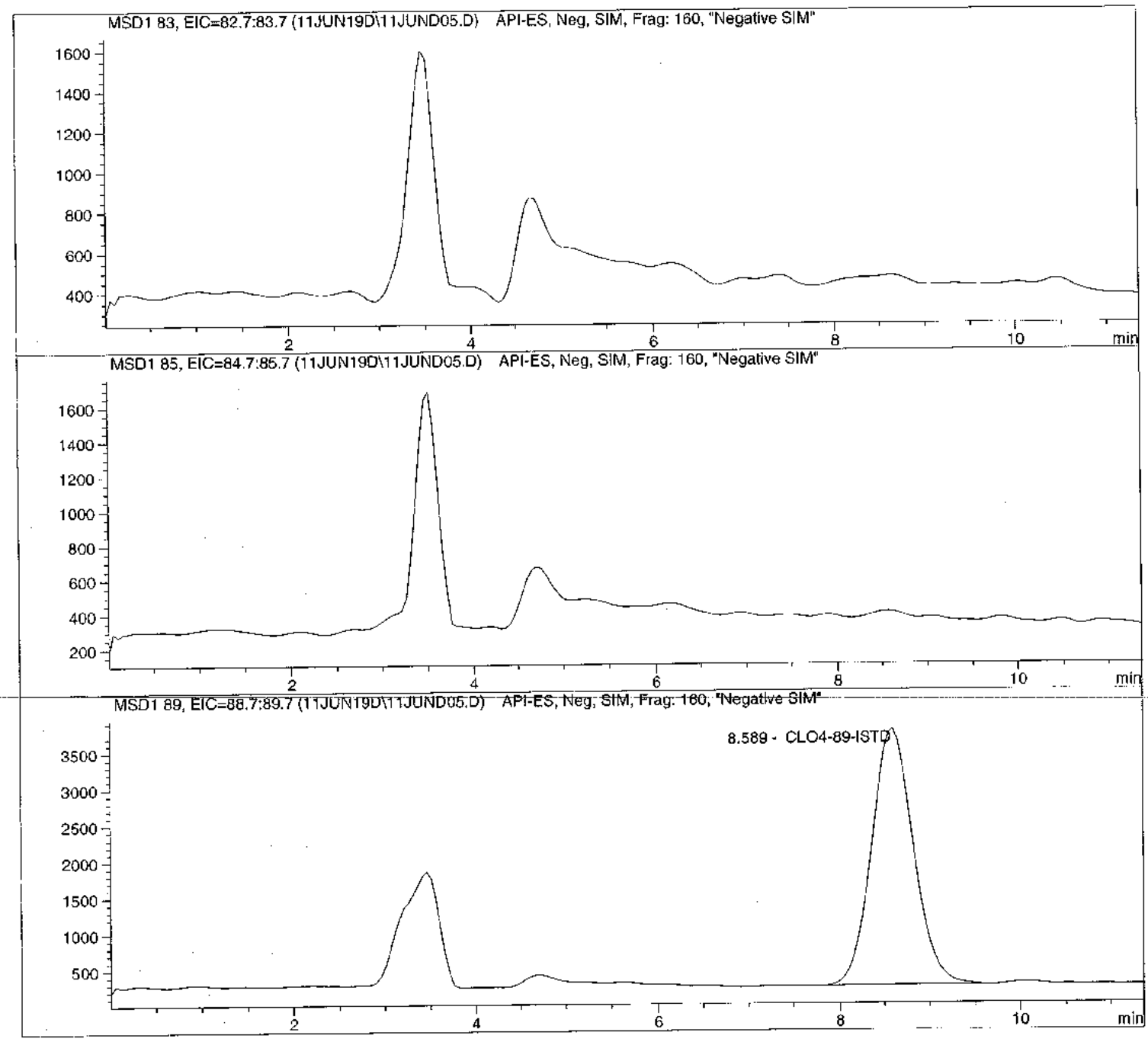
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.589	PBA	112941.5	5.0000	CLO4-89-ISTD

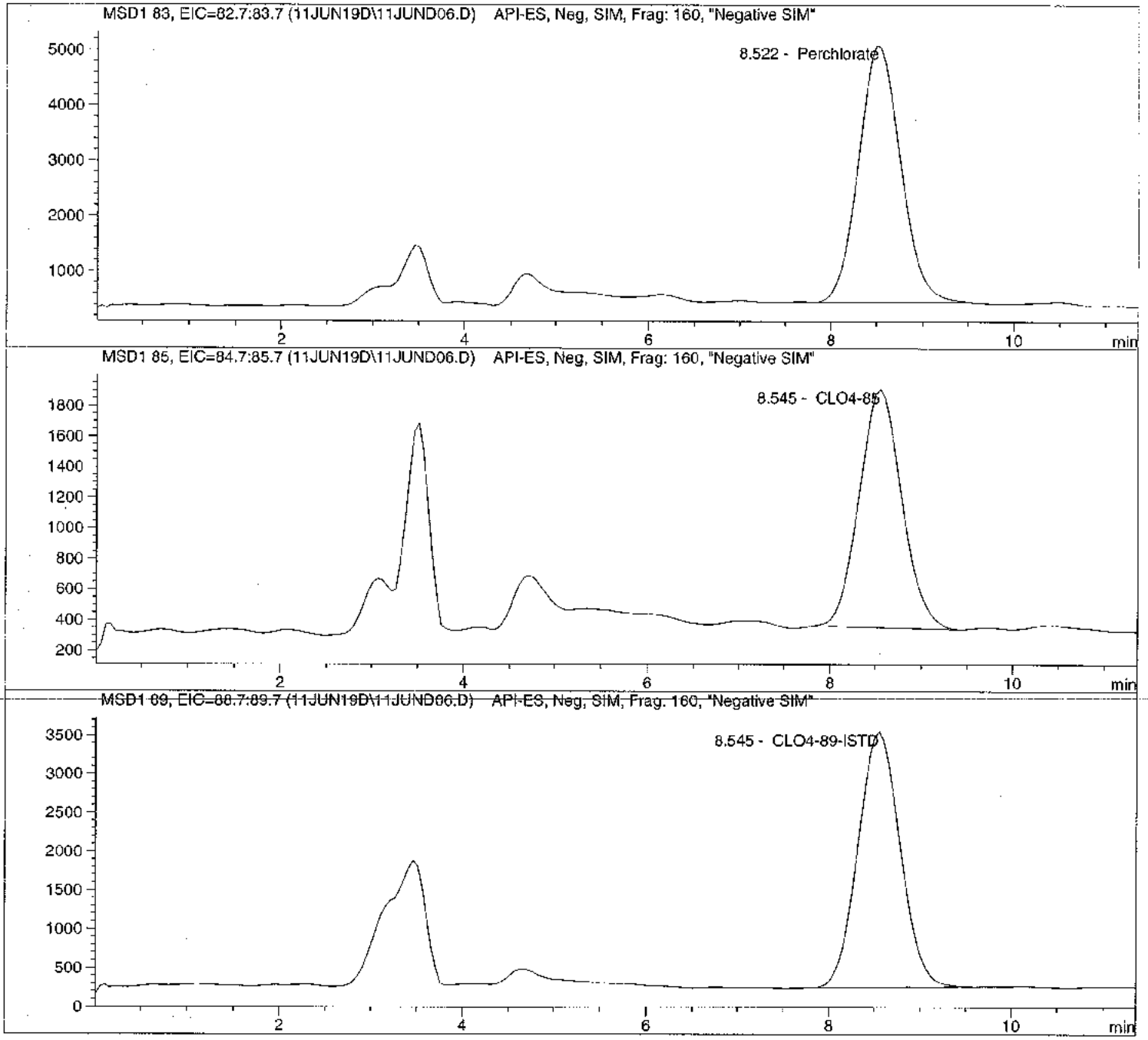
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S 00939571

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.522	BBA	146622.1	4.5674	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	50109.7	5.0958	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	105110.4	5.0000	CLO4-89-ISTD

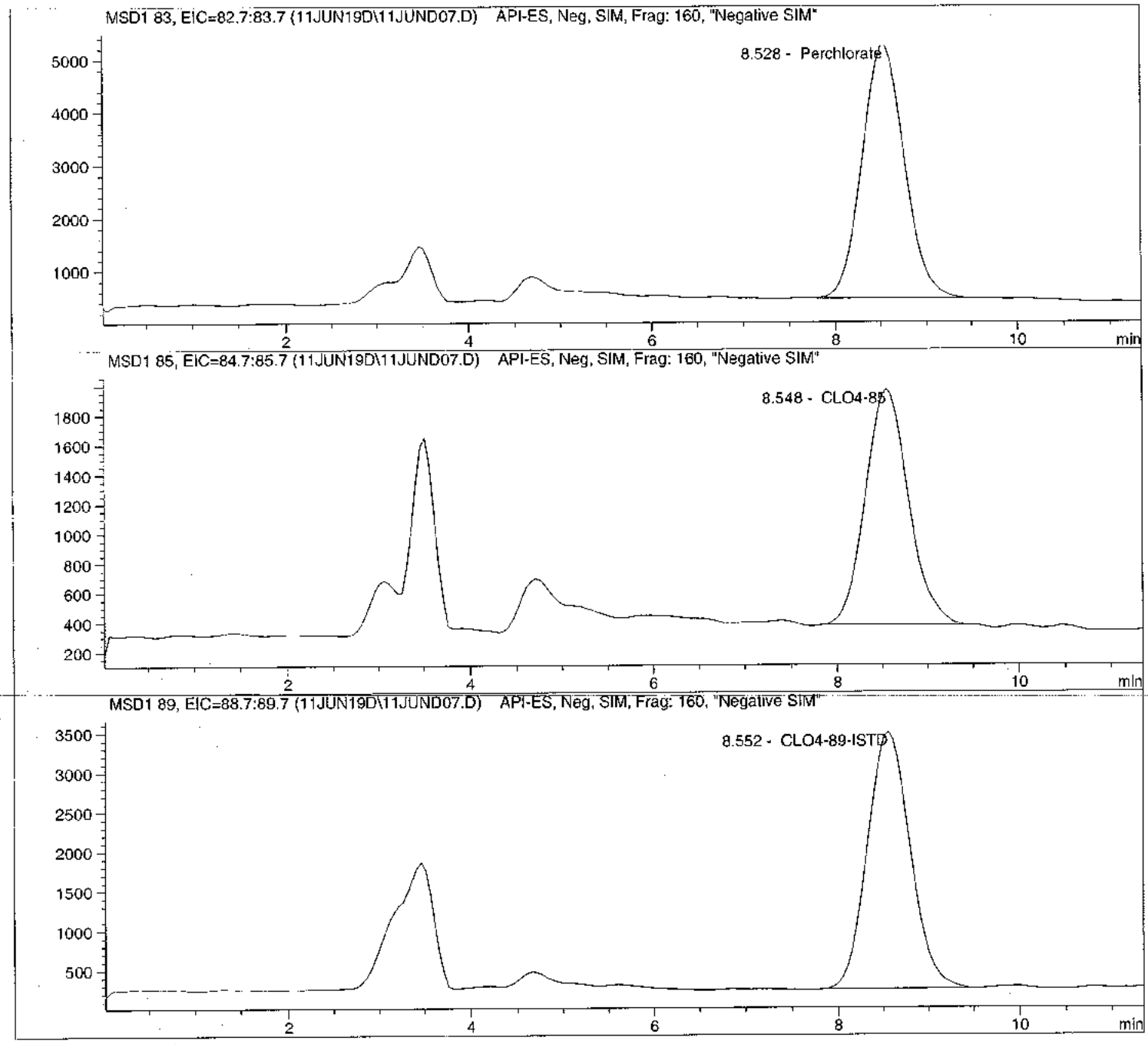
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND07.D Sample Name: 657800 158021D

Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.528	BBA	154645.8	4.7847	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.548	PBA	52435.8	5.3052	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.552	PBA	105604.1	5.0000	CLO4-89-ISTD

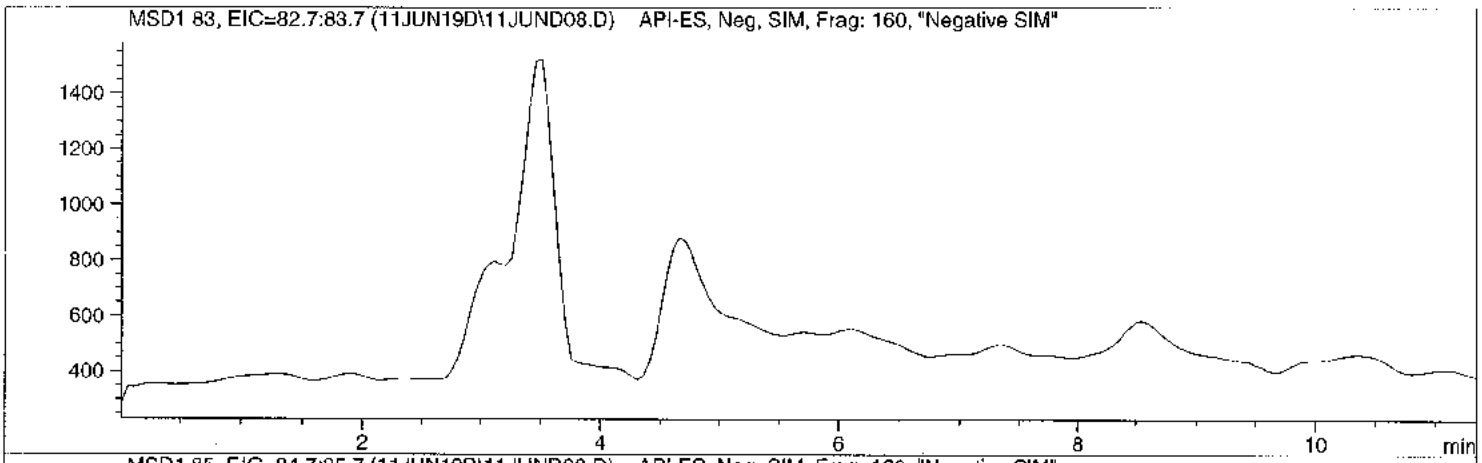
*** End of Report ***

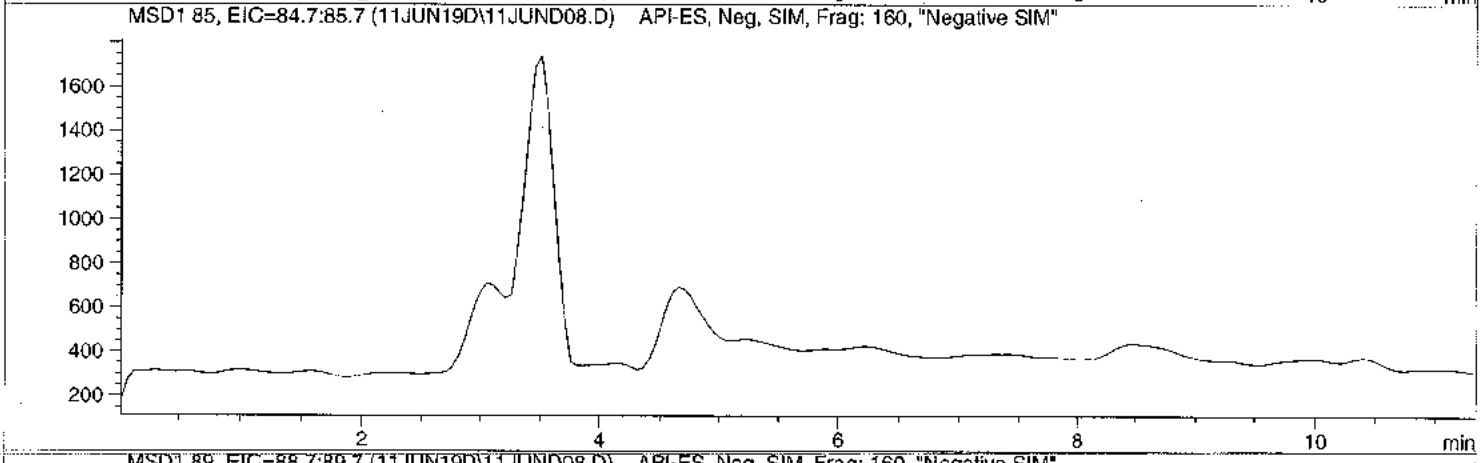
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

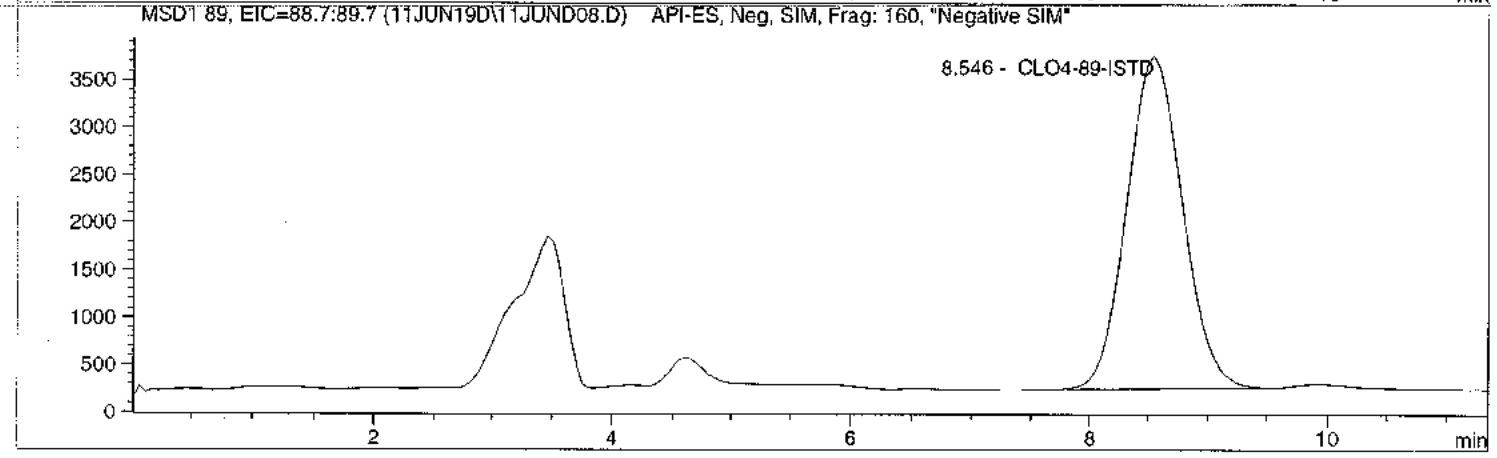
Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.546	BBA	114182.4	5.0000	CLO4-89-ISTD

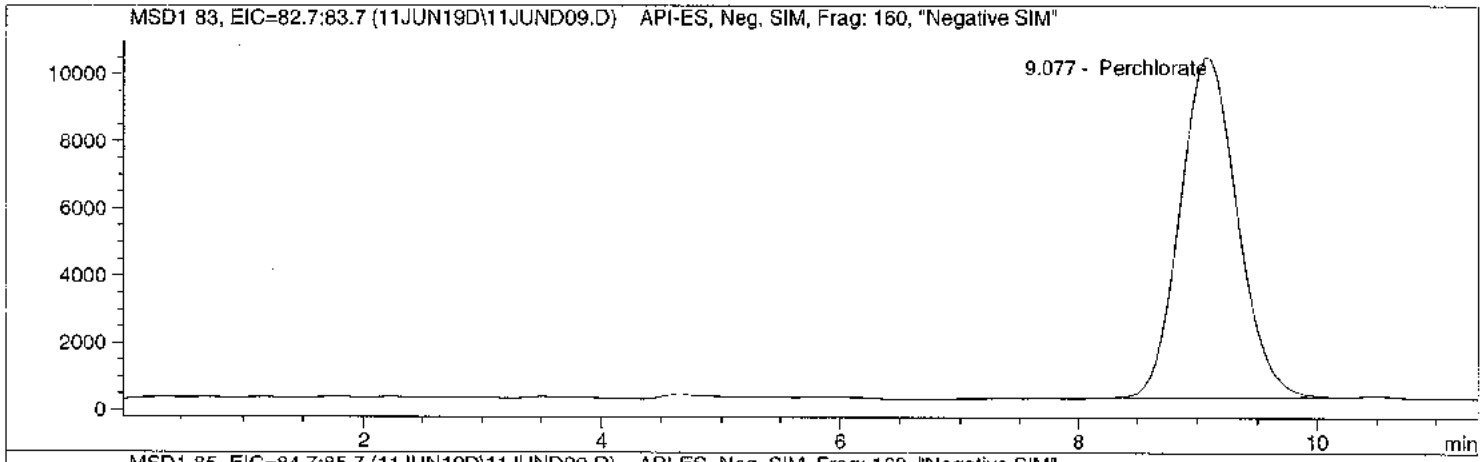
*** End of Report ***

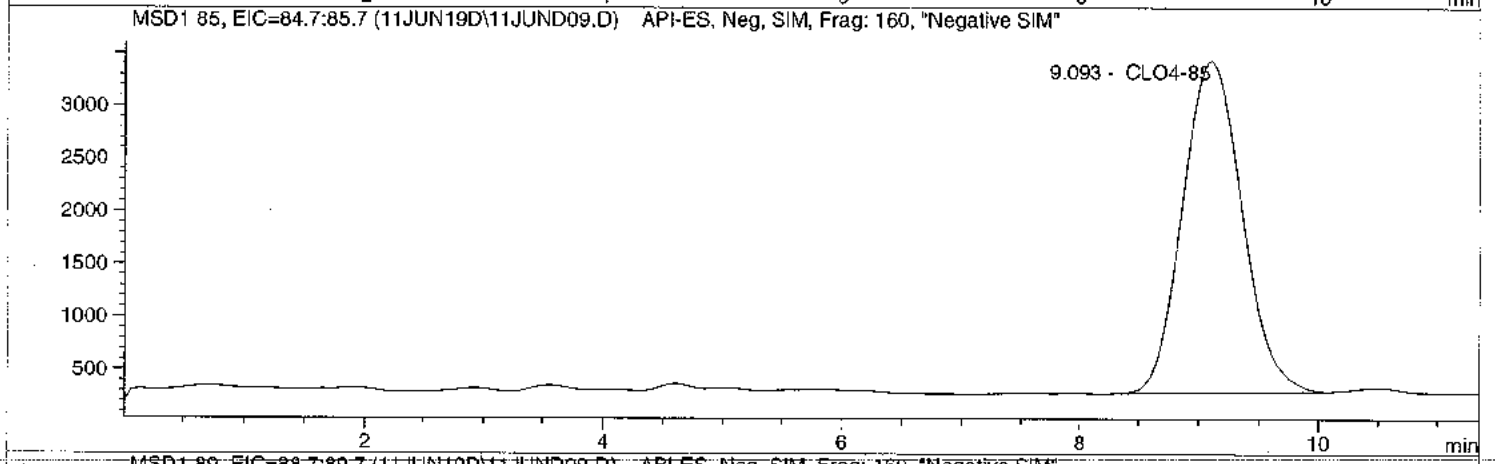
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

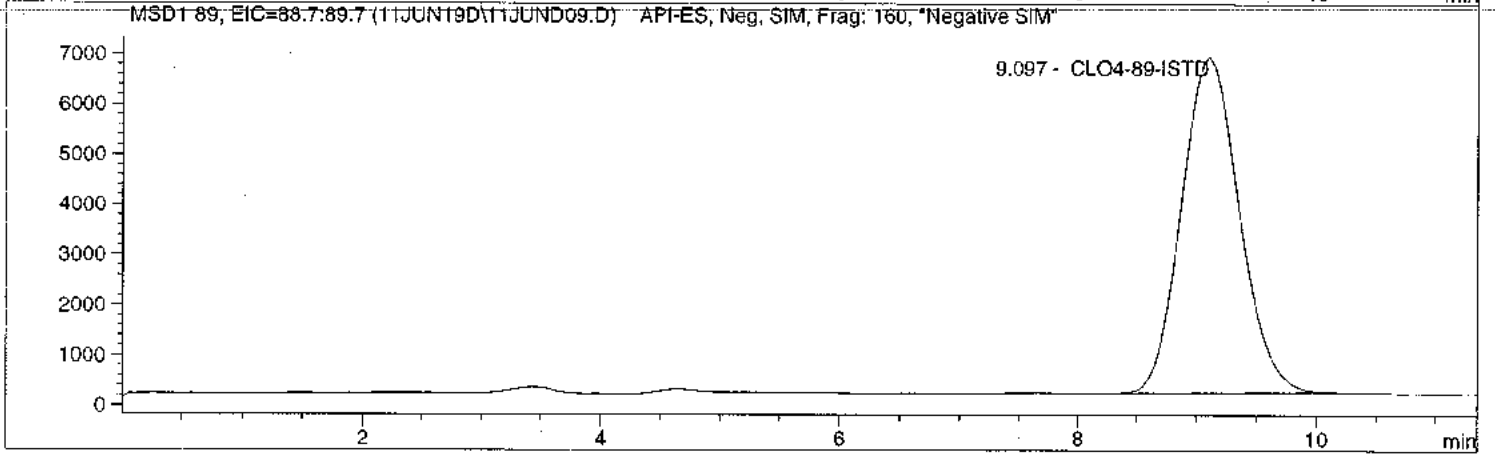
Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1000.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.077	BBA	332187.1	4885.0237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.093	PBA	107205.2	5161.4923	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.097	PBA	221981.4	5000.0000	CLO4-89-ISTD

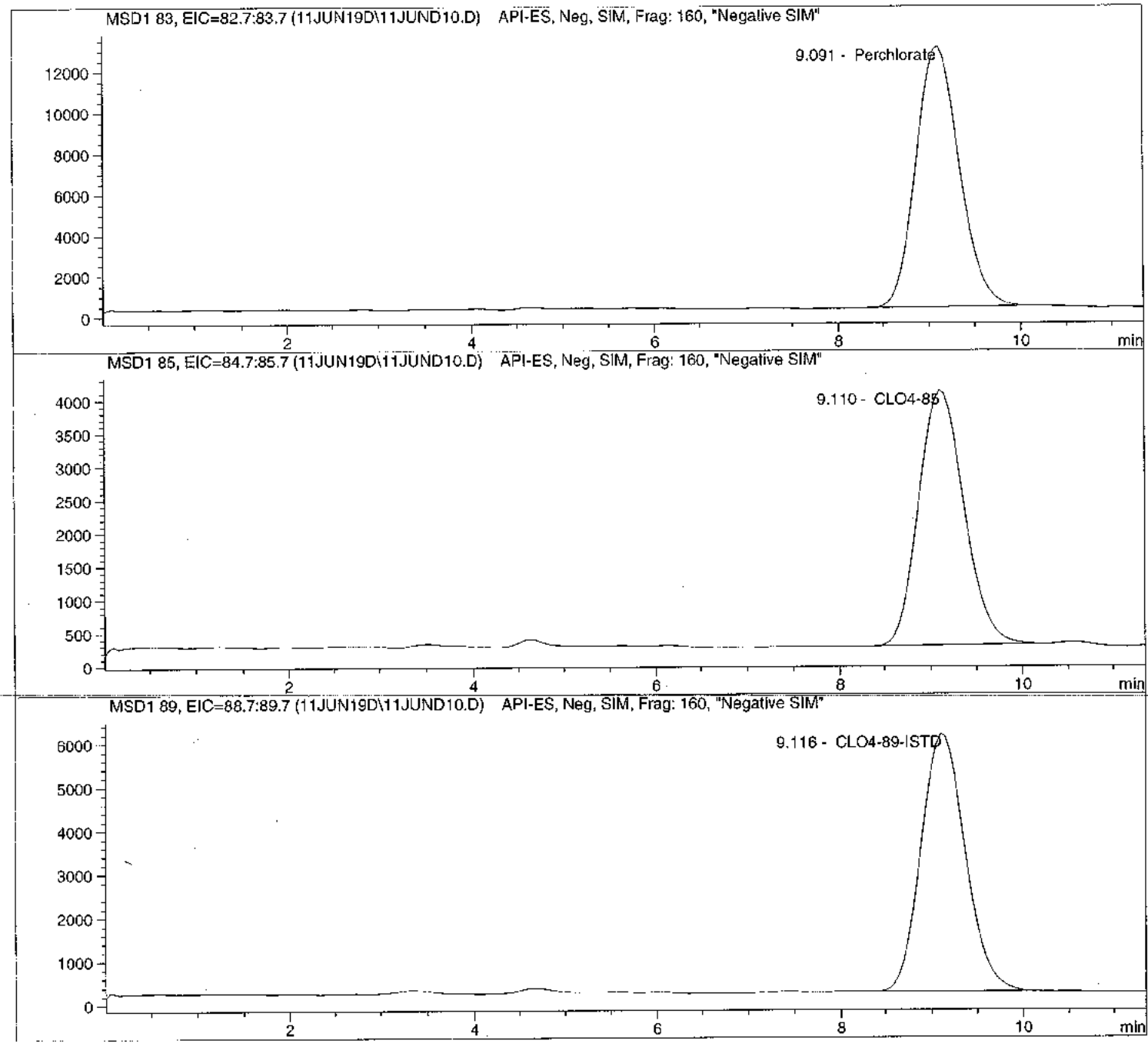
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.091	BBA	413978.8	6820.0559	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.110	PBA	130297.0	7096.6957	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.116	BBA	195449.6	5000.0000	CLO4-89-ISTD

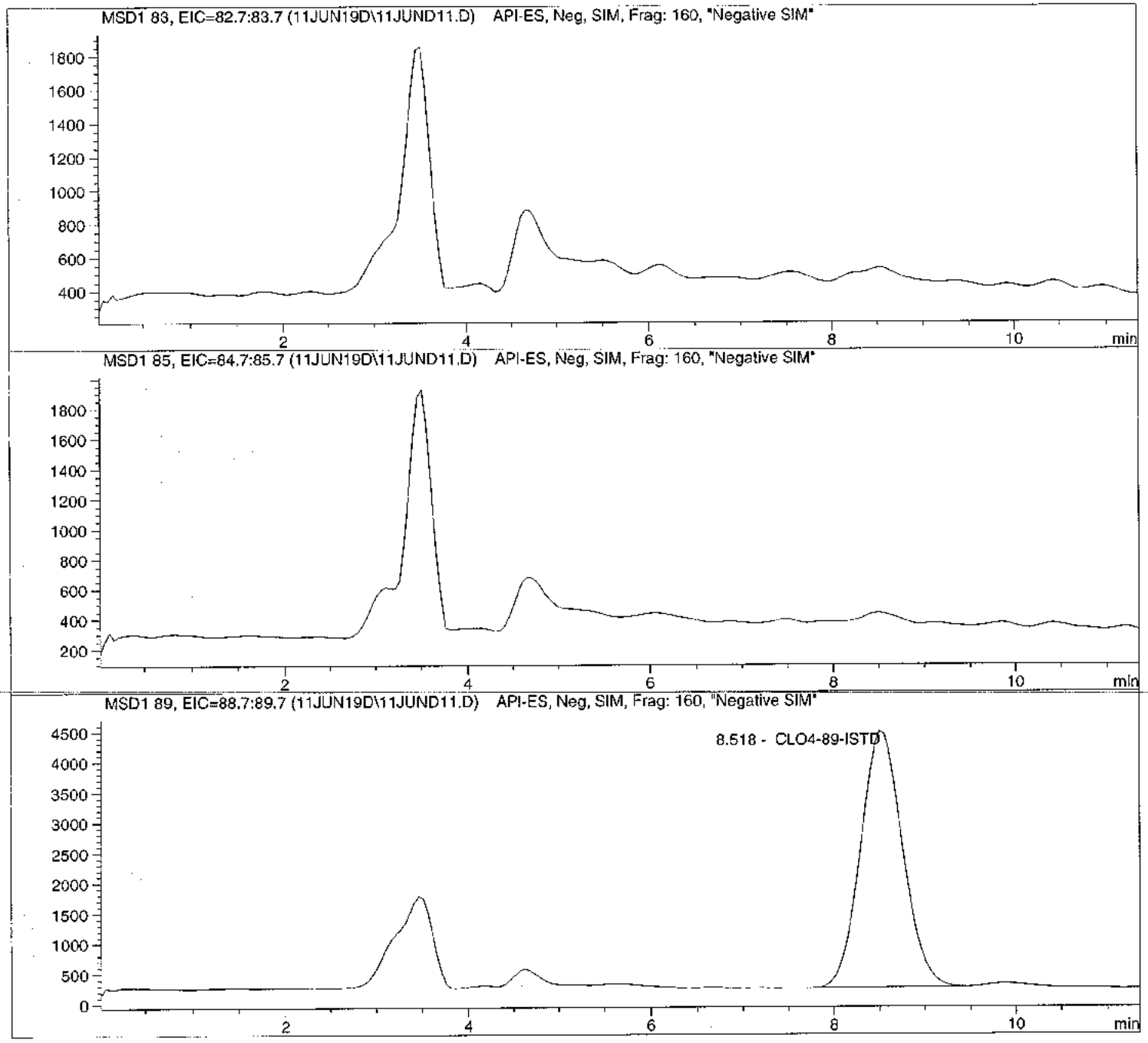
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.518	PBA	133827.9	5.0000	CLO4-89-ISTD

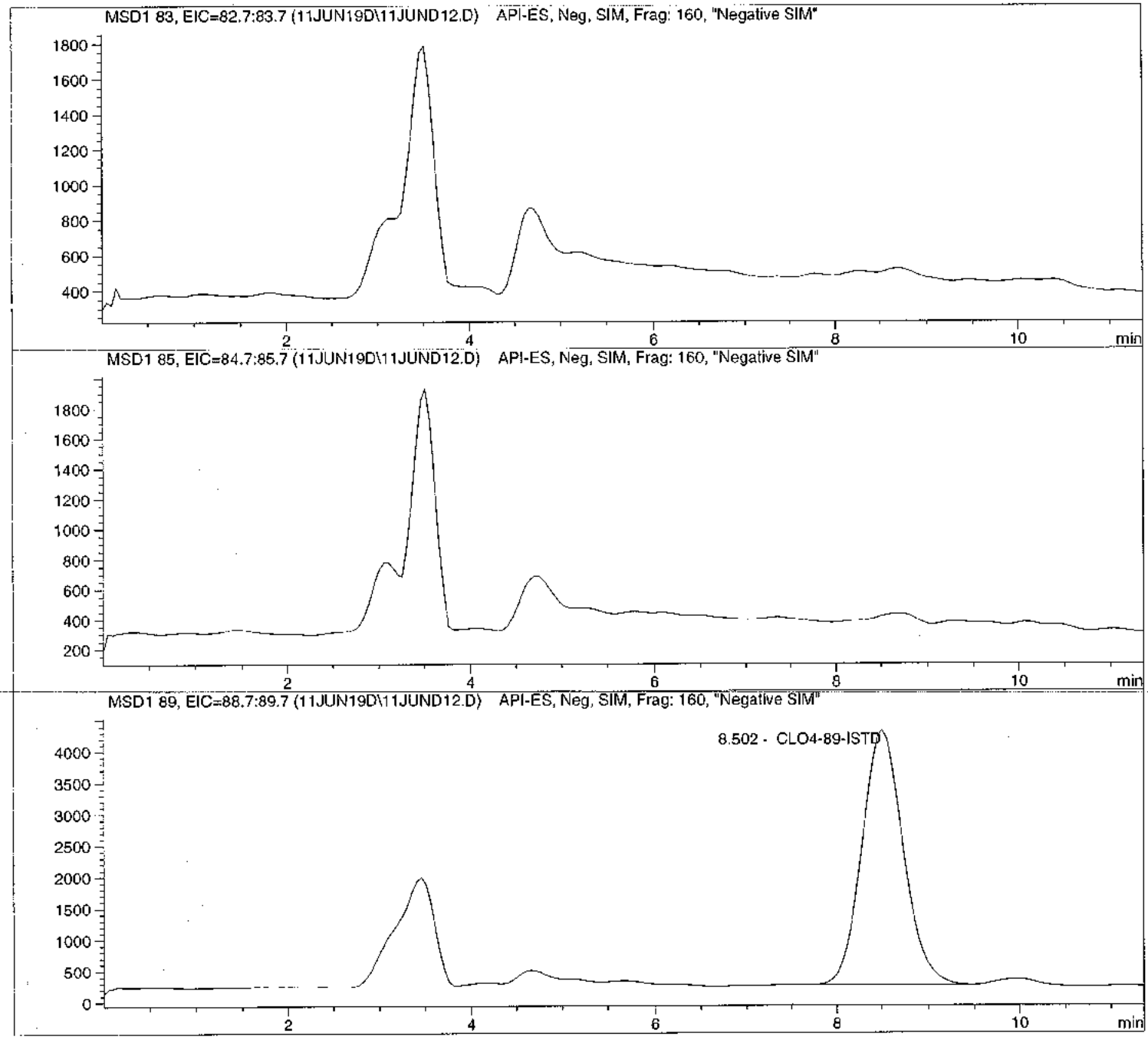
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	BBA	127033.7	5.0000	CLO4-89-ISTD

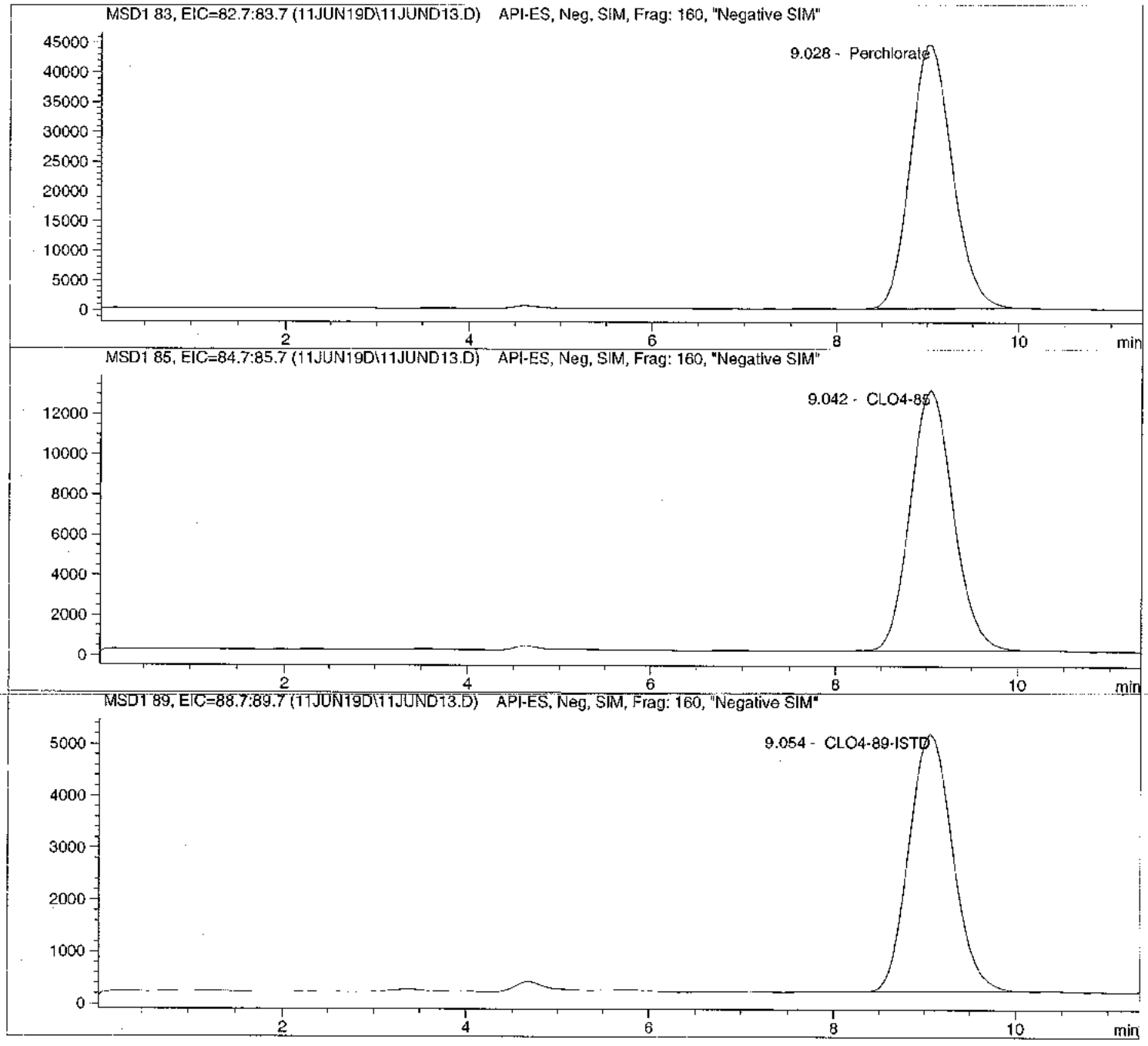
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.028	PBA	1423337.3	25.9807	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.042	BBA	426236.8	26.2061	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.054	BBA	166286.8	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

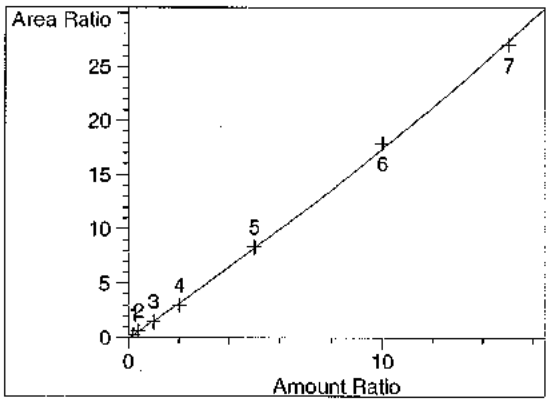
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

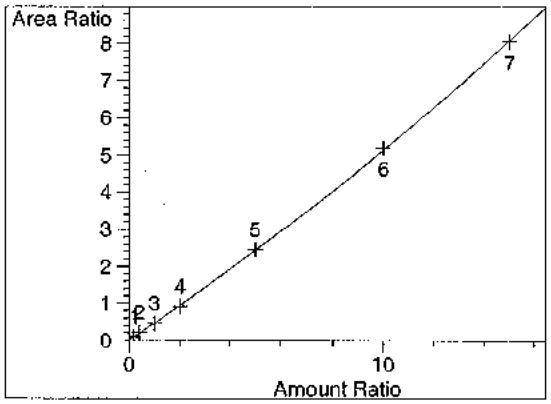
Peak Sum Table

No Entries in table

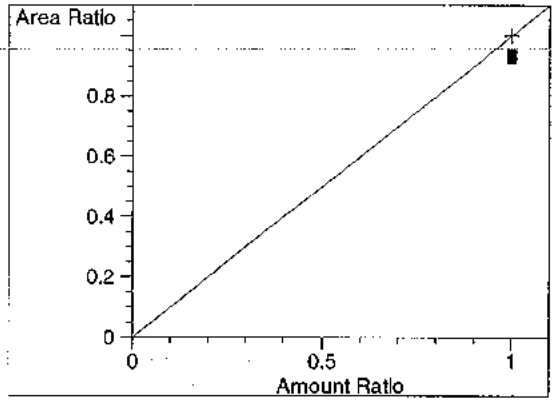
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

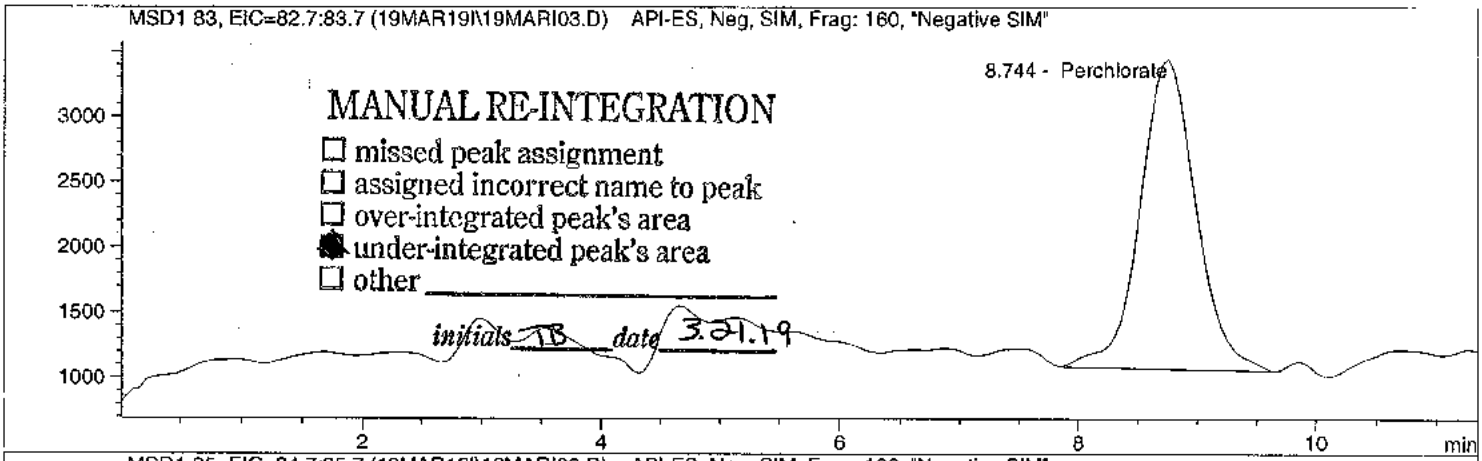
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

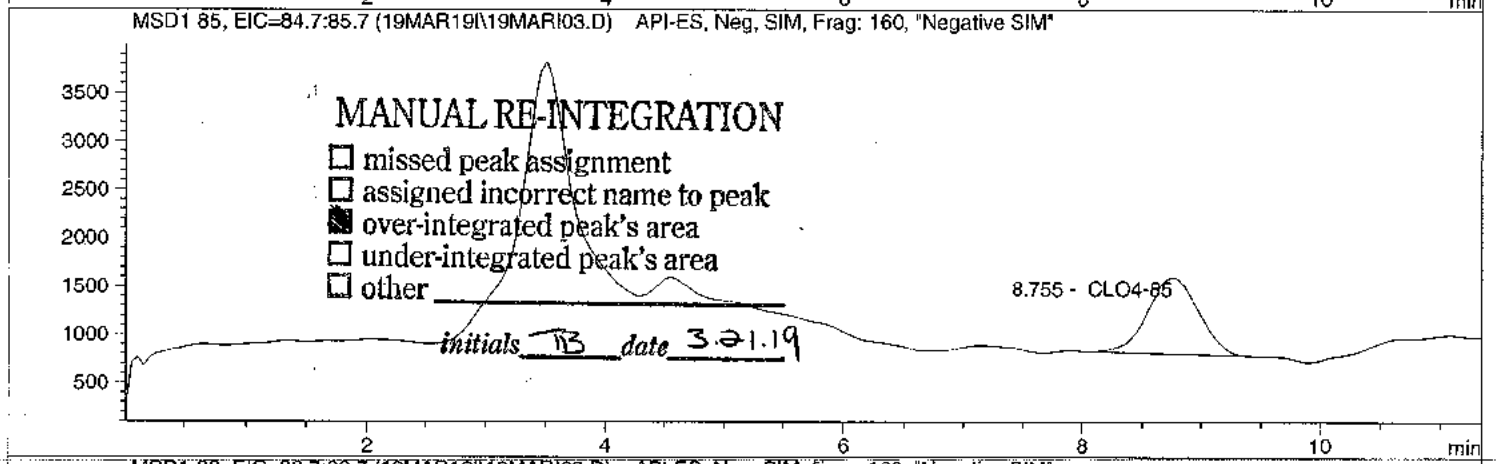
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

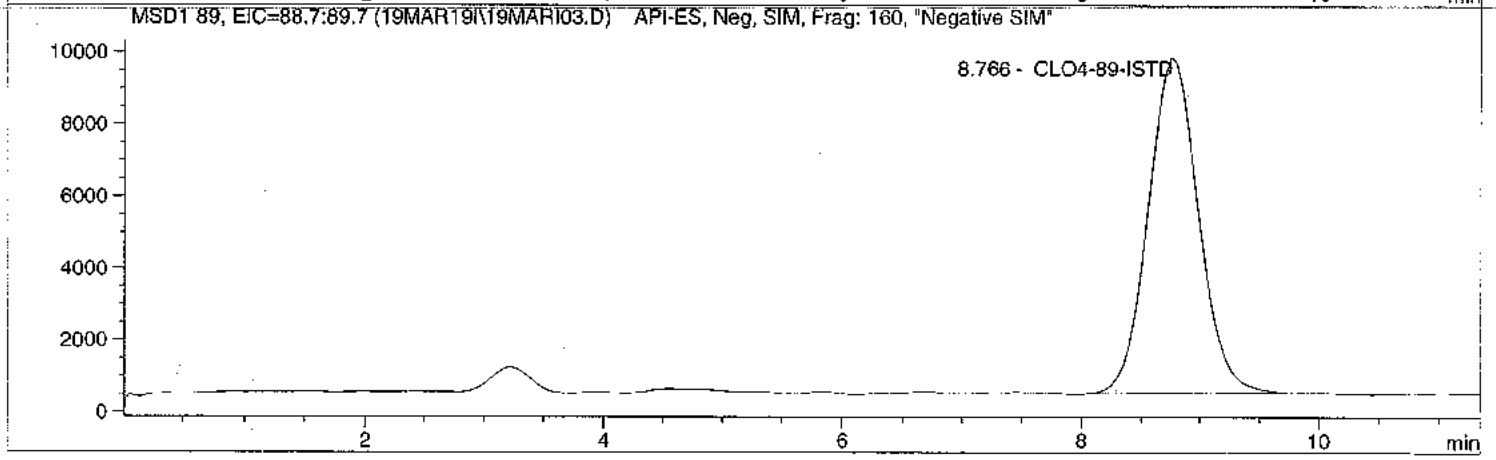
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

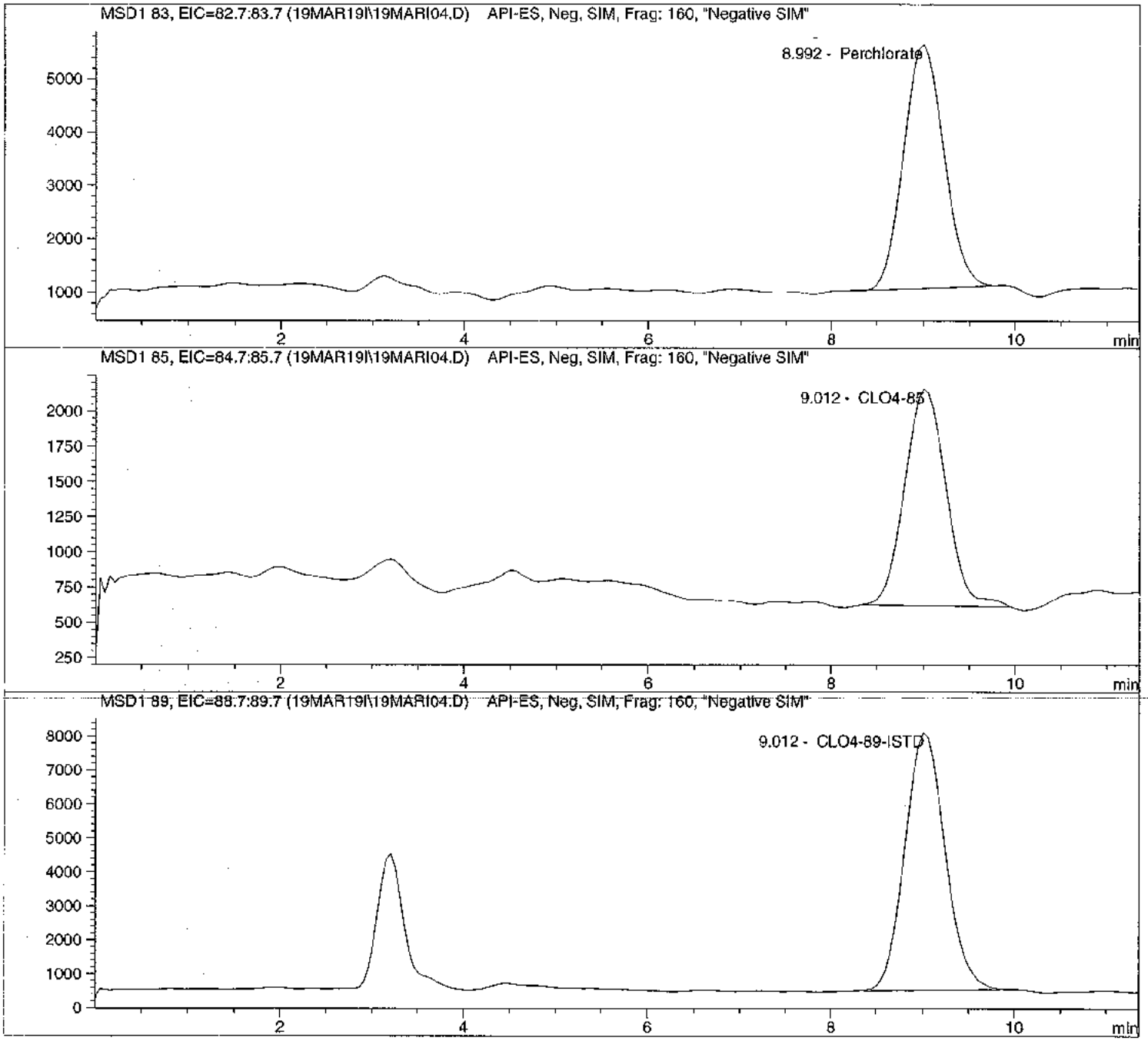
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

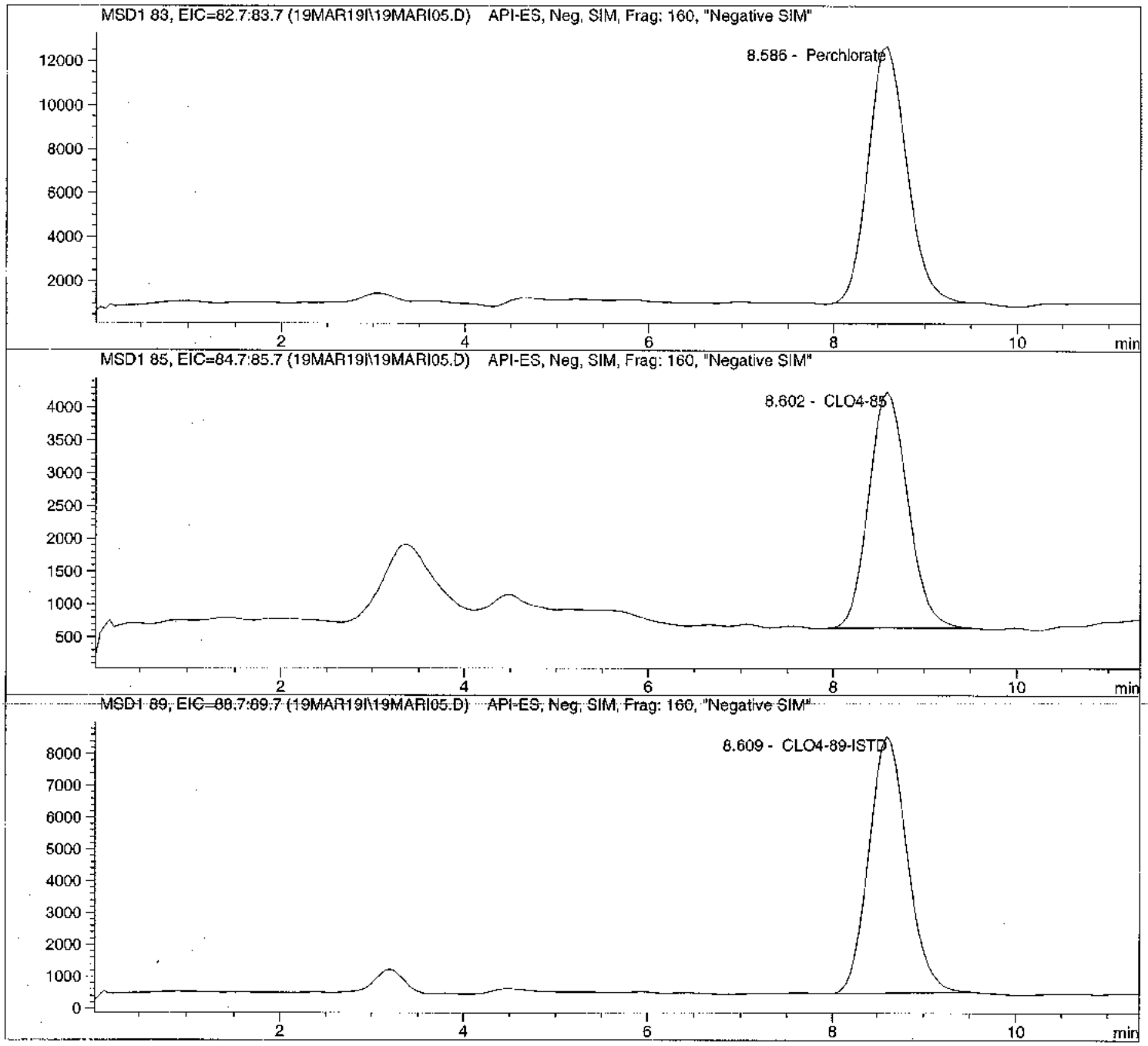
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

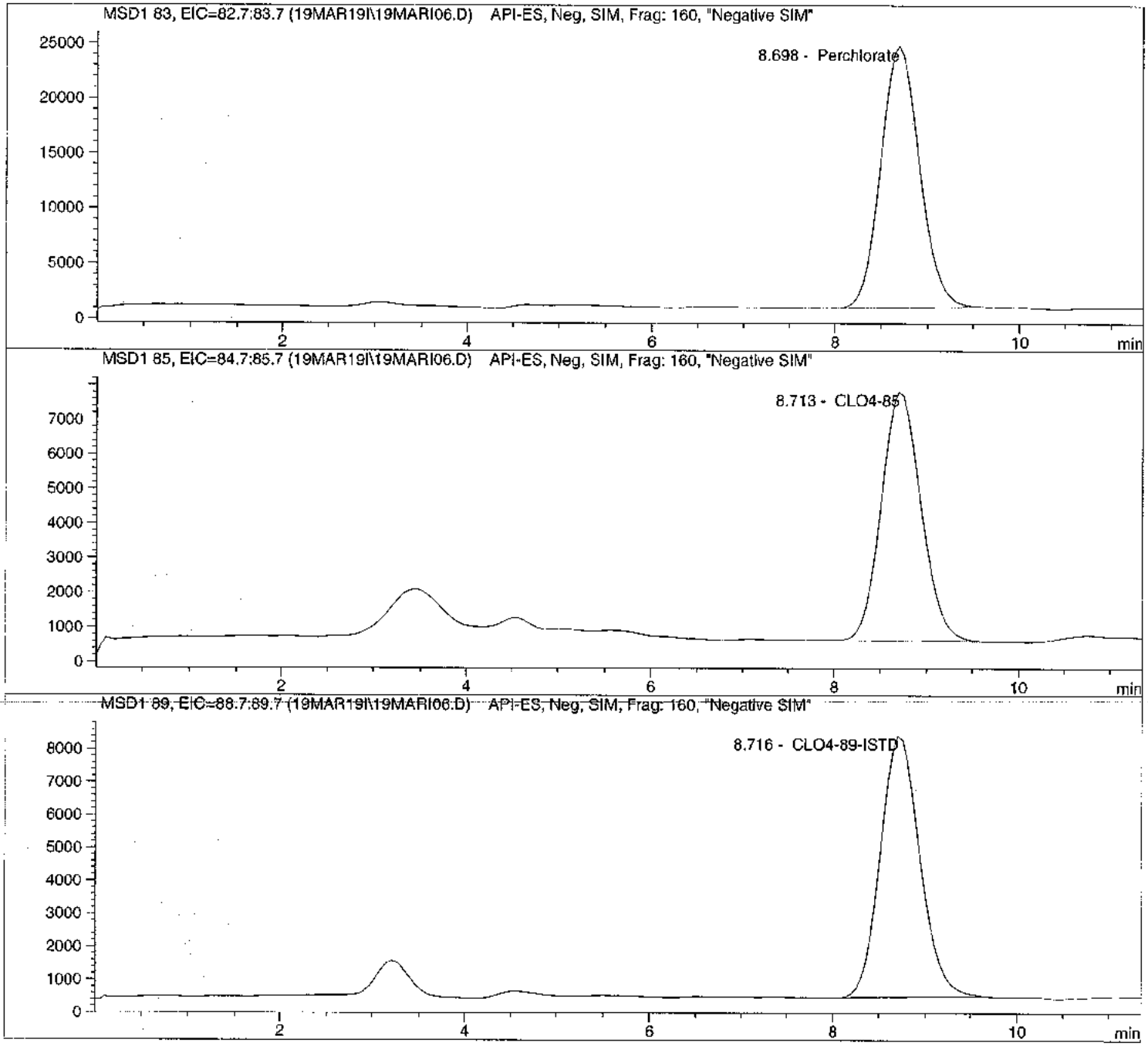
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

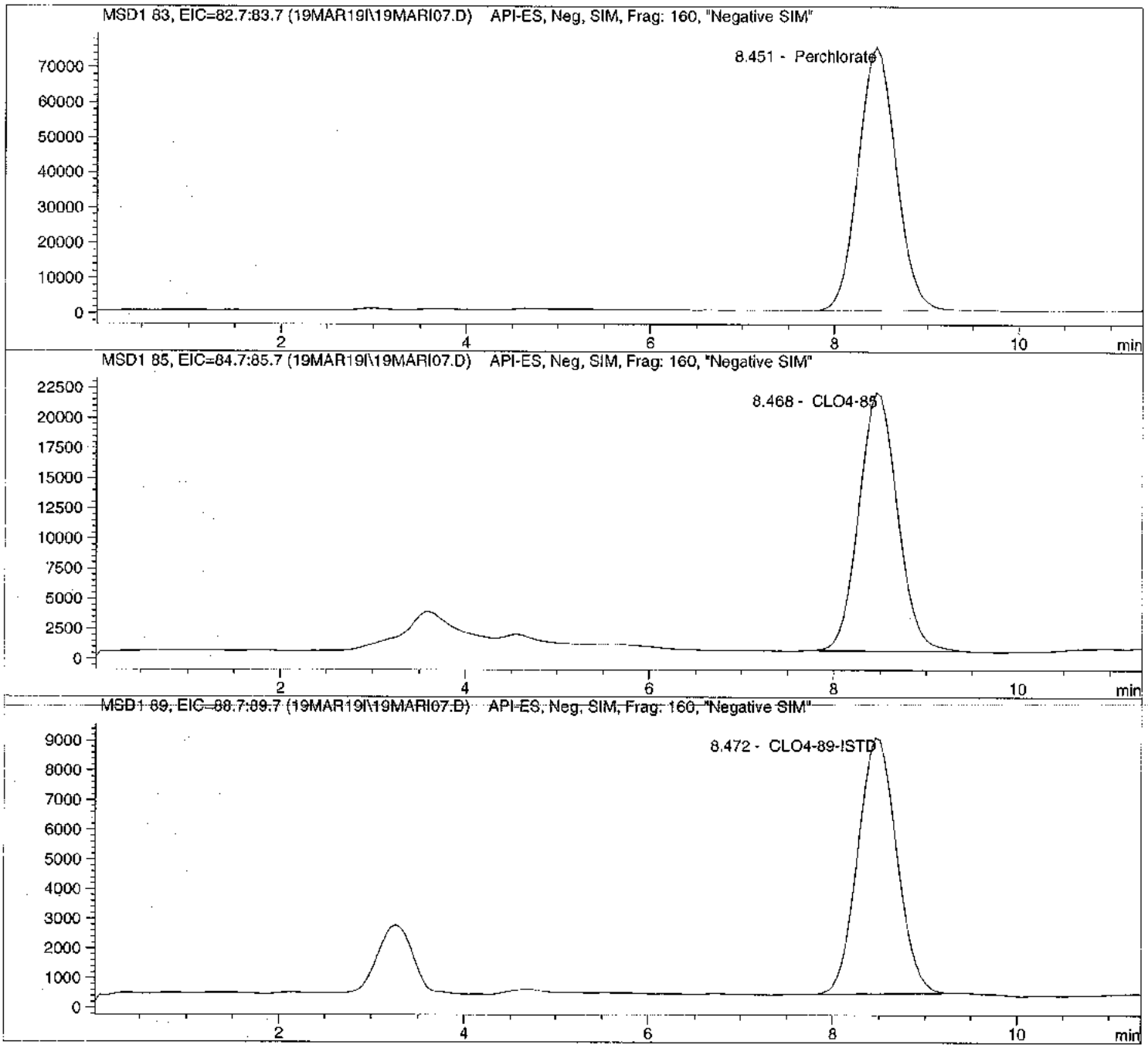
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

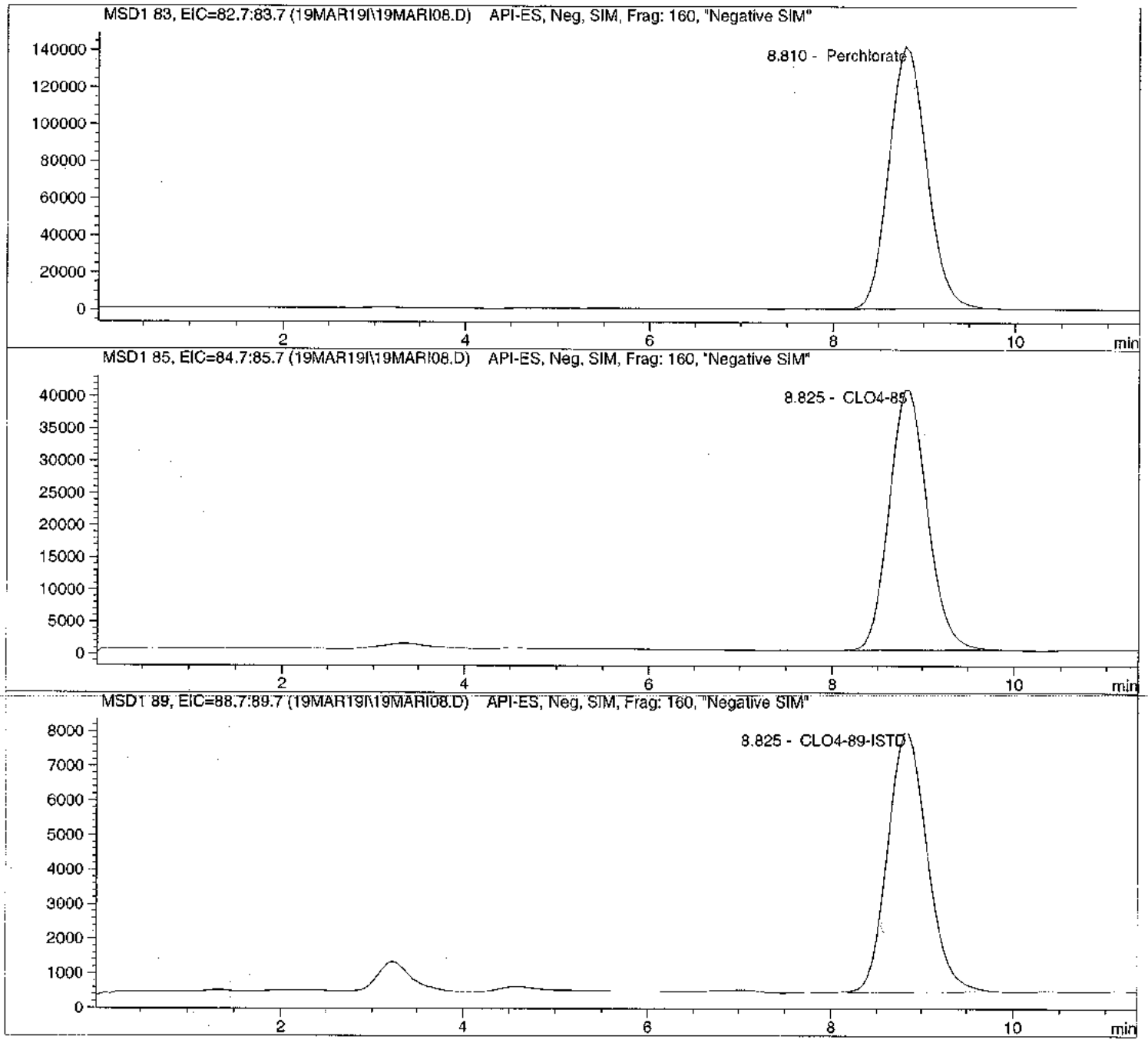
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

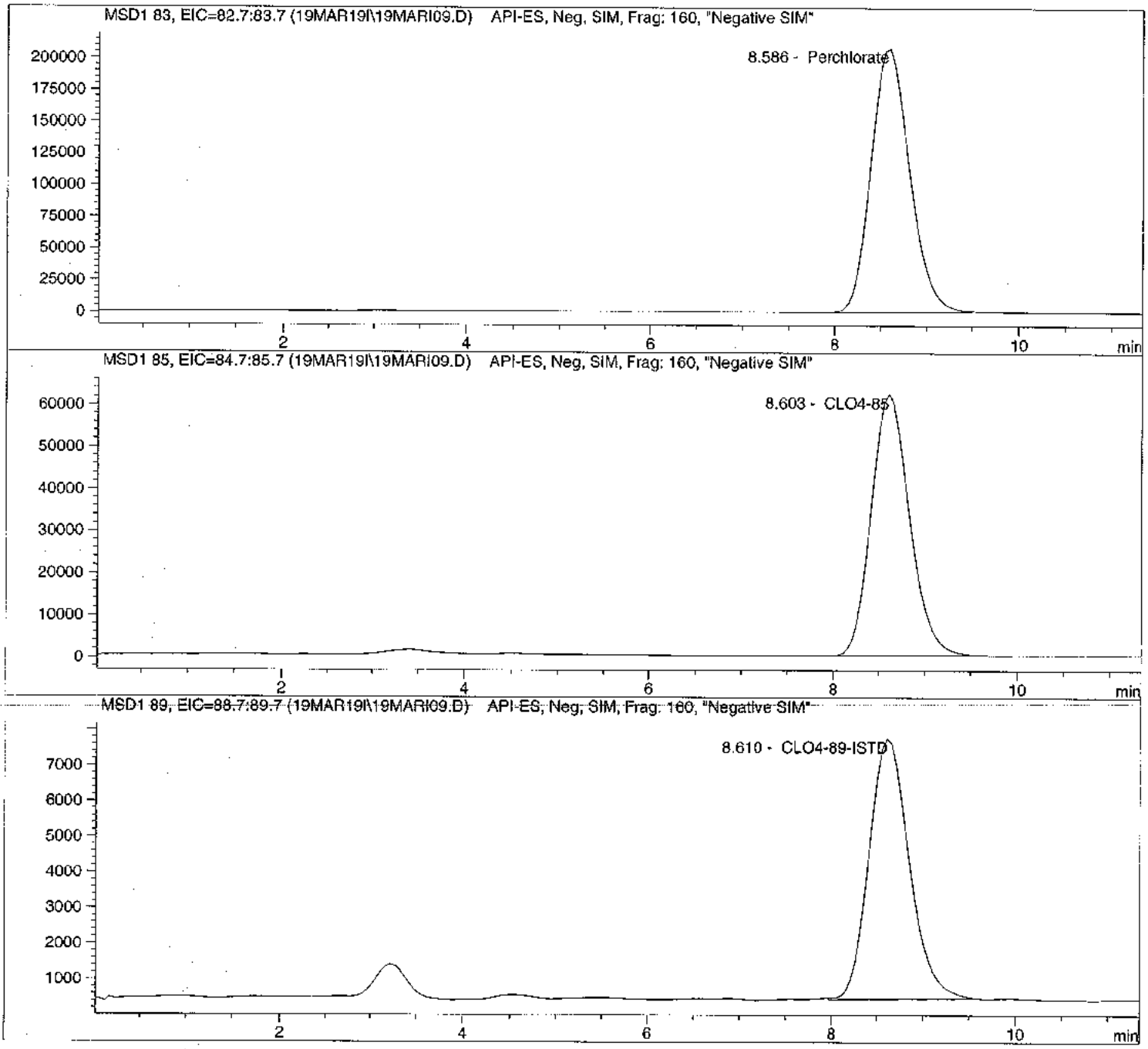
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

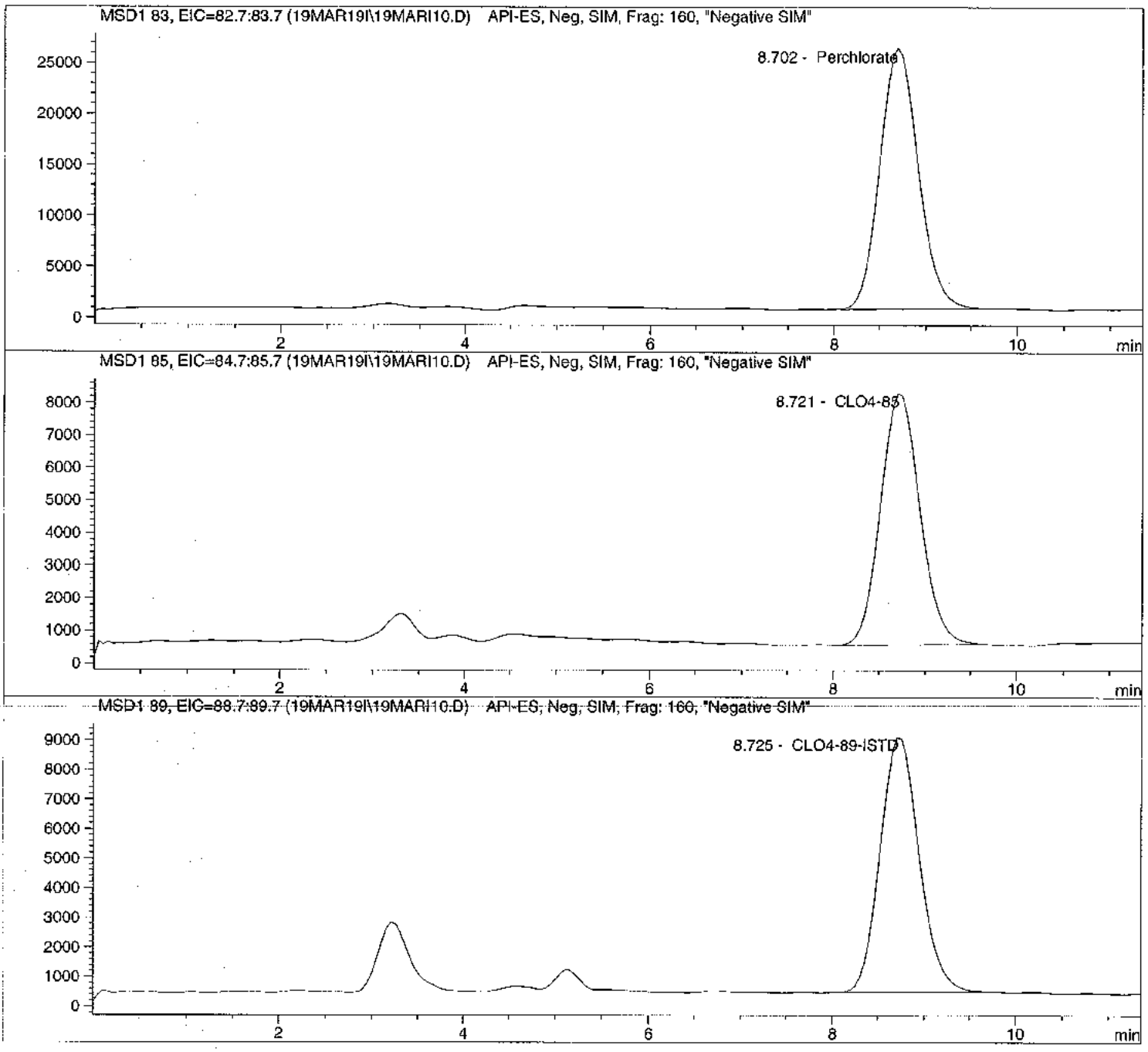
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

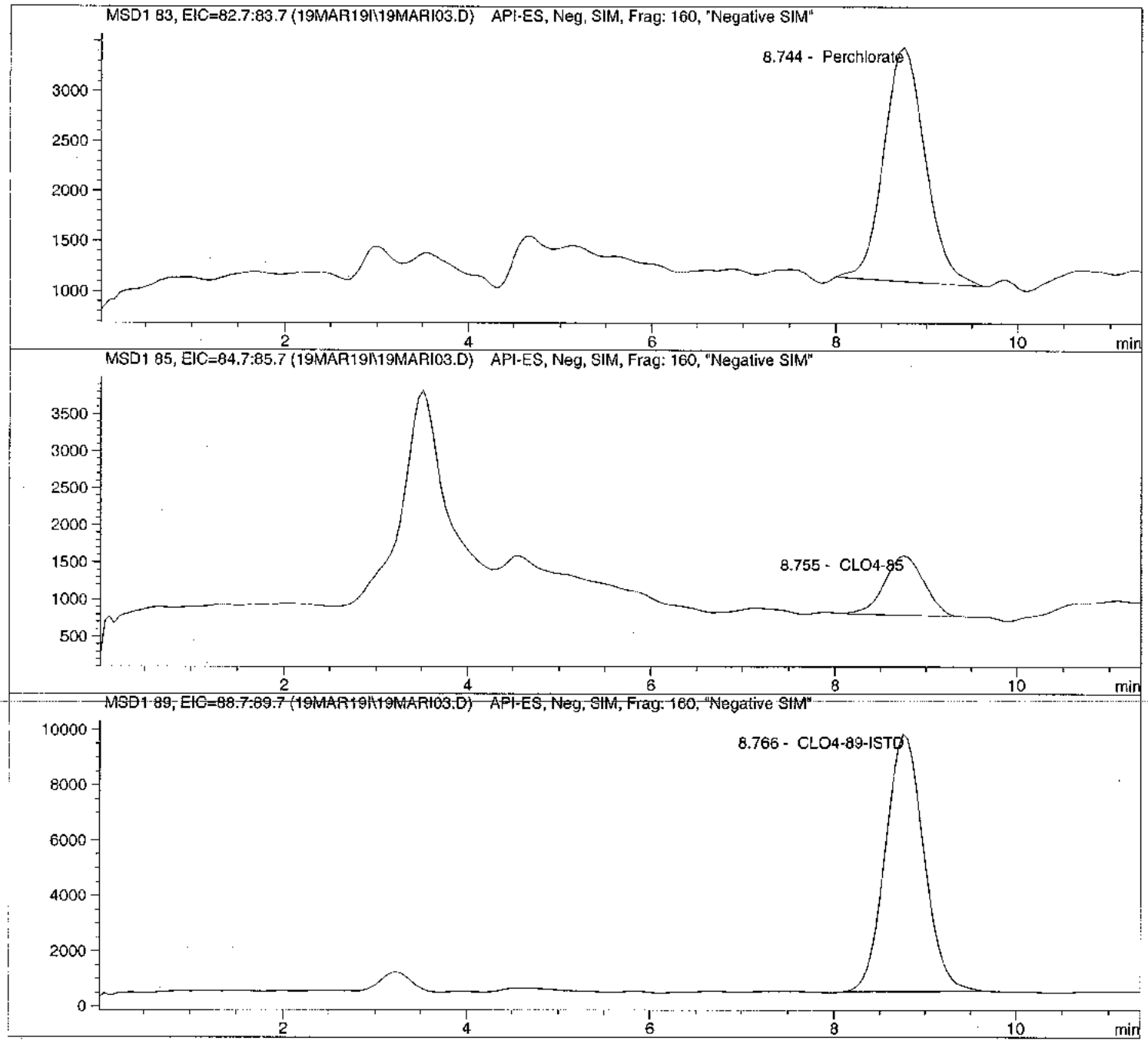
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

June 27, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19060172**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Jun 05, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 27-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19060172

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060172-01	LH18/24-SP650_060419	Water		04-Jun-2019 14:00	05-Jun-2019 09:00	☐
HS19060172-02	LH18/24-SP650_060419_BIX	Water		04-Jun-2019 14:00	05-Jun-2019 09:00	☐

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order:

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

WetChemistry by Method E350.3

Batch ID: R340032

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E365.3

Batch ID: R339873

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19060172

Sample ID: LH18/24-SP650_060419 Lab ID:HS19060172-01

Collection Date: 04-Jun-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: RG
Nitrogen, Ammonia (As N)	**7.5**		**0.20**	**0.10**	**0.20**	**mg/L**	1	07-Jun-2019 10:45
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: MZD
Phosphorus, Total Orthophosphate (As P)	**2.11**		**0.100**	**0.200**	**0.250**	**mg/L**	10	05-Jun-2019 14:55
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	20-Jun-2019 10:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19060172

Sample ID: LH18/24-SP650_060419_BIX Lab ID:HS19060172-02

Collection Date: 04-Jun-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jun-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19060172

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R339873	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3			**Matrix:** Water		
HS19060172-01	LH18/24-SP650_060419	04 Jun 2019 14:00			05 Jun 2019 14:55	10
Batch ID R340032	**Test Name :** AMMONIA AS N BY E350.3(ISE)			**Matrix:** Water		
HS19060172-01	LH18/24-SP650_060419	04 Jun 2019 14:00			07 Jun 2019 10:45	1
Batch ID R340666	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19060172-02	LH18/24-SP650_060419_BIX	04 Jun 2019 14:00			17 Jun 2019 18:06	1
Batch ID R340873	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS			**Matrix:** Water		
HS19060172-01	LH18/24-SP650_060419	04 Jun 2019 14:00			20 Jun 2019 10:27	1

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19060172

QC BATCH REPORT

Batch ID: R339873 (0) **Instrument:** UV-2450 **Method:** ORTHO PHOSPHATE (PO4) AS P BY E365.3

MBLK Sample ID: **MBLK-339873** Units: **mg/L** Analysis Date: **05-Jun-2019 14:55**
Client ID: Run ID: **UV-2450_339873** SeqNo: **5108274** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0200	0.0250								U

LCS Sample ID: **LCS-339873** Units: **mg/L** Analysis Date: **05-Jun-2019 14:55**
Client ID: Run ID: **UV-2450_339873** SeqNo: **5108275** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.251	0.0250	0.25	0	100	85 - 115				

MS Sample ID: **HS19060172-01MS** Units: **mg/L** Analysis Date: **05-Jun-2019 14:55**
Client ID: **LH18/24-SP650_060419** Run ID: **UV-2450_339873** SeqNo: **5108277** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	4.42	0.250	2.5	2.11	92.4	80 - 120				

MSD Sample ID: **HS19060172-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2019 14:55**
Client ID: **LH18/24-SP650_060419** Run ID: **UV-2450_339873** SeqNo: **5108278** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	4.55	0.250	2.5	2.11	97.6	80 - 120	4.42	2.9	20	

The following samples were analyzed in this batch: HS19060172-01

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19060172

QC BATCH REPORT

Batch ID: R340032 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R340032** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111522** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R340032** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111521** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.54	0.20	10	0	105	80 - 120				

MS Sample ID: **HS19051885-01MS** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111524** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.69	0.20	10	0.2668	104	80 - 120				

MSD Sample ID: **HS19051885-01MSD** Units: **mg/L** Analysis Date: **07-Jun-2019 10:45**
Client ID: Run ID: **WetChem_HS_340032** SeqNo: **5111523** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.64	0.20	10	0.2668	104	80 - 120	10.69	0.469	20	

The following samples were analyzed in this batch: HS19060172-01

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS19060172**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Illinois	004438	29-Jun-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Louisiana	03087	30-Jun-2019
Maryland	343, 2018-2019	30-Jun-2019
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 27-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19060172

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19060172-01	LH18/24-SP650_060419	Login	05/06/2019 10:50:41	NDR	WET161
HS19060172-01	LH18/24-SP650_060419	Login	05/06/2019 10:50:41	NDR	WET161
HS19060172-01	LH18/24-SP650_060419	Login	05/06/2019 10:50:41	NDR	Sub
HS19060172-02	LH18/24-SP650_060419_BIX	Login	05/06/2019 10:50:41	NDR	Sub

ALS Houston, US Date: 27-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060172
Date/Time Received: **05-Jun-2019 09:00**
Received by: **NDR**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 5-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature — 5-Jun-2019 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☐	No ☑	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	4.1c UC/C	IR25
Cooler(s)/Kit(s):	43593	
Date/Time sample(s) sent to storage:	06/05/2019 11:30am	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes: Sample Bottle count does not match
Sx -LH18/24-SP650_060419 COC= 2 Bottles
Received = 3

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modshia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. NWO1312.0150.0 16.0001

Job: GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

Prepared By: Scott Beesinger

P.O. Number

HS19060172

Bhate Environmental Associates, Inc.
18/24 Longhorn GW Treatment Plant Weekly Sampl

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE							Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_060419	Water	06/04/19 / 14:00		2	X	X									H2SO4	
LH18/24-SP650_060419	Water	06/04/19 / 14:00		1			X								NONE	
LH18/24-SP650_060419_BIX	Water	06/04/19 / 14:00		1				X							NONE	

Additional Remarks: **Standard TAT on all parameters**

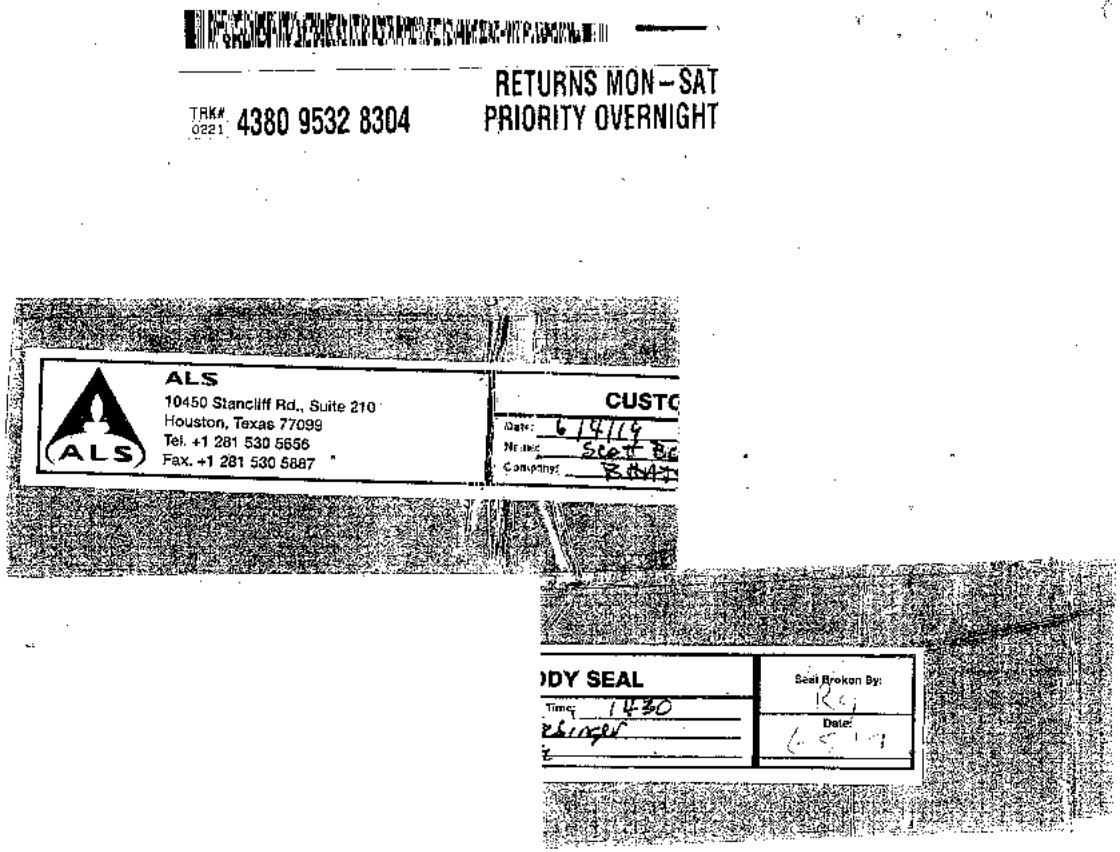
Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	06/04/19	14:30	R Cuga	6/5/19	09:00						

For Lab Use Only

Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
				R Cuga	6/5/19	09:00	4°C	-	cooler # 435913 IR #25 CPO

Remarks:

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly



TRK# 0221 4380 9532 8304

RETURNS MON – SAT
PRIORITY OVERNIGHT

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUSTO
Date: 6/14/14
Name: Scott Bo
Company: BBN

DY SEAL
Time: 1430

Seal Broken By:
Date:

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

June 19, 2019

Analytical Report for Service Request No: K1905259

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS19060172

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory June 06, 2019
For your reference, these analyses have been assigned our service request number **K1905259.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
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www.alsglobal.com

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Raw Data
    General Chemistry

Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
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1317 South 13th Ave, Kelso, WA 98626 | 1-360-577-7222 | www.alsglobal.com

Client: ALS Environmental - US
Project: HS19060172
Sample Matrix: Water

Service Request: K1905259
Date Received: 06/06/2019

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 06/06/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 06/19/2019

Chain of Custody

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L1905259

10450 Stancliff Rd, Ste 210
Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **11519**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19060172
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060172-01**	**LH18/24-SP650_060419**	**Water**	**04 Jun 2019 14:00**
	TOC Analysis for DOD Level IV			19 Jun 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: [signature] Date/Time: 6/5/19 1800

Received By: [signature] ALS Kelso Date/Time: 6/6/19 0940

Cooler ID(s): _____ Temperature(s): _____

00939635

PC KL

Cooler Receipt and Preservation Form

Client ALS-Houston Service Request K19 05259

Received: 6/6/19 Opened: 6/6/19 By: AM Unloaded: 6/6/19 By:

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2-Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
0.2	0.2	2.4	2.4	0	381	11919	480978347636	

4. Packing material: *Inserts* (*Baggies*) *Bubble Wrap* *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

General Chemistry

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ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1905259
Project:	HS19060172	**Date Collected:**	06/4/19
Sample Matrix:	Water	**Date Received:**	06/6/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_060419	K1905259-001	**2.21**	0.50	0.20	0.07	1	06/16/19 06:15	
Method Blank	K1905259-MB	ND U	0.50	0.20	0.07	1	06/15/19 17:30	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1905259
Project	HS19060172	**Date Collected:**	06/04/19
Sample Matrix:	Water	**Date Received:**	06/06/19
		Date Analyzed:	06/16/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_060419	**Units:**	mg/L
Lab Code:	K1905259-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K1905259-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	2.21	2.25	2.23	2	10

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1905259
Project:	HS19060172	**Date Analyzed:**	06/15/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	639524

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1905259-LCS	25.1	25.0	100	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1905259
Project: HS19060172

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	639524	KQ1908381-01	06/15/19 21:44	25.0	24.5	98	90-110
CCV2	639524	KQ1908381-02	06/16/19 02:55	25.0	24.5	98	90-110
CCV3	639524	KQ1908381-03	06/16/19 07:11	25.0	24.1	96	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1905259
Project: HS19060172

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	639524	KQ1908381-04	06/15/19 21:59	0.50	0.20	0.07	ND	U
CCB2	639524	KQ1908381-05	06/16/19 03:09	0.50	0.20	0.07	ND	U
CCB3	639524	KQ1908381-06	06/16/19 07:26	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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5361, 5369
III I

Work Request # (Original) (KI905246, 5084, 5126, 5198, 5259, 5259, 5249, 5339, 5126, 5262, 5277, 5278, 5279, 5305, 5360)

Tier: IV II III IV IV IV I II III IV IV III III II IV

Date Analyzed: 6/10/19

Analyst: JBCD

Run # TOC: 638808, 638810, 638815, 638817

Analysis: TOC

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	(yes)/no/NA
2.	Holding times met for all analyses and for all samples?	(yes)/no/NA
3.	Are calculations correct?	(yes)/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/(NA)
5.	All quality control criteria met?	(yes)/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	(yes)/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	(yes)/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	(yes)/no/NA
9.	Are results for methods blanks all ND?	(yes)/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/(no)/NA
11.	Are all exceptions explained?	(yes)/no/NA
12.	Have all applicable service requests been reviewed?	(yes)/no/NA
13.	Are all samples labeled correctly?	(yes)/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	(yes)/no/NA
15.	Are detection limits and units reported correctly?	(yes)/no/NA
16.	Is the unused space on the benchsheet crossed out?	(yes)/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/(no)/NA

COMMENTS: KI905258-6, 5198-3 Sent for RA (Needs dilution)
KI905259-1 sent for RA due to high RSD% from sample carry over.
KI905126-2, 5198-4, 5277-2, 5279-1 Report a high % RSD. However, these samples are less than 5x the MRL.

Final Approved by: [signature] Date: 06/14/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638808 **Method/Testcode:** 9060/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1905246-001	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 17:23:00	N	IV
K1905246-003	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 18:18:00	N	IV
K1905246-004	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 19:14:00	N	IV
K1905246-005	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 21:20:00	N	IV
KQ1908058-01	Carbon, Total Organic	CCV		Ground Water	25.15 mg/L	10 mL	25.2 mg/L	1			101		6/10/19 14:47:00	N	IV
KQ1908058-02	Carbon, Total Organic	CCV		Ground Water	27.51 mg/L	10 mL	27.5 mg/L	1			110		6/10/19 22:43:00	N	IV
KQ1908058-03	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 15:02:00	N	IV
KQ1908058-04	Carbon, Total Organic	CCB		Ground Water	0.19 mg/L	10 mL	0.19 mg/L J	1	0.07	0.50			6/10/19 22:58:00	N	IV
KQ1908058-05	Carbon, Total Organic	MB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 15:16:00	N	IV
KQ1908058-06	Carbon, Total Organic	MB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 15:16:00	N	IV
KQ1908058-07	Carbon, Total Organic	MB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 15:16:00	N	IV
KQ1908058-08	Carbon, Total Organic	MB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 15:16:00	N	IV
KQ1908058-09	Carbon, Total Organic	LCS		Ground Water	24.62 mg/L	10 mL	24.6 mg/L	1	0.07	0.50	98		6/10/19 16:12:00	N	IV
KQ1908058-10	Carbon, Total Organic	LCS		Ground Water	24.74 mg/L	10 mL	24.7 mg/L	1	0.07	0.50	99		6/10/19 16:12:00	N	IV
KQ1908058-11	Carbon, Total Organic	LCS		Ground Water	25.10 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/10/19 16:12:00	N	IV
KQ1908058-12	Carbon, Total Organic	LCS		Ground Water	24.96 mg/L	10 mL	25.0 mg/L	1	0.07	0.50	100		6/10/19 16:12:00	N	IV
KQ1908058-13	Carbon, Total Organic	DUP	K1905246-001	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 17:23:00	N	IV
KQ1908058-14	Carbon, Total Organic	TRP	K1905246-001	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 17:23:00	N	IV
KQ1908058-15	Carbon, Total Organic	QUAD	K1905246-001	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 17:23:00	N	IV
KQ1908058-16	Carbon, Total Organic	DUP	K1905246-003	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 18:18:00	N	IV
KQ1908058-17	Carbon, Total Organic	TRP	K1905246-003	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 18:18:00	N	IV
KQ1908058-18	Carbon, Total Organic	QUAD	K1905246-003	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 18:18:00	N	IV
KQ1908058-19	Carbon, Total Organic	DUP	K1905246-004	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 19:14:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

06/14/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638808 **Method/Testcode:** 9060/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1908058-20	Carbon, Total Organic	TRP	K1905246-004	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 19:14:00	N	IV
KQ1908058-21	Carbon, Total Organic	QUAD	K1905246-004	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 19:14:00	N	IV
KQ1908058-22	Carbon, Total Organic	MS	K1905246-004	Ground Water	25.43 mg/L	10 mL	25.4 mg/L	1	0.07	0.50	102		6/10/19 20:10:00	N	IV
KQ1908058-23	Carbon, Total Organic	DUP	K1905246-005	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 21:20:00	N	IV
KQ1908058-24	Carbon, Total Organic	TRP	K1905246-005	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 21:20:00	N	IV
KQ1908058-25	Carbon, Total Organic	QUAD	K1905246-005	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/10/19 21:20:00	N	IV
KQ1908058-26	Carbon, Total Organic	MS	K1905246-004	Ground Water	25.58 mg/L	10 mL	25.6 mg/L	1	0.07	0.50	102		6/10/19 20:10:00	N	IV
KQ1908058-27	Carbon, Total Organic	MS	K1905246-004	Ground Water	25.72 mg/L	10 mL	25.7 mg/L	1	0.07	0.50	103		6/10/19 20:10:00	N	IV
KQ1908058-28	Carbon, Total Organic	MS	K1905246-004	Ground Water	25.75 mg/L	10 mL	25.8 mg/L	1	0.07	0.50	103		6/10/19 20:10:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638810 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1905084-004	Carbon, Total Organic	N/A		Water	7.86 mg/L	10 mL	786 mg/L	100	7	50			6/11/19 06:17:00	N	II
K1905084-005	Carbon, Total Organic	N/A		Water	6.52 mg/L	10 mL	652 mg/L	100	7	50			6/11/19 06:45:00	N	II
K1905126-001	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 07:41:00	N	III
K1905126-002	Carbon, Total Organic	N/A		Ground Water	0.13 mg/L	10 mL	0.13 mg/L J	1	0.07	0.50			6/11/19 08:09:00	Y	III
K1905126-003	Carbon, Total Organic	N/A		Ground Water	0.27 mg/L	10 mL	0.27 mg/L J	1	0.07	0.50			6/11/19 09:36:00	N	III
K1905126-004	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 10:04:00	N	III
K1905198-003	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	2.0 mg/L U	4	0.3	2.0			6/10/19 22:15:00	N	IV
K1905198-004	Carbon, Total Organic	N/A		Ground Water	1.55 mg/L	10 mL	1.55 mg/L	1	0.07	0.50			6/10/19 23:13:00	N	IV
K1905198-005	Carbon, Total Organic	N/A		Ground Water	47.30 mg/L	10 mL	94.6 mg/L	2	0.2	1.0			6/10/19 23:41:00	N	IV
K1905258-001	Carbon, Total Organic	N/A		Water	6.61 mg/L	10 mL	66.1 mg/L	10	0.7	5.0			6/11/19 00:37:00	N	IV
K1905258-002	Carbon, Total Organic	N/A		Water	30.64 mg/L	10 mL	306 mg/L	10	0.7	5.0			6/11/19 01:33:00	N	IV
K1905258-003	Carbon, Total Organic	N/A		Water	12.86 mg/L	10 mL	12.9 mg/L	1	0.07	0.50			6/11/19 02:30:00	N	IV
K1905258-004	Carbon, Total Organic	N/A		Water	4.69 mg/L	10 mL	4.69 mg/L	1	0.07	0.50			6/11/19 02:58:00	N	IV
K1905258-005	Carbon, Total Organic	N/A		Water	4.11 mg/L	10 mL	4.11 mg/L	1	0.07	0.50			6/11/19 03:26:00	N	IV
K1905258-006	Carbon, Total Organic	N/A		Water	63.63 mg/L	10 mL	318 mg/L	5	0.4	2.5			6/11/19 04:53:00	N	IV
K1905259-001	Carbon, Total Organic	N/A		Water	2.92 mg/L	10 mL	2.92 mg/L	1	0.07	0.50			6/11/19 05:21:00	N	IV
K1905298-001	Carbon, Total Organic	N/A		Drinking Water	0.12 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 07:13:00	N	I
K1905338-001	Carbon, Total Organic	N/A		Water	1.66 mg/L	10 mL	1.66 mg/L	1	0.07	0.50			6/11/19 05:49:00	N	II
KQ1908062-01	Carbon, Total Organic	CCV		Water	25.15 mg/L	10 mL	25.2 mg/L	1			101		6/10/19 14:47:00	N	IV
KQ1908062-02	Carbon, Total Organic	CCV		Water	27.51 mg/L	10 mL	27.5 mg/L	1			110		6/10/19 22:43:00	N	IV
KQ1908062-03	Carbon, Total Organic	CCV		Water	24.91 mg/L	10 mL	24.9 mg/L	1			100		6/11/19 03:54:00	N	IV
KQ1908062-04	Carbon, Total Organic	CCV		Water	24.86 mg/L	10 mL	24.9 mg/L	1			100		6/11/19 08:37:00	N	IV
KQ1908062-05	Carbon, Total Organic	CCV		Water	24.61 mg/L	10 mL	24.6 mg/L	1			98		6/11/19 13:35:00	N	IV
KQ1908062-06	Carbon, Total Organic	CCB		Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/10/19 15:02:00	N	IV
KQ1908062-07	Carbon, Total Organic	CCB		Water	0.19 mg/L	10 mL	0.19 mg/L J	1	0.07	0.50			6/10/19 22:58:00	N	IV
KQ1908062-08	Carbon, Total Organic	CCB		Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 04:09:00	N	IV
KQ1908062-09	Carbon, Total Organic	CCB		Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 08:52:00	N	IV
KQ1908062-10	Carbon, Total Organic	CCB		Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 13:50:00	N	IV
KQ1908062-11	Carbon, Total Organic	MB		Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 04:24:00	N	IV
KQ1908062-12	Carbon, Total Organic	LCS		Water	25.36 mg/L	10 mL	25.4 mg/L	1	0.07	0.50	101		6/11/19 04:38:00	N	IV
KQ1908062-13	Carbon, Total Organic	DUP	K1905258-001	Water	6.52 mg/L	10 mL	65.2 mg/L	10	0.7	5.0		1	6/11/19 00:37:00	N	IV
KQ1908062-14	Carbon, Total Organic	DUP	K1905258-002	Water	30.25 mg/L	10 mL	302 mg/L	10	0.7	5.0		1	6/11/19 01:33:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638810 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1908062-15	Carbon, Total Organic	DUP	K1905258-003	Water	12.98 mg/L	10 mL	13.0 mg/L	1	0.07	0.50		<1	6/11/19 02:30:00	N	IV
KQ1908062-16	Carbon, Total Organic	DUP	K1905258-004	Water	4.50 mg/L	10 mL	4.50 mg/L	1	0.07	0.50		4	6/11/19 02:58:00	N	IV
KQ1908062-17	Carbon, Total Organic	DUP	K1905258-005	Water	4.16 mg/L	10 mL	4.16 mg/L	1	0.07	0.50		1	6/11/19 03:26:00	N	IV
KQ1908062-18	Carbon, Total Organic	DUP	K1905258-006	Water	63.10 mg/L	10 mL	316 mg/L	5	0.4	2.5		<1	6/11/19 04:53:00	N	IV
KQ1908062-19	Carbon, Total Organic	DUP	K1905259-001	Water	2.60 mg/L	10 mL	2.60 mg/L	1	0.07	0.50		12*	6/11/19 05:21:00	N	IV
KQ1908062-20	Carbon, Total Organic	DUP	K1905338-001	Water	1.64 mg/L	10 mL	1.64 mg/L	1	0.07	0.50		1	6/11/19 05:49:00	N	II
KQ1908062-21	Carbon, Total Organic	DUP	K1905084-004	Water	7.95 mg/L	10 mL	795 mg/L	100	7	50		1	6/11/19 06:17:00	N	II
KQ1908062-22	Carbon, Total Organic	DUP	K1905084-005	Water	6.46 mg/L	10 mL	646 mg/L	100	7	50		<1	6/11/19 06:45:00	N	II
KQ1908062-23	Carbon, Total Organic	DUP	K1905298-001	Drinking Water	0.05 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 07:13:00	N	I
KQ1908062-24	Carbon, Total Organic	DUP	K1905126-001	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 07:41:00	N	III
KQ1908062-25	Carbon, Total Organic	DUP	K1905126-002	Ground Water	0.18 mg/L	10 mL	0.18 mg/L J	1	0.07	0.50		33*	6/11/19 08:09:00	N	III
KQ1908062-26	Carbon, Total Organic	DUP	K1905126-003	Ground Water	0.25 mg/L	10 mL	0.25 mg/L J	1	0.07	0.50		7	6/11/19 09:36:00	N	III
KQ1908062-27	Carbon, Total Organic	DUP	K1905126-004	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 10:04:00	N	III
KQ1908062-28	Carbon, Total Organic	MS	K1905126-002	Ground Water	25.89 mg/L	10 mL	25.9 mg/L	1	0.07	0.50	103		6/11/19 09:07:00	N	III
KQ1908062-29	Carbon, Total Organic	DUP	K1905198-003	Ground Water	-0.01 mg/L	10 mL	2.0 mg/L U	4	0.3	2.0		NC	6/10/19 22:15:00	N	IV
KQ1908062-30	Carbon, Total Organic	DUP	K1905198-004	Ground Water	1.28 mg/L	10 mL	1.28 mg/L	1	0.07	0.50		19*	6/10/19 23:13:00	N	IV
KQ1908062-31	Carbon, Total Organic	DUP	K1905198-005	Ground Water	47.09 mg/L	10 mL	94.2 mg/L	2	0.2	1.0		<1	6/10/19 23:41:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638815 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1905126-005	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 10:32:00	N	III
K1905126-006	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 11:00:00	N	III
K1905126-007	Carbon, Total Organic	N/A		Ground Water	0.07 mg/L	10 mL	0.07 mg/L J	1	0.07	0.50			6/11/19 11:28:00	N	III
K1905126-008	Carbon, Total Organic	N/A		Ground Water	0.30 mg/L	10 mL	0.30 mg/L J	1	0.07	0.50			6/11/19 11:56:00	N	III
K1905126-009	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 12:24:00	N	III
K1905262-001	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 12:53:00	N	IV
K1905262-002	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 14:19:00	N	IV
K1905277-001	Carbon, Total Organic	N/A		Ground Water	0.33 mg/L	10 mL	0.33 mg/L J	1	0.07	0.50			6/11/19 14:48:00	Y	IV
K1905277-002	Carbon, Total Organic	N/A		Ground Water	0.36 mg/L	10 mL	0.36 mg/L J	1	0.07	0.50			6/11/19 15:15:00	N	IV
K1905277-003	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 16:13:00	N	IV
KQ1908063-01	Carbon, Total Organic	MS	K1905277-001	Ground Water	25.85 mg/L	10 mL	25.9 mg/L	1	0.07	0.50	102		6/11/19 15:16:00	N	IV
KQ1908063-02	Carbon, Total Organic	DUP	K1905277-001	Ground Water	0.30 mg/L	10 mL	0.30 mg/L J	1	0.07	0.50		9	6/11/19 14:48:00	N	IV
KQ1908063-03	Carbon, Total Organic	CCV		Ground Water	24.86 mg/L	10 mL	24.9 mg/L	1			100		6/11/19 08:37:00	N	III
KQ1908063-04	Carbon, Total Organic	CCV		Ground Water	24.61 mg/L	10 mL	24.6 mg/L	1			98		6/11/19 13:21:00	N	III
KQ1908063-05	Carbon, Total Organic	CCV		Ground Water	24.69 mg/L	10 mL	24.7 mg/L	1			99		6/11/19 17:24:00	N	III
KQ1908063-06	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 08:52:00	N	III
KQ1908063-07	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 13:35:00	N	III
KQ1908063-08	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 17:39:00	N	III
KQ1908063-09	Carbon, Total Organic	MB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 13:50:00	N	III
KQ1908063-10	Carbon, Total Organic	LCS		Ground Water	25.06 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/11/19 14:05:00	N	III
KQ1908063-11	Carbon, Total Organic	DUP	K1905126-005	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 10:32:00	N	III
KQ1908063-12	Carbon, Total Organic	DUP	K1905126-006	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 11:00:00	N	III
KQ1908063-13	Carbon, Total Organic	DUP	K1905126-007	Ground Water	0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 11:28:00	N	III

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined

06/14/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638815 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1908063-14	Carbon, Total Organic	DUP	K1905126-008	Ground Water	0.33 mg/L	10 mL	0.33 mg/L J	1	0.07	0.50		8	6/11/19 11:56:00	N	III
KQ1908063-15	Carbon, Total Organic	DUP	K1905126-009	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 12:24:00	N	III
KQ1908063-16	Carbon, Total Organic	DUP	K1905262-001	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 12:53:00	N	IV
KQ1908063-17	Carbon, Total Organic	DUP	K1905262-002	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 14:19:00	N	IV
KQ1908063-18	Carbon, Total Organic	DUP	K1905277-002	Ground Water	0.32 mg/L	10 mL	0.32 mg/L J	1	0.07	0.50		12*	6/11/19 15:45:00	N	IV
KQ1908063-19	Carbon, Total Organic	DUP	K1905277-003	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 16:13:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638817 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1905278-001	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 16:41:00	Y	III
K1905278-002	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 17:54:00	N	III
K1905278-003	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 18:22:00	N	III
K1905279-001	Carbon, Total Organic	N/A		Ground Water	0.49 mg/L	10 mL	0.49 mg/L J	1	0.07	0.50			6/11/19 18:50:00	N	III
K1905305-001	Carbon, Total Organic	N/A		Water	5.67 mg/L	10 mL	5.67 mg/L	1	0.07	0.50			6/11/19 19:18:00	N	II
K1905360-001	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 19:46:00	N	IV
K1905361-001	Carbon, Total Organic	N/A		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 20:14:00	N	III
K1905369-001	Carbon, Total Organic	N/A		Water	5.21 mg/L	10 mL	10.4 mg/L	2	0.2	1.0			6/11/19 20:42:00	N	I
K1905369-002	Carbon, Total Organic	N/A		Water	13.49 mg/L	10 mL	13.5 mg/L	1	0.07	0.50			6/11/19 21:10:00	N	I
K1905369-003	Carbon, Total Organic	N/A		Water	1.77 mg/L	10 mL	1.77 mg/L	1	0.07	0.50			6/11/19 21:38:00	N	I
K1905369-004	Carbon, Total Organic	N/A		Water	9.26 mg/L	10 mL	18.5 mg/L	2	0.2	1.0			6/11/19 22:06:00	N	I
K1905369-005	Carbon, Total Organic	N/A		Water	10.02 mg/L	10 mL	10.0 mg/L	1	0.07	0.50			6/11/19 23:33:00	N	I
K1905369-006	Carbon, Total Organic	N/A		Water	13.53 mg/L	10 mL	27.1 mg/L	2	0.2	1.0			6/12/19 00:01:00	N	I
K1905369-007	Carbon, Total Organic	N/A		Water	27.08 mg/L	10 mL	54.2 mg/L	2	0.2	1.0			6/12/19 00:29:00	N	I
K1905369-008	Carbon, Total Organic	N/A		Water	9.58 mg/L	10 mL	19.2 mg/L	2	0.2	1.0			6/12/19 00:58:00	N	I
K1905369-009	Carbon, Total Organic	N/A		Water	27.74 mg/L	10 mL	27.7 mg/L	1	0.07	0.50			6/12/19 01:26:00	N	I
KQ1908064-01	Carbon, Total Organic	CCV		Ground Water	24.61 mg/L	10 mL	24.6 mg/L	1			98		6/11/19 13:21:00	N	III
KQ1908064-02	Carbon, Total Organic	CCV		Ground Water	24.69 mg/L	10 mL	24.7 mg/L	1			99		6/11/19 17:24:00	N	III
KQ1908064-03	Carbon, Total Organic	CCV		Ground Water	24.59 mg/L	10 mL	24.6 mg/L	1			98		6/11/19 22:34:00	N	III
KQ1908064-04	Carbon, Total Organic	CCV		Ground Water	25.23 mg/L	10 mL	25.2 mg/L	1			101		6/12/19 01:54:00	N	III
KQ1908064-05	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 13:35:00	N	III
KQ1908064-06	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 17:39:00	N	III
KQ1908064-07	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 22:49:00	N	III
KQ1908064-08	Carbon, Total Organic	CCB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/12/19 02:08:00	N	III
KQ1908064-09	Carbon, Total Organic	MB		Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/11/19 23:04:00	N	III
KQ1908064-10	Carbon, Total Organic	LCS		Ground Water	25.08 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/11/19 23:18:00	N	III
KQ1908064-11	Carbon, Total Organic	DUP	K1905278-001	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 16:41:00	N	III

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

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Results Summary

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 638817 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1908064-12	Carbon, Total Organic	MS	K1905278-001	Ground Water	25.08 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/11/19 17:10:00	N	III
KQ1908064-13	Carbon, Total Organic	DUP	K1905278-002	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 17:54:00	N	III
KQ1908064-14	Carbon, Total Organic	DUP	K1905278-003	Ground Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 18:22:00	N	III
KQ1908064-15	Carbon, Total Organic	DUP	K1905279-001	Ground Water	0.55 mg/L	10 mL	0.55 mg/L	1	0.07	0.50		11*	6/11/19 18:50:00	N	III
KQ1908064-16	Carbon, Total Organic	DUP	K1905305-001	Water	5.61 mg/L	10 mL	5.61 mg/L	1	0.07	0.50		1	6/11/19 19:18:00	N	II
KQ1908064-17	Carbon, Total Organic	DUP	K1905360-001	Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 19:46:00	N	III
KQ1908064-18	Carbon, Total Organic	DUP	K1905361-001	Water	-0.01 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/11/19 20:14:00	N	III
KQ1908064-19	Carbon, Total Organic	DUP	K1905369-001	Water	5.20 mg/L	10 mL	10.4 mg/L	2	0.2	1.0		<1	6/11/19 20:42:00	N	I
KQ1908064-20	Carbon, Total Organic	DUP	K1905369-002	Water	13.23 mg/L	10 mL	13.2 mg/L	1	0.07	0.50		2	6/11/19 21:10:00	N	I
KQ1908064-21	Carbon, Total Organic	DUP	K1905369-003	Water	1.75 mg/L	10 mL	1.75 mg/L	1	0.07	0.50		1	6/11/19 21:38:00	N	I
KQ1908064-22	Carbon, Total Organic	DUP	K1905369-004	Water	9.13 mg/L	10 mL	18.3 mg/L	2	0.2	1.0		1	6/11/19 22:06:00	N	I
KQ1908064-23	Carbon, Total Organic	DUP	K1905369-005	Water	9.62 mg/L	10 mL	9.62 mg/L	1	0.07	0.50		4	6/11/19 23:33:00	N	I
KQ1908064-24	Carbon, Total Organic	DUP	K1905369-006	Water	13.51 mg/L	10 mL	27.0 mg/L	2	0.2	1.0		<1	6/12/19 00:01:00	N	I
KQ1908064-25	Carbon, Total Organic	DUP	K1905369-007	Water	26.81 mg/L	10 mL	53.6 mg/L	2	0.2	1.0		<1	6/12/19 00:29:00	N	I
KQ1908064-26	Carbon, Total Organic	DUP	K1905369-008	Water	9.35 mg/L	10 mL	18.7 mg/L	2	0.2	1.0		2	6/12/19 00:58:00	N	I
KQ1908064-27	Carbon, Total Organic	DUP	K1905369-009	Water	27.62 mg/L	10 mL	27.6 mg/L	1	0.07	0.50		<1	6/12/19 01:26:00	N	I

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

0.207	OBSERVATIONS 15	ABOVE
0.000	STD Deviation 0.05347	0
0.000	AVERAGE 0.01381	0
0.000	UCL 0.06728	0
0.000	LCL -0.03967	0
0.000		0
0.000		0
0.000	OBSERVATIONS 0	0
0.000	STD Deviation 0.00000	0
0.000	AVERAGE #DIV/0!	0
0.000	UCL #DIV/0!	0
0.000	LCL #DIV/0!	0
0.000		0
0.000		0
0.000	OBSERVATIONS 0	0
	STD Deviation 0.00000	0
	AVERAGE #DIV/0!	0
	UCL #DIV/0!	0
	LCL #DIV/0!	0
		0
		0
	OBSERVATIONS 0	0
	STD Deviation #DIV/0!	0
	AVERAGE #DIV/0!	0
		0
		0
		0
		0
		0

06/14/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	25.166	0.0138	25.1522	25.15219	25.2	6/10/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
4	MB1	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
5	MB1d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
6	MB1t	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
7	MB1q	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
8	[TOC] LCS [24ppm]	1	24.636	0.0138	24.6226	24.62259	25	6/10/2019
9	TOC] LCS [24ppm]d	1	24.757	0.0138	24.7428	24.74279	24.74	6/10/2019
10	[TOC] LCS [24ppm]t	1	25.110	0.0138	25.0962	25.09619	25.10	6/10/2019
11	TOC] LCS [24ppm]q	1	24.975	0.0138	24.9613	24.96129	25.0	6/10/2019
12	K1905246-001	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
13	K1905246-001d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
14	K1905246-001t	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
15	K1905246-001q	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
16	K1905246-003	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
17	K1905246-003d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
18	K1905246-003t	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
19	K1905246-003q	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
20	K1905246-004	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
21	K1905246-004d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
22	K1905246-004t	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
23	K1905246-004q	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
24	K1905246-004ms	1	25.447	0.0138	25.4335	25.43349	25.43	6/10/2019
25	K1905246-004msd	1	25.594	0.0138	25.5797	25.57969	25.58	6/10/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: KD		Date Analyzed 6/10/19	
Reviewed By: [signature]		Date Reviewed 06/19/19	

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1905246-004	1	25.734	0.0138	25.7198	25.71979	25.72	6/10/2019
27	K1905246-004	1	25.764	0.0138	25.7504	25.75039	25.75	6/10/2019
28	K1905246-005	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
29	K1905246-005d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
30	K1905246-005t	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
31	K1905246-005q	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
32	C] CCV 25 ppm [25 p	1	27.519	0.0138	27.5054	27.50539	27.5	6/10/2019
33	[TOC] CCB [0 ppm]	1	0.207	0.0138	0.1933	0.19329	<0.5	6/10/2019
34		1		0.0000	0.0000	0	<0.5	
35		1		0.0000	0.0000	0	<0.5	
36		1		0.0000	0.0000	0	<0.5	
37		1		0.0000	0.0000	0	<0.5	
38		1		0.0000	0.0000	0	<0.5	
39		1		0.0000	0.0000	0	<0.5	
40		1		0.0000	0.0000	0	<0.5	
41		1		0.0000	0.0000	0	<0.5	
42		1		0.0000	0.0000	0	<0.5	
43		1		0.0000	0.0000	0	<0.5	
44		1		0.0000	0.0000	0	<0.5	
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By: BD Date Analyzed 6/10/19

Reviewed By: [signature] Date Reviewed 6/14/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	25.166	0.0138	25.1522	25.15219	25.2	6/10/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/10/2019
4	K1905198-003	4	0.000	0.0138	-0.0138	-0.05524	<0.5	6/10/2019
5	K1905198-003d	4	0.000	0.0138	-0.0138	-0.05524	<0.5	6/10/2019
6	C] CCV 25 ppm [25 p	1	27.519	0.0138	27.5054	27.50539	27.51	6/10/2019
7	[TOC] CCB [0 ppm]	1	0.207	0.0138	0.1933	0.19329	<0.5	6/10/2019
8	K1905198-004	1	1.560	0.0138	1.5457	1.54569	2	6/10/2019
9	K1905198-004d	1	1.296	0.0138	1.2820	1.28199	1.28	6/10/2019
10	K1905198-005	2	47.316	0.0138	47.3022	94.60438	94.60	6/10/2019
11	K1905198-005d	2	47.104	0.0138	47.0906	94.18118	94.2	6/10/2019
12	K1905258-001	10	6.622	0.0138	6.6084	66.0839	66.08	6/11/2019
13	K1905258-001d	10	6.531	0.0138	6.5170	65.1699	65.17	6/11/2019
14	K1905258-002	10	30.649	0.0138	30.6355	306.3549	306.35	6/11/2019
15	K1905258-002d	10	30.260	0.0138	30.2457	302.4569	302.5	6/11/2019
16	K1905258-003	1	12.874	0.0138	12.8601	12.86009	12.9	6/11/2019
17	K1905258-003d	1	12.994	0.0138	12.9801	12.98009	12.98	6/11/2019
18	K1905258-004	1	4.703	0.0138	4.6889	4.68889	4.7	6/11/2019
19	K1905258-004d	1	4.518	0.0138	4.5042	4.50419	4.5	6/11/2019
20	K1905258-005	1	4.124	0.0138	4.1104	4.11039	4.11	6/11/2019
21	K1905258-005d	1	4.170	0.0138	4.1565	4.15649	4.16	6/11/2019
22	C] CCV 25 ppm [25 p	1	24.924	0.0138	24.9103	24.91029	24.9	6/11/2019
23	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
24	MB2	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
25	[TOC] LCS [24ppm]	1	25.379	0.0138	25.3648	25.36479	25.36	6/11/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

	date	time
Analyzed By: BP	Date Analyzed 6/10/19	
Reviewed By: [signature]	Date Reviewed 06/14/19	

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1905258-006	5	63.641	0.0138	63.6273	318.13645	318.14	6/11/2019
27	K1905258-006d	5	63.117	0.0138	63.1030	315.51495	315.51	6/11/2019
28	K1905259-001	1	2.937	0.0138	2.9230	2.92299	2.9	6/11/2019
29	K1905259-001d	1	2.615	0.0138	2.6010	2.60099	2.6	6/11/2019
30	K1905338-001	1	1.671	0.0138	1.6567	1.65669	1.7	6/11/2019
31	K1905338-001d	1	1.650	0.0138	1.6360	1.63599	1.6	6/11/2019
32	K1905084-004	100	7.870	0.0138	7.8565	785.649	785.6	6/11/2019
33	K1905084-004d	100	7.963	0.0138	7.9490	794.899	794.9	6/11/2019
34	K1905084-005	100	6.537	0.0138	6.5231	652.309	652.3	6/11/2019
35	K1905084-005d	100	6.472	0.0138	6.4586	645.859	645.9	6/11/2019
36	K1905298-001	1	0.135	0.0138	0.1211	0.12109	<0.5	6/11/2019
37	K1905298-001d	1	0.067	0.0138	0.0532	0.05319	<0.5	6/11/2019
38	K1905126-001	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
39	K1905126-001d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
40	K1905126-002	1	0.140	0.0138	0.1264	0.12639	<0.5	6/11/2019
41	K1905126-002d	1	0.190	0.0138	0.1762	0.17619	<0.5	6/11/2019
42	C] CCV 25 ppm [25 p	1	24.876	0.0138	24.8620	24.86199	24.9	6/11/2019
43	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
44	K1905126-002ms	1	25.907	0.0138	25.8933	25.89329	25.9	6/11/2019
45	K1905126-003	1	0.280	0.0138	0.2660	0.26599	<0.5	6/11/2019
46	K1905126-003d	1	0.262	0.0138	0.2481	0.24809	<0.5	6/11/2019
47	K1905126-004	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
48	K1905126-004d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
49	C] CCV 25 ppm [25 p	1	24.628	0.0138	24.6141	24.61409	24.6	6/11/2019
50	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019

Analyzed By: BCD	Date Analyzed 6/19/19
Reviewed By: [signature]	Date Reviewed 06/18/19 TH

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	CJ CCV 25 ppm [25 p	1	24.876	0.0138	24.8620	24.86199	24.9	6/11/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
4	K1905126-005	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
5	K1905126-005d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
6	K1905126-006	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
7	K1905126-006d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
8	K1905126-007	1	0.085	0.0138	0.0711	0.07109	<0.5	6/11/2019
9	K1905126-007d	1	0.023	0.0138	0.0095	0.00949	<0.5	6/11/2019
10	K1905126-008	1	0.314	0.0138	0.3000	0.29999	<0.5	6/11/2019
11	K1905126-008d	1	0.339	0.0138	0.3252	0.32519	<0.5	6/11/2019
12	K1905126-009	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
13	K1905126-009d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
14	K1905262-001	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
15	K1905262-001d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
16	CJ CCV 25 ppm [25 p	1	24.628	0.0138	24.6141	24.61409	24.6	6/11/2019
17	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
18	MB3	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
19	[TOC] LCS [25ppm]	1	25.069	0.0138	25.0556	25.05559	25.1	6/11/2019
20	K1905262-002	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
21	K1905262-002d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
22	K1905277-001	1	0.344	0.0138	0.3302	0.33019	<0.5	6/11/2019
23	K1905277-001d	1	0.315	0.0138	0.3010	0.30099	<0.5	6/11/2019
24	K1905277-001ms	1	25.866	0.0138	25.8518	25.85179	25.85	6/11/2019
25	K1905277-002	1	0.375	0.0138	0.3611	0.36109	<0.5	6/11/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: BD	Date Analyzed	6/10/19	
Reviewed By:	Date Reviewed	06/14/19	

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1905277-002d	1	0.333	0.0138	0.3193	0.31929	<0.5	6/11/2019
27	K1905277-003	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
28	K1905277-003d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
29	C] CCV 25 ppm [25 p	1	24.708	0.0138	24.6941	24.69409	24.7	6/11/2019
30	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
31		1		0.0000	0.0000	0	<0.5	
32		1		0.0000	0.0000	0	<0.5	
33		1		0.0000	0.0000	0	<0.5	
34		1		0.0000	0.0000	0	<0.5	
35		1		0.0000	0.0000	0	<0.5	
36		1		0.0000	0.0000	0	<0.5	
37		1		0.0000	0.0000	0	<0.5	
38		1		0.0000	0.0000	0	<0.5	
39		1		0.0000	0.0000	0	<0.5	
40		1		0.0000	0.0000	0	<0.5	
41		1		0.0000	0.0000	0	<0.5	
42		1		0.0000	0.0000	0	<0.5	
43		1		0.0000	0.0000	0	<0.5	
44		1		0.0000	0.0000	0	<0.5	
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By:	BD	Date Analyzed	6/10/19
Reviewed By:		Date Reviewed	06/14/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	CJ CCV 25 ppm [25 p	1	24.628	0.0138	24.6141	24.61409	24.6	6/11/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
4	K1905278-001	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
5	K1905278-001d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
6	K1905278-001ms	1	25.097	0.0138	25.0836	25.08359	25.08	6/11/2019
7	CJ CCV 25 ppm [25 p	1	24.708	0.0138	24.6941	24.69409	24.7	6/11/2019
8	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
9	K1905278-002	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
10	K1905278-002d	1	0.009	0.0138	-0.0050	-0.00501	<0.5	6/11/2019
11	K1905278-003	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
12	K1905278-003d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
13	K1905279-001	1	0.506	0.0138	0.4918	0.49179	<0.5	6/11/2019
14	K1905279-001d	1	0.561	0.0138	0.5475	0.54749	0.55	6/11/2019
15	K1905305-001	1	5.683	0.0138	5.6692	5.66919	5.7	6/11/2019
16	K1905305-001d	1	5.625	0.0138	5.6109	5.61089	5.6	6/11/2019
17	K1905360-001	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
18	K1905360-001d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
19	K1905361-001	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
20	K1905361-001d	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
21	K1905369-001	2	5.225	0.0138	5.2116	10.42318	10.42	6/11/2019
22	K1905369-001d	2	5.217	0.0138	5.2032	10.40638	10.4	6/11/2019
23	K1905369-002	1	13.506	0.0138	13.4921	13.49209	13.5	6/11/2019
24	K1905369-002d	1	13.245	0.0138	13.2307	13.23069	13.23	6/11/2019
25	K1905369-003	1	1.788	0.0138	1.7744	1.77439	1.77	6/11/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: BCP	Date Analyzed	6/10/19	
Reviewed By: [signature]	Date Reviewed	06/14/19	

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1905369-003d	1	1.767	0.0138	1.7527	1.75269	1.75	6/11/2019
27	K1905369-004	2	9.272	0.0138	9.2581	18.51618	18.52	6/11/2019
28	K1905369-004d	2	9.143	0.0138	9.1287	18.25738	18.3	6/11/2019
29	C] CCV 25 ppm [25 p	1	24.605	0.0138	24.5909	24.59089	24.6	6/11/2019
30	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
31	MB4	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/11/2019
32	[TOC] LCS [25ppm]	1	25.095	0.0138	25.0808	25.08079	25.1	6/11/2019
33	K1905369-005	1	10.033	0.0138	10.0194	10.01939	10.0	6/11/2019
34	K1905369-005d	1	9.637	0.0138	9.6227	9.62269	9.6	6/11/2019
35	K1905369-006	2	13.541	0.0138	13.5276	27.05518	27.1	6/12/2019
36	K1905369-006d	2	13.525	0.0138	13.5114	27.02278	27.0	6/12/2019
37	K1905369-007	2	27.089	0.0138	27.0756	54.15118	54.2	6/12/2019
38	K1905369-007d	2	26.827	0.0138	26.8130	53.62598	53.6	6/12/2019
39	K1905369-008	2	9.595	0.0138	9.5814	19.16278	19.2	6/12/2019
40	K1905369-008d	2	9.361	0.0138	9.3469	18.69378	18.7	6/12/2019
41	K1905369-009	1	27.755	0.0138	27.7409	27.74089	27.7	6/12/2019
42	K1905369-009d	1	27.636	0.0138	27.6218	27.62179	27.6	6/12/2019
43	C] CCV 25 ppm [25 p	1	25.243	0.0138	25.2287	25.22869	25.2	6/12/2019
44	[TOC] CCB [0 ppm]	1	0.000	0.0138	-0.0138	-0.01381	<0.5	6/12/2019
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By: ZCD	Date Analyzed 6/10/19
Reviewed By:	Date Reviewed 06/19/19

TOC: 638808, 638810, 638815, 638817

Schedule: 06102019

Version: 8
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/06/10 14:58 - Monday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1905246-001.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
4	Sample	K1905246-003.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
5	Sample	K1905246-004.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
6	Sample	K1905246-004.08 ms	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
7	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
8	Sample	K1905246-005.08	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
9	Sample	K1905198-003.01 4x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1905198-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1905198-005.01 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1905258-001.01 5x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1905258-001.01 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1905258-002.01 5x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1905258-002.01 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1905258-002.01 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1905258-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1905258-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1905258-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1905258-006.01 5x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1905259-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1905338-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
24	Sample	K1905084-004.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1905084-005.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1905298-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1905126-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1905126-002.10	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1905126-002.10 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
30	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
31	Sample	K1905126-003.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K1905126-004.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	K1905126-005.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
34	Sample	K1905126-006.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1905126-007.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1905126-008.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1905126-009.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1905262-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

Printed on: June 12, 2019 09:05:55

06/14/19

Schedule: 06102019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K1905262-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1905277-001.07	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1905277-001.07 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
43	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
44	Sample	K1905277-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1905277-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1905278-001.10	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1905278-001.10 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	K1905278-002.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K1905278-003.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	K1905279-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	K1905305-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K1905360-001.04	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	K1905361-001.03	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	K1905369-001.02 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	K1905369-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K1905369-003.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K1905369-004.02 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
58	Sample	MB4	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
59	Sample	K1905369-005.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	K1905369-006.02 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	K1905369-007.02 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
62	Sample	K1905369-008.02 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
63	Sample	K1905369-009.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 06102019
Monday, June 10, 2019 11:35 AM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/06/12 09:06 - Wednesday

Report Summary Information

Company Location: Gen Chem Lab
Schedule Name: 06102019
Instrument Name: Fusion1
Report Version: 1 of 1
Report Creation by Operators (schedule version): Fusion1 (Fusion1) (v2), Fusion1 (Fusion1) (v3), Fusion1 (Fusion1) (v4), Fusion1 (Fusion1) (v5), Fusion1 (Fusion1) (v6), Fusion1 (Fusion1) (v7), Fusion1 (Fusion1) (v8)
Comment:

Engine Version: 1.1.5.1
Firmware Version: 1.2.0696
Connection: RS232 COM1

06/14/19

Report Results

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/06/10 11:35

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.10	19.05	5.96	49.89	08:00
2	TC Clean	10.04	13.22	3.18	49.69	07:17
3	TC Clean	2.58	5.76	3.18	49.62	07:02
4	TC Clean	1.54	4.74	3.19	49.82	07:02

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/06/10 12:10

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.40	15.52	3.12	49.83	07:59

2	TC Clean	4.03	7.15	3.12	49.77	07:17
3	TC Clean	1.73	4.78	3.05	49.80	07:02
4	TC Clean	1.09	4.26	3.17	49.70	07:01

Sample Type: Clean — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Start Time
◉	(clean)		Clean	2019/06/10 12:44

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.96	3.91	2.95	49.91	07:58
2	TC Clean	3.32	6.45	3.13	49.77	07:17
3	TC Clean	1.69	4.71	3.02	49.76	07:02
4	TC Clean	1.63	4.45	2.82	49.80	07:03

Sample Type: Blank (Creating v1265) — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Start Time
◉	(blank)		Reagent/Acid Blank	2019/06/10 13:42

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	9.85	12.74	2.90	49.71	05:29
2	TC Clean	4.64	7.74	3.11	49.84	07:16
3	TC Clean	1.95	4.81	2.86	49.87	07:01
4	TC Clean	1.13	4.26	3.13	49.92	07:01
5	Reagent Blank	3.40	6.47	3.07	49.91	08:12
6	Acid Blank	1.23	4.37	3.15	49.64	05:26

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 14:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.17	11.31	3.15	50.09	10:33

Dilution **Blank Contribution** **Method** **Calibration**

1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.1660 ppm (PASS)	0.0000 ppm	0%	2019/06/10 14:47

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.1660	251.6603	180.29	183.46	3.17	50.15	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/10 15:02

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.10	9.37	3.28	50.13	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 15:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.40	8.57	3.16	50.26	10:29
2	TOC	0.0000	0.0000	5.08	8.36	3.28	50.19	10:25
3	TOC	0.0000	0.0000	5.33	8.40	3.07	50.22	10:30
4	TOC	0.0000	0.0000	5.16	8.35	3.19	50.30	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS

From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.8291 ppm (PASS)	0.2130 ppm	0.86%	2019/06/10 16:12

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.6364	246.3641	176.69	179.76	3.07	50.27	10:25
C	TOC	25.0 ppm	2	24.7566	247.5663	177.51	180.80	3.29	50.27	10:26
C	TOC	25.0 ppm	3	25.1100	251.1005	179.91	183.15	3.25	50.32	10:32
C	TOC	25.0 ppm	4	24.9751	249.7510	178.99	182.08	3.09	50.33	10:26

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	2	TOC	ICS	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 17:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.78	10.84	3.05	50.31	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	3	TOC	K1905246-001.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 17:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.88	9.87	2.99	50.34	10:30
2	TOC	0.0000	0.0000	6.85	9.83	2.98	50.34	10:24
3	TOC	0.0000	0.0000	7.00	9.95	2.96	50.22	10:31
4	TOC	0.0000	0.0000	6.68	9.85	3.17	50.20	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	4	TOC	K1905246-003.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 18:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.81	10.84	3.03	50.19	10:25
2	TOC	0.0000	0.0000	7.77	11.00	3.23	50.18	10:30

3	TOC	0.0000	0.0000	7.38	10.64	3.26	50.24	10:27
4	TOC	0.0000	0.0000	7.53	10.65	3.12	50.25	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
5	TOC	K1905246-004.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 19:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.37	9.43	3.07	50.18	10:27
2	TOC	0.0000	0.0000	6.56	9.77	3.21	50.20	10:26
3	TOC	0.0000	0.0000	5.94	9.20	3.25	50.20	10:27
4	TOC	0.0000	0.0000	6.33	9.39	3.06	50.18	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
6	TOC	K1905246-004.08 ms	25.6346 ppm	0.1453 ppm	0.5700%	2019/06/10 20:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.4473	254.4733	181.48	184.54	3.06	50.12	10:27
2	TOC	25.5935	255.9347	182.47	185.60	3.13	50.10	10:29
3	TOC	25.7336	257.3357	183.42	186.56	3.14	50.14	10:27
4	TOC	25.7642	257.6421	183.63	186.71	3.08	50.06	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
7	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 21:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.17	9.16	2.99	50.09	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
8	TOC	K1905246-005.08	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 21:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.16	10.27	3.10	50.11	10:27
2	TOC	0.0000	0.0000	7.54	10.56	3.02	50.18	10:30
3	TOC	0.0000	0.0000	7.57	10.61	3.04	50.11	10:29

4	TOC	0.0000	0.0000	7.27	10.27	3.00	50.07	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	9	TOC	K1905198-003.01 4x	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/10 22:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	-42248.80	-42245.72	3.08	50.08	10:28
2	TOC	0.0000	0.0000	-15736.81	-15732.85	3.96	50.00	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	27.5192 ppm (PASS)	0.0000 ppm	0%	2019/06/10 22:43

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	27.5192	275.1917	196.26	200.18	3.92	50.00	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.2071 ppm (PASS)	0.0000 ppm	0%	2019/06/10 22:58

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.2071	2.0706	10.87	14.15	3.28	50.01	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Analysis	Std. Dev.

	Pos	Type	Sample ID	Result (ppmC)	(ppmC)	RSD	Start Time
◆	10	TOC	K1905198-004.01	1.4277 ppm	0.1865 ppm	13.0600%	2019/06/10 23:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5595	15.5952	19.33	22.57	3.24	50.12	10:29
2	TOC	1.2958	12.9582	17.54	20.47	2.93	50.01	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	11	TOC	K1905198-005.01 2x	47.2102 ppm	0.1496 ppm	0.3200%	2019/06/10 23:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	47.3160	473.1596	329.92	333.00	3.08	50.05	10:27
2	TOC	47.1044	471.0441	328.48	331.58	3.10	50.15	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	K1905258-001.01 5x	13.9756 ppm	0.3591 ppm	2.5700%	2019/06/11 00:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	14.2295	142.2949	105.33	108.53	3.20	50.02	10:28
2	TOC	13.7217	137.2168	101.88	105.03	3.15	50.09	10:25

NR, using other dilution BEP 6/14/19

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	K1905258-001.01 10x	6.5765 ppm	0.0646 ppm	0.9800%	2019/06/11 00:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.6222	66.2218	53.69	57.01	3.31	50.05	10:30
2	TOC	6.5308	65.3084	53.07	56.35	3.28	50.06	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	14	TOC	K1905258-002.01 5x	52.5986 ppm	0.3332 ppm	0.6300%	2019/06/11 01:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	52.3630	523.6300	364.18	367.44	3.26	50.11	10:29
2	TOC	52.8343	528.3428	367.38	370.92	3.54	50.05	10:27

NR using other dilution BEP 6/14/19

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	15	TOC	K1905258-002.01 10x	30.4544 ppm	0.2756 ppm	0.9100%	2019/06/11 01:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	30.6493	306.4935	216.79	220.32	3.53	50.12	10:28
2	TOC	30.2595	302.5954	214.14	217.47	3.33	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	16	TOC	K1905258-002.01 20x	15.5532 ppm	0.1910 ppm	1.2300%	2019/06/11 02:02

NR using other dilution

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.6883	156.8826	115.23	118.48	3.25	49.98	10:32
2	TOC	15.4181	154.1807	113.40	116.42	3.02	50.07	10:30

BCD 6/13/19

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	17	TOC	K1905258-003.01	12.9339 ppm	0.0849 ppm	0.6600%	2019/06/11 02:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	12.8739	128.7385	96.13	99.19	3.06	49.97	10:32
2	TOC	12.9939	129.9392	96.94	100.08	3.13	49.93	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	18	TOC	K1905258-004.01	4.6104 ppm	0.1306 ppm	2.8300%	2019/06/11 02:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.7027	47.0275	40.66	43.80	3.13	49.99	10:32
2	TOC	4.5180	45.1801	39.41	42.59	3.17	49.89	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	19	TOC	K1905258-005.01	4.1473 ppm	0.0326 ppm	0.7900%	2019/06/11 03:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	4.1242	41.2422	36.74	39.97	3.24	49.96	10:27
2	TOC	4.1703	41.7033	37.05	40.04	2.99	49.88	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.9241 ppm (PASS)	0.0000 ppm	0%	2019/06/11 03:54

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9241	249.2413	178.65	181.87	3.23	49.88	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/11 04:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.93	10.05	3.12	49.87	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 04:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.44	8.60	3.16	49.87	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC)	CAS_salt_010711	CAS_salt_010711

(v1265) (v4) (v30)

Sample Type: Check Standard --> LCS

From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.3786 ppm (PASS)	0.0000 ppm	0%	2019/06/11 04:38

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.3786	253.7861	181.73	185.02	3.29	49.87	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	21	TOC	K1905258-006.01 5x	63.3789 ppm	0.3707 ppm	0.5800%	2019/06/11 04:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	63.6411	636.4109	440.73	443.84	3.10	49.87	10:29
2	TOC	63.1168	631.1678	437.18	440.33	3.16	49.86	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	22	TOC	K1905259-001.01	2.7758 ppm	0.2277 ppm	8.2000%	2019/06/11 05:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.9368	29.3682	28.68	31.83	3.15	49.89	10:28
2	TOC	2.6148	26.1478	26.49	29.47	2.97	49.91	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	23	TOC	K1905338-001.02	1.6601 ppm	0.0146 ppm	0.8800%	2019/06/11 05:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6705	16.7046	20.08	23.26	3.17	49.90	10:29
2	TOC	1.6498	16.4983	19.94	23.11	3.17	49.90	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	K1905084-004.01 100x	7.9165 ppm	0.0654 ppm	0.8300%	2019/06/11 06:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.8703	78.7027	62.17	65.29	3.13	49.92	10:26
2	TOC	7.9628	79.6279	62.79	65.86	3.06	49.90	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	K1905084-005.01 100x	6.5046 ppm	0.0456 ppm	0.7000%	2019/06/11 06:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.5369	65.3688	53.12	56.34	3.23	49.91	10:29
2	TOC	6.4724	64.7235	52.68	55.85	3.17	49.89	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	26	TOC	K1905298-001.01	0.1010 ppm	0.0480 ppm	47.5600%	2019/06/11 07:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1349	1.3494	9.66	12.79	3.13	49.88	10:29
2	TOC	0.0670	0.6702	9.20	12.36	3.16	49.86	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	27	TOC	K1905126-001.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 07:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.52	10.68	3.17	49.88	10:26
2	TOC	0.0000	0.0000	7.37	10.62	3.25	49.79	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	28	TOC	K1905126-002.10	0.1651 ppm	0.0352 ppm	21.3200%	2019/06/11 08:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1402	1.4024	9.70	12.66	2.97	49.76	10:25
2	TOC	0.1900	1.9004	10.03	13.12	3.09	49.72	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.8758 ppm (PASS)	0.0000 ppm	0%	2019/06/11 08:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.8758	248.7581	178.32	181.28	2.96	49.78	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/11 08:52

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.34	8.50	3.16	49.80	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	29	TOC	K1905126-002.10 ms	25.9071 ppm	0.0000 ppm	0.0000%	2019/06/11 09:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.9071	259.0711	184.60	187.66	3.06	49.82	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC)	CAS_salt_010711	CAS_salt_010711

(v1265) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	30	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 09:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.60	8.68	3.08	49.73	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	31	TOC	K1905126-003.02	0.2708 ppm	0.0126 ppm	4.6500%	2019/06/11 09:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2798	2.7975	10.64	13.76	3.11	49.80	10:25
2	TOC	0.2619	2.6193	10.52	13.75	3.23	50.09	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	32	TOC	K1905126-004.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 10:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.77	9.83	3.06	50.02	10:27
2	TOC	0.0000	0.0000	6.91	10.04	3.13	50.08	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	33	TOC	K1905126-005.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 10:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.11	10.12	3.01	50.09	10:28
2	TOC	0.0000	0.0000	7.04	10.12	3.08	50.06	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	34	TOC	K1905126-006.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 11:00

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	0.0000	0.0000	6.72	9.66	2.95	50.15	10:28
2	TOC	0.0000	0.0000	6.57	9.54	2.97	50.15	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	35	TOC	K1905126-007.02	0.0541 ppm	0.0435 ppm	80.5500%	2019/06/11 11:28

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0849	0.8485	9.32	12.30	2.99	50.12	10:26
2	TOC	0.0233	0.2327	8.90	11.94	3.04	50.12	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	36	TOC	K1905126-008.02	0.3264 ppm	0.0178 ppm	5.4600%	2019/06/11 11:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3138	3.1379	10.87	13.83	2.96	50.14	10:27
2	TOC	0.3390	3.3898	11.04	13.97	2.93	50.14	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	37	TOC	K1905126-009.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 12:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.58	9.74	3.16	50.11	10:29
2	TOC	0.0000	0.0000	7.04	9.97	2.93	50.09	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	38	TOC	K1905262-001.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 12:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.96	9.96	3.00	50.07	10:28
2	TOC	0.0000	0.0000	7.17	10.25	3.08	50.19	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6279 ppm (PASS)	0.0000 ppm	0%	2019/06/11 13:21

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6279	246.2787	176.64	179.77	3.13	50.13	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0003 ppm (PASS)	0.0000 ppm	0%	2019/06/11 13:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.08	8.29	3.21	50.13	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 13:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.60	7.58	2.97	50.20	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	25.0694 ppm (PASS)	0.0000 ppm	0%	2019/06/11 14:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.0694	250.6939	179.63	182.89	3.25	50.13	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	40	TOC	K1905262-002.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 14:19

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.44	10.67	3.23	50.15	10:28
2	TOC	0.0000	0.0000	6.64	9.86	3.22	50.26	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	41	TOC	K1905277-001.07	0.3294 ppm	0.0206 ppm	6.2600%	2019/06/11 14:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3440	3.4399	11.08	14.27	3.19	50.25	10:27
2	TOC	0.3148	3.1482	10.88	14.02	3.14	50.23	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	42	TOC	K1905277-001.07 ms	25.8656 ppm	0.0000 ppm	0.0000%	2019/06/11 15:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.8656	258.6557	184.32	187.54	3.22	50.18	10:34

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	43	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 15:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.11	8.29	3.18	50.20	10:34

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	44	TOC	K1905277-002.01	0.3540 ppm	0.0296 ppm	8.3600%	2019/06/11 15:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3749	3.7492	11.29	14.27	2.98	50.20	10:28
2	TOC	0.3331	3.3308	11.00	14.29	3.28	50.24	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	45	TOC	K1905277-003.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 16:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.55	8.75	3.20	50.22	10:28
2	TOC	0.0000	0.0000	5.35	8.66	3.30	50.24	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	46	TOC	K1905278-001.10	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 16:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.70	10.85	3.15	50.27	10:29
2	TOC	0.0000	0.0000	7.96	10.95	2.99	50.28	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	47	TOC	K1905278-001.10 ms	25.0974 ppm	0.0000 ppm	0.0000%	2019/06/11 17:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.0974	250.9744	179.10	182.07	2.97	50.26	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.7079 ppm (PASS)	0.0000 ppm	0%	2019/06/11 17:24

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.7079	247.0786	177.18	180.31	3.13	50.26	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 8

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/11 17:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	4.96	8.18	3.22	50.27	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample

From Schedule Version 8

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
48	TOC	K1905278-002.04	0.0044 ppm	0.0062 ppm	141.4200%	2019/06/11 17:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.50	11.63	3.13	50.27	10:29
2	TOC	0.0088	0.0883	8.80	11.88	3.08	50.29	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
49	TOC	K1905278-003.04	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 18:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.59	8.67	3.08	50.30	10:28
2	TOC	0.0000	0.0000	5.15	8.27	3.12	50.23	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	50	TOC	K1905279-001.02	0.5334 ppm	0.0394 ppm	7.3800%	2019/06/11 18:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5056	5.0560	12.18	15.23	3.05	50.16	10:26
2	TOC	0.5613	5.6128	12.55	15.66	3.11	50.22	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	51	TOC	K1905305-001.01	5.6538 ppm	0.0413 ppm	0.7300%	2019/06/11 19:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.6830	56.8301	47.32	50.44	3.12	50.18	10:25
2	TOC	5.6247	56.2467	46.92	50.07	3.14	50.14	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	52	TOC	K1905360-001.04	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 19:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.84	10.08	3.23	50.17	10:27
2	TOC	0.0000	0.0000	7.02	10.14	3.12	50.21	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	53	TOC	K1905361-001.03	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 20:14

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.81	10.97	3.16	50.17	10:30
2	TOC	0.0000	0.0000	7.96	11.25	3.29	50.19	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	54	TOC	K1905369-001.02 2x	5.2212 ppm	0.0059 ppm	0.1100%	2019/06/11 20:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.2254	52.2544	44.21	47.40	3.19	50.19	10:27

2	TOC	5.2170	52.1704	44.16	47.37	3.21	50.23	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	55	TOC	K1905369-002.02	13.3752 ppm	0.1848 ppm	1.3800%	2019/06/11 21:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.5059	135.0586	100.42	103.57	3.15	50.19	10:26
2	TOC	13.2445	132.4451	98.65	101.86	3.22	50.16	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	56	TOC	K1905369-003.02	1.7773 ppm	0.0153 ppm	0.8600%	2019/06/11 21:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7882	17.8817	20.88	24.25	3.37	50.24	10:26
2	TOC	1.7665	17.6651	20.73	23.96	3.22	50.16	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	57	TOC	K1905369-004.02 2x	9.2072 ppm	0.0915 ppm	0.9900%	2019/06/11 22:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.2719	92.7188	71.68	74.77	3.09	50.16	10:29
2	TOC	9.1425	91.4253	70.80	73.97	3.17	50.12	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.6047 ppm (PASS)	0.0000 ppm	0%	2019/06/11 22:34

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.6047	246.0474	176.48	179.71	3.24	50.04	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/11 22:49

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.11	8.22	3.11	50.05	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/11 23:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	4.45	7.48	3.03	50.06	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	25.0946 ppm (PASS)	0.0000 ppm	0%	2019/06/11 23:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.0946	250.9458	179.80	182.94	3.14	49.93	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	59	TOC	K1905369-005.02	9.8349 ppm	0.2805 ppm	2.8500%	2019/06/11 23:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	10.0332	100.3323	76.85	79.77	2.92	49.96	10:28
2	TOC	9.6365	96.3650	74.16	77.34	3.19	49.86	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	60	TOC	K1905369-006.02 2x	13.5333 ppm	0.0115 ppm	0.0800%	2019/06/12 00:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.5414	135.4136	100.66	103.97	3.31	49.94	10:29
2	TOC	13.5252	135.2516	100.55	103.66	3.11	49.86	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	61	TOC	K1905369-007.02 2x	26.9581 ppm	0.1856 ppm	0.6900%	2019/06/12 00:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.0894	270.8936	192.62	195.65	3.03	49.97	10:31
2	TOC	26.8268	268.2683	190.84	193.78	2.94	49.88	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	62	TOC	K1905369-008.02 2x	9.4780 ppm	0.1658 ppm	1.7500%	2019/06/12 00:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.5952	95.9525	73.88	76.92	3.05	49.80	10:29
2	TOC	9.3607	93.6071	72.28	75.31	3.02	49.79	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	63	TOC	K1905369-009.02	27.6951 ppm	0.0842 ppm	0.3000%	2019/06/12 01:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.7547	277.5466	197.14	200.30	3.16	49.74	10:29

2	TOC	27.6356	276.3562	196.33	199.36	3.02	49.76	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7430 (IC) (v1265)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.2425 ppm (PASS)	0.0000 ppm	0%	2019/06/12 01:54

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.2425	252.4249	180.81	183.95	3.14	49.75	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/12 02:08

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.01	8.98	2.97	49.73	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1264	1.3990	1.2110	0.0000	0.0000	0.0000	2019/06/06 15:32	Fusion1 (Fusion1)
v1265	1.1340	1.2260	0.0000	0.0000	0.0000	2019/06/10 14:28	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version:	v30	Calibration curve formula:	TOC: y = 6.788x + 9.463
Ver Creation:	2019/03/05 17:42	r^2 value:	TOC: r^2 = 0.99963
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version:	v4	Operator:	Fusion1 (Fusion1)
Ver Creation:	2019/02/21 17:57		
Comment:			

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off

SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/06/12 02:26

ALS Environmental

StarLIMS Run: 638808, 638810, 638815, 638817

Analysis: TOC/DOC

Method: 415.1, SM 5310 C, 9060, 9060A

CCV: 11-GEN-05-77K 50 ppm LCS: 11-GEN-05-77D 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-78F

21 % H3PO4: 11-GEN-05-78G

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: FE1165

Analyzed By:	BD	Date Analyzed:	6/10/19
Reviewed By:	[signature]	Date Reviewed:	06/14/19

Work Request # Original ( ) KP1051/4-6, 5418, 5298, 5420, 5440, 5449, 5451, 5478, 5589, 5518, 5409, 5449, 5422, 5422, 5558, 5589, 5595, 5625, 5295, 5317

Tier: IV IV IV II II II II II II IV I II I II II II

Date Analyzed: 6/16/19

Analyst: BCD/HLM

Analysis: TOC/DOC

Run # TOC: 639522, 639523, 639524 DOC: 639525

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	(yes)/no/NA
2.	Holding times met for all analyses and for all samples?	(yes)/no/NA
3.	Are calculations correct?	(yes)/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/(NA)
5.	All quality control criteria met?	(yes)/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	(yes)/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	(yes)/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	(yes)/no/NA
9.	Are results for methods blanks all ND?	(yes)/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/(no)/NA
11.	Are all exceptions explained?	(yes)/no/NA
12.	Have all applicable service requests been reviewed?	(yes)/no/NA
13.	Are all samples labeled correctly?	(yes)/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	(yes)/no/NA
15.	Are detection limits and units reported correctly?	(yes)/no/NA
16.	Is the unused space on the benchsheet crossed out?	(yes)/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	(yes)/no/NA

COMMENTS: KP1054204/4d, KP1055B-2/2d Sent for QA due to being overdiluted. KP1055971/4, 5478-6 report a high %RSD, but these samples are less than 5x the MRL. KP1051/4-6/6d reports a high %RSD due to non-homogenous, dirty samples.

Final Approved by: [signature] Date: 06/18/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 639522 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1905114-006	Carbon, Total Organic	N/A		Ground Water	5.41 mg/L	10 mL	54.1 mg/L	10	0.7	5.0			6/15/19 03:35:00	N	IV
K1905198-003	Carbon, Total Organic	N/A		Ground Water	13.60 mg/L	10 mL	1360 mg/L	100	7	50			6/15/19 02:11:00	N	IV
K1905258-006	Carbon, Total Organic	N/A		Water	3.31 mg/L	10 mL	331 mg/L	100	7	50			6/15/19 01:13:00	N	IV
K1905420-001	Carbon, Total Organic	N/A		Water	0.38 mg/L	10 mL	50 mg/L U	100	7	50			6/15/19 13:58:00	N	II
K1905440-001	Carbon, Total Organic	N/A		Water	21.35 mg/L	10 mL	21.3 mg/L	1	0.07	0.50			6/15/19 04:03:00	N	II
K1905440-002	Carbon, Total Organic	N/A		Water	21.51 mg/L	10 mL	21.5 mg/L	1	0.07	0.50			6/15/19 04:31:00	N	II
K1905440-003	Carbon, Total Organic	N/A		Water	20.63 mg/L	10 mL	20.6 mg/L	1	0.07	0.50			6/15/19 04:59:00	N	II
K1905440-004	Carbon, Total Organic	N/A		Water	20.85 mg/L	10 mL	20.8 mg/L	1	0.07	0.50			6/15/19 05:27:00	N	II
K1905449-001	Carbon, Total Organic	N/A		Water	1.54 mg/L	10 mL	1.54 mg/L	1	0.07	0.50			6/15/19 14:40:00	N	II
K1905451-001	Carbon, Total Organic	N/A		Water	6.46 mg/L	10 mL	646 mg/L	100	7	50			6/15/19 11:35:00	N	II
K1905451-002	Carbon, Total Organic	N/A		Water	5.83 mg/L	10 mL	583 mg/L	100	7	50			6/15/19 12:33:00	N	II
K1905478-001	Carbon, Total Organic	N/A		Ground Water	28.06 mg/L	10 mL	28.1 mg/L	1	0.07	0.50			6/15/19 05:55:00	N	II
K1905478-002	Carbon, Total Organic	N/A		Ground Water	9.82 mg/L	10 mL	9.82 mg/L	1	0.07	0.50			6/15/19 06:23:00	N	II
K1905478-003	Carbon, Total Organic	N/A		Ground Water	18.57 mg/L	10 mL	18.6 mg/L	1	0.07	0.50			6/15/19 07:50:00	N	II
K1905478-004	Carbon, Total Organic	N/A		Ground Water	9.86 mg/L	10 mL	9.86 mg/L	1	0.07	0.50			6/15/19 08:18:00	Y	II
K1905478-005	Carbon, Total Organic	N/A		Ground Water	7.89 mg/L	10 mL	7.89 mg/L	1	0.07	0.50			6/15/19 09:29:00	N	II
K1905478-006	Carbon, Total Organic	N/A		Ground Water	0.67 mg/L	10 mL	0.67 mg/L	1	0.07	0.50			6/15/19 10:11:00	N	II
K1905478-007	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 10:59:00	N	II
K1905589-001	Carbon, Total Organic	N/A		Water	3.74 mg/L	10 mL	3.74 mg/L	1	0.07	0.50			6/15/19 13:01:00	N	II
K1905589-003	Carbon, Total Organic	N/A		Water	2.59 mg/L	10 mL	2.59 mg/L	1	0.07	0.50			6/15/19 13:30:00	N	II
KQ1908379-01	Carbon, Total Organic	CCV		Water	24.94 mg/L	10 mL	24.9 mg/L	1					6/14/19 18:11:00	N	IV
KQ1908379-02	Carbon, Total Organic	CCV		Water	24.59 mg/L	10 mL	24.6 mg/L	1					6/15/19 01:13:00	N	IV
KQ1908379-03	Carbon, Total Organic	CCV		Water	25.46 mg/L	10 mL	25.5 mg/L	1					6/15/19 06:51:00	N	IV
KQ1908379-04	Carbon, Total Organic	CCV		Water	24.96 mg/L	10 mL	25.0 mg/L	1					6/15/19 12:03:00	N	IV
KQ1908379-05	Carbon, Total Organic	CCV		Water	24.89 mg/L	10 mL	24.9 mg/L	1					6/15/19 17:01:00	N	IV
KQ1908379-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/14/19 18:26:00	N	IV
KQ1908379-07	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 01:56:00	N	IV
KQ1908379-08	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 07:06:00	N	IV
KQ1908379-09	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 12:18:00	N	IV
KQ1908379-10	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 17:15:00	N	IV
KQ1908379-11	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/14/19 18:41:00	N	IV
KQ1908379-12	Carbon, Total Organic	LCS		Water	25.40 mg/L	10 mL	25.4 mg/L	1	0.07	0.50	102		6/14/19 19:37:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Printed 6/18/19 10:35

Results Summary

06/18/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 639522 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1908379-13	Carbon, Total Organic	MS	K1905478-004	Ground Water	29.95 mg/L	10 mL	59.9 mg/L	2	0.2	1.0	100		6/15/19 08:46:00	N	II
KQ1908379-14	Carbon, Total Organic	DUP	K1905258-006	Water	3.33 mg/L	10 mL	333 mg/L	100	7	50		<1	6/15/19 01:13:00	N	IV
KQ1908379-15	Carbon, Total Organic	DUP	K1905198-003	Ground Water	13.59 mg/L	10 mL	1360 mg/L	100	7	50		<1	6/15/19 02:11:00	N	IV
KQ1908379-17	Carbon, Total Organic	DUP	K1905114-006	Ground Water	6.29 mg/L	10 mL	62.9 mg/L	10	0.7	5.0		15*	6/15/19 03:35:00	N	IV
KQ1908379-18	Carbon, Total Organic	DUP	K1905440-001	Water	21.00 mg/L	10 mL	21.0 mg/L	1	0.07	0.50		2	6/15/19 04:03:00	N	II
KQ1908379-19	Carbon, Total Organic	DUP	K1905440-002	Water	21.25 mg/L	10 mL	21.2 mg/L	1	0.07	0.50		1	6/15/19 04:31:00	N	II
KQ1908379-20	Carbon, Total Organic	DUP	K1905440-003	Water	20.93 mg/L	10 mL	20.9 mg/L	1	0.07	0.50		1	6/15/19 04:59:00	N	II
KQ1908379-21	Carbon, Total Organic	DUP	K1905440-004	Water	20.80 mg/L	10 mL	20.8 mg/L	1	0.07	0.50		<1	6/15/19 05:27:00	N	II
KQ1908379-22	Carbon, Total Organic	DUP	K1905478-001	Ground Water	28.39 mg/L	10 mL	28.4 mg/L	1	0.07	0.50		1	6/15/19 05:55:00	N	II
KQ1908379-23	Carbon, Total Organic	DUP	K1905478-002	Ground Water	9.35 mg/L	10 mL	9.35 mg/L	1	0.07	0.50		5	6/15/19 06:23:00	N	II
KQ1908379-24	Carbon, Total Organic	DUP	K1905478-003	Ground Water	18.70 mg/L	10 mL	18.7 mg/L	1	0.07	0.50		<1	6/15/19 07:50:00	N	II
KQ1908379-25	Carbon, Total Organic	DUP	K1905478-004	Ground Water	9.86 mg/L	10 mL	9.86 mg/L	1	0.07	0.50		<1	6/15/19 08:18:00	N	II
KQ1908379-26	Carbon, Total Organic	DUP	K1905478-005	Ground Water	7.97 mg/L	10 mL	7.97 mg/L	1	0.07	0.50		<1	6/15/19 09:29:00	N	II
KQ1908379-27	Carbon, Total Organic	DUP	K1905478-006	Ground Water	0.59 mg/L	10 mL	0.59 mg/L	1	0.07	0.50		12*	6/15/19 10:11:00	N	II
KQ1908379-28	Carbon, Total Organic	DUP	K1905478-007	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/15/19 10:59:00	N	II
KQ1908379-29	Carbon, Total Organic	DUP	K1905451-001	Water	6.46 mg/L	10 mL	646 mg/L	100	7	50		<1	6/15/19 11:35:00	N	II
KQ1908379-30	Carbon, Total Organic	DUP	K1905451-002	Water	5.90 mg/L	10 mL	590 mg/L	100	7	50		1	6/15/19 12:33:00	N	II
KQ1908379-31	Carbon, Total Organic	DUP	K1905589-001	Water	3.64 mg/L	10 mL	3.64 mg/L	1	0.07	0.50		3	6/15/19 13:01:00	N	II
KQ1908379-32	Carbon, Total Organic	DUP	K1905589-003	Water	2.58 mg/L	10 mL	2.58 mg/L	1	0.07	0.50		<1	6/15/19 13:30:00	N	II
KQ1908379-33	Carbon, Total Organic	DUP	K1905420-001	Water	0.39 mg/L	10 mL	39 mg/L J	100	7	50		NC	6/15/19 13:58:00	N	II
KQ1908379-34	Carbon, Total Organic	DUP	K1905449-001	Water	1.47 mg/L	10 mL	1.47 mg/L	1	0.07	0.50		5	6/15/19 14:40:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 639523 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1905198-006	Carbon, Total Organic	N/A		Ground Water	3.96 mg/L	10 mL	3.96 mg/L	1	0.07	0.50			6/15/19 03:07:00	N	IV
K1905409-001	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 20:48:00	N	I
K1905409-002	Carbon, Total Organic	N/A		Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 21:16:00	N	I
K1905449-002	Carbon, Total Organic	N/A		Water	0.56 mg/L	10 mL	0.56 mg/L	1	0.07	0.50			6/15/19 15:08:00	N	II
K1905477-001	Carbon, Total Organic	N/A		Water	1.72 mg/L	10 mL	1.72 mg/L	1	0.07	0.50			6/15/19 15:36:00	N	I
K1905477-002	Carbon, Total Organic	N/A		Water	19.94 mg/L	10 mL	19.9 mg/L	1	0.07	0.50			6/15/19 16:04:00	N	I
K1905477-003	Carbon, Total Organic	N/A		Water	2.68 mg/L	10 mL	2.68 mg/L	1	0.07	0.50			6/15/19 16:32:00	N	I
K1905477-004	Carbon, Total Organic	N/A		Water	1.23 mg/L	10 mL	1.23 mg/L	1	0.07	0.50			6/15/19 17:59:00	N	I
K1905482-001	Carbon, Total Organic	N/A		Water	0.40 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 18:27:00	N	II
K1905482-002	Carbon, Total Organic	N/A		Water	1.54 mg/L	10 mL	1.54 mg/L	1	0.07	0.50			6/15/19 18:56:00	N	II
K1905482-003	Carbon, Total Organic	N/A		Water	0.62 mg/L	10 mL	0.62 mg/L	1	0.07	0.50			6/15/19 19:24:00	N	II
K1905482-004	Carbon, Total Organic	N/A		Water	0.87 mg/L	10 mL	0.87 mg/L	1	0.07	0.50			6/15/19 19:52:00	N	II
K1905482-005	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 20:20:00	N	II
K1905558-001	Carbon, Total Organic	N/A		Water	1.48 mg/L	10 mL	1.48 mg/L	1	0.07	0.50			6/15/19 22:14:00	N	II
K1905558-002	Carbon, Total Organic	N/A		Water	1.64 mg/L	10 mL	1.64 mg/L	1	0.07	0.50			6/15/19 22:42:00	N	II
K1905558-003	Carbon, Total Organic	N/A		Water	1.07 mg/L	10 mL	1.07 mg/L	1	0.07	0.50			6/15/19 23:10:00	N	II
K1905558-004	Carbon, Total Organic	N/A		Water	1.59 mg/L	10 mL	1.59 mg/L	1	0.07	0.50			6/15/19 23:38:00	N	II
K1905558-005	Carbon, Total Organic	N/A		Water	1.53 mg/L	10 mL	1.53 mg/L	1	0.07	0.50			6/16/19 00:06:00	N	II
K1905586-001	Carbon, Total Organic	N/A		Water	0.69 mg/L	10 mL	0.69 mg/L	1	0.07	0.50			6/16/19 00:34:00	N	II
K1905586-002	Carbon, Total Organic	N/A		Water	0.19 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 01:02:00	N	II
KQ1908380-01	Carbon, Total Organic	MS	K1905198-006	Ground Water	25.56 mg/L	10 mL	25.6 mg/L	1	0.07	0.50	86		6/16/19 10:45:00	N	IV
KQ1908380-02	Carbon, Total Organic	CCV		Ground Water	24.59 mg/L	10 mL	24.6 mg/L	1					6/15/19 01:41:00	N	IV
KQ1908380-03	Carbon, Total Organic	CCV		Ground Water	25.46 mg/L	10 mL	25.5 mg/L	1					6/15/19 06:51:00	N	IV
KQ1908380-04	Carbon, Total Organic	CCV		Ground Water	24.96 mg/L	10 mL	25.0 mg/L	1					6/15/19 12:03:00	N	IV
KQ1908380-05	Carbon, Total Organic	CCV		Ground Water	24.89 mg/L	10 mL	24.9 mg/L	1					6/15/19 17:01:00	N	IV
KQ1908380-06	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 01:56:00	N	IV
KQ1908380-07	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 07:06:00	N	IV
KQ1908380-08	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 12:18:00	N	IV
KQ1908380-09	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 17:15:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

06/18/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 639523 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1908380-10	Carbon, Total Organic	MB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 07:21:00	N	IV
KQ1908380-11	Carbon, Total Organic	LCS		Ground Water	25.44 mg/L	10 mL	25.4 mg/L	1	0.07	0.50	102		6/15/19 07:35:00	N	IV
KQ1908380-12	Carbon, Total Organic	DUP	K1905198-006	Ground Water	3.83 mg/L	10 mL	3.83 mg/L	1	0.07	0.50		3	6/15/19 03:07:00	N	IV
KQ1908380-13	Carbon, Total Organic	DUP	K1905449-002	Water	0.53 mg/L	10 mL	0.53 mg/L	1	0.07	0.50		5	6/15/19 15:08:00	N	II
KQ1908380-14	Carbon, Total Organic	DUP	K1905477-001	Water	1.75 mg/L	10 mL	1.75 mg/L	1	0.07	0.50		2	6/15/19 15:36:00	N	I
KQ1908380-15	Carbon, Total Organic	DUP	K1905477-002	Water	19.70 mg/L	10 mL	19.7 mg/L	1	0.07	0.50		1	6/15/19 16:04:00	N	I
KQ1908380-16	Carbon, Total Organic	DUP	K1905477-003	Water	2.56 mg/L	10 mL	2.56 mg/L	1	0.07	0.50		5	6/15/19 16:32:00	N	I
KQ1908380-17	Carbon, Total Organic	DUP	K1905477-004	Water	1.13 mg/L	10 mL	1.13 mg/L	1	0.07	0.50		9	6/15/19 17:59:00	N	I
KQ1908380-18	Carbon, Total Organic	DUP	K1905482-001	Water	0.46 mg/L	10 mL	0.46 mg/L J	1	0.07	0.50		NC	6/15/19 18:27:00	N	II
KQ1908380-19	Carbon, Total Organic	DUP	K1905482-002	Water	1.52 mg/L	10 mL	1.52 mg/L	1	0.07	0.50		<1	6/15/19 18:56:00	N	II
KQ1908380-20	Carbon, Total Organic	DUP	K1905482-003	Water	0.63 mg/L	10 mL	0.63 mg/L	1	0.07	0.50		2	6/15/19 19:24:00	N	II
KQ1908380-21	Carbon, Total Organic	DUP	K1905482-004	Water	0.82 mg/L	10 mL	0.82 mg/L	1	0.07	0.50		6	6/15/19 19:52:00	N	II
KQ1908380-22	Carbon, Total Organic	DUP	K1905482-005	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/15/19 20:20:00	N	II
KQ1908380-23	Carbon, Total Organic	DUP	K1905409-001	Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/15/19 20:48:00	N	I
KQ1908380-24	Carbon, Total Organic	DUP	K1905409-002	Reagent Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/15/19 21:16:00	N	I
KQ1908380-25	Carbon, Total Organic	DUP	K1905558-001	Water	1.41 mg/L	10 mL	1.41 mg/L	1	0.07	0.50		5	6/15/19 22:14:00	N	II
KQ1908380-26	Carbon, Total Organic	DUP	K1905558-002	Water	1.61 mg/L	10 mL	1.61 mg/L	1	0.07	0.50		2	6/15/19 22:42:00	N	II
KQ1908380-27	Carbon, Total Organic	DUP	K1905558-003	Water	1.06 mg/L	10 mL	1.06 mg/L	1	0.07	0.50		1	6/15/19 23:10:00	N	II
KQ1908380-28	Carbon, Total Organic	DUP	K1905558-004	Water	1.54 mg/L	10 mL	1.54 mg/L	1	0.07	0.50		3	6/15/19 23:38:00	N	II
KQ1908380-29	Carbon, Total Organic	DUP	K1905558-005	Water	1.48 mg/L	10 mL	1.48 mg/L	1	0.07	0.50		3	6/16/19 00:06:00	N	II
KQ1908380-30	Carbon, Total Organic	DUP	K1905586-001	Water	0.67 mg/L	10 mL	0.67 mg/L	1	0.07	0.50		4	6/16/19 00:34:00	N	II
KQ1908380-31	Carbon, Total Organic	DUP	K1905586-002	Water	0.16 mg/L	10 mL	0.16 mg/L J	1	0.07	0.50		NC	6/16/19 01:02:00	N	II
KQ1908380-32	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 21:59:00	N	IV
KQ1908380-33	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 03:09:00	N	IV
KQ1908380-34	Carbon, Total Organic	CCV		Ground Water	24.50 mg/L	10 mL	24.5 mg/L	1					6/15/19 21:44:00	N	IV
KQ1908380-35	Carbon, Total Organic	CCV		Ground Water	24.52 mg/L	10 mL	24.5 mg/L	1					6/16/19 02:55:00	N	IV
KQ1908380-36	Carbon, Total Organic	CCV		Ground Water	24.12 mg/L	10 mL	24.1 mg/L	1					6/16/19 07:11:00	N	IV
KQ1908380-37	Carbon, Total Organic	CCV		Ground Water	25.11 mg/L	10 mL	25.1 mg/L	1					6/16/19 11:00:00	N	IV
KQ1908380-38	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 07:26:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 639523 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1908380-39	Carbon, Total Organic	CCB		Ground Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 11:14:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 639524 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1905259-001	Carbon, Total Organic	N/A		Water	2.21 mg/L	10 mL	2.21 mg/L	1	0.07	0.50			6/16/19 06:15:00	N	IV
K1905597-001	Carbon, Total Organic	N/A		Water	0.61 mg/L	10 mL	0.61 mg/L	1	0.07	0.50			6/16/19 01:30:00	N	IV
K1905597-002	Carbon, Total Organic	N/A		Water	2.79 mg/L	10 mL	11.2 mg/L	4	0.3	2.0			6/16/19 01:58:00	N	IV
K1905597-003	Carbon, Total Organic	N/A		Water	2.72 mg/L	10 mL	10.9 mg/L	4	0.3	2.0			6/16/19 02:27:00	N	IV
K1905597-004	Carbon, Total Organic	N/A		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 03:53:00	N	IV
K1905597-005	Carbon, Total Organic	N/A		Water	0.32 mg/L	10 mL	0.32 mg/L J	1	0.07	0.50			6/16/19 04:22:00	N	IV
K1905597-006	Carbon, Total Organic	N/A		Water	2.34 mg/L	10 mL	2.34 mg/L	1	0.07	0.50			6/16/19 04:50:00	Y	IV
K1905597-007	Carbon, Total Organic	N/A		Water	1.43 mg/L	10 mL	1.43 mg/L	1	0.07	0.50			6/16/19 05:47:00	N	IV
KQ1908381-01	Carbon, Total Organic	CCV		Water	24.50 mg/L	10 mL	24.5 mg/L	1					6/15/19 21:44:00	N	IV
KQ1908381-02	Carbon, Total Organic	CCV		Water	24.52 mg/L	10 mL	24.5 mg/L	1					6/16/19 02:55:00	N	IV
KQ1908381-03	Carbon, Total Organic	CCV		Water	24.12 mg/L	10 mL	24.1 mg/L	1					6/16/19 07:11:00	N	IV
KQ1908381-04	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 21:59:00	N	IV
KQ1908381-05	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 03:09:00	N	IV
KQ1908381-06	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 07:26:00	N	IV
KQ1908381-07	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/15/19 17:30:00	N	IV
KQ1908381-08	Carbon, Total Organic	LCS		Water	25.11 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/15/19 17:45:00	N	IV
KQ1908381-09	Carbon, Total Organic	MS	K1905597-006	Water	26.78 mg/L	10 mL	53.6 mg/L	2	0.2	1.0	102		6/16/19 05:18:00	N	IV
KQ1908381-10	Carbon, Total Organic	DUP	K1905597-001	Water	0.50 mg/L	10 mL	0.50 mg/L J	1	0.07	0.50		20*	6/16/19 01:30:00	N	IV
KQ1908381-11	Carbon, Total Organic	DUP	K1905597-002	Water	2.79 mg/L	10 mL	11.2 mg/L	4	0.3	2.0		<1	6/16/19 01:58:00	N	IV
KQ1908381-12	Carbon, Total Organic	DUP	K1905597-003	Water	2.70 mg/L	10 mL	10.8 mg/L	4	0.3	2.0		<1	6/16/19 02:27:00	N	IV
KQ1908381-13	Carbon, Total Organic	DUP	K1905597-004	Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50		NC	6/16/19 03:53:00	N	IV
KQ1908381-14	Carbon, Total Organic	DUP	K1905597-005	Water	0.30 mg/L	10 mL	0.30 mg/L J	1	0.07	0.50		8	6/16/19 04:22:00	N	IV
KQ1908381-15	Carbon, Total Organic	DUP	K1905597-006	Water	2.37 mg/L	10 mL	2.37 mg/L	1	0.07	0.50		1	6/16/19 04:50:00	N	IV
KQ1908381-16	Carbon, Total Organic	DUP	K1905597-007	Water	1.41 mg/L	10 mL	1.41 mg/L	1	0.07	0.50		2	6/16/19 05:47:00	N	IV
KQ1908381-17	Carbon, Total Organic	DUP	K1905259-001	Water	2.25 mg/L	10 mL	2.25 mg/L	1	0.07	0.50		2	6/16/19 06:15:00	N	IV

06/18/19

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Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 639525 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1905589-002	Carbon, Dissolved Organic (DOC)	N/A		Water	3.12 mg/L	10 mL	3.12 mg/L	1	0.07	0.50			6/16/19 06:43:00	N	II
K1905589-004	Carbon, Dissolved Organic (DOC)	N/A		Water	2.29 mg/L	10 mL	2.29 mg/L	1	0.07	0.50			6/16/19 07:41:00	N	II
K1905595-001	Carbon, Dissolved Organic (DOC)	N/A		Water	0.57 mg/L	10 mL	0.57 mg/L	1	0.07	0.50			6/16/19 09:49:00	N	I
K1905595-002	Carbon, Dissolved Organic (DOC)	N/A		Water	0.00 mg/L	10 mL	50 mg/L U	100	7	50			6/16/19 10:17:00	N	I
K1905625-001	Carbon, Dissolved Organic (DOC)	N/A		Effluent	1.22 mg/L	10 mL	1.22 mg/L	1	0.07	0.50			6/16/19 08:09:00	N	II
K1905625-002	Carbon, Dissolved Organic (DOC)	N/A		Effluent	1.21 mg/L	10 mL	1.21 mg/L	1	0.07	0.50			6/16/19 09:06:00	N	II
KQ1908382-01	Carbon, Dissolved Organic (DOC)	CCV		Water	24.52 mg/L	10 mL	24.5 mg/L	1					6/16/19 02:55:00	N	II
KQ1908382-02	Carbon, Dissolved Organic (DOC)	CCV		Water	24.12 mg/L	10 mL	24.1 mg/L	1					6/16/19 07:11:00	N	II
KQ1908382-03	Carbon, Dissolved Organic (DOC)	CCV		Water	25.11 mg/L	10 mL	25.1 mg/L	1					6/16/19 11:00:00	N	II
KQ1908382-04	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 03:09:00	N	II
KQ1908382-05	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 07:26:00	N	II
KQ1908382-06	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 11:14:00	N	II
KQ1908382-07	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/16/19 03:24:00	N	II
KQ1908382-08	Carbon, Dissolved Organic (DOC)	LCS		Water	25.10 mg/L	10 mL	25.1 mg/L	1	0.07	0.50	100		6/16/19 03:39:00	N	II
KQ1908382-09	Carbon, Dissolved Organic (DOC)	MS	K1905625-001	Effluent	26.86 mg/L	10 mL	26.9 mg/L	1	0.07	0.50	103		6/16/19 08:37:00	N	II
KQ1908382-10	Carbon, Dissolved Organic (DOC)	DUP	K1905589-002	Water	3.13 mg/L	10 mL	3.13 mg/L	1	0.07	0.50		<1	6/16/19 06:43:00	N	II
KQ1908382-11	Carbon, Dissolved Organic (DOC)	DUP	K1905589-004	Water	2.30 mg/L	10 mL	2.30 mg/L	1	0.07	0.50		<1	6/16/19 07:41:00	N	II
KQ1908382-12	Carbon, Dissolved Organic (DOC)	DUP	K1905625-001	Effluent	1.28 mg/L	10 mL	1.28 mg/L	1	0.07	0.50		5	6/16/19 08:09:00	N	II
KQ1908382-13	Carbon, Dissolved Organic (DOC)	DUP	K1905625-002	Effluent	1.21 mg/L	10 mL	1.21 mg/L	1	0.07	0.50		<1	6/16/19 09:06:00	N	II
KQ1908382-14	Carbon, Dissolved Organic (DOC)	DUP	K1905595-001	Water	0.58 mg/L	10 mL	0.58 mg/L	1	0.07	0.50		2	6/16/19 09:49:00	N	I
KQ1908382-15	Carbon, Dissolved Organic (DOC)	DUP	K1905595-002	Water	0.00 mg/L	10 mL	50 mg/L U	100	7	50		NC	6/16/19 10:17:00	N	I

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	24.937	0.0000	24.9374	24.9374	24.9	6/14/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/14/2019
4	MB1	1	0.000	0.0000	0.0000	0	<0.5	6/14/2019
5	[TOC] LCS [24ppm]	1	25.401	0.0000	25.4009	25.4009	25.4	6/14/2019
6	K1905258-006	100	3.314	0.0000	3.3140	331.4	331.40	6/15/2019
7	K1905258-006d	100	3.327	0.0000	3.3271	332.71	332.7	6/15/2019
8	C] CCV 25 ppm [25 p	1	24.590	0.0000	24.5900	24.59	25	6/15/2019
9	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
10	K1905198-003	100	13.598	0.0000	13.5984	1359.84	1359.84	6/15/2019
11	K1905198-003d	100	13.590	0.0000	13.5897	1358.97	1359.0	6/15/2019
12	K1905114-006	10	5.412	0.0000	5.4117	54.117	54.12	6/15/2019
13	K1905114-006d	10	6.290	0.0000	6.2895	62.895	62.90	6/15/2019
14	K1905440-001	1	21.348	0.0000	21.3480	21.348	21.35	6/15/2019
15	K1905440-001d	1	21.002	0.0000	21.0020	21.002	21.0	6/15/2019
16	K1905440-002	1	21.512	0.0000	21.5121	21.5121	21.5	6/15/2019
17	K1905440-002d	1	21.247	0.0000	21.2469	21.2469	21.25	6/15/2019
18	K1905440-003	1	20.626	0.0000	20.6264	20.6264	20.6	6/15/2019
19	K1905440-003d	1	20.933	0.0000	20.9333	20.9333	20.9	6/15/2019
20	K1905440-004	1	20.849	0.0000	20.8493	20.8493	20.85	6/15/2019
21	K1905440-004d	1	20.795	0.0000	20.7951	20.7951	20.80	6/15/2019
22	K1905478-001	1	28.056	0.0000	28.0558	28.0558	28.1	6/15/2019
23	K1905478-001d	1	28.385	0.0000	28.3853	28.3853	28.4	6/15/2019
24	K1905478-002	1	9.821	0.0000	9.8214	9.8214	9.82	6/15/2019
25	K1905478-002d	1	9.348	0.0000	9.3476	9.3476	9.35	6/15/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By:		Date Analyzed	6/16/19
Reviewed By:		Date Reviewed	06/18/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	C] CCV 25 ppm [25 p	1	25.464	0.0000	25.4635	25.4635	25.46	6/15/2019
27	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
28	K1905478-003	1	18.571	0.0000	18.5707	18.5707	18.6	6/15/2019
29	K1905478-003d	1	18.705	0.0000	18.7046	18.7046	18.7	6/15/2019
30	K1905478-004	1	9.865	0.0000	9.8646	9.8646	9.9	6/15/2019
31	K1905478-004d	1	9.856	0.0000	9.8560	9.856	9.9	6/15/2019
32	K1905478-004ms	2	29.953	0.0000	29.9530	59.906	59.9	6/15/2019
33	K1905478-005	1	7.894	0.0000	7.8940	7.894	7.9	6/15/2019
34	K1905478-005d	1	7.970	0.0000	7.9703	7.9703	8.0	6/15/2019
35	K1905478-006	1	0.673	0.0000	0.6731	0.6731	0.7	6/15/2019
36	K1905478-006d	1	0.595	0.0000	0.5947	0.5947	0.6	6/15/2019
37	K1905478-007	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
38	K1905478-007d	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
39	K1905451-001	100	6.462	0.0000	6.4621	646.21	646.2	6/15/2019
40	K1905451-001d	100	6.461	0.0000	6.4610	646.1	646.1	6/15/2019
41	C] CCV 25 ppm [25 p	1	24.963	0.0000	24.9627	24.9627	25.0	6/15/2019
42	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
43	K1905451-002	100	5.830	0.0000	5.8303	583.03	583.0	6/15/2019
44	K1905451-002d	100	5.902	0.0000	5.9022	590.22	590.2	6/15/2019
45	K1905589-001	1	3.741	0.0000	3.7412	3.7412	3.7	6/15/2019
46	K1905589-001d	1	3.637	0.0000	3.6370	3.637	3.6	6/15/2019
47	K1905589-003	1	2.586	0.0000	2.5861	2.5861	2.6	6/15/2019
48	K1905589-003d	1	2.583	0.0000	2.5834	2.5834	2.6	6/15/2019
49	K1905420-001	100	0.378	0.0000	0.3783	37.83	37.8	6/15/2019
50	K1905420-001d	100	0.387	0.0000	0.3867	38.67	38.7	6/15/2019

Analyzed By:	BCD	Date Analyzed	6/16/19
Reviewed By:	[signature]	Date Reviewed	06/18/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	K1905449-001	1	1.539	0.0000	1.5389	1.5389	1.54	6/15/2019
52	K1905449-001d	1	1.469	0.0000	1.4688	1.4688	1.5	6/15/2019
53	C] CCV 25 ppm [25 p	1	24.894	0.0000	24.8939	24.8939	24.9	6/15/2019
54	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
55		1		0.0000	0.0000	0	<0.5	
56		1		0.0000	0.0000	0	<0.5	
57		1		0.0000	0.0000	0	<0.5	
58		1		0.0000	0.0000	0	<0.5	
59		1		0.0000	0.0000	0	<0.5	
60		1		0.0000	0.0000	0	<0.5	
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By: [illegible]	Date Analyzed 6/16/19
Reviewed By:	Date Reviewed

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	24.590	0.0000	24.5900	24.59	24.6	6/15/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
4	K1905198-006	1	3.957	0.0000	3.9572	3.9572	4.0	6/15/2019
5	K1905198-006d	1	3.834	0.0000	3.8337	3.8337	3.8	6/15/2019
6	C] CCV 25 ppm [25 p	1	25.464	0.0000	25.4635	25.4635	25.46	6/15/2019
7	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
8	MB2	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
9	[TOC] LCS [24ppm]	1	25.436	0.0000	25.4355	25.4355	25.44	6/15/2019
10	C] CCV 25 ppm [25 p	1	24.963	0.0000	24.9627	24.9627	24.96	6/15/2019
11	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
12	K1905449-002	1	0.558	0.0000	0.5581	0.5581	0.56	6/15/2019
13	K1905449-002d	1	0.529	0.0000	0.5290	0.529	0.53	6/15/2019
14	K1905477-001	1	1.722	0.0000	1.7217	1.7217	1.72	6/15/2019
15	K1905477-001d	1	1.754	0.0000	1.7538	1.7538	1.8	6/15/2019
16	K1905477-002	1	19.942	0.0000	19.9421	19.9421	19.9	6/15/2019
17	K1905477-002d	1	19.696	0.0000	19.6957	19.6957	19.70	6/15/2019
18	K1905477-003	1	2.685	0.0000	2.6845	2.6845	2.7	6/15/2019
19	K1905477-003d	1	2.556	0.0000	2.5556	2.5556	2.6	6/15/2019
20	C] CCV 25 ppm [25 p	1	24.894	0.0000	24.8939	24.8939	24.89	6/15/2019
21	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
22	K1905477-004	1	1.231	0.0000	1.2310	1.231	1.2	6/15/2019
23	K1905477-004d	1	1.126	0.0000	1.1263	1.1263	1.1	6/15/2019
24	K1905482-001	1	0.404	0.0000	0.4040	0.404	<0.5	6/15/2019
25	K1905482-001d	1	0.464	0.0000	0.4636	0.4636	<0.5	6/15/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By:		Date Analyzed	6/16/19
Reviewed By:		Date Reviewed	06/18/19

Revision 1, 2010 R:\WET\ANALYSES\TOC\TEMPLATE\TOCwaterLIMS

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1905482-002	1	1.537	0.0000	1.5366	1.5366	1.54	6/15/2019
27	K1905482-002d	1	1.522	0.0000	1.5215	1.5215	1.52	6/15/2019
28	K1905482-003	1	0.620	0.0000	0.6196	0.6196	0.6	6/15/2019
29	K1905482-003d	1	0.632	0.0000	0.6317	0.6317	0.6	6/15/2019
30	K1905482-004	1	0.870	0.0000	0.8701	0.8701	0.9	6/15/2019
31	K1905482-004d	1	0.818	0.0000	0.8181	0.8181	0.8	6/15/2019
32	K1905482-005	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
33	K1905482-005d	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
34	K1905409-001	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
35	K1905409-001d	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
36	K1905409-002	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
37	K1905409-002d	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
38	C] CCV 25 ppm [25 p	1	24.499	0.0000	24.4988	24.4988	24.5	6/15/2019
39	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
40	K1905558-001	1	1.482	0.0000	1.4823	1.4823	1.5	6/15/2019
41	K1905558-001d	1	1.412	0.0000	1.4121	1.4121	1.4	6/15/2019
42	K1905558-002	1	1.642	0.0000	1.6423	1.6423	1.6	6/15/2019
43	K1905558-002d	1	1.608	0.0000	1.6080	1.608	1.6	6/15/2019
44	K1905558-003	1	1.073	0.0000	1.0728	1.0728	1.1	6/15/2019
45	K1905558-003d	1	1.061	0.0000	1.0610	1.061	1.1	6/15/2019
46	K1905558-004	1	1.588	0.0000	1.5881	1.5881	1.6	6/15/2019
47	K1905558-004d	1	1.543	0.0000	1.5426	1.5426	1.5	6/15/2019
48	K1905558-005	1	1.526	0.0000	1.5259	1.5259	1.5	6/16/2019
49	K1905558-005d	1	1.484	0.0000	1.4841	1.4841	1.5	6/16/2019
50	K1905586-001	1	0.693	0.0000	0.6929	0.6929	0.7	6/16/2019

Analyzed By: KCP	Date Analyzed 6/16/19
Reviewed By: [signature]	Date Reviewed 06/18/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
51	K1905586-001d	1	0.666	0.0000	0.6657	0.6657	0.67	6/16/2019
52	K1905586-002	1	0.189	0.0000	0.1892	0.1892	<0.5	6/16/2019
53	K1905586-002d	1	0.160	0.0000	0.1601	0.1601	<0.5	6/16/2019
54	C] CCV 25 ppm [25 p	1	24.518	0.0000	24.5184	24.5184	24.5	6/16/2019
55	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
56	C] CCV 25 ppm [25 p	1	24.117	0.0000	24.1171	24.1171	24.1	6/16/2019
57	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
58	K1905198-006ms	1	25.561	0.0000	25.5611	25.5611	25.6	6/16/2019
59	C] CCV 25 ppm [25 p	1	25.111	0.0000	25.1105	25.1105	25.1	6/16/2019
60	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
61		1		0.0000	0.0000	0	<0.5	
62		1		0.0000	0.0000	0	<0.5	
63		1		0.0000	0.0000	0	<0.5	
64		1		0.0000	0.0000	0	<0.5	
65		1		0.0000	0.0000	0	<0.5	
66		1		0.0000	0.0000	0	<0.5	
67		1		0.0000	0.0000	0	<0.5	
68		1		0.0000	0.0000	0	<0.5	
69		1		0.0000	0.0000	0	<0.5	
70		1		0.0000	0.0000	0	<0.5	
71		1		0.0000	0.0000	0	<0.5	
72		1		0.0000	0.0000	0	<0.5	
73		1		0.0000	0.0000	0	<0.5	
74		1		0.0000	0.0000	0	<0.5	
75		1		0.0000	0.0000	0	<0.5	

Analyzed By:	BCB	Date Analyzed	6/16/19
Reviewed By:		Date Reviewed	06/18/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	MB3	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
3	[TOC] LCS [25ppm]	1	25.114	0.0000	25.1136	25.1136	25.1	6/15/2019
4	C] CCV 25 ppm [25 p	1	24.499	0.0000	24.4988	24.4988	24.5	6/15/2019
5	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/15/2019
6	K1905597-001	1	0.607	0.0000	0.6073	0.6073	0.61	6/16/2019
7	K1905597-001d	1	0.496	0.0000	0.4957	0.4957	<0.5	6/16/2019
8	K1905597-002	4	2.794	0.0000	2.7938	11.1752	11	6/16/2019
9	K1905597-002d	4	2.791	0.0000	2.7914	11.1656	11.17	6/16/2019
10	K1905597-003	4	2.724	0.0000	2.7238	10.8952	10.90	6/16/2019
11	K1905597-003d	4	2.704	0.0000	2.7035	10.814	10.8	6/16/2019
12	C] CCV 25 ppm [25 p	1	24.518	0.0000	24.5184	24.5184	24.52	6/16/2019
13	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
14	K1905597-004	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
15	K1905597-004d	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
16	K1905597-005	1	0.325	0.0000	0.3247	0.3247	<0.5	6/16/2019
17	K1905597-005d	1	0.301	0.0000	0.3007	0.3007	<0.5	6/16/2019
18	K1905597-006	1	2.345	0.0000	2.3445	2.3445	2.3	6/16/2019
19	K1905597-006d	1	2.369	0.0000	2.3694	2.3694	2.4	6/16/2019
20	K1905597-006ms	2	26.784	0.0000	26.7837	53.5674	53.57	6/16/2019
21	K1905597-007	1	1.434	0.0000	1.4339	1.4339	1.43	6/16/2019
22	K1905597-007d	1	1.412	0.0000	1.4118	1.4118	1.4	6/16/2019
23	K1905259-001	1	2.214	0.0000	2.2135	2.2135	2.2	6/16/2019
24	K1905259-001d	1	2.252	0.0000	2.2524	2.2524	2.25	6/16/2019
25	C] CCV 25 ppm [25 p	1	24.117	0.0000	24.1171	24.1171	24.12	6/16/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date time
Analyzed By: KC	Date Analyzed	6/16/19
Reviewed By:	Date Reviewed	6/18/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
27		1		0.0000	0.0000	0	<0.5	
28		1		0.0000	0.0000	0	<0.5	
29		1		0.0000	0.0000	0	<0.5	
30		1		0.0000	0.0000	0	<0.5	
31		1		0.0000	0.0000	0	<0.5	
32		1		0.0000	0.0000	0	<0.5	
33		1		0.0000	0.0000	0	<0.5	
34		1		0.0000	0.0000	0	<0.5	
35		1		0.0000	0.0000	0	<0.5	
36		1		0.0000	0.0000	0	<0.5	
37		1		0.0000	0.0000	0	<0.5	
38		1		0.0000	0.0000	0	<0.5	
39		1		0.0000	0.0000	0	<0.5	
40		1		0.0000	0.0000	0	<0.5	
41		1		0.0000	0.0000	0	<0.5	
42		1		0.0000	0.0000	0	<0.5	
43		1		0.0000	0.0000	0	<0.5	
44		1		0.0000	0.0000	0	<0.5	
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By: RP	Date Analyzed 6/16/19
Reviewed By: [signature]	Date Reviewed 06/18/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	24.518	0.0000	24.5184	24.5184	24.5	6/16/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
4	MB4	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
5	[TOC] LCS [25ppm]	1	25.100	0.0000	25.1000	25.1	25.1	6/16/2019
6	K1905589-002	1	3.123	0.0000	3.1233	3.1233	3.12	6/16/2019
7	K1905589-002d	1	3.128	0.0000	3.1282	3.1282	3.1	6/16/2019
8	C] CCV 25 ppm [25 p	1	24.117	0.0000	24.1171	24.1171	24	6/16/2019
9	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
10	K1905589-004	1	2.294	0.0000	2.2935	2.2935	2.29	6/16/2019
11	K1905589-004d	1	2.303	0.0000	2.3031	2.3031	2.3	6/16/2019
12	K1905625-001	1	1.221	0.0000	1.2211	1.2211	1.22	6/16/2019
13	K1905625-001d	1	1.285	0.0000	1.2848	1.2848	1.28	6/16/2019
14	K1905625-001ms	1	26.865	0.0000	26.8649	26.8649	26.86	6/16/2019
15	K1905625-002	1	1.214	0.0000	1.2136	1.2136	1.2	6/16/2019
16	K1905625-002d	1	1.207	0.0000	1.2073	1.2073	1.2	6/16/2019
17	K1905595-001	1	0.568	0.0000	0.5675	0.5675	0.57	6/16/2019
18	K1905595-001d	1	0.578	0.0000	0.5782	0.5782	0.6	6/16/2019
19	K1905595-002 100X	100	0.000	0.0000	0.0000	0	<0.5	6/16/2019
20	K1905595-002 100Xd	100	0.000	0.0000	0.0000	0	<0.5	6/16/2019
21	C] CCV 25 ppm [25 p	1	25.111	0.0000	25.1105	25.1105	25.11	6/16/2019
22	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/16/2019
23		1		0.0000	0.0000	0	<0.5	
24		1		0.0000	0.0000	0	<0.5	
25		1		0.0000	0.0000	0	<0.5	

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By: KP		Date Analyzed 6/16/19	
Reviewed By: [signature]		Date Reviewed 06/18/19	

TOC: 639522, 639523, 639524, DOC: 639525

Schedule: 06142019

Version: 8
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/06/15 16:20 - Saturday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1905436-001.01	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
4	Sample	NR K1905436-001.01 ms	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
5	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
6	Sample	K1905436-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
7	Sample	NR K1905436-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
8	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1905258-006.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1905198-003.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1905198-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1905114-006.01 10x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1905440-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1905440-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1905440-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1905440-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
18	Sample	K1905478-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
19	Sample	K1905478-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
21	Sample	K1905478-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1905478-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	K1905478-004.01 ms 2x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
24	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1905478-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	K1905478-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
27	Sample	K1905478-007.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1905451-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1905451-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	K1905589-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
31	Sample	K1905589-003.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
32	Sample	K1905420-001.02 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
33	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
34	Sample	K1905449-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
35	Sample	K1905449-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
36	Sample	K1905477-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
37	Sample	K1905477-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
38	Sample	K1905477-003.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready

06/18/19

Schedule: 06142019

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
39	Sample	MB3	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
40	Sample	K1905477-004.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
41	Sample	K1905482-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
42	Sample	K1905482-002.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
43	Sample	K1905482-003.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
44	Sample	K1905482-004.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
45	Sample	K1905482-005.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
46	Sample	K1905409-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
47	Sample	K1905409-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
48	Sample	K1905558-001.14	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
49	Sample	K1905558-002.14	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
50	Sample	K1905558-003.14	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
51	Sample	K1905558-004.14	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
52	Sample	K1905558-005.14	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
53	Sample	K1905586-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
54	Sample	K1905586-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
55	Sample	K1905597-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
56	Sample	K1905597-002.01 4x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
57	Sample	K1905597-003.01 4x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
58	Sample	MB4	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [25.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
59	Sample	K1905597-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
60	Sample	K1905597-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
61	Sample	K1905597-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
62	Sample	K1905597-006.01 ms 2x	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
63	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
64	Sample	K1905597-007.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
65	Sample	K1905259-001.02	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
66	Sample	K1905589-002.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
67	Sample	K1905589-004.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
68	Sample	K1905625-001.03 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
69	Sample	K1905625-001.03 ms doc	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
70	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
71	Sample	K1905625-002.03 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
72	Sample	FB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
73	Sample	K1905595-001.03 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
74	Sample	K1905595-002.03 100x doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
75	Sample	K1905198-006.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

00939709

Fusion Report - 06142019
Friday, June 14, 2019 03:25 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/06/18 08:56 - Tuesday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	06142019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v2) Fusion1 (Fusion1) (v3) Fusion1 (Fusion1) (v4) Fusion1 (Fusion1) (v5) Fusion1 (Fusion1) (v6) Fusion1 (Fusion1) (v7) Fusion1 (Fusion1) (v8)		
Comment:			

Report Results

06/18/19

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/06/14 15:25

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	13.34	18.06	4.72	49.88	07:58
2	TC Clean	14.48	17.60	3.12	49.67	07:18
3	TC Clean	3.52	6.54	3.02	49.90	07:04
4	TC Clean	2.44	5.68	3.24	49.76	07:02

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/06/14 16:04

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	12.04	15.23	3.18	49.96	07:59

2	TC Clean	5.88	9.04	3.16	49.75	07:16
3	TC Clean	2.16	5.37	3.21	49.79	07:02
4	TC Clean	1.43	4.65	3.22	49.90	07:02

Sample Type: Clean — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
*	(clean)		Clean	2019/06/14 16:39

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.06	4.16	3.09	49.78	05:26
2	TC Clean	4.34	7.40	3.05	49.94	07:19
3	TC Clean	2.36	5.45	3.10	49.86	07:02
4	TC Clean	1.88	4.87	2.98	49.79	07:00

Sample Type: Blank (Creating v1266) — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Start Time
*	(blank)		Reagent/Acid Blank	2019/06/14 17:10

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	1.16	4.21	3.05	49.68	05:25
2	TC Clean	4.58	7.72	3.15	49.84	07:16
3	TC Clean	2.49	5.59	3.10	49.83	07:00
4	TC Clean	1.81	4.95	3.14	49.94	07:01
5	Reagent Blank	6.66	9.83	3.17	49.86	08:11
6	Acid Blank	1.49	4.73	3.24	49.69	05:29

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	D	TOC	RB	0.3200 ppm	0.0000 ppm	0.0000%	2019/06/14 17:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3200	3.1998	11.13	14.35	3.22	50.07	10:29

Dilution Blank Contribution Method Calibration

1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.9374 ppm (PASS)	0.0000 ppm	0%	2019/06/14 18:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9374	249.3739	178.74	181.86	3.12	50.09	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/14 18:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.93	11.23	3.30	50.20	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/14 18:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.04	10.20	3.16	50.08	10:28
2	TOC	0.0000	0.0000	7.38	10.54	3.17	49.99	10:29
3	TOC	0.0000	0.0000	7.03	10.13	3.09	49.96	10:27
4	TOC	0.0000	0.0000	7.13	10.13	3.00	49.92	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

00939712

Sample Type: Check Standard --> LCS From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.4375 ppm (PASS)	0.1009 ppm	0.40%	2019/06/14 19:37

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.4009	254.0086	181.88	184.97	3.09	49.87	10:27
C	TOC	25.0 ppm	2	25.5837	255.8368	183.12	186.21	3.08	49.84	10:25
C	TOC	25.0 ppm	3	25.4128	254.1279	181.96	185.20	3.24	49.89	10:27
C	TOC	25.0 ppm	4	25.3525	253.5254	181.55	184.86	3.30	49.81	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC	ICS	0.2434 ppm	0.0000 ppm	0.0000%	2019/06/14 20:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.2434	2.4338	10.61	13.81	3.20	49.81	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

NR no room

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K1905436-001.01	0.7283 ppm	0.0388 ppm	5.3200%	2019/06/14 20:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7857	7.8566	14.29	17.55	3.25	49.80	10:27
2	TOC	0.7089	7.0891	13.77	17.02	3.25	49.80	10:30
3	TOC	0.7017	7.0169	13.72	16.97	3.25	49.80	10:28
4	TOC	0.7169	7.1686	13.83	16.98	3.15	49.83	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

NR no room

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	4	TOC	K1905436-001.01 ms	27.4897 ppm	0.0961 ppm	0.3500%	2019/06/14 21:44

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	27.5876	275.8760	196.22	199.32	3.10	49.83	10:28
2	TOC	27.3697	273.6972	194.74	198.12	3.38	49.84	10:28

3	TOC	27.5424	275.4238	195.92	199.07	3.15	49.85	10:30
4	TOC	27.4591	274.5914	195.35	198.50	3.14	49.87	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	5	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/14 22:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.54	10.78	3.24	49.89	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	6	TOC	K1905436-002.01 100x	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/14 22:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.04	11.07	3.02	49.89	10:31
2	TOC	0.0000	0.0000	7.57	10.75	3.19	49.89	10:27
3	TOC	0.0000	0.0000	7.71	10.95	3.24	49.91	10:27
4	TOC	0.0000	0.0000	7.76	10.87	3.11	49.94	10:27

per 6/18/19
3/5436
NC

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	7	TOC	K1905436-003.01 100x	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/14 23:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.52	10.65	3.13	49.96	10:24
2	TOC	0.0000	0.0000	7.59	10.61	3.02	49.96	10:24
3	TOC	0.0000	0.0000	7.36	10.42	3.05	49.95	10:31
4	TOC	0.0000	0.0000	7.66	10.79	3.12	49.97	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	8	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 00:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.48	9.62	3.14	49.96	10:29
2	TOC	0.0000	0.0000	6.84	9.91	3.07	49.98	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	9	TOC	K1905258-006.01 100x	3.3205 ppm	0.0093 ppm	0.2800%	2019/06/15 01:13

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.3140	33.1397	31.46	34.50	3.05	49.99	10:28
2	TOC	3.3271	33.2708	31.54	34.86	3.31	50.00	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.5900 ppm (PASS)	0.0000 ppm	0%	2019/06/15 01:41

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5900	245.9001	176.38	179.52	3.14	50.01	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/15 01:56

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.08	10.33	3.25	50.01	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 3

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

10	TOC	K1905198-003.01 100x	13.5940 ppm	0.0061 ppm	0.0500%	2019/06/15 02:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	13.5984	135.9838	101.26	104.50	3.24	49.97	10:27
2	TOC	13.5897	135.8969	101.21	104.44	3.23	49.98	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
11	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 02:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.99	10.12	3.13	49.99	10:30
2	TOC	0.0000	0.0000	6.59	9.86	3.27	50.00	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
12	TOC	K1905198-006.01	3.8954 ppm	0.0873 ppm	2.2400%	2019/06/15 03:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.9572	39.5717	35.82	39.04	3.22	50.00	10:29
2	TOC	3.8337	38.3371	34.98	38.07	3.09	50.02	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
13	TOC	K1905114-006.01 10x	5.8506 ppm	0.6208 ppm	10.6100%	2019/06/15 03:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.4117	54.1166	45.69	49.02	3.32	50.01	10:31
2	TOC	6.2895	62.8954	51.65	54.78	3.12	50.01	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
14	TOC	K1905440-001.01	21.1750 ppm	0.2447 ppm	1.1600%	2019/06/15 04:03

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.3480	213.4801	153.87	157.12	3.25	50.03	10:28
2	TOC	21.0020	210.0196	151.52	154.86	3.34	50.02	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	15	TOC	K1905440-002.01	21.3795 ppm	0.1875 ppm	0.8800%	2019/06/15 04:31

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	21.5121	215.1212	154.98	158.24	3.25	50.02	10:26
2	TOC	21.2469	212.4695	153.18	156.37	3.19	50.02	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	16	TOC	K1905440-003.01	20.7799 ppm	0.2170 ppm	1.0400%	2019/06/15 04:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	20.6264	206.2644	148.97	152.17	3.19	50.04	10:26
2	TOC	20.9333	209.3330	151.05	154.23	3.17	50.04	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	17	TOC	K1905440-004.01	20.8222 ppm	0.0383 ppm	0.1800%	2019/06/15 05:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	20.8493	208.4933	150.48	153.72	3.23	50.03	10:28
2	TOC	20.7951	207.9512	150.12	153.41	3.29	50.04	10:23

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	18	TOC	K1905478-001.01	28.2206 ppm	0.2330 ppm	0.8300%	2019/06/15 05:55

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	28.0558	280.5579	199.40	202.57	3.17	50.01	10:27
2	TOC	28.3853	283.8534	201.64	204.78	3.14	50.03	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	19	TOC	K1905478-002.01	9.5845 ppm	0.3350 ppm	3.5000%	2019/06/15 06:23

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.8214	98.2139	75.63	78.90	3.28	50.03	10:31
2	TOC	9.3476	93.4761	72.41	75.52	3.11	50.02	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.4635 ppm (PASS)	0.0000 ppm	0%	2019/06/15 06:51

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.4635	254.6347	182.31	185.62	3.32	50.02	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/15 07:06

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.42	11.67	3.25	50.01	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 07:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.06	10.22	3.16	50.01	10:36

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC)	CAS_salt_010711	CAS_salt_010711

(v1266)	(v4)	(v30)

Sample Type: Check Standard --> LCS — From Schedule Version 3

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	25.4355 ppm (PASS)	0.0000 ppm	0%	2019/06/15 07:35

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.4355	254.3548	182.12	185.25	3.13	50.02	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 3

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	21	TOC	K1905478-003.01	18.6377 ppm	0.0947 ppm	0.5100%	2019/06/15 07:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	18.5707	185.7073	135.02	138.21	3.19	50.04	10:30
2	TOC	18.7046	187.0465	135.93	139.24	3.32	50.00	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	22	TOC	K1905478-004.01	9.8603 ppm	0.0060 ppm	0.0600%	2019/06/15 08:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	9.8646	98.6456	75.92	79.15	3.23	50.00	10:27
2	TOC	9.8560	98.5601	75.86	79.06	3.19	49.99	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	23	TOC	K1905478-004.01 ms 2x	29.9530 ppm	0.0000 ppm	0.0000%	2019/06/15 08:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	29.9530	299.5298	212.28	215.36	3.08	50.01	10:31

Dilution	Blank Contribution	Method	Calibration

1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	24	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 09:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.77	11.03	3.26	49.99	10:28
2	TOC	0.0000	0.0000	6.82	10.06	3.24	49.98	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Sample — From Schedule Version 4

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	25	TOC	K1905478-005.01	7.9322 ppm	0.0540 ppm	0.6800%	2019/06/15 09:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	7.8940	78.9400	62.54	65.71	3.16	49.95	10:31
2	TOC	7.9703	79.7032	63.06	66.27	3.21	49.94	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Sample — From Schedule Version 5

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	26	TOC	K1905478-006.01	0.6339 ppm	0.0554 ppm	8.7400%	2019/06/15 10:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6731	6.7311	13.53	16.69	3.16	49.87	10:27
2	TOC	0.5947	5.9474	13.00	16.22	3.22	49.86	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Sample — From Schedule Version 6

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	27	TOC	K1905478-007.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 10:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time

1	TOC	0.0000	0.0000	7.39	10.50	3.11	49.81	10:29
2	TOC	0.0000	0.0000	7.27	10.48	3.21	49.79	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Sample — From Schedule Version 7

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	28	TOC	K1905451-001.01 100x	6.4615 ppm	0.0007 ppm	0.0100%	2019/06/15 11:35

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.4621	64.6205	52.82	55.88	3.05	49.78	10:28
2	TOC	6.4610	64.6102	52.82	55.95	3.14	49.76	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.9627 ppm (PASS)	0.0000 ppm	0%	2019/06/15 12:03

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.9627	249.6273	178.91	182.18	3.27	49.76	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 7

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/15 12:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.39	10.62	3.23	49.80	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 7

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
29	TOC	K1905451-002.01 100x	5.8663 ppm	0.0508 ppm	0.8700%	2019/06/15 12:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.8303	58.3034	48.54	51.75	3.21	49.80	10:30
2	TOC	5.9022	59.0224	49.02	52.16	3.13	49.81	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
30	TOC	K1905589-001.01	3.6891 ppm	0.0736 ppm	2.0000%	2019/06/15 13:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.7412	37.4120	34.35	37.49	3.13	49.77	10:27
2	TOC	3.6370	36.3704	33.65	36.75	3.10	49.81	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
31	TOC	K1905589-003.01	2.5847 ppm	0.0019 ppm	0.0700%	2019/06/15 13:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.5861	25.8606	26.51	29.58	3.06	49.93	10:26
2	TOC	2.5834	25.8341	26.50	29.65	3.15	49.88	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
32	TOC	K1905420-001.02 100x	0.3825 ppm	0.0059 ppm	1.5500%	2019/06/15 13:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3783	3.7832	11.53	14.74	3.21	49.85	10:31
2	TOC	0.3867	3.8672	11.58	14.76	3.18	49.89	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
33	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 14:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.91	9.10	3.19	50.00	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	34	TOC	K1905449-001.02	1.5038 ppm	0.0496 ppm	3.3000%	2019/06/15 14:40

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5389	15.3891	19.41	22.54	3.14	49.92	10:26
2	TOC	1.4688	14.6879	18.93	22.03	3.10	49.91	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	35	TOC	K1905449-002.02	0.5435 ppm	0.0205 ppm	3.7800%	2019/06/15 15:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5581	5.5805	12.75	15.85	3.10	49.96	10:28
2	TOC	0.5290	5.2903	12.55	15.63	3.08	49.95	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	36	TOC	K1905477-001.02	1.7378 ppm	0.0227 ppm	1.3100%	2019/06/15 15:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.7217	17.2173	20.65	23.75	3.10	49.91	10:25
2	TOC	1.7538	17.5385	20.86	23.98	3.11	50.02	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	37	TOC	K1905477-002.02	19.8189 ppm	0.1743 ppm	0.8800%	2019/06/15 16:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	19.9421	199.4213	144.33	147.57	3.25	49.94	10:29
2	TOC	19.6957	196.9567	142.65	145.86	3.21	50.03	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	38	TOC	K1905477-003.02	2.6200 ppm	0.0911 ppm	3.4800%	2019/06/15 16:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.6845	26.8447	27.18	30.31	3.13	49.99	10:30
2	TOC	2.5556	25.5557	26.31	29.38	3.08	50.03	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.8939 ppm (PASS)	0.0000 ppm	0%	2019/06/15 17:01

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.8939	248.9393	178.44	181.45	3.01	50.04	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/15 17:15

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.72	9.73	3.01	50.03	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	39	TOC	MB3	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 17:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.76	8.85	3.09	50.09	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	25.1136 ppm (PASS)	0.0000 ppm	0%	2019/06/15 17:45

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.1136	251.1358	179.93	183.18	3.24	50.06	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	40	TOC	K1905477-004.02	1.1786 ppm	0.0741 ppm	6.2800%	2019/06/15 17:59

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2310	12.3101	17.32	20.63	3.31	49.99	10:27
2	TOC	1.1263	11.2627	16.60	19.84	3.24	50.03	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	41	TOC	K1905482-001.02	0.4338 ppm	0.0422 ppm	9.7300%	2019/06/15 18:27

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.4040	4.0396	11.70	15.00	3.30	50.06	10:28
2	TOC	0.4636	4.6362	12.11	15.22	3.11	49.96	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	42	TOC	K1905482-002.02	1.5290 ppm	0.0106 ppm	0.6900%	2019/06/15 18:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5366	15.3655	19.39	22.43	3.04	49.99	10:27
2	TOC	1.5215	15.2153	19.29	22.48	3.19	50.05	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	43	TOC	K1905482-003.02	0.6257 ppm	0.0085 ppm	1.3700%	2019/06/15 19:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6196	6.1963	13.17	16.27	3.10	49.95	10:29
2	TOC	0.6317	6.3171	13.25	16.32	3.07	50.04	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	44	TOC	K1905482-004.02	0.8441 ppm	0.0368 ppm	4.3600%	2019/06/15 19:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.8701	8.7008	14.87	17.98	3.11	49.92	10:25
2	TOC	0.8181	8.1807	14.51	17.78	3.27	49.86	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	45	TOC	K1905482-005.02	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 20:20

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.83	9.01	3.18	49.83	10:31
2	TOC	0.0000	0.0000	6.27	9.49	3.21	49.80	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	46	TOC	K1905409-001.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 20:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.61	8.78	3.17	49.79	10:29
2	TOC	0.0000	0.0000	5.86	8.91	3.05	49.77	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC)	CAS_salt_010711	CAS_salt_010711

(v1266) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	47	TOC	K1905409-002.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/15 21:16

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.33	8.57	3.25	49.78	10:30
2	TOC	0.0000	0.0000	5.75	9.02	3.27	49.77	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.4988 ppm (PASS)	0.0000 ppm	0%	2019/06/15 21:44

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.4988	244.9882	175.76	178.90	3.14	49.76	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/15 21:59

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.20	9.37	3.17	49.80	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	48	TOC	K1905558-001.14	1.4472 ppm	0.0497 ppm	3.4300%	2019/06/15 22:14

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Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4823	14.8234	19.02	22.22	3.20	49.82	10:28
2	TOC	1.4121	14.1207	18.54	21.65	3.11	49.81	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	49	TOC	K1905558-002.14	1.6252 ppm	0.0243 ppm	1.4900%	2019/06/15 22:42

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.6423	16.4233	20.11	23.32	3.21	49.84	10:29
2	TOC	1.6080	16.0800	19.88	23.13	3.26	49.85	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	50	TOC	K1905558-003.14	1.0669 ppm	0.0083 ppm	0.7800%	2019/06/15 23:10

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.0728	10.7279	16.24	19.41	3.17	49.88	10:27
2	TOC	1.0610	10.6100	16.16	19.31	3.15	49.89	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	51	TOC	K1905558-004.14	1.5654 ppm	0.0322 ppm	2.0600%	2019/06/15 23:38

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5881	15.8811	19.74	22.67	2.93	49.90	10:30
2	TOC	1.5426	15.4259	19.43	22.58	3.15	49.90	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	52	TOC	K1905558-005.14	1.5050 ppm	0.0296 ppm	1.9700%	2019/06/16 00:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.5259	15.2595	19.32	22.36	3.05	49.93	10:29
2	TOC	1.4841	14.8411	19.03	22.23	3.20	49.94	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC)	CAS_salt_010711	CAS_salt_010711

(v1266) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	53	TOC	K1905586-001.01	0.6793 ppm	0.0192 ppm	2.8200%	2019/06/16 00:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6929	6.9285	13.66	16.86	3.20	49.93	10:30
2	TOC	0.6657	6.6574	13.48	16.66	3.18	49.89	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	54	TOC	K1905586-002.01	0.1747 ppm	0.0205 ppm	11.7500%	2019/06/16 01:02

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1892	1.8916	10.24	13.54	3.30	49.89	10:28
2	TOC	0.1601	1.6014	10.05	13.18	3.13	49.89	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	55	TOC	K1905597-001.01	0.5515 ppm	0.0789 ppm	14.3000%	2019/06/16 01:30

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6073	6.0726	13.08	16.24	3.16	49.89	10:28
2	TOC	0.4957	4.9574	12.32	15.62	3.29	49.89	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	56	TOC	K1905597-002.01 4x	2.7926 ppm	0.0017 ppm	0.0600%	2019/06/16 01:58

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.7938	27.9378	27.92	31.16	3.24	49.92	10:28
2	TOC	2.7914	27.9142	27.91	31.03	3.12	49.92	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	57	TOC	K1905597-003.01 4x	2.7136 ppm	0.0144 ppm	0.5300%	2019/06/16 02:27

Rep	Base	ppm	µg	Adjusted	NDIR (Abs)	Baseline	Pressure	Run

#	Analysis Type			(Abs)			(Abs)	(psig)	Time
1	TOC	2.7238	27.2380	27.45	30.52	3.08	49.91	10:29
2	TOC	2.7035	27.0347	27.31	30.44	3.13	49.91	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.5184 ppm (PASS)	0.0000 ppm	0%	2019/06/16 02:55

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5184	245.1841	175.89	178.91	3.01	49.91	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/16 03:09

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.87	9.03	3.16	49.90	10:32

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	58	TOC	MB4	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/16 03:24

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.10	8.27	3.17	49.91	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS

From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◉	C	TOC	25.0000	1:1	[TOC] LCS [25.0 ppm]	0 / infinity (NA / NA)	25.1000 ppm (PASS)	0.0000 ppm	0%	2019/06/16 03:39

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	25.1000	251.0003	179.84	182.99	3.15	49.93	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample

From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	59	TOC	K1905597-004.01	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/16 03:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.74	11.82	3.08	49.93	10:32
2	TOC	0.0000	0.0000	7.73	10.91	3.18	49.95	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	60	TOC	K1905597-005.01	0.3127 ppm	0.0170 ppm	5.4300%	2019/06/16 04:22

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3247	3.2470	11.16	14.33	3.17	49.96	10:27
2	TOC	0.3007	3.0068	11.00	14.19	3.18	49.96	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	61	TOC	K1905597-006.01	2.3569 ppm	0.0176 ppm	0.7500%	2019/06/16 04:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.3445	23.4446	24.87	27.92	3.05	49.98	10:25
2	TOC	2.3694	23.6935	25.04	28.05	3.01	49.98	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

00939731

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	62	TOC	K1905597-006.01 ms 2x	26.7837 ppm	0.0000 ppm	0.0000%	2019/06/16 05:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.7837	267.8368	190.77	193.77	3.00	49.99	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	63	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/16 05:32

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.96	9.15	3.19	49.99	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	64	TOC	K1905597-007.01	1.4228 ppm	0.0156 ppm	1.1000%	2019/06/16 05:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.4339	14.3387	18.69	21.73	3.04	50.01	10:29
2	TOC	1.4118	14.1177	18.54	21.56	3.02	50.02	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	65	TOC	K1905259-001.02	2.2329 ppm	0.0275 ppm	1.2300%	2019/06/16 06:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2135	22.1349	23.99	27.17	3.18	50.02	10:28
2	TOC	2.2524	22.5238	24.25	27.32	3.08	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	66	TOC	K1905589-002.02 doc	3.1258 ppm	0.0034 ppm	0.1100%	2019/06/16 06:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1233	31.2334	30.16	33.36	3.20	50.06	10:28
2	TOC	3.1282	31.2820	30.19	33.30	3.10	50.06	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.1171 ppm (PASS)	0.0000 ppm	0%	2019/06/16 07:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1171	241.1711	173.17	176.46	3.30	50.07	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/16 07:26

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.56	8.74	3.18	50.07	10:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 8

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	67	TOC	K1905589-004.02 doc	2.2983 ppm	0.0068 ppm	0.2900%	2019/06/16 07:41

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.2935	22.9348	24.53	27.49	2.96	50.06	10:30
2	TOC	2.3031	23.0306	24.59	27.60	3.01	50.06	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time

68	TOC	K1905625-001.03 doc	1.2530 ppm	0.0450 ppm	3.5900%	2019/06/16 08:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2211	12.2114	17.25	20.44	3.19	50.03	10:26
2	TOC	1.2848	12.8478	17.68	20.58	2.90	50.04	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
	69	TOC	K1905625-001.03 ms doc	26.8649 ppm	0.0000 ppm	0.0000%	2019/06/16 08:37

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	26.8649	268.6485	191.32	194.50	3.18	50.03	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
	70	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/16 08:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.07	9.21	3.14	50.02	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
	71	TOC	K1905625-002.03 doc	1.2105 ppm	0.0045 ppm	0.3700%	2019/06/16 09:06

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.2136	12.1363	17.20	20.50	3.30	50.02	10:32
2	TOC	1.2073	12.0729	17.16	20.43	3.28	50.00	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
	72	TOC	FB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/16 09:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.63	8.73	3.10	50.00	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	73	TOC	K1905595-001.03 doc	0.5729 ppm	0.0076 ppm	1.3300%	2019/06/16 09:49

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5675	5.6748	12.81	15.96	3.15	49.99	10:30
2	TOC	0.5782	5.7824	12.89	16.02	3.14	50.02	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	74	TOC	K1905595-002.03 100x doc	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/16 10:17

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.91	10.07	3.16	49.97	10:28
2	TOC	0.0000	0.0000	6.95	10.10	3.15	49.95	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	75	TOC	K1905198-006.01 ms	25.5611 ppm	0.0000 ppm	0.0000%	2019/06/16 10:45

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.5611	255.6107	182.47	185.58	3.12	49.91	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.9600 (IC) (v1266)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 8

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◉	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	25.1105 ppm (PASS)	0.0000 ppm	0%	2019/06/16 11:00

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	25.1105	251.1049	179.91	183.10	3.19	49.89	10:30

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 8

00939735

Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/16 11:14

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.98	9.18	3.20	49.85	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1265	1.1340	1.2260	0.0000	0.0000	0.0000	2019/06/10 14:28	Fusion1 (Fusion1)
v1266	2.2187	1.4940	0.0000	0.0000	0.0000	2019/06/14 17:57	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version:	v30	Calibration curve formula:	TOC: y = 6.788x + 9.463
Ver Creation:	2019/03/05 17:42	r^2 value:	TOC: r^2 = 0.99963
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

00939736

Name: CAS_salt_010711 (TOC)

Version: v4 Operator: Fusion1 (Fusion1)
Ver Creation: 2019/02/21 17:57
Comment:

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1
SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date

00939737

1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/06/16 11:32

StarLIMS Run: 639522, 639523, 639524, 639525

Analysis: TOC/DOC

Method: 415.1, SM 5310 C, 9060, 9060A

CCV: 11-GEN-05-77K 50 ppm LCS: 11-GEN-05-77D 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml – 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-78I

21 % H3PO4: 11-GEN-05-78H

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: FE1165 6/15/19

Analyzed By:	BCD / HLM	Date Analyzed:	6/16/19
Reviewed By:	[signature]	Date Reviewed:	06/18/19

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1915802, 1915803, 1915852, 1916229; 1916231; 1916232

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2261 (241120)

General Set Information: There were six field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 657797) was less than 1/2 the CRDL. The recovery for the LCS (657798) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Thomas Bosch June 12, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: June 13, 2019

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Workorder: **34-1916232**
Project ID: HS19060172
Purchase Order: HS19060172
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_060419_BIX	1916232001	06/04/19	06/06/19	

ANALYTICAL REPORT

Workorder: 34-1916232
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP650_060419_BIX**	Sampling Site: NA	Collected: 06/04/2019
Lab ID: 1916232001	Media: 125 mL Nalgene	Received: 06/06/2019
Matrix: Water	Sampling Parameter: NA	

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:** LCMS04
	Batch: ELMS/2261 (HBN: 241120)	**Percent Solid:** NA
	Analyzed: 06/11/2019 11:19	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 06/12/2019 12:46	/S/ Stephen Brose 06/13/2019 10:59

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1916232
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1916232

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2261 (HBN: 241120)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 657797
Analyzed: 06/11/2019 09:31
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 657798
Analyzed: 06/11/2019 09:04
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.34	4.00	109	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1915802001	**MS:**	657799
Analyzed:	06/11/2019 09:45	**Analyzed:**	06/11/2019 09:58
Dilution:	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L

	MSD:	657800
	Analyzed:	06/11/2019 10:12
	Dilution:	1
	Units:	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.57	4	114	78.8	123.8	4.78	120	4.65	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 06/12/2019 12:47	/S/ Stephen Brose 06/13/2019 10:59

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

1916232

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

18698/#2
1916232

SAMPLING STATE: **Dept of Defense** **COC ID:** **11520**

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123 **Phone:** +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19060172
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060172-02**	**LH18/24-SP650_060419_BIX**	**Water**	**04 Jun 2019 14:00**
	SUB_Perch-6850			19 Jun 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 6/5/19 1800

Received By: _____ Date/Time: 6-6-19 0955

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19060172	***Split:***	**Workorder ID:** 1916232	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Requested Analysis

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	COOL	EPA 6850, DoD QSM
1	06/04/2019 14:00	LH18/24-SP650_060419_BIX	1916232001		Water	A	1		A
2									
3									
4									
5									
6									
7									
8									
9									
10									

135 of 209

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Cootes, Gaileen	06/06/2019 09:55	ALS Sample Receiving	Sample Login
	6.6.19 1425	3B	STORAGE
R.33.1	6-11-19/08:00	T Bazal	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ **Lab Notebook No.:** _____

Prepared / Analyzed by: _____ **Date / Time:** _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00939746

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS HOUSTON

Project/Task/Site: _____

Date/Time of Receipt: 6-6-19 0955

Number of Coolers Received: (1)

Condition of Coolers:	(Acceptable)/Unacceptable	Temperature Control:	(Present)/Not Included
Cooler Custody Seals:	(Present)/Absent/NA		
	(Intact)/Broken/NA	Location Temp Taken:	(Control)/Between Samples
Container Custody Seals:	Present/(Absent)/NA		
	Intact/Broken/(NA)	Are all temperatures within project specific guidelines?	(Yes)/No/NA
Ice Present:	(Yes)/No/NA		
	(Frozen)/Melted/NA	VOA Headspace Present?	Yes/No/(NA)

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9676	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: _____ (Signature) GAYLEEN COATES (Printed Name) 6-6-19 (Date)

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018

Must Deliver Next Business Day
Time and Tempature Sensitive!

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 05JUN19
ACTWGT: 10.85 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS1906016B/172/174 - RJ

FedEx Express

TRK# 0201 **4609 7834 7670**

THU - 06 JUN 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US **SLC**

Batch Worklist

Batch: ELMS/ 2261 **Created:** 6/11/2019 07:45 **Instrument:** **HBN:** 241120

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1915802 [ENV_LVL4]
Workorder: 1915803 [ENV_LVL4]
Workorder: 1915852 [ENV_LVL4]
Workorder: 1916229 [ENV_LVL4]
Workorder: 1916231 [ENV_LVL4]
Workorder: 1916232 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	657794	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	
2	657795	RLVS for HBN 241120 [ELMS/2261				RLVS	3		E685041C3Q	5311		6/13/2019	
3	657796	ICS for HBN 241120 [ELMS/2261]				ICS	3		E6850..D3Q	5311		6/13/2019	
4	657797	LMB for HBN 241120 [ELMS/2261]				LMB	3		E6850Q413Q	5311		6/13/2019	
5	657798	LCS for HBN 241120 [ELMS/2261]				LCS	3		E6850Q413Q	5311		6/13/2019	
6	1915802001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915802001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
7	657799	LH18/24-SP650...(1915802001MS)				MS	3		E6850Q413Q	5311		6/13/2019	
8	657800	LH18/24-SP65...(1915802001MSD)				MSD	3		E6850Q413Q	5311		6/13/2019	
9	1915803001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915803001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
10	1915852001	LH18/24-SP140_052919				SAMPLE	3	1915852001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
11	1916229001	LH18/24-SP140_060419				SAMPLE	3	1916229001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
12	1916231001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916231001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
13	1916232001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916232001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
14	657801	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	

00039749

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1915802 (001), 1915803 (001), 1915852 (001), 1916229 (001); 1916231 (001); 1916232 (001) ELMS Batch/HBN ID: 2261 (241120)
Prep Date: 06/11/2019 Analysis Date: 06/11/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\11JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 657798; Target = 4.0µg/L. ASTM type II water was used for LMB 657797.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\241120-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2261 HBN: 241120 1915802/1915803/1915852 Sample Set IDs if Applicable: 1916229/1916231/1916232	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		**Description - ASTM Type II Water**
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SOFF-012A	Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED
ANAB ACCREDITED

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: *T. J. Eckersley*

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

00939768

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	657794 CCV@25	Vial 71	1	Control	1	1.90258e6	8.986	26.94929
*	657798 QC@4.0	Vial 72	1	Control	2	3.85542e5	8.884	4.34115
*	657796 ICS@4.0	Vial 73	1	Control	3	2.32261e5	8.623	3.98229
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	1.46622e5	8.522	4.56740
*	657800 158021D	Vial 77	1	Sample	7	1.54646e5	8.528	4.78474
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	3.32187e5	9.077	4885.02369
*	1916229001 1K	Vial 80	1	Sample	10	4.13979e5	9.091	6820.05588
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.42334e6	9.028	25.98075

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	657794 CCV@25	Vial 71	1	Control	1	5.56917e5	9.003	26.60911
*	657798 QC@4.0	Vial 72	1	Control	2	1.22598e5	8.893	4.50107
*	657796 ICS@4.0	Vial 73	1	Control	3	7.62920e4	8.637	4.24932
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	5.01097e4	8.545	5.09575
*	657800 158021D	Vial 77	1	Sample	7	5.24358e4	8.548	5.30516
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	1.07205e5	9.093	5161.49233
*	1916229001 1K	Vial 80	1	Sample	10	1.30297e5	9.110	7096.69575
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	4.26237e5	9.042	26.20612

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	657794 CCV@25	Vial 71	1	Control	1	2.13798e5	9.004	5.00000
*	657798 QC@4.0	Vial 72	1	Control	2	2.91481e5	8.904	5.00000
*	657796 ICS@4.0	Vial 73	1	Control	3	1.92225e5	8.645	5.00000
*	657797 LMB	Vial 74	1	Control	4	3.01884e5	9.082	5.00000
*	1915802001	Vial 75	1	Sample	5	1.12941e5	8.589	5.00000
*	657799 158021S	Vial 76	1	Sample	6	1.05110e5	8.545	5.00000
*	657800 158021D	Vial 77	1	Sample	7	1.05604e5	8.552	5.00000
*	1915803001	Vial 78	1	Sample	8	1.14182e5	8.546	5.00000
*	1915852001 1K	Vial 79	1	Sample	9	2.21981e5	9.097	5000.00000
*	1916229001 1K	Vial 80	1	Sample	10	1.95450e5	9.116	5000.00000
*	1916231001	Vial 81	1	Sample	11	1.33828e5	8.518	5.00000
*	1916232001	Vial 82	1	Sample	12	1.27034e5	8.502	5.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.66287e5	9.054	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

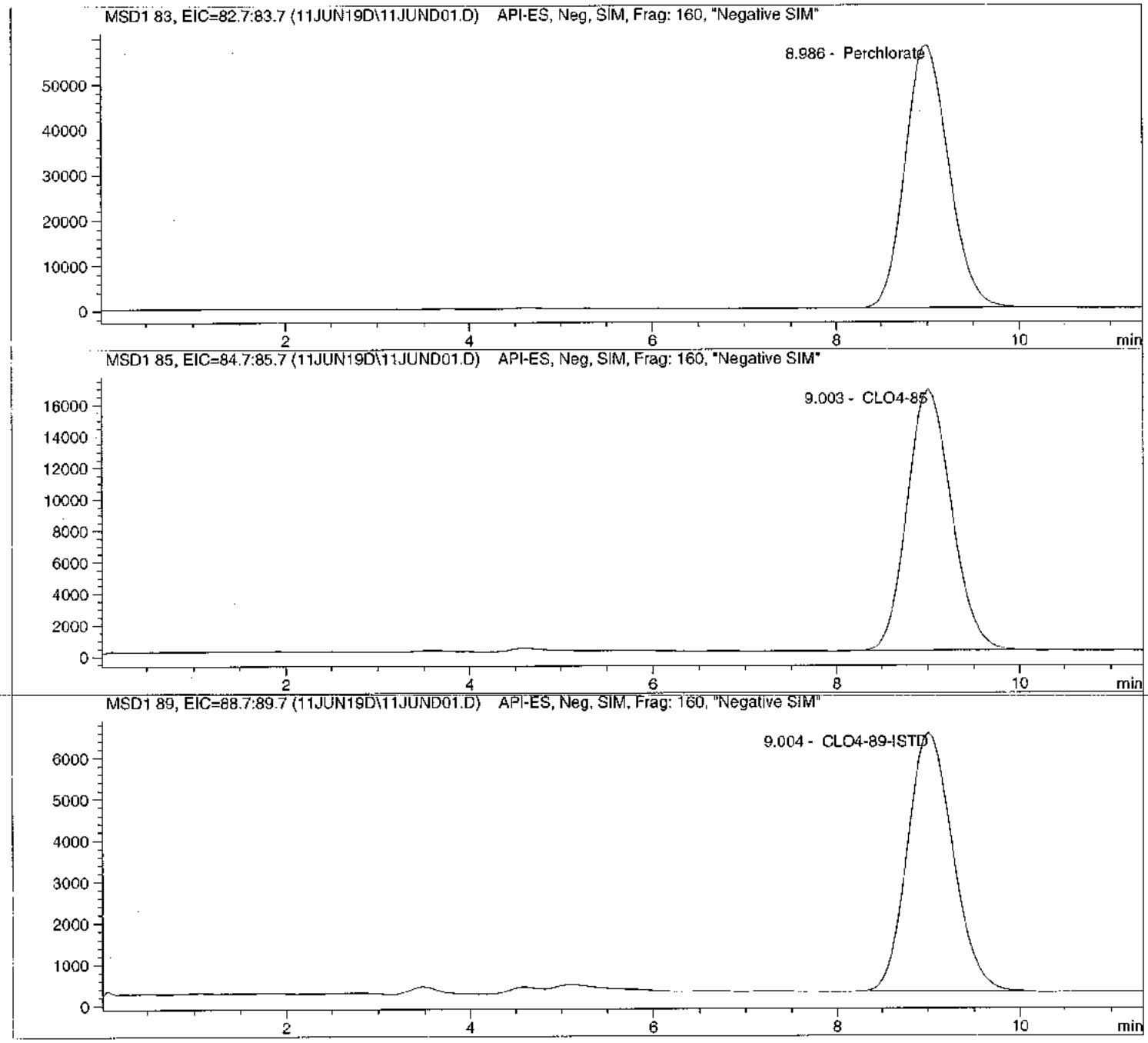
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	657794 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	657798 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	657796 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	657797 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1915802001	CLO4-AQN	1	Sample		
6	Vial 76	657799 158021S	CLO4-AQN	1	Sample		
7	Vial 77	657800 158021D	CLO4-AQN	1	Sample		
8	Vial 78	1915803001	CLO4-AQN	1	Sample		
9	Vial 79	1915852001 1K	CLO4-AQN	1	Sample		
10	Vial 80	1916229001 1K	CLO4-AQN	1	Sample		
11	Vial 81	1916231001	CLO4-AQN	1	Sample		
12	Vial 82	1916232001	CLO4-AQN	1	Sample		
13	Vial 71	657801 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.986	PBA	1902575.4	26.9493	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.003	PBA	556916.8	26.6091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.004	PBA	213798.0	5.0000	CLO4-89-ISTD

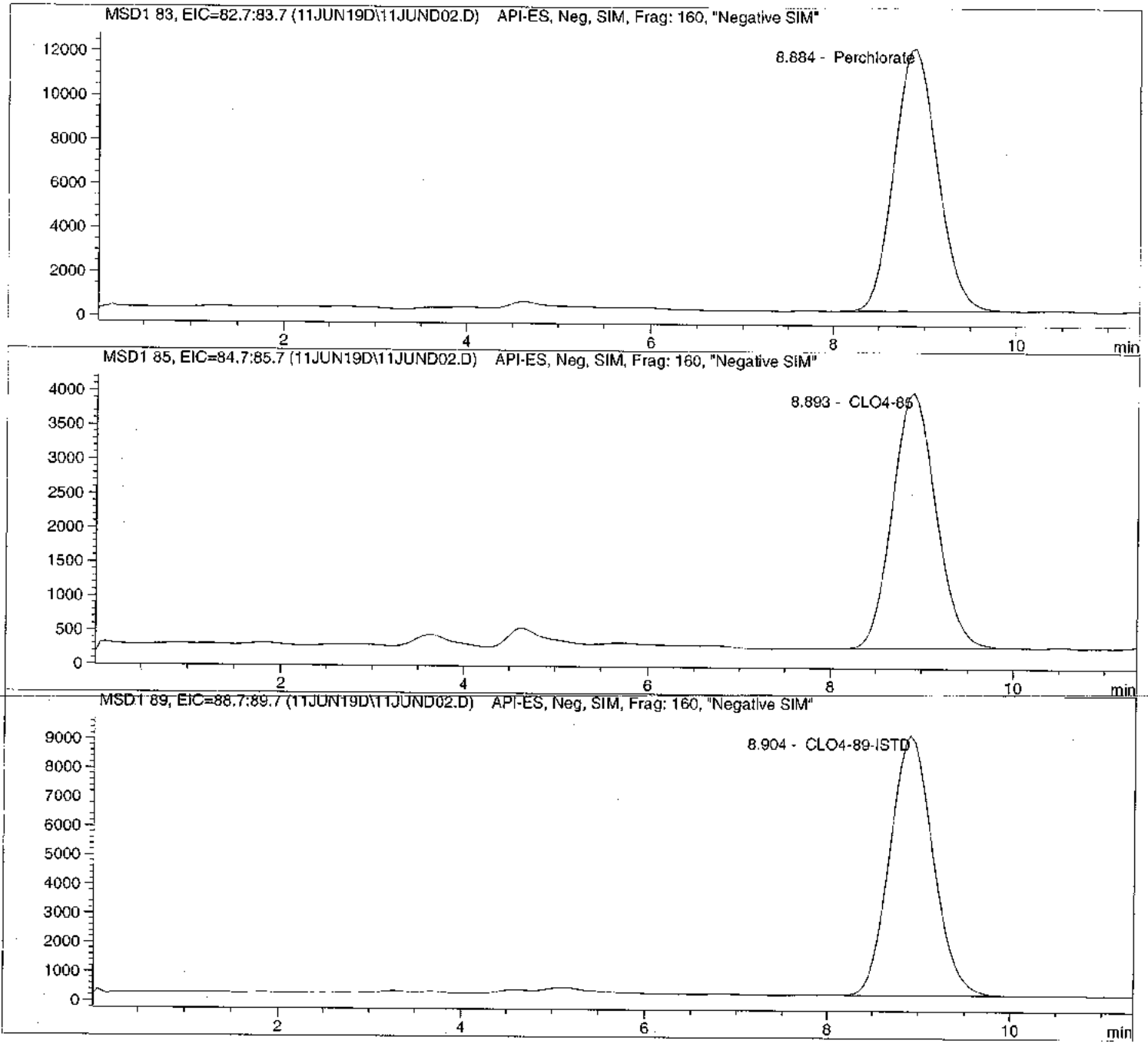
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.884	PBA	385541.7	4.3412	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.893	BBA	122598.4	4.5011	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.904	BBA	291480.6	5.0000	CLO4-89-ISTD

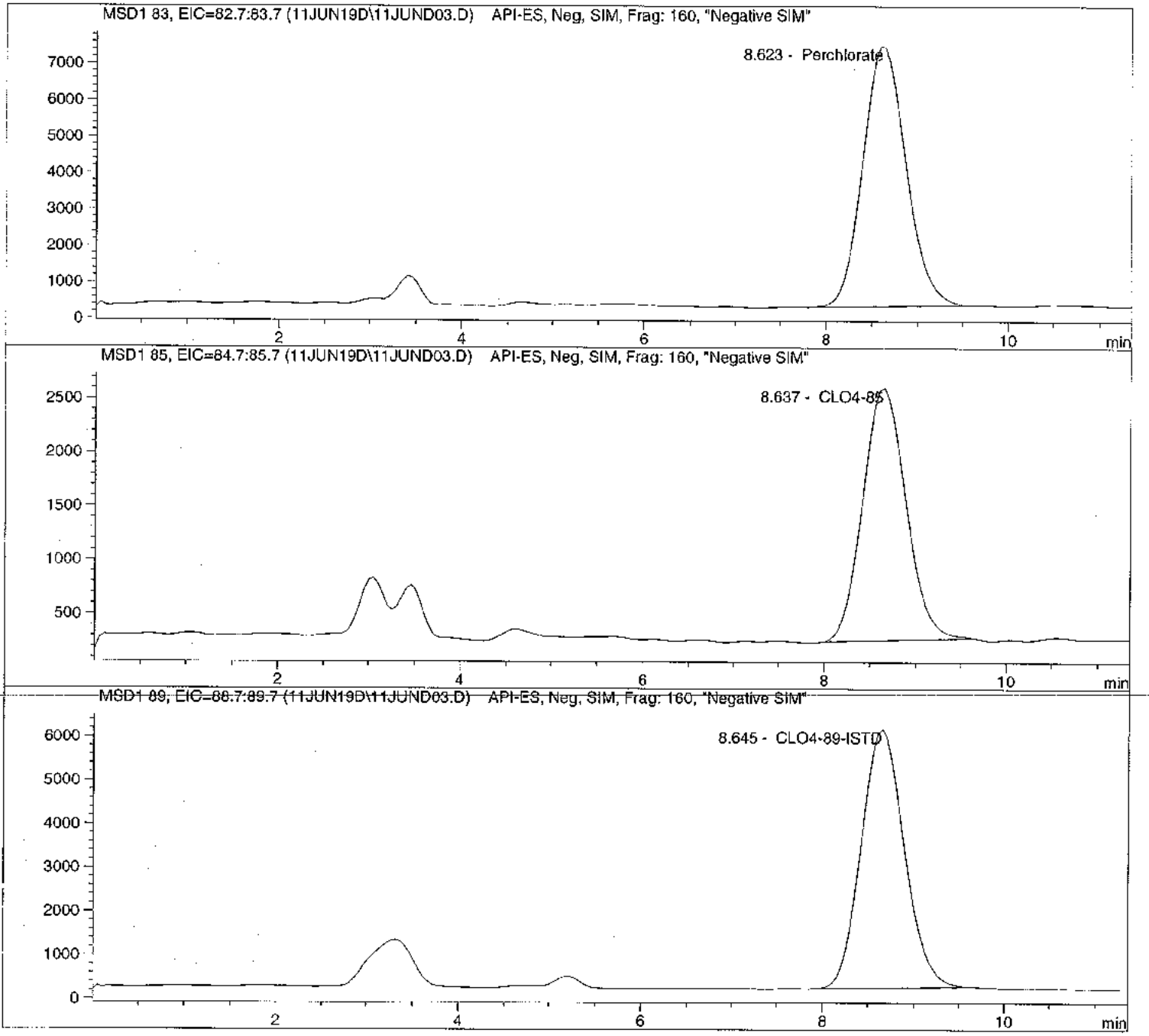
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.623	PBA	232261.2	3.9823	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.637	PBA	76292.0	4.2493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.645	PBA	192224.9	5.0000	CLO4-89-ISTD

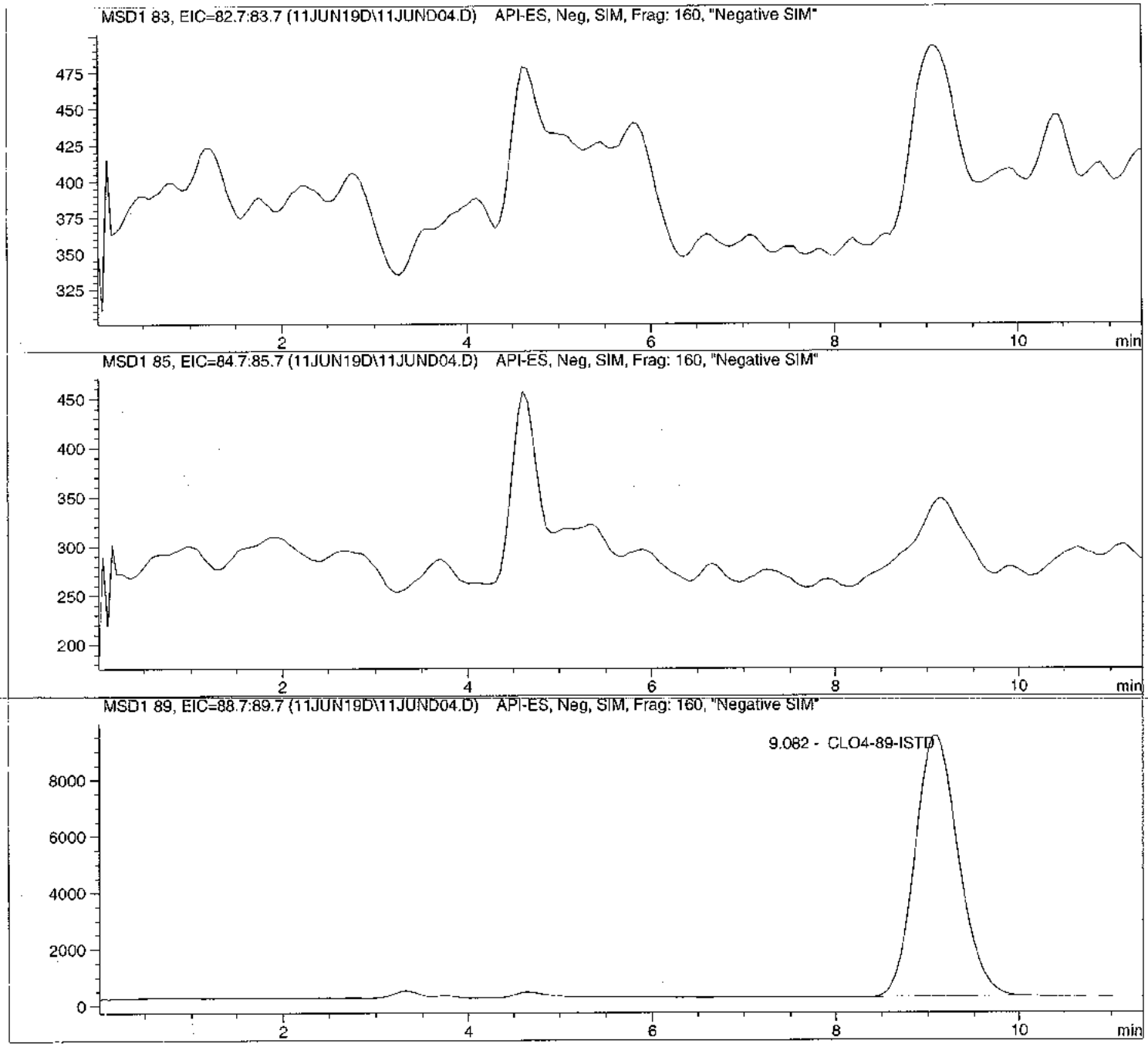
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.082	PBA	301883.5	5.0000	CLO4-89-ISTD

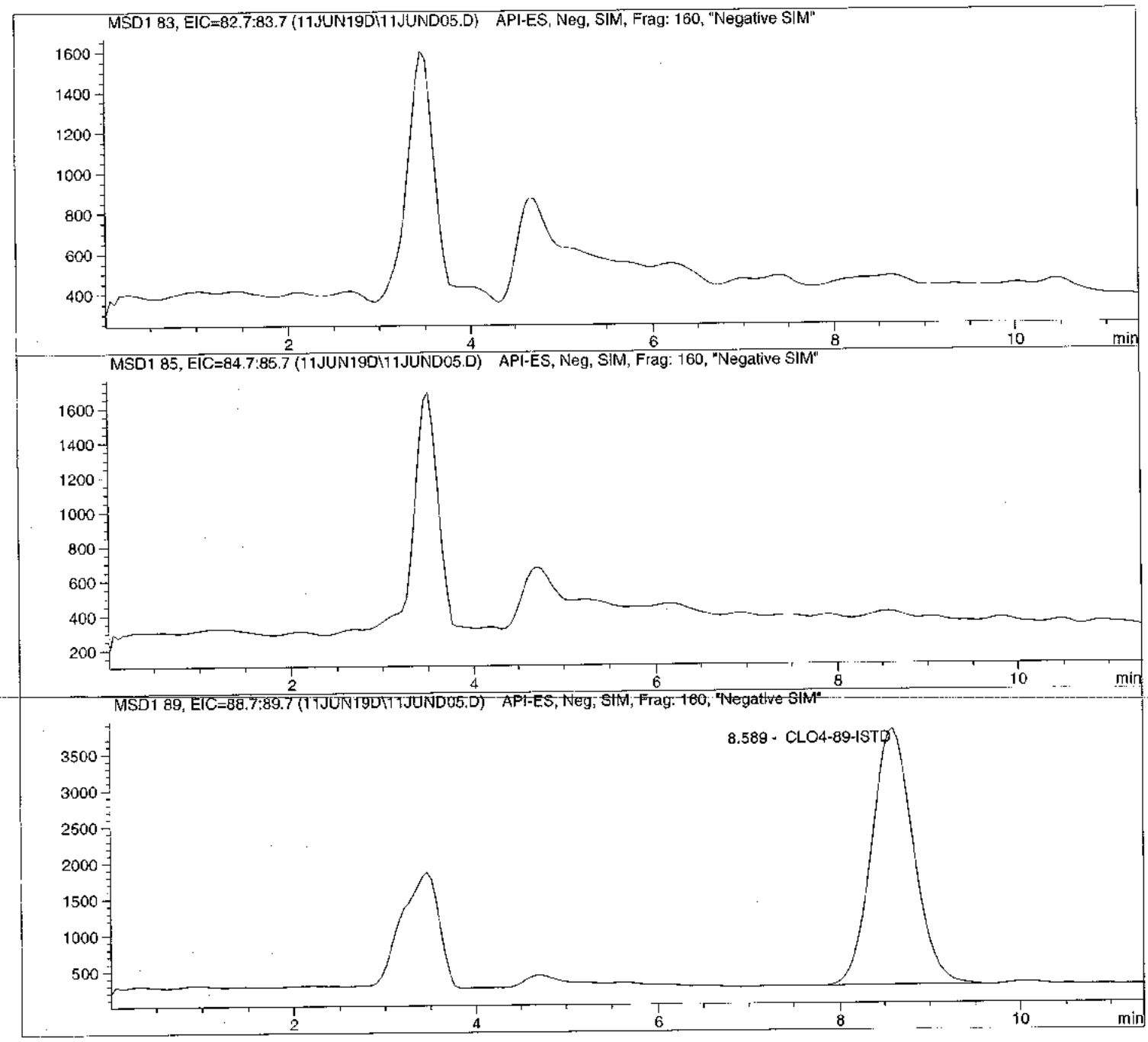
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.589	PBA	112941.5	5.0000	CLO4-89-ISTD

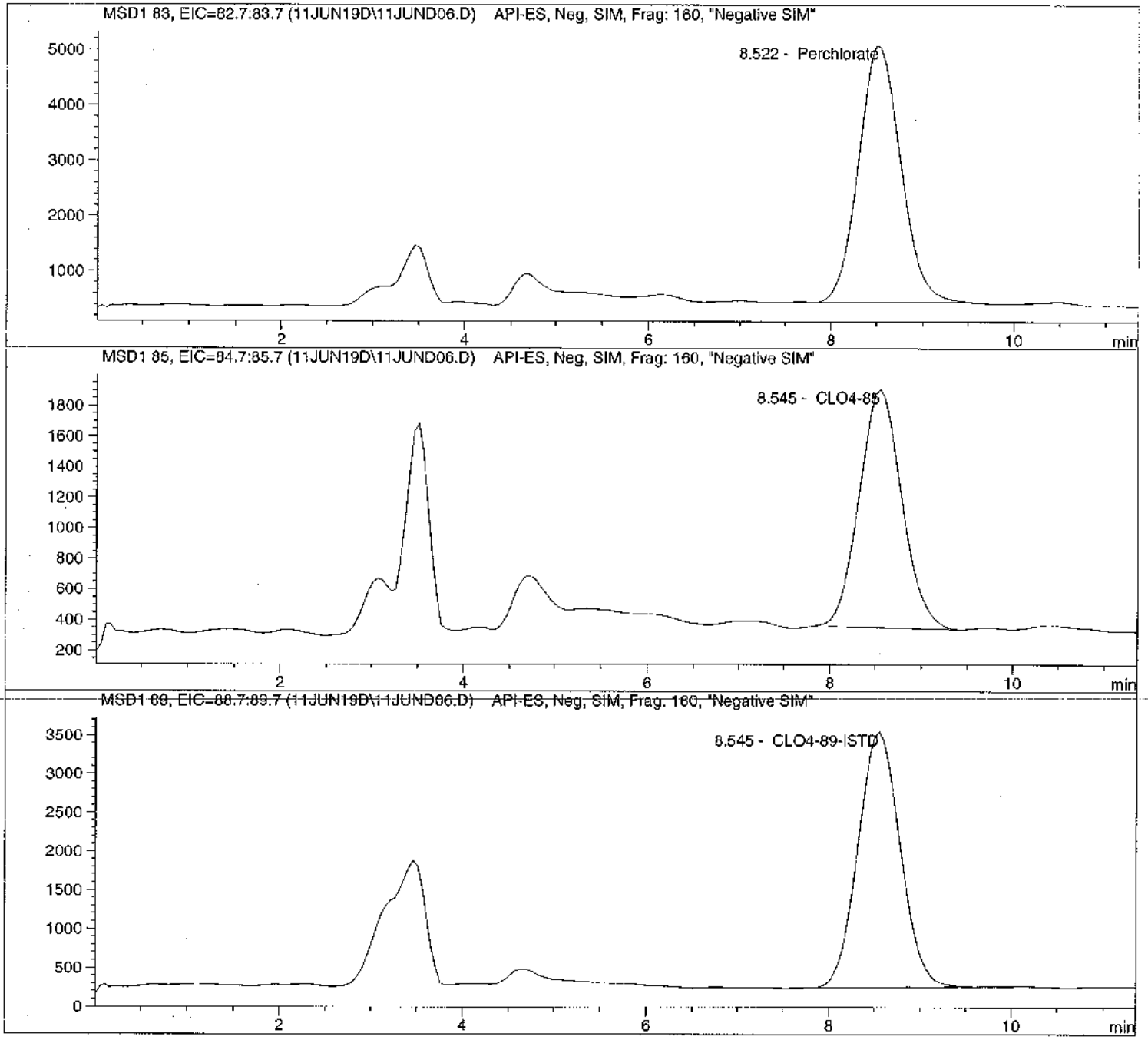
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.522	BBA	146622.1	4.5674	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	50109.7	5.0958	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	105110.4	5.0000	CLO4-89-ISTD

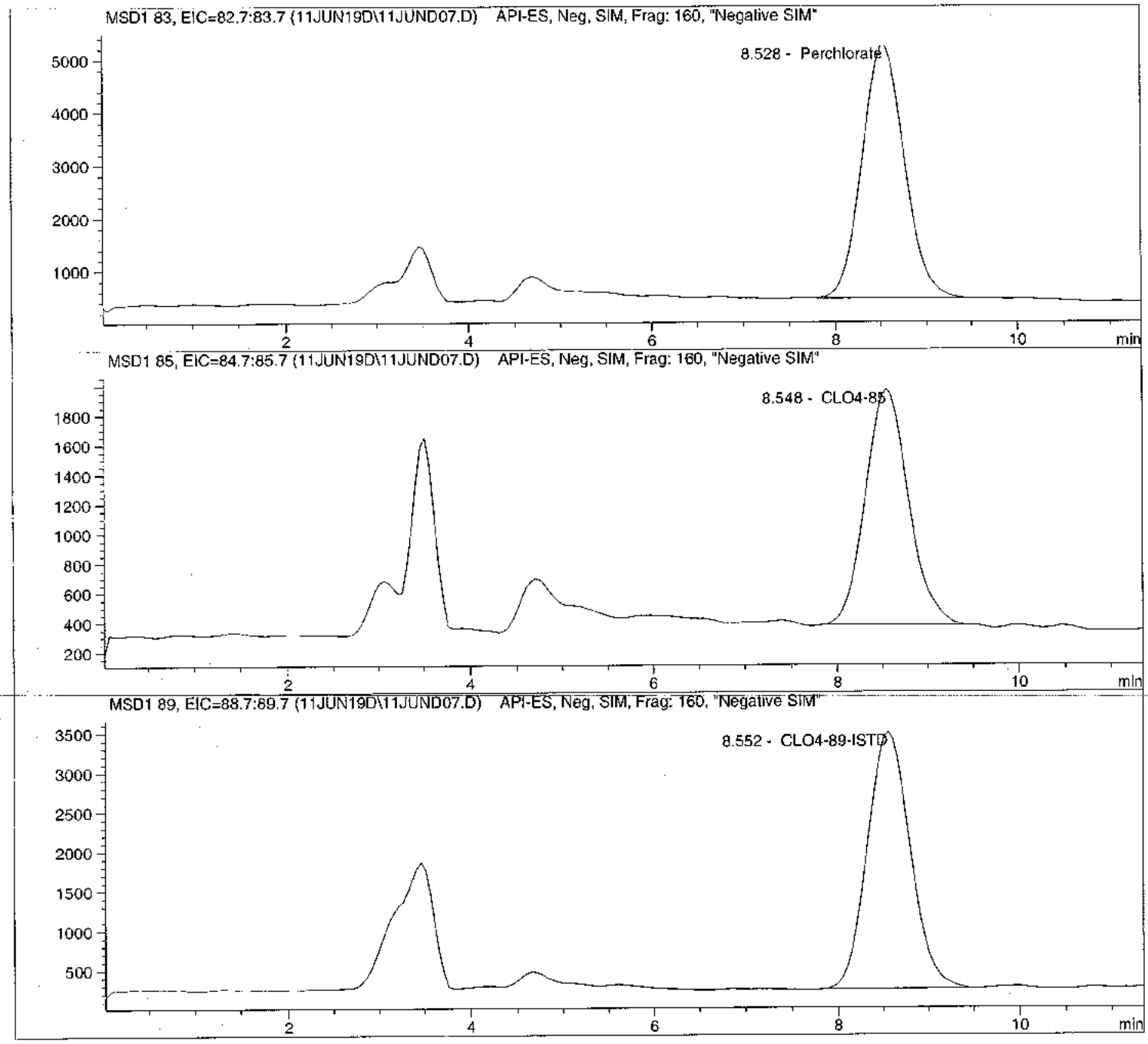
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND07.D Sample Name: 657800 158021D

Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.528	BBA	154645.8	4.7847	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.548	PBA	52435.8	5.3052	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.552	PBA	105604.1	5.0000	CLO4-89-ISTD

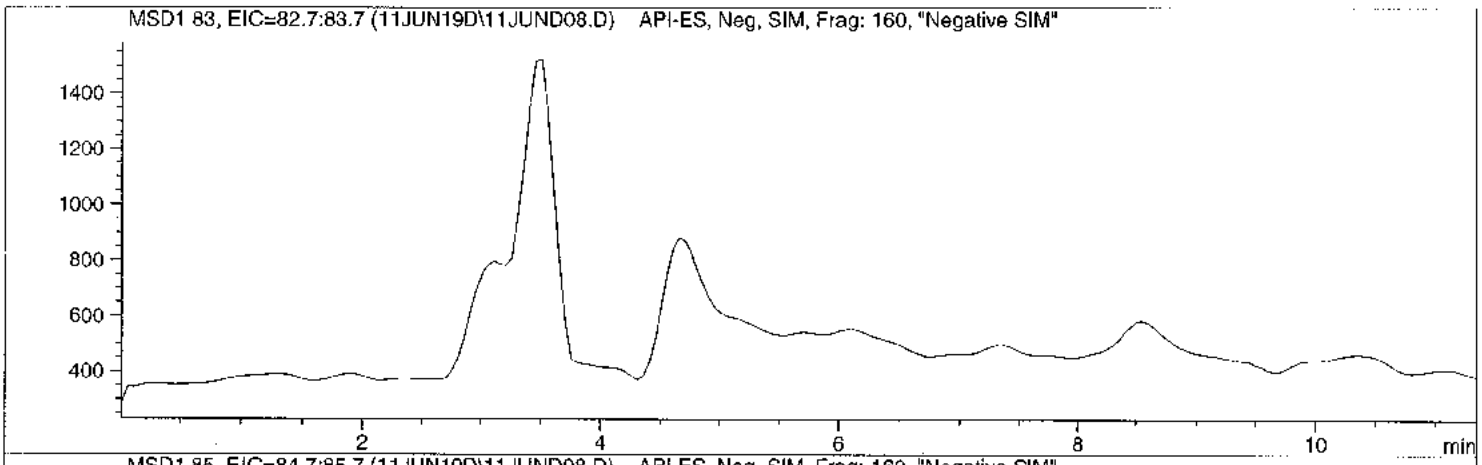
*** End of Report ***

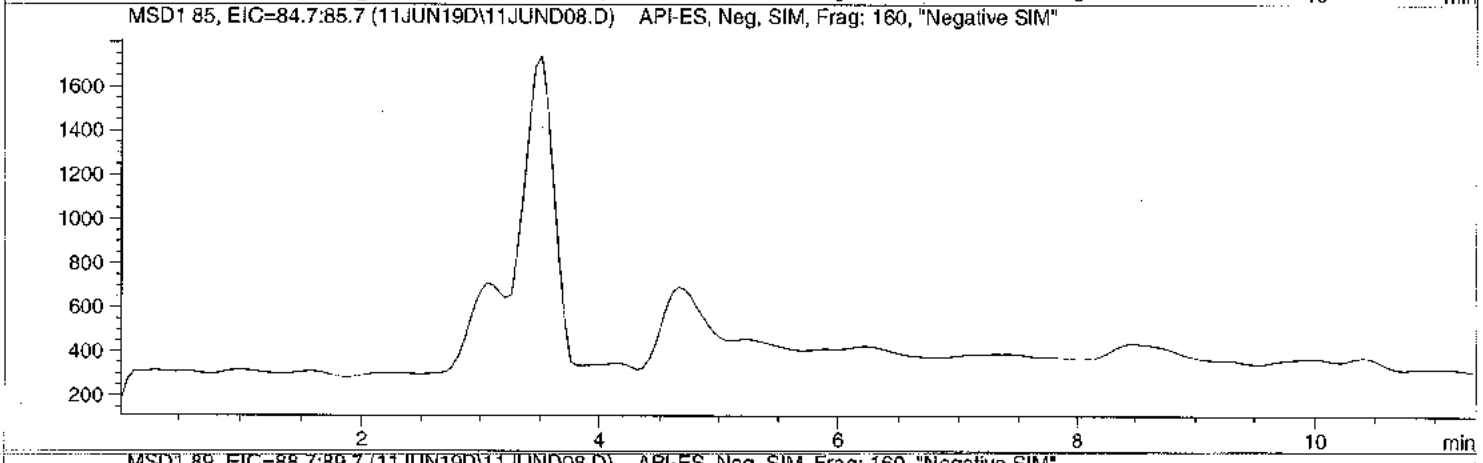
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

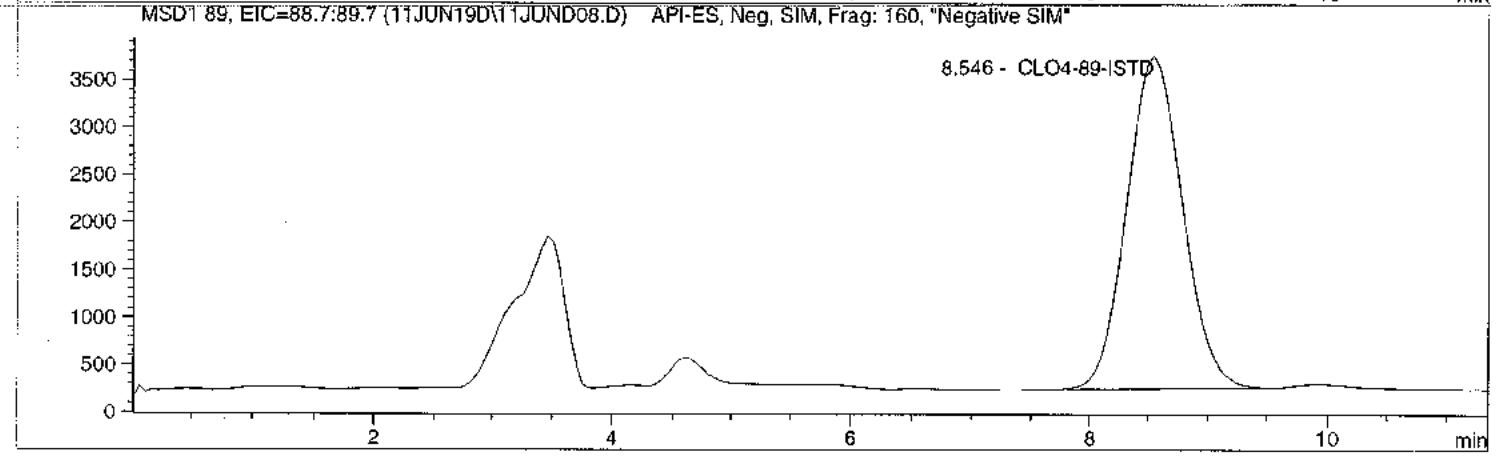
Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.546	BBA	114182.4	5.0000	CLO4-89-ISTD

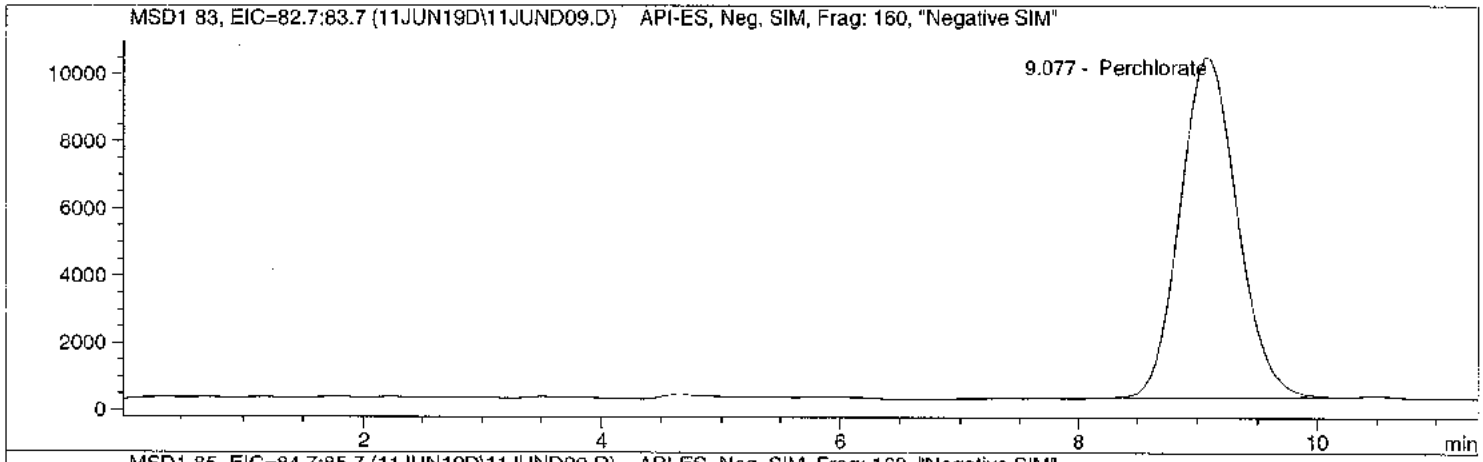
*** End of Report ***

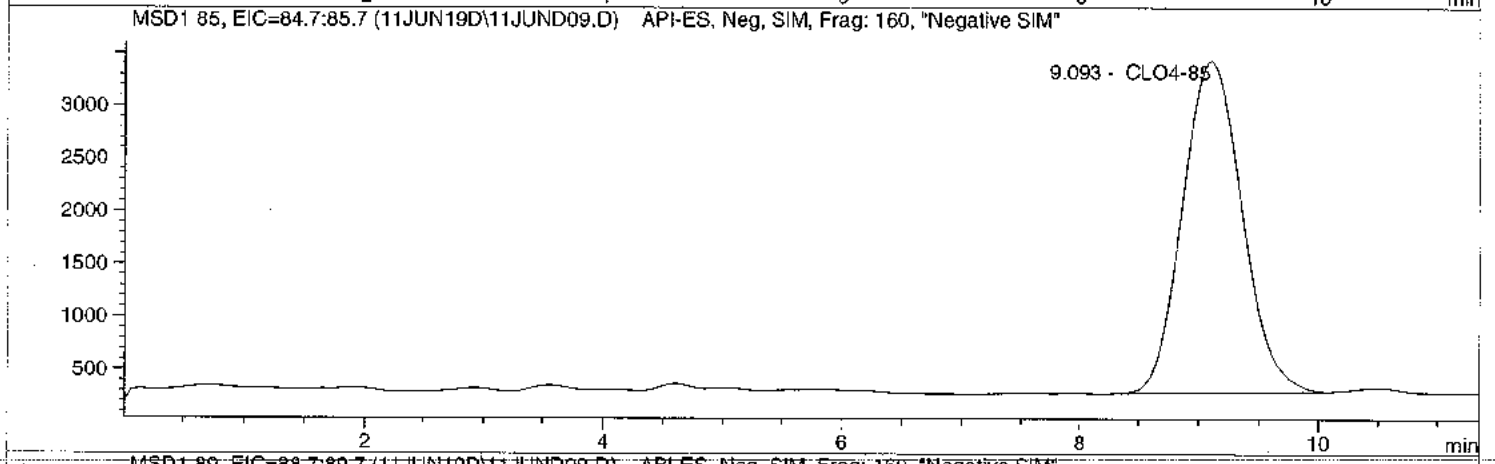
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

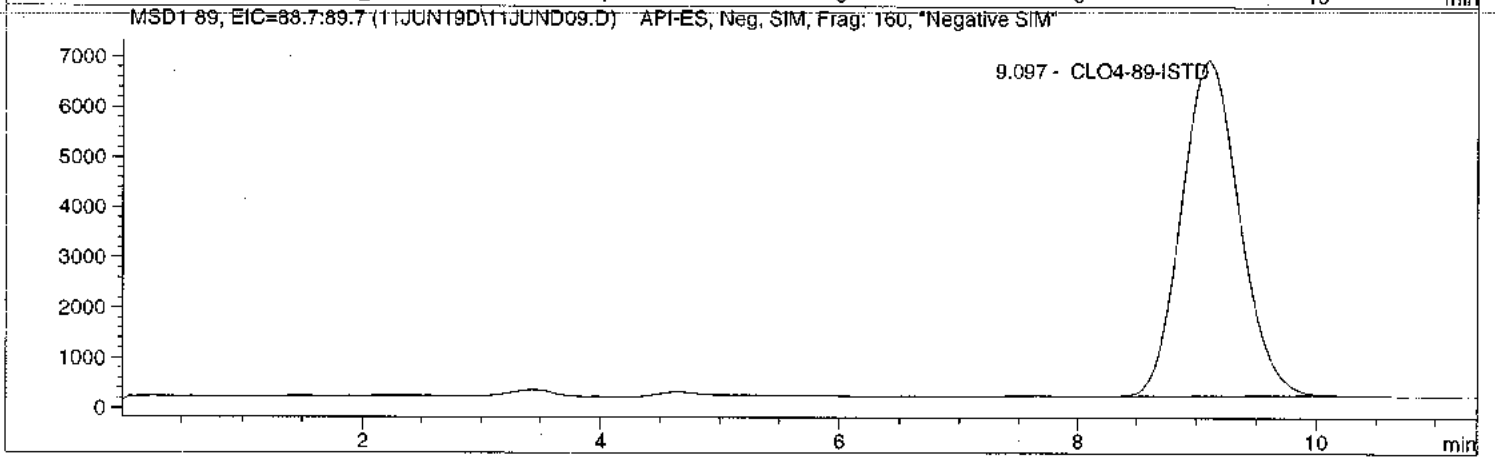
Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.077	BBA	332187.1	4885.0237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.093	PBA	107205.2	5161.4923	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.097	PBA	221981.4	5000.0000	CLO4-89-ISTD

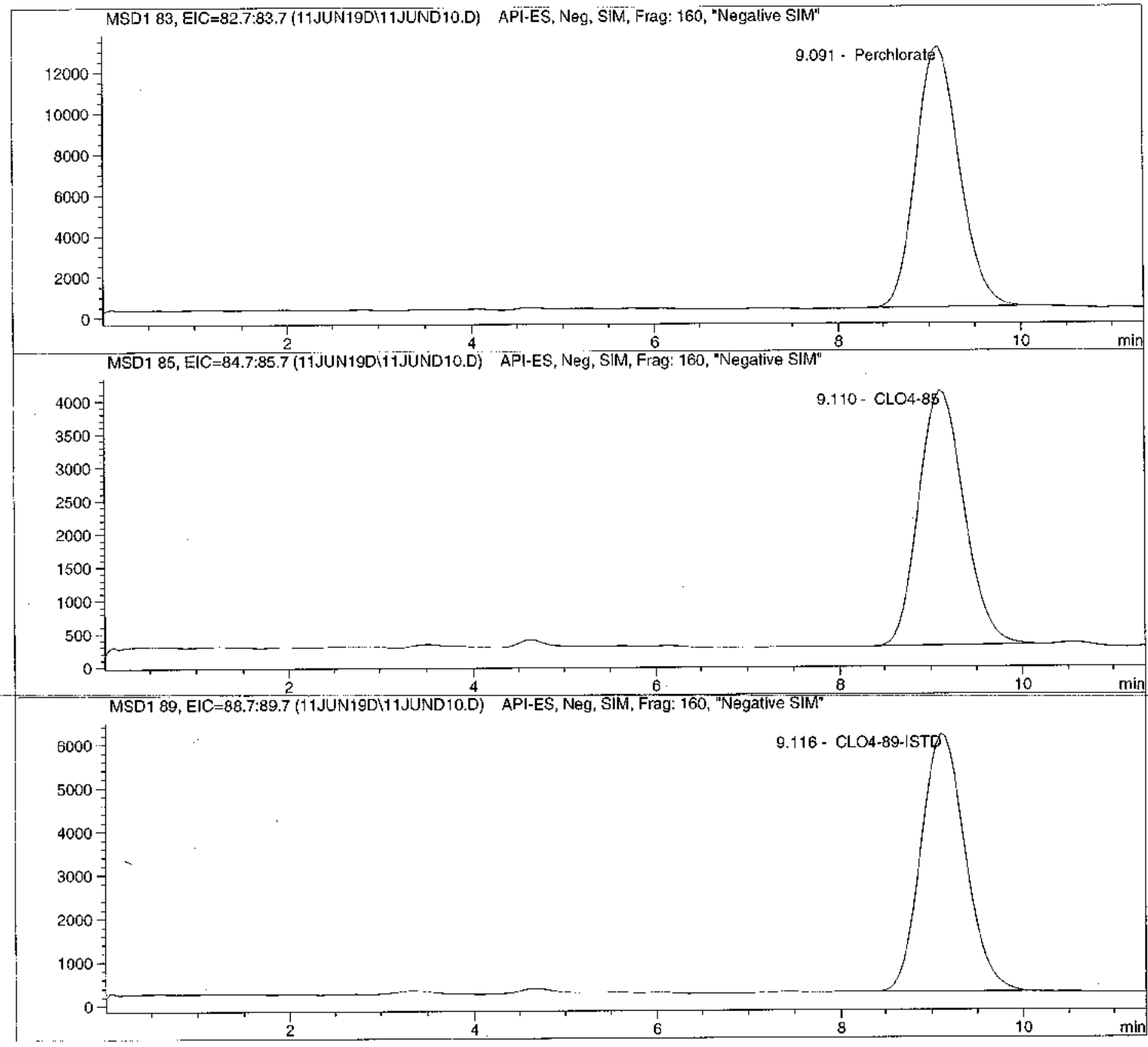
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.091	BBA	413978.8	6820.0559	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.110	PBA	130297.0	7096.6957	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.116	BBA	195449.6	5000.0000	CLO4-89-ISTD

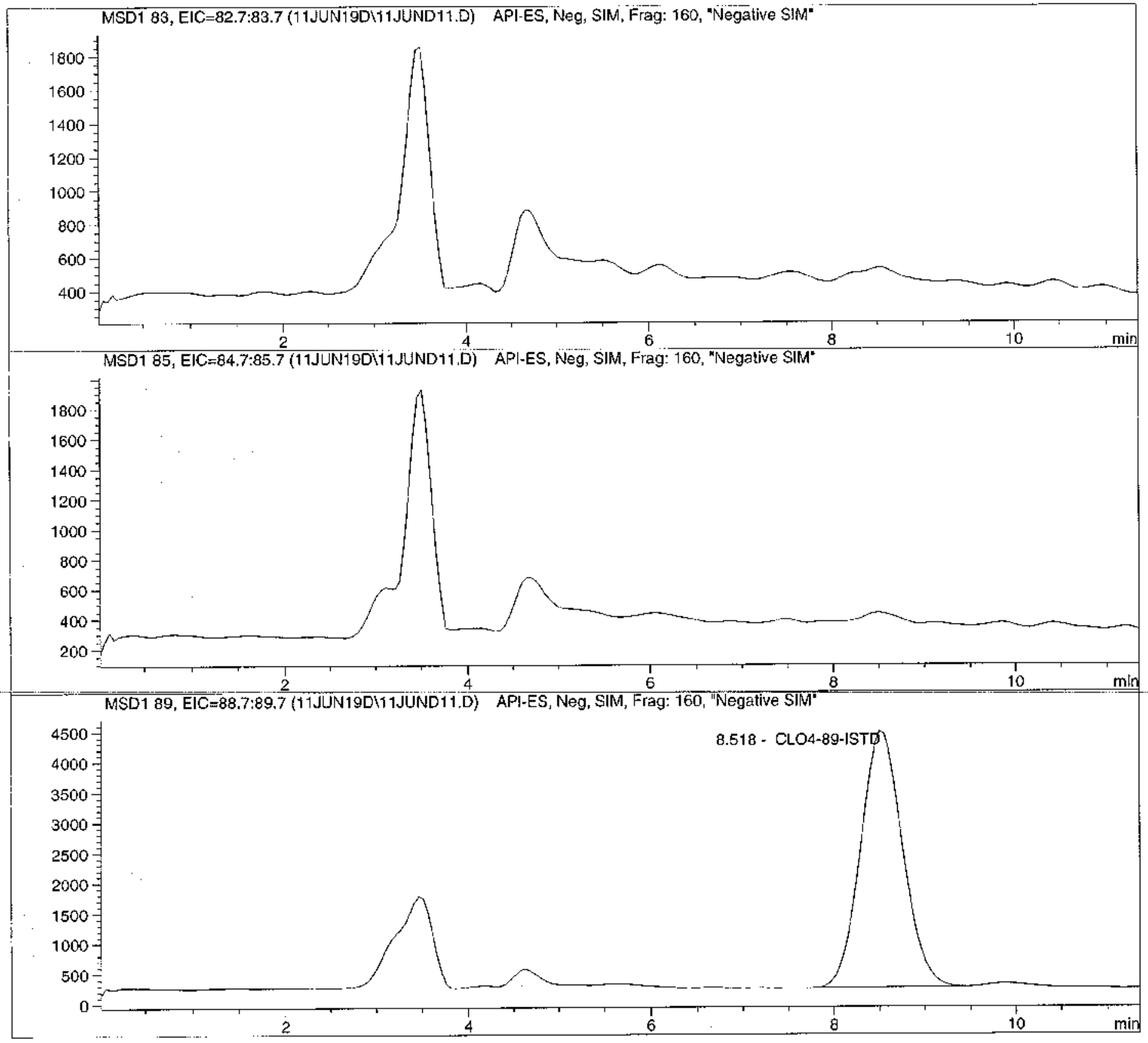
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.518	PBA	133827.9	5.0000	CLO4-89-ISTD

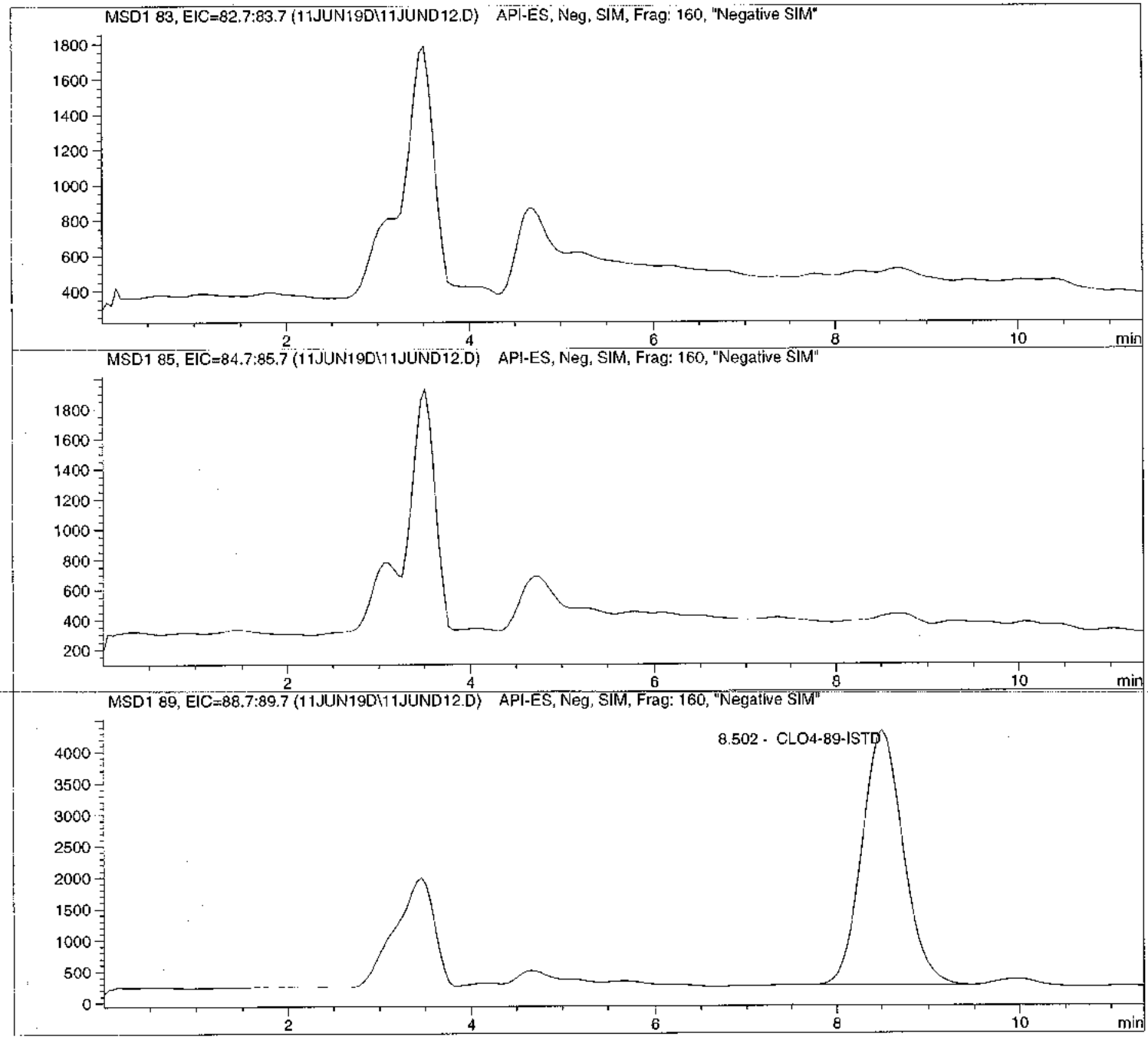
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	BBA	127033.7	5.0000	CLO4-89-ISTD

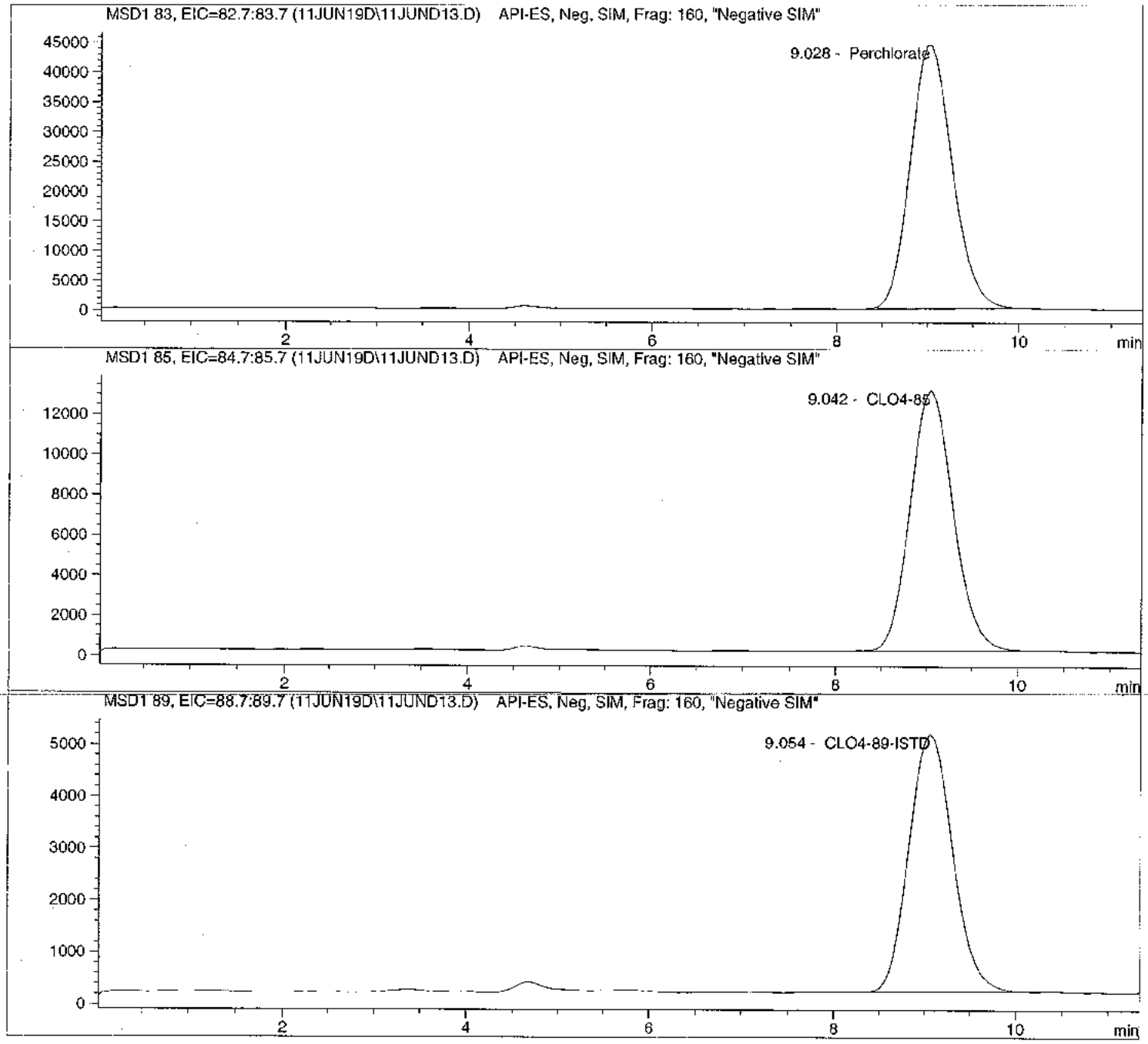
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.028	PBA	1423337.3	25.9807	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.042	BBA	426236.8	26.2061	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.054	BBA	166286.8	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

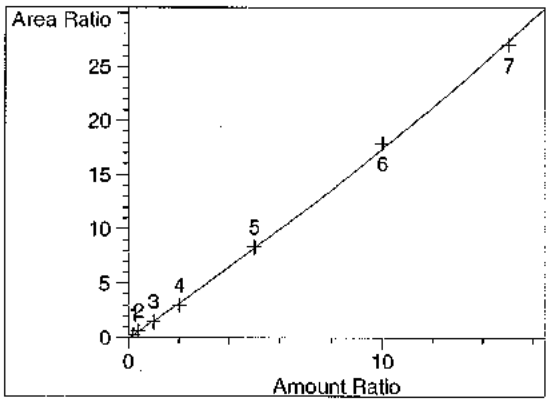
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

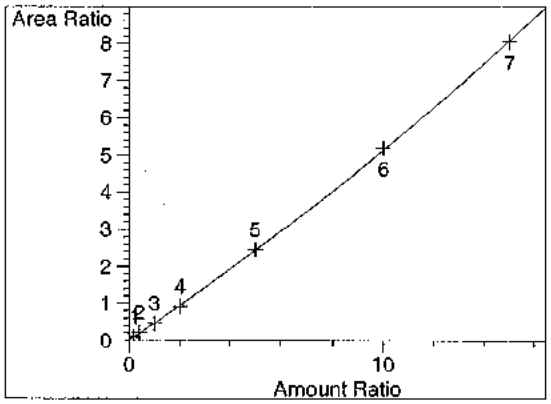
Peak Sum Table

No Entries in table

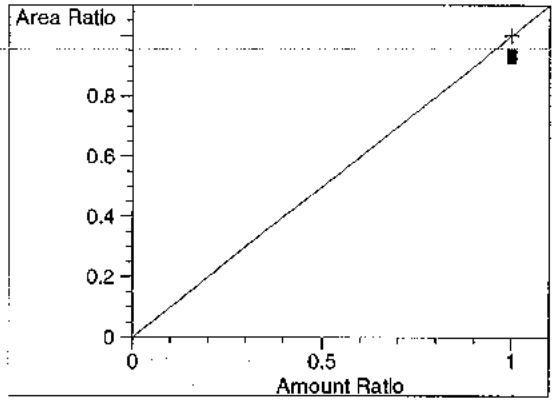
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

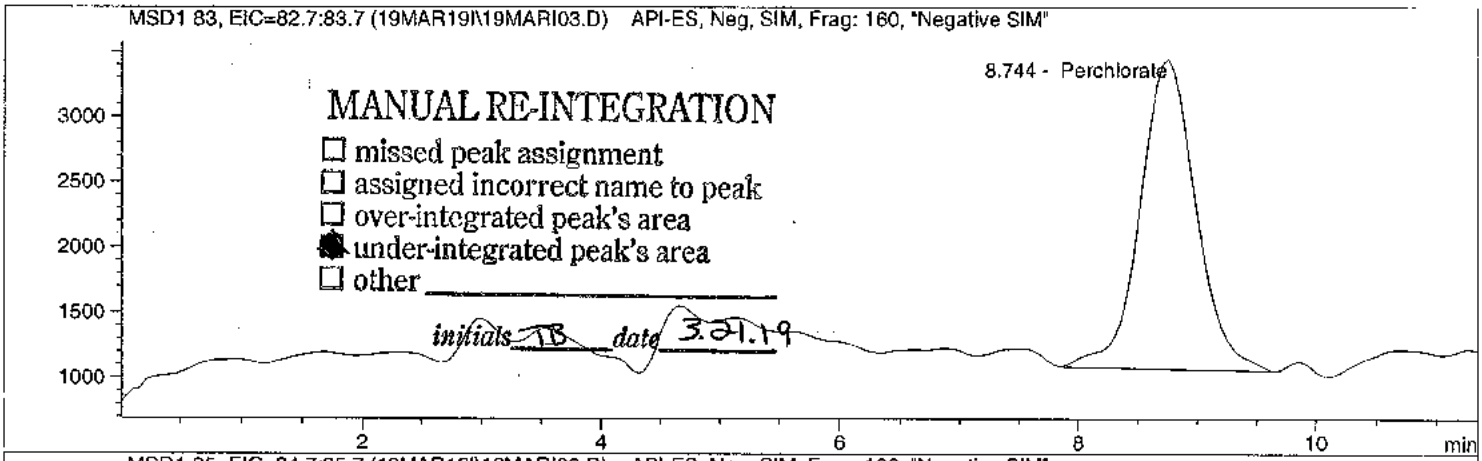
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

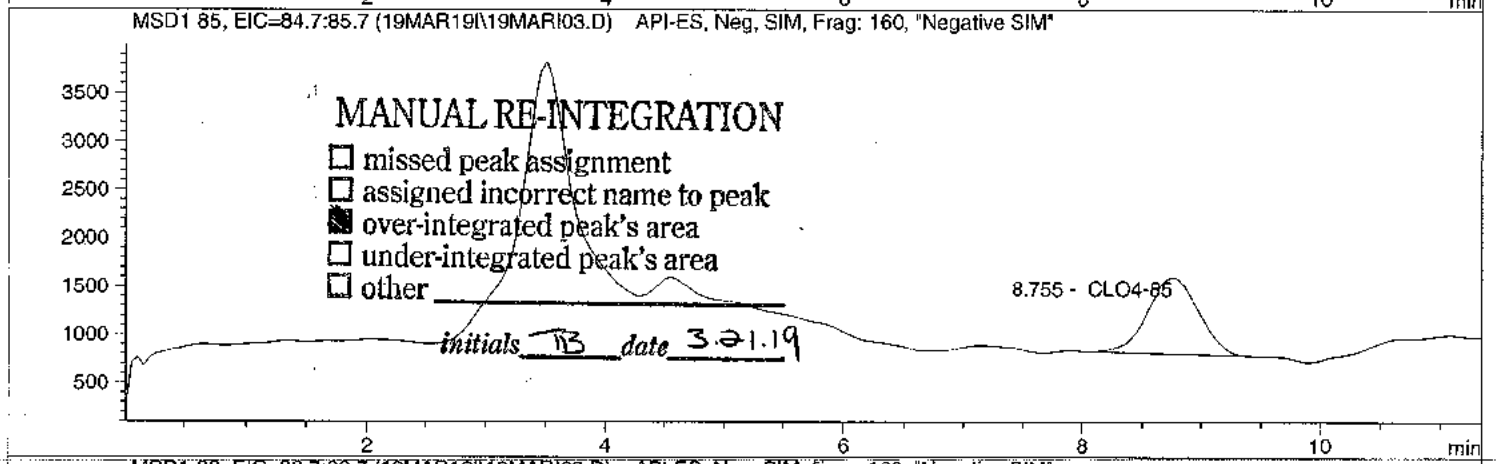
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

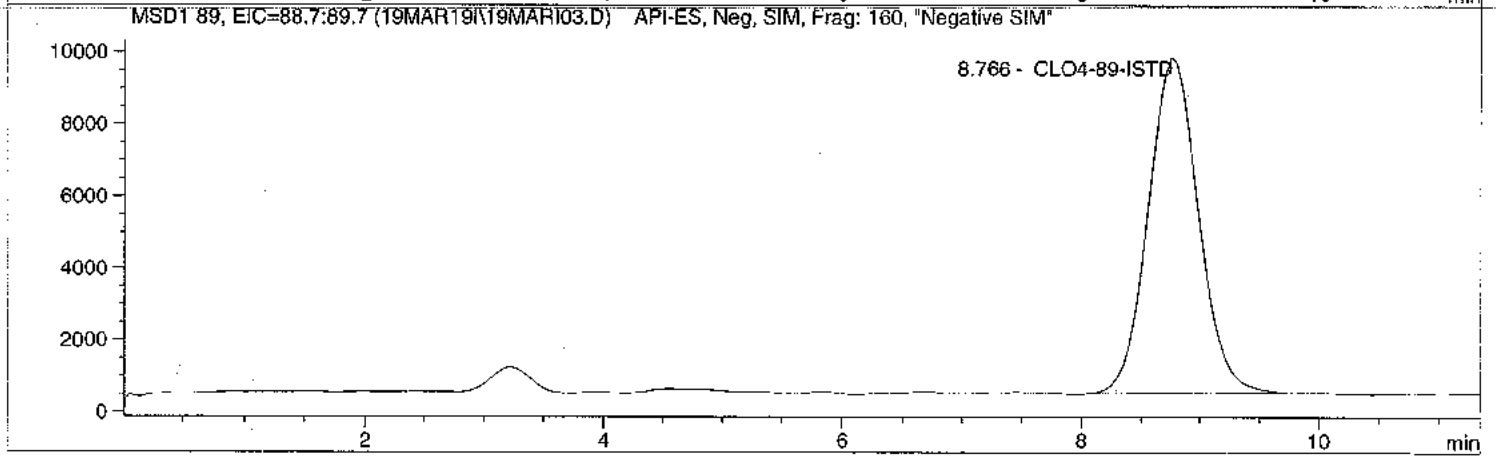
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

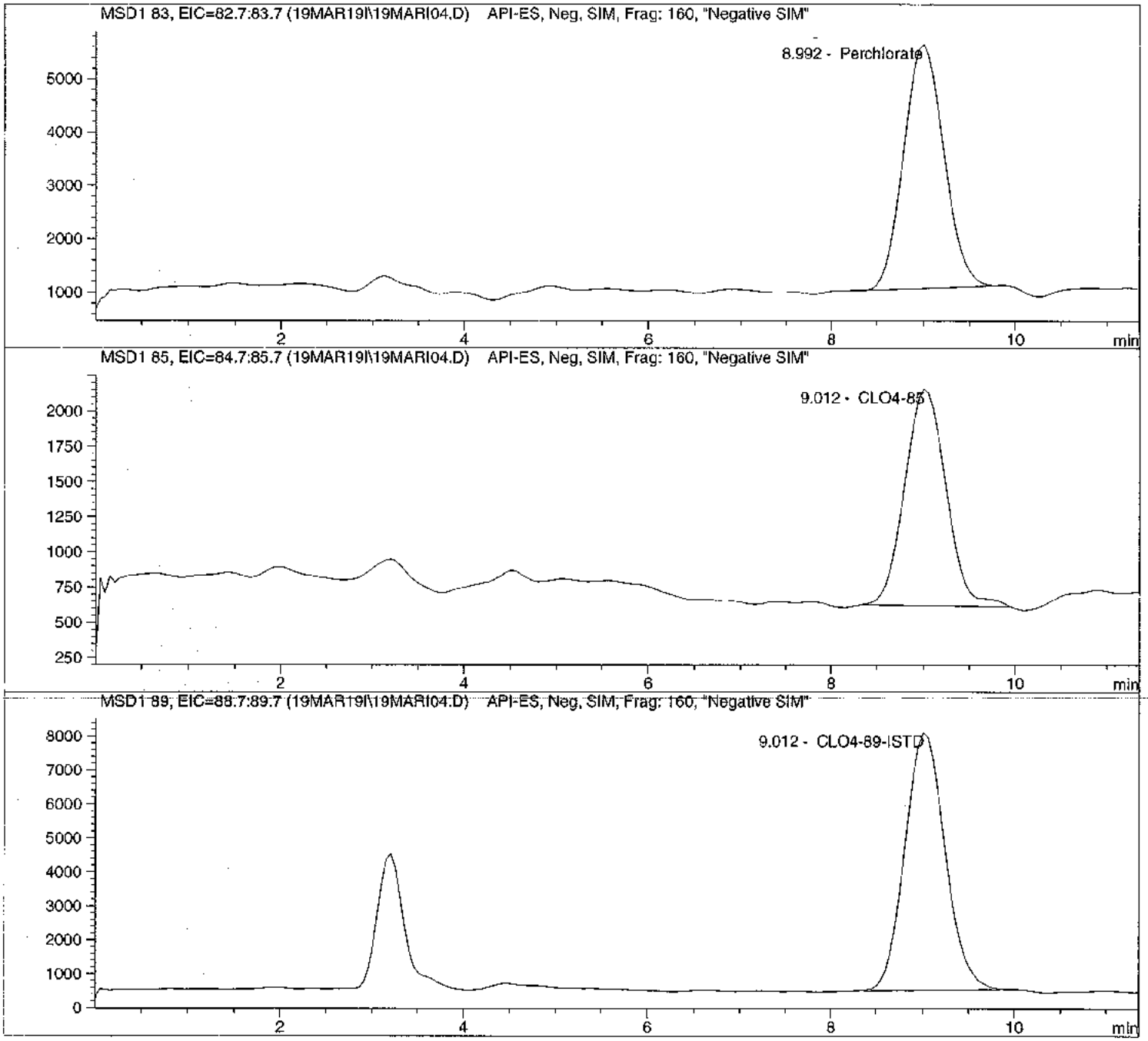
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

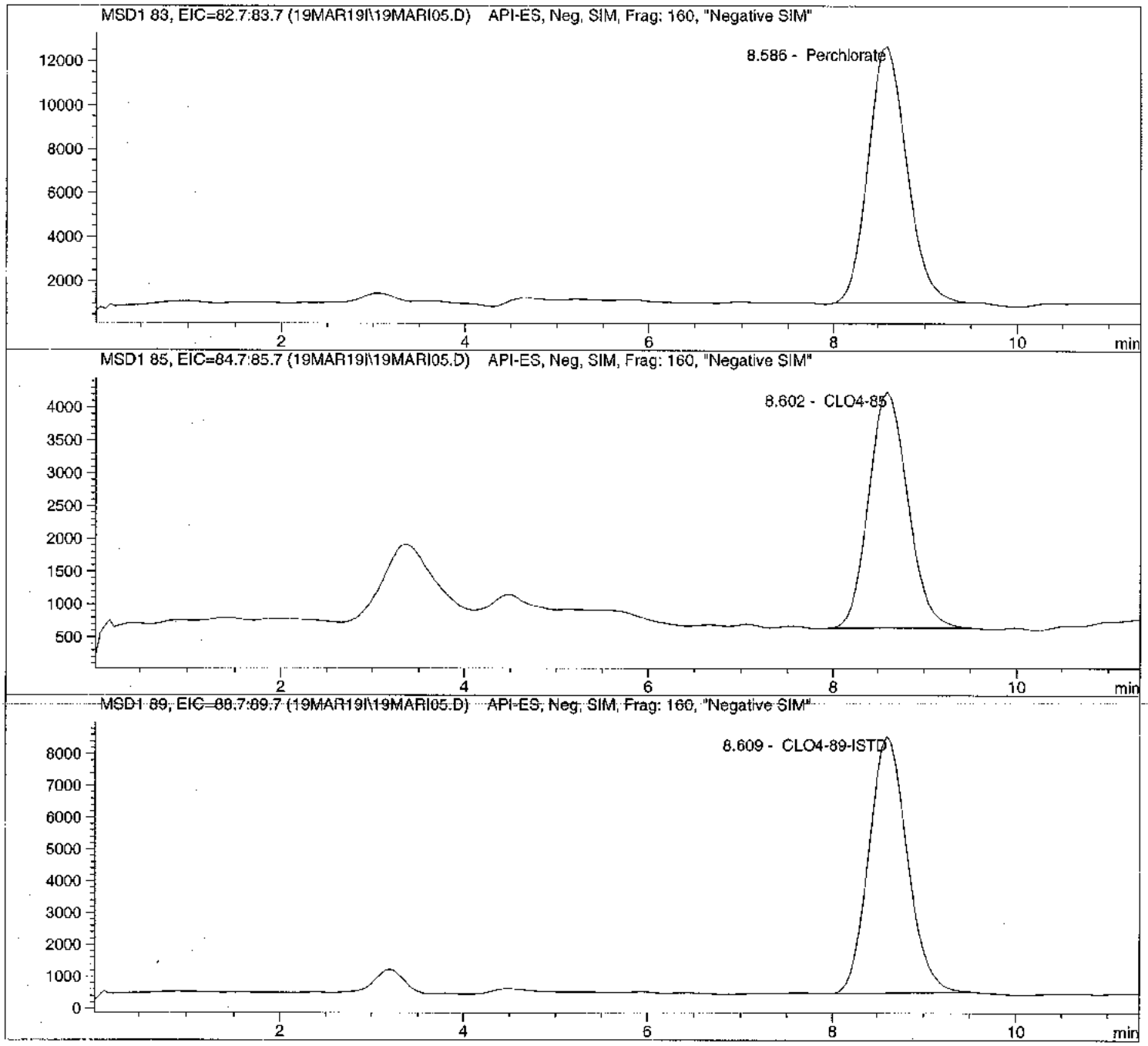
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

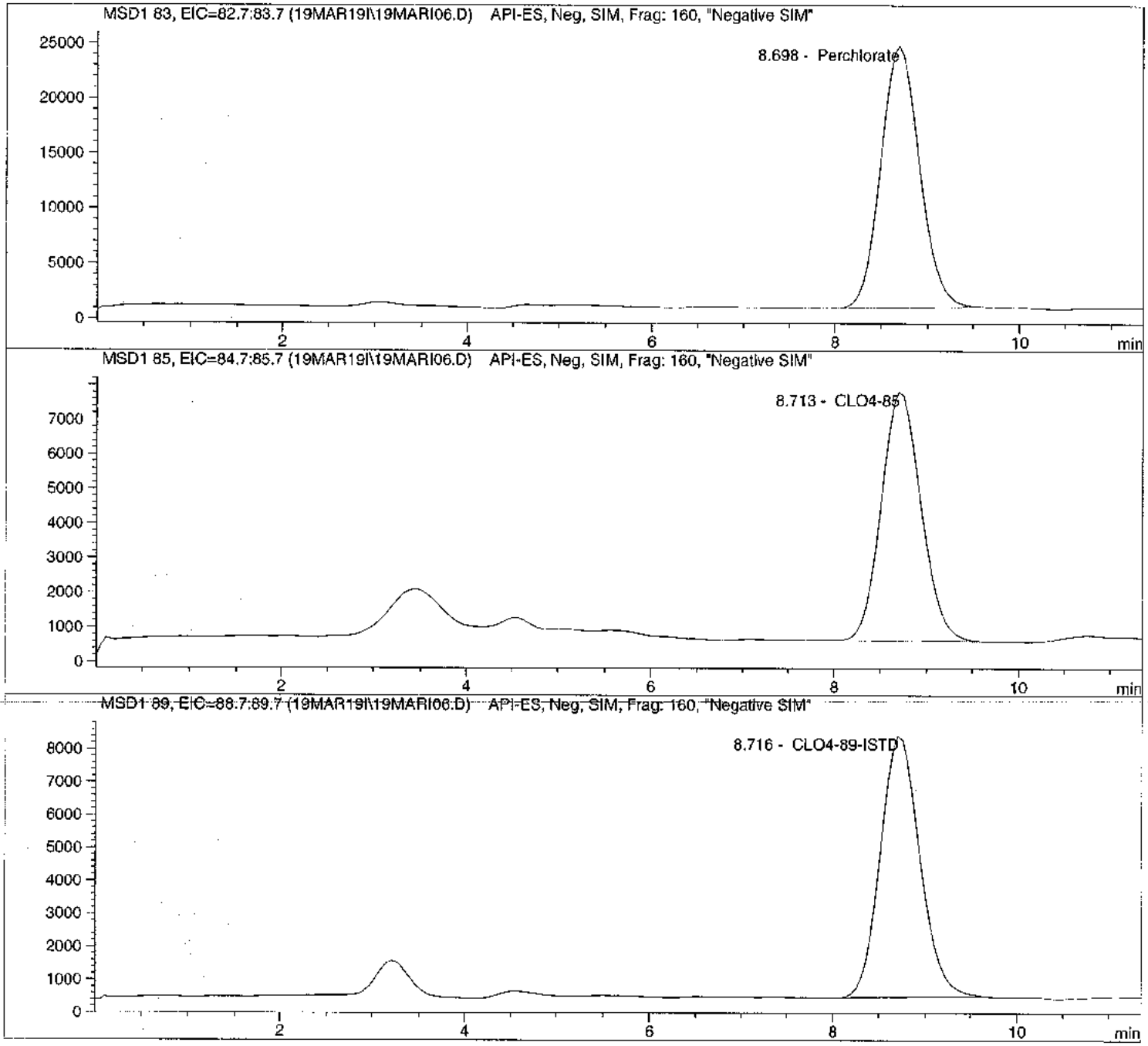
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

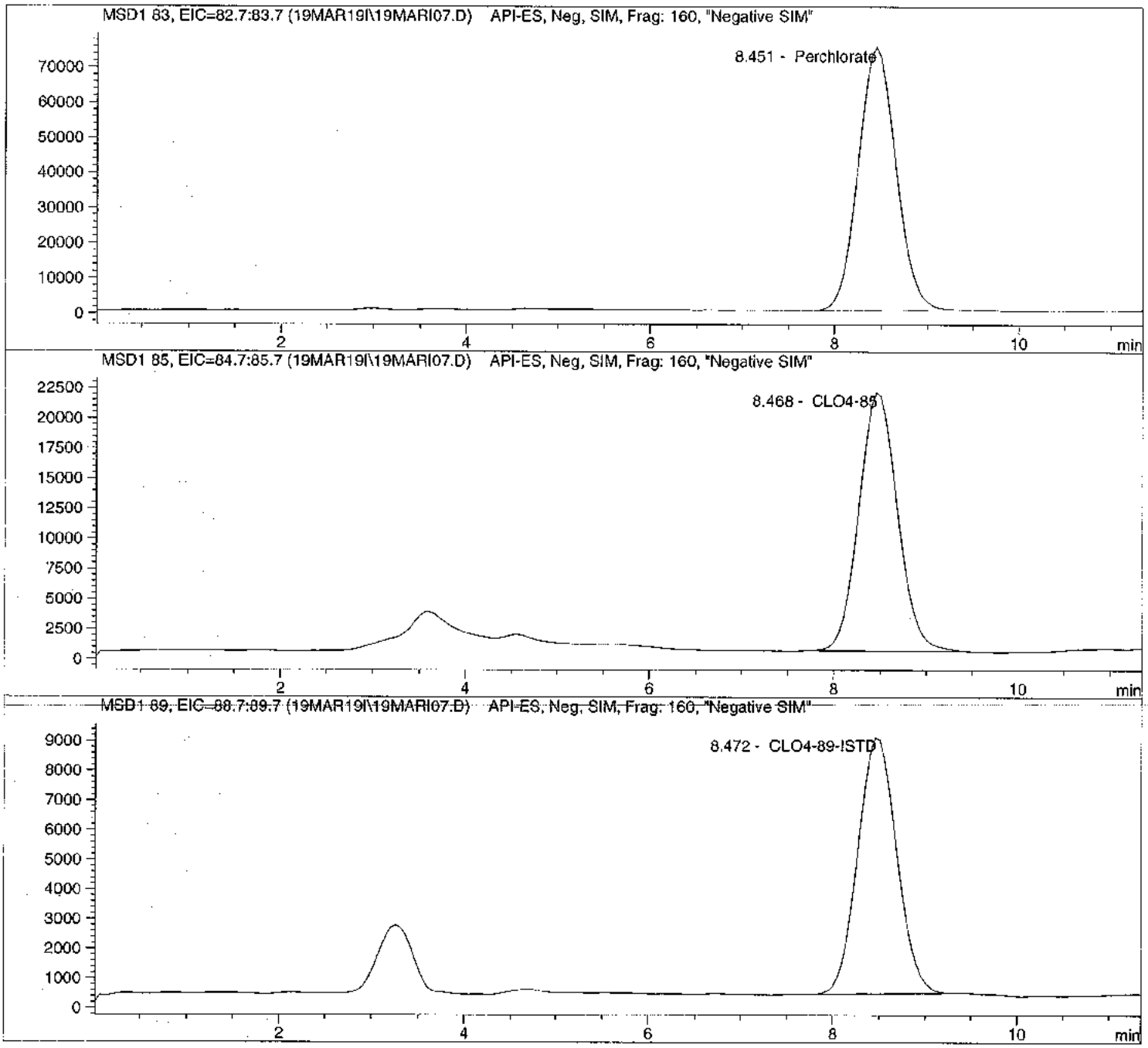
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

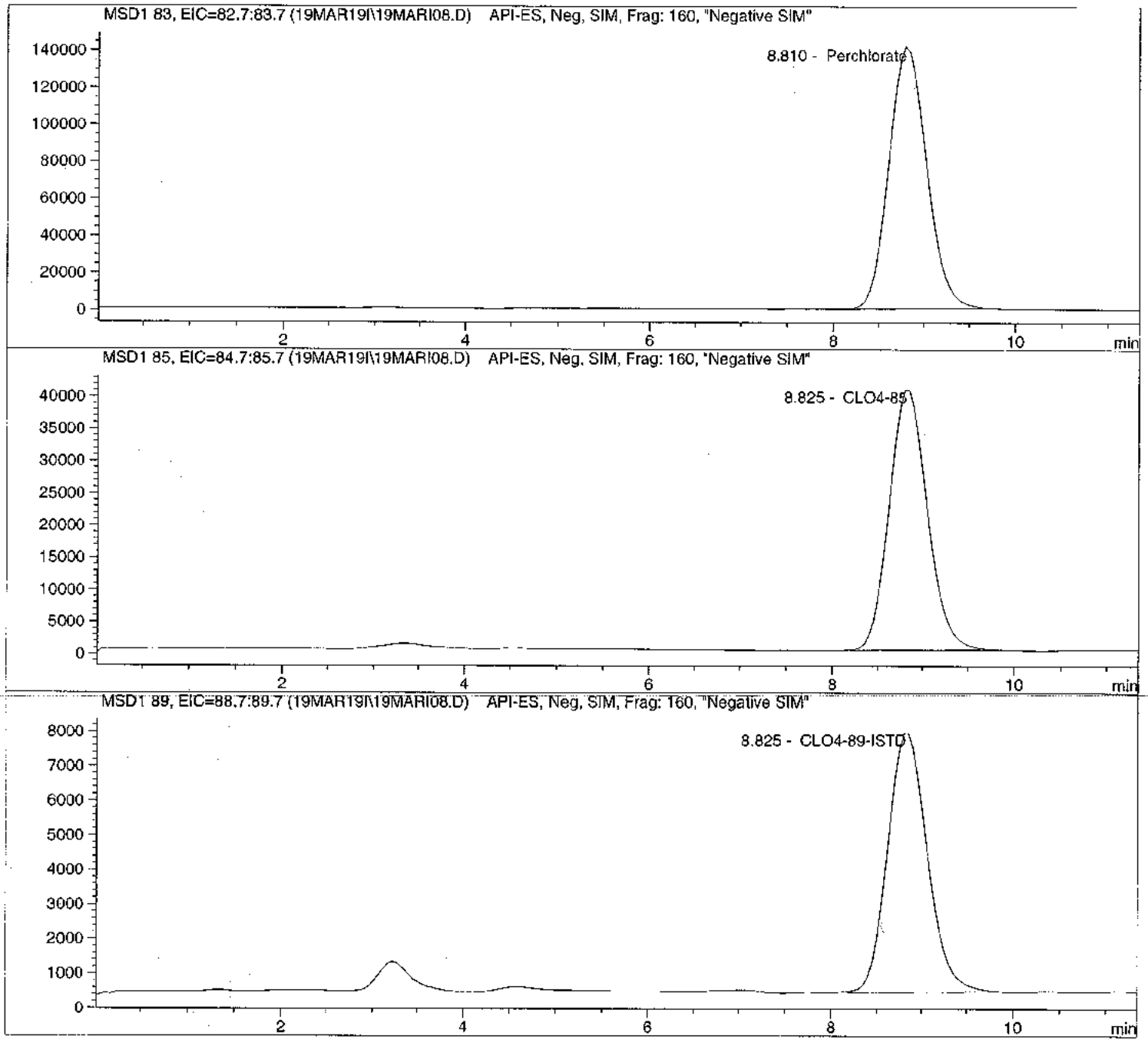
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

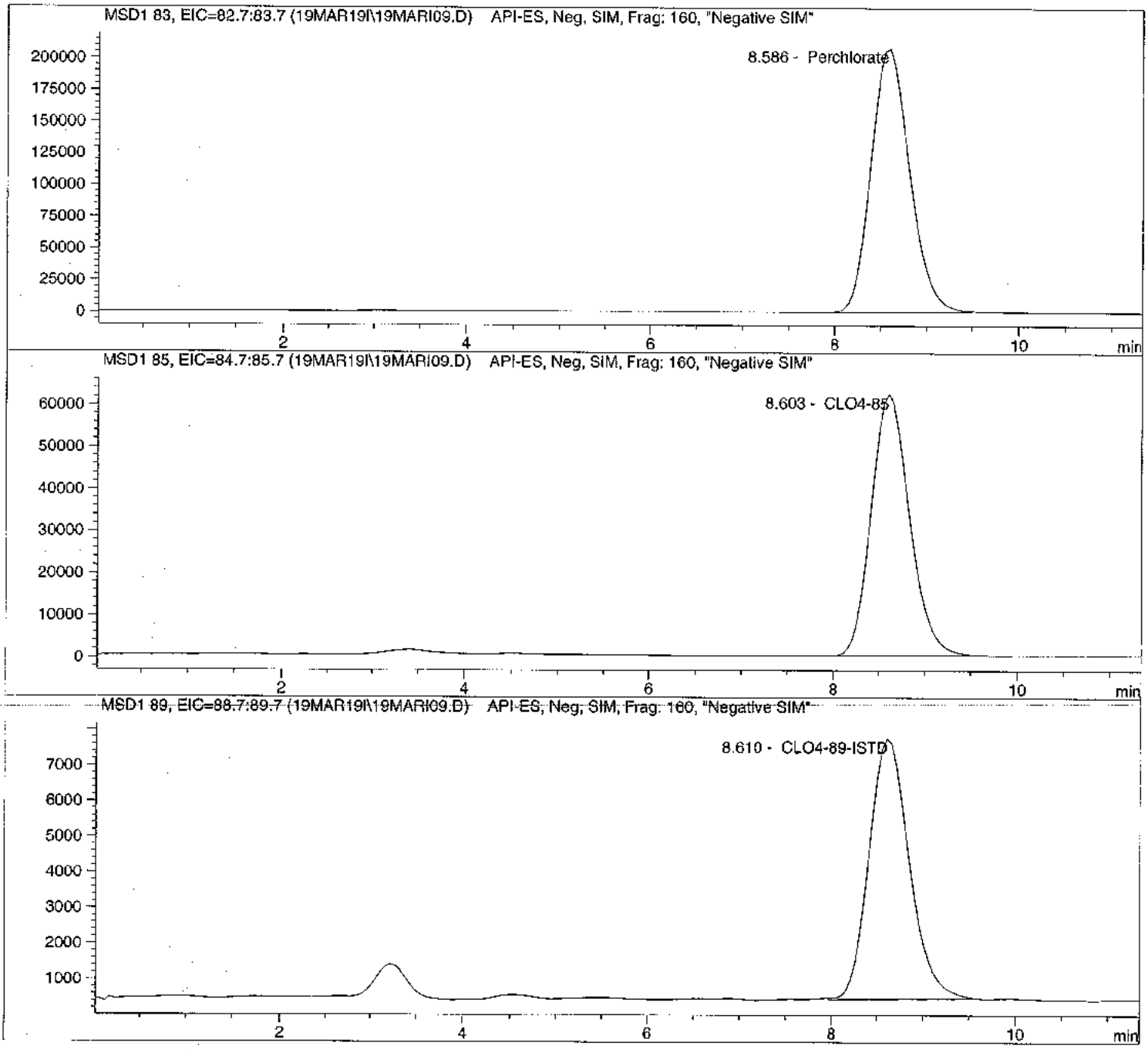
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

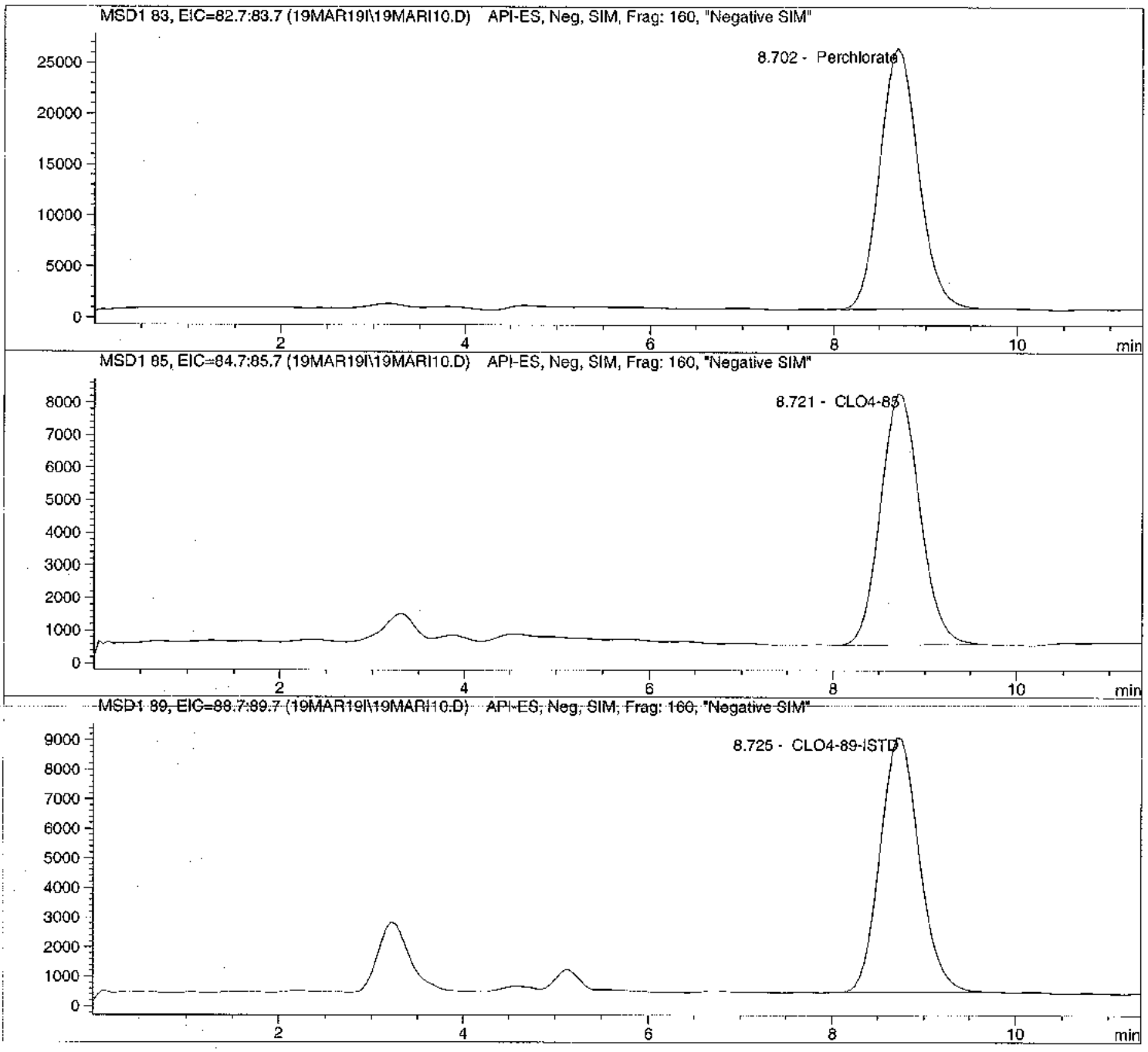
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

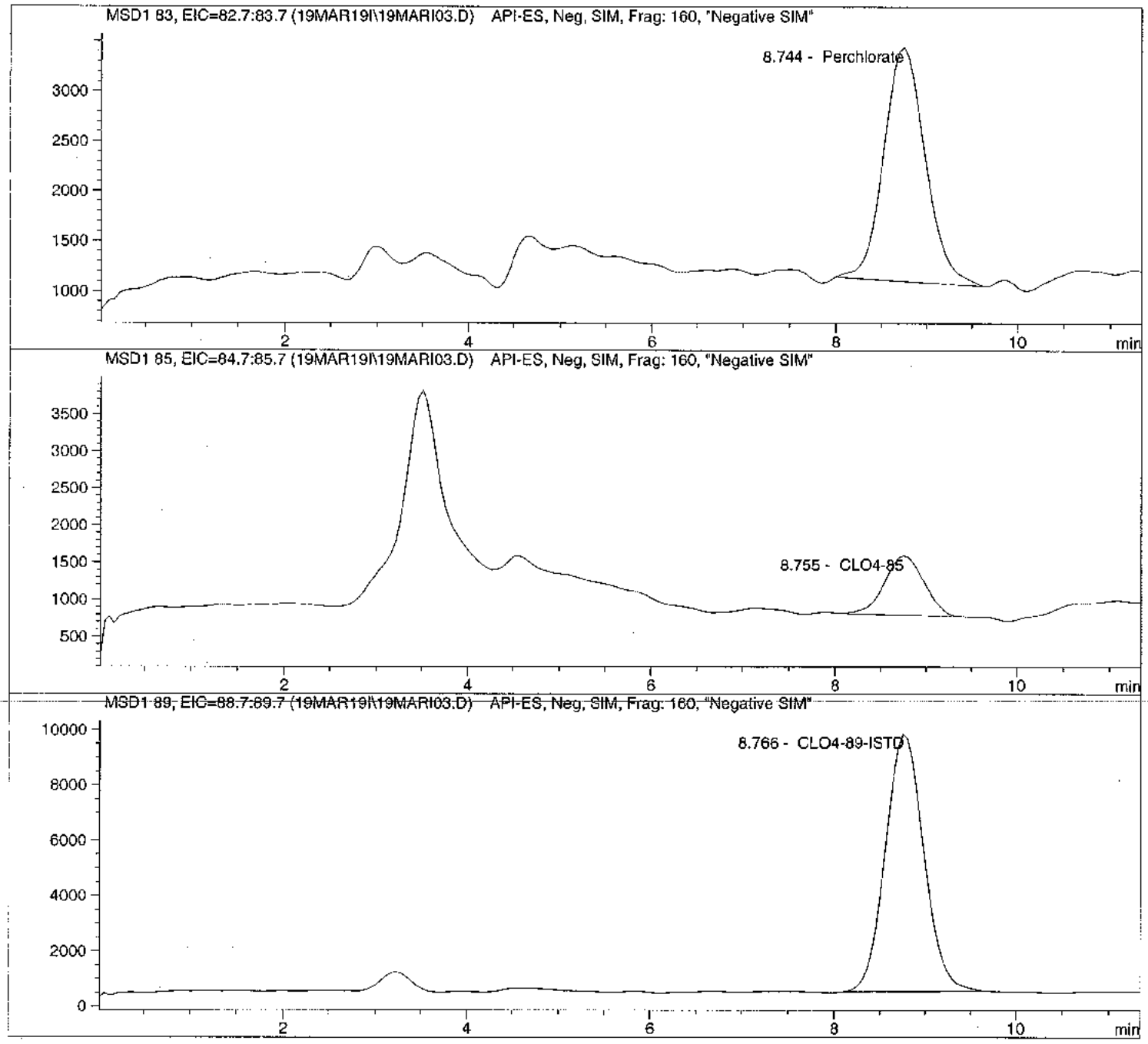
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

June 18, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19060174**

Laboratory Results for: **LH18/24 GW Treatment Plant Monthly Influent Samples**

Dear Marcia,

ALS Environmental received 1 sample(s) on Jun 05, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 18-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
Work Order: HS19060174

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060174-01	LH18/24-SP140_060419	Water		04-Jun-2019 14:00	05-Jun-2019 09:50	☐

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
Work Order:

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

Metals by Method SW6020

Batch ID: 141628

Sample ID: HS19060168-01MS

• MS and MSD are for an unrelated sample

WetChemistry by Method SW7196

Batch ID: R339970

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder:HS19060174
Sample ID: LH18/24-SP140_060419
Lab ID:HS19060174-01
Collection Date: 04-Jun-2019 14:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jun-2019		Analyst: JHD
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jun-2019 22:35
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jun-2019 22:35
HEXAVALENT CHROMIUM BY SW7196A		**Method:SW7196**						Analyst: MZD
Chromium, Hexavalent	0.0100	U	0.00600	0.0100	0.0100	mg/L	1	05-Jun-2019 12:00
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jun-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19060174

Batch ID: 141628 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060174-01	1	10	10 (mL)	1

ALS Houston, US Date: 18-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19060174

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID 141628	**Test Name :** METALS BY ICPMS BY SW6020A			**Matrix:** Water		
HS19060174-01	LH18/24-SP140_060419	04 Jun 2019 14:00		05 Jun 2019 14:21	05 Jun 2019 22:35	1
Batch ID R339970	**Test Name :** HEXAVALENT CHROMIUM BY SW7196A			**Matrix:** Water		
HS19060174-01	LH18/24-SP140_060419	04 Jun 2019 14:00			05 Jun 2019 12:00	1
Batch ID R340666	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19060174-01	LH18/24-SP140_060419	04 Jun 2019 14:00			17 Jun 2019 18:06	1

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19060174

QC BATCH REPORT

Batch ID: 141628 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

MBLK Sample ID: **MBLK-141628** Units: **mg/L** Analysis Date: **05-Jun-2019 22:04**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108740** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.00250	0.00200								U
Silver	0.000500	0.00200								U

LCS Sample ID: **LCS-141628** Units: **mg/L** Analysis Date: **05-Jun-2019 22:05**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108741** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.05646	0.00200	0.05	0	113	80 - 120				
Silver	0.04978	0.00200	0.05	0	99.6	80 - 120				

LCSD Sample ID: **LCSD-141628** Units: **mg/L** Analysis Date: **05-Jun-2019 22:07**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108742** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.05732	0.00200	0.05	0	115	80 - 120	0.05646	1.52	20	
Silver	0.04954	0.00200	0.05	0	99.1	80 - 120	0.04978	0.491	20	

MS Sample ID: **HS19060168-01MS** Units: **mg/L** Analysis Date: **05-Jun-2019 22:13**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108745** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.02727	0.00200	0.05	0.00018	54.2	80 - 120				S
Silver	0.04571	0.00200	0.05	-0.000008	91.4	80 - 120				

MSD Sample ID: **HS19060168-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2019 22:14**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108746** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.02972	0.00200	0.05	0.00018	59.1	80 - 120	0.02727	8.59	20	S
Silver	0.04632	0.00200	0.05	-0.000008	92.6	80 - 120	0.04571	1.31	20	

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19060174

QC BATCH REPORT

Batch ID: 141628 (0) **Instrument: ICPMS06** **Method: ICP-MS METALS BY SW6020A**

PDS Sample ID: **HS19060168-01PDS** Units: **mg/L** Analysis Date: **05-Jun-2019 22:16**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108747** PrepDate: **05-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Selenium	0.1059	0.00200	0.1	0.00018	106	75 - 125				
Silver	0.08679	0.00200	0.1	-0.000008	86.8	75 - 125				

SD Sample ID: **HS19060168-01SD** Units: **mg/L** Analysis Date: **05-Jun-2019 22:11**
Client ID: Run ID: **ICPMS06_339849** SeqNo: **5108744** PrepDate: **05-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Selenium	0.0125	0.0100					0.00018	0	10	U
Silver	0.00250	0.0100					-0.000008	0	10	U

The following samples were analyzed in this batch: HS19060174-01

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: HS19060174

QC BATCH REPORT

Batch ID: R339970 (0) **Instrument: UV-2450** **Method: HEXAVALENT CHROMIUM BY SW7196A**

MBLK Sample ID: **MBLK-339970** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339970** SeqNo: **5110287** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.0100	0.0100								U

LCS Sample ID: **LCS-339970** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339970** SeqNo: **5110288** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.23	0.0100	0.25	0	92.0	90 - 111				

MS Sample ID: **HS19060177-01MS** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339970** SeqNo: **5110290** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.268	0.0100	0.25	-0.004	109	90 - 111				

MSD Sample ID: **HS19060177-01MSD** Units: **mg/L** Analysis Date: **05-Jun-2019 12:00**
Client ID: Run ID: **UV-2450_339970** SeqNo: **5110291** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium, Hexavalent	0.265	0.0100	0.25	-0.004	108	90 - 111	0.268	1.13	20	

The following samples were analyzed in this batch: HS19060174-01

ALS Houston, US Date: 18-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
WorkOrder: **HS19060174**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Illinois	004438	29-Jun-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Louisiana	03087	30-Jun-2019
Maryland	343, 2018-2019	30-Jun-2019
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 18-jun-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 GW Treatment Plant Monthly Influent Samples
Work Order: HS19060174

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19060174-01	LH18/24-SP140_060419	Login	05/06/2019 11:04:34	NDR	Sub
HS19060174-01	LH18/24-SP140_060419	Login	05/06/2019 11:04:34	NDR	WET250
HS19060174-01	LH18/24-SP140_060419	Login	05/06/2019 11:04:34	NDR	MET053

ALS Houston, US Date: 18-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060174
Date/Time Received: **05-Jun-2019 09:50**
Received by: **RPG**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 5-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature — 5-Jun-2019 Date

Matrices: **water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	4.1c uc/c	IR 25
Cooler(s)/Kit(s):	43593	
Date/Time sample(s) sent to storage:	06/04/2019 11:30	

Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☐	N/A ☑
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd., Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: RJ Modshia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. NWO1312.0150.0 16.0001

Job:
GROUNDWATER TREATMENT PLANT MONTHLY INFLUENT SAMPLES

Prepared By: Scott Beesinger

P.O. Number

HS19060174

Bhate Environmental Associates, Inc.
18/24 GW Treatment Plant Monthly Influent Samples

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	SILVER & SELENIUM	HEXAVALENT CHROMIUM	PERCHLORATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP140_060419	Water	06/04/19 / 14:00		1	X			HNO3	
LH18/24-SP140_060419	Water	06/04/19 / 14:00		2		X	X	NONE	

Additional Remarks: **STANDARD TURN AROUND TIME**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	06/04/19	14:30	R Ciga	6/5/19	07:30						

For Lab Use Only

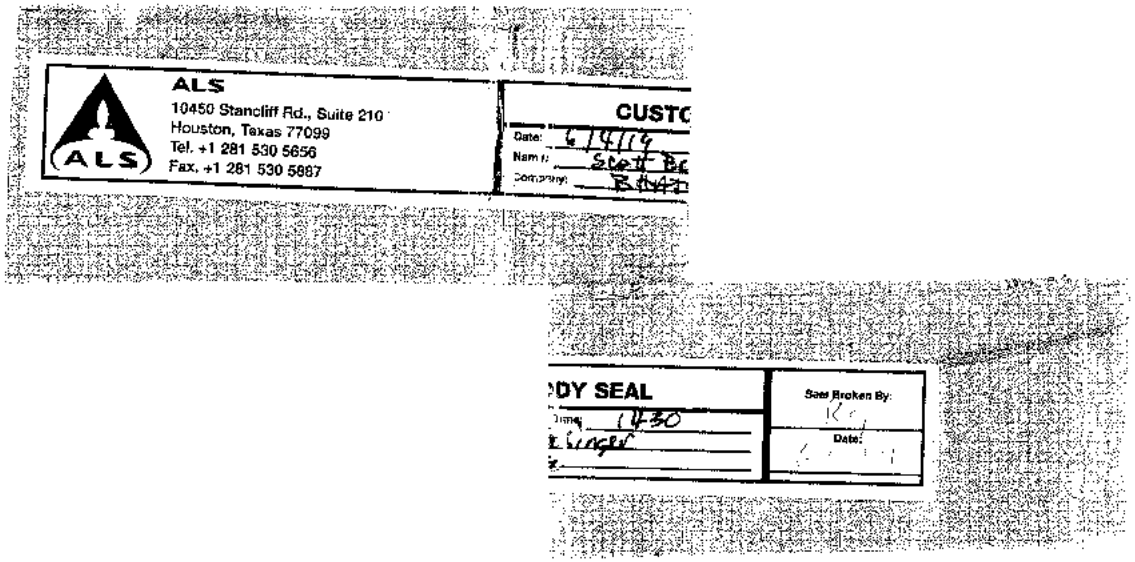
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
				R Ciga	6/5/19	07:30	4.1c	–	cooler # 43593 IR#25 CF0

Remarks:

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly

TRK# [0221] 4380 9532 8304

RETURNS MON – SAT
PRIORITY OVERNIGHT



Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1915802, 1915803, 1915852, 1916229; 1916231; 1916232

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2261 (241120)

General Set Information: There were six field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 657797) was less than 1/2 the CRDL. The recovery for the LCS (657798) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03).

Thomas Bosch June 12, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: June 13, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1916229**
Project ID: HS19060174
Purchase Order: HS19060174
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP140_060419	1916229001	06/04/19	06/06/19	

ANALYTICAL REPORT

Workorder: 34-1916229
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **LH18/24-SP140_060419**	Sampling Site: NA	Collected: 06/04/2019
Lab ID: 1916229001	Media: 125 mL Nalgene	Received: 06/06/2019
Matrix: Water	Sampling Parameter: NA	

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:** LCMS04
	Batch: ELMS/2261 (HBN: 241120)	**Percent Solid:** NA
	Analyzed: 06/11/2019 10:52	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**6800**	1000	2000	4000	1000	

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 06/12/2019 12:46	/S/ Stephen Brose 06/13/2019 10:59

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1916229
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1916229

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2261 (HBN: 241120)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 657797
Analyzed: 06/11/2019 09:31
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 657798
Analyzed: 06/11/2019 09:04
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.34	4.00	109	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1915802001	**MS:**	657799
Analyzed:	06/11/2019 09:45	**Analyzed:**	06/11/2019 09:58
Dilution:	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L

	MSD:	657800
	Analyzed:	06/11/2019 10:12
	Dilution:	1
	Units:	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.57	4	114	78.8	123.8	4.78	120	4.65	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 06/12/2019 12:47	/S/ Stephen Brose 06/13/2019 10:59

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

1916229

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

18698/#2
19/6229

SAMPLING STATE: **Dept of Defense**

COC ID: **11521**

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19060174
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060174-01**	**LH18/24-SP140_060419**	**Water**	**04 Jun 2019 14:00**
	SUB_Perch-6850			19 Jun 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 6/5/19 1800

Received By: _____ Date/Time: 6.6.19 0955

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19060174	***Split:***	**Workorder ID:** 1916229	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	COOL	Requested Analysis: EPA 6850, DoD QSM
1	06/04/2019 14:00	LH18/24-SP140_060419	1916229001		Water	A	1		A
2									
3									
4									
5									
6									
7									
8									
9									
10									

23 of 97

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Coates, Gayleen	06/06/2019 09:55	ALS Sample Receiving	Sample Login
R.331	6.6.19 1420	3B	STORAGE
	6.11.19/08.00	T. Bush	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ **Lab Notebook No.:** _____

Prepared / Analyzed by: _____ **Date / Time:** _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00939843

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS HOUSTON

Project/Task/Site:

Date/Time of Receipt: 6.6.19 0955

Number of Coolers Received: (1)

Condition of Coolers:	(Acceptable)/Unacceptable	Temperature Control:	(Present)/Not Included
Cooler Custody Seals:	(Present)/Absent/NA		
	(Intact)/Broken/NA	Location Temp Taken:	(Control)/Between Samples
Container Custody Seals:	Present/(Absent)/NA		
	Intact/Broken/(NA)	Are all temperatures within project specific guidelines?	(Yes)/No/NA
Ice Present:	(Yes)/No/NA		
	(Frozen)/Melted/NA	VOA Headspace Present?	Yes/No/(NA)

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9676	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [signature] GAYLEEN COATES 6.6.19

Signature / Printed Name / Date

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018

Must Deliver Next Business Day
Time and Tempature Sensitive!

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 05JUN19
ACTWGT: 10.85 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO **SAMPLE RECEIVING**
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS1906016B/172/174-RJ

551C1/B210/104C

FedEx Express

J181119B0505U1uv

TRK# 0201 4809 7834 7670

THU - 06 JUN 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US **SLC**

Batch Worklist

Batch: ELMS/ 2261 **Created:** 6/11/2019 07:45 **Instrument:** **HBN:** 241120

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1915802 [ENV_LVL4]
Workorder: 1915803 [ENV_LVL4]
Workorder: 1915852 [ENV_LVL4]
Workorder: 1916229 [ENV_LVL4]
Workorder: 1916231 [ENV_LVL4]
Workorder: 1916232 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	657794	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	
2	657795	RLVS for HBN 241120 [ELMS/2261				RLVS	3		E685041C3Q	5311		6/13/2019	
3	657796	ICS for HBN 241120 [ELMS/2261]				ICS	3		E6850..D3Q	5311		6/13/2019	
4	657797	LMB for HBN 241120 [ELMS/2261]				LMB	3		E6850Q413Q	5311		6/13/2019	
5	657798	LCS for HBN 241120 [ELMS/2261]				LCS	3		E6850Q413Q	5311		6/13/2019	
6	1915802001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915802001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
7	657799	LH18/24-SP650...(1915802001MS)				MS	3		E6850Q413Q	5311		6/13/2019	
8	657800	LH18/24-SP65...(1915802001MSD)				MSD	3		E6850Q413Q	5311		6/13/2019	
9	1915803001	LH18/24-SP650_052919_BIX				SAMPLE	3	1915803001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
10	1915852001	LH18/24-SP140_052919				SAMPLE	3	1915852001-A	E6850Q41.3	5480	6/26/2019	6/13/2019	
11	1916229001	LH18/24-SP140_060419				SAMPLE	3	1916229001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
12	1916231001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916231001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
13	1916232001	LH18/24-SP650_060419_BIX				SAMPLE	3	1916232001-A	E6850Q41.3	5480	7/2/2019	6/19/2019	
14	657801	CCV for HBN 241120 [ELMS/2261]				CCV	3		E685041C3Q	5311		6/13/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1915802 (001), 1915803 (001), 1915852 (001), 1916229 (001); 1916231 (001); 1916232 (001) ELMS Batch/HBN ID: 2261 (241120)
Prep Date: 06/11/2019 Analysis Date: 06/11/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\11JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 657798; Target = 4.0µg/L. ASTM type II water was used for LMB 657797.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1915802001 (Client ID: LH18/24-SP650_052919_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1915852001 and 1916229001 were analyzed and reported from 1:1,000 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\241120-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 657795) is reported from the analysis of the Laboratory Control Sample (LCS – 657798) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03).

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2261 HBN: 241120 1915802/1915803/1915852 Sample Set IDs if Applicable: 1916229/1916231/1916232	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#		
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		**Description - ASTM Type II Water**
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED TESTING LABORATORY

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NCSL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	657794 CCV@25	Vial 71	1	Control	1	1.90258e6	8.986	26.94929
*	657798 QC@4.0	Vial 72	1	Control	2	3.85542e5	8.884	4.34115
*	657796 ICS@4.0	Vial 73	1	Control	3	2.32261e5	8.623	3.98229
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	1.46622e5	8.522	4.56740
*	657800 158021D	Vial 77	1	Sample	7	1.54646e5	8.528	4.78474
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	3.32187e5	9.077	4885.02369
*	1916229001 1K	Vial 80	1	Sample	10	4.13979e5	9.091	6820.05588
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.42334e6	9.028	25.98075

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	657794 CCV@25	Vial 71	1	Control	1	5.56917e5	9.003	26.60911
*	657798 QC@4.0	Vial 72	1	Control	2	1.22598e5	8.893	4.50107
*	657796 ICS@4.0	Vial 73	1	Control	3	7.62920e4	8.637	4.24932
*	657797 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1915802001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	657799 158021S	Vial 76	1	Sample	6	5.01097e4	8.545	5.09575
*	657800 158021D	Vial 77	1	Sample	7	5.24358e4	8.548	5.30516
*	1915803001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1915852001 1K	Vial 79	1	Sample	9	1.07205e5	9.093	5161.49233
*	1916229001 1K	Vial 80	1	Sample	10	1.30297e5	9.110	7096.69575
*	1916231001	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1916232001	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	657801 CCV@25	Vial 71	1	Control	13	4.26237e5	9.042	26.20612

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	657794 CCV@25	Vial 71	1	Control	1	2.13798e5	9.004	5.00000
*	657798 QC@4.0	Vial 72	1	Control	2	2.91481e5	8.904	5.00000
*	657796 ICS@4.0	Vial 73	1	Control	3	1.92225e5	8.645	5.00000
*	657797 LMB	Vial 74	1	Control	4	3.01884e5	9.082	5.00000
*	1915802001	Vial 75	1	Sample	5	1.12941e5	8.589	5.00000
*	657799 158021S	Vial 76	1	Sample	6	1.05110e5	8.545	5.00000
*	657800 158021D	Vial 77	1	Sample	7	1.05604e5	8.552	5.00000
*	1915803001	Vial 78	1	Sample	8	1.14182e5	8.546	5.00000
*	1915852001 1K	Vial 79	1	Sample	9	2.21981e5	9.097	5000.00000
*	1916229001 1K	Vial 80	1	Sample	10	1.95450e5	9.116	5000.00000
*	1916231001	Vial 81	1	Sample	11	1.33828e5	8.518	5.00000
*	1916232001	Vial 82	1	Sample	12	1.27034e5	8.502	5.00000
*	657801 CCV@25	Vial 71	1	Control	13	1.66287e5	9.054	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

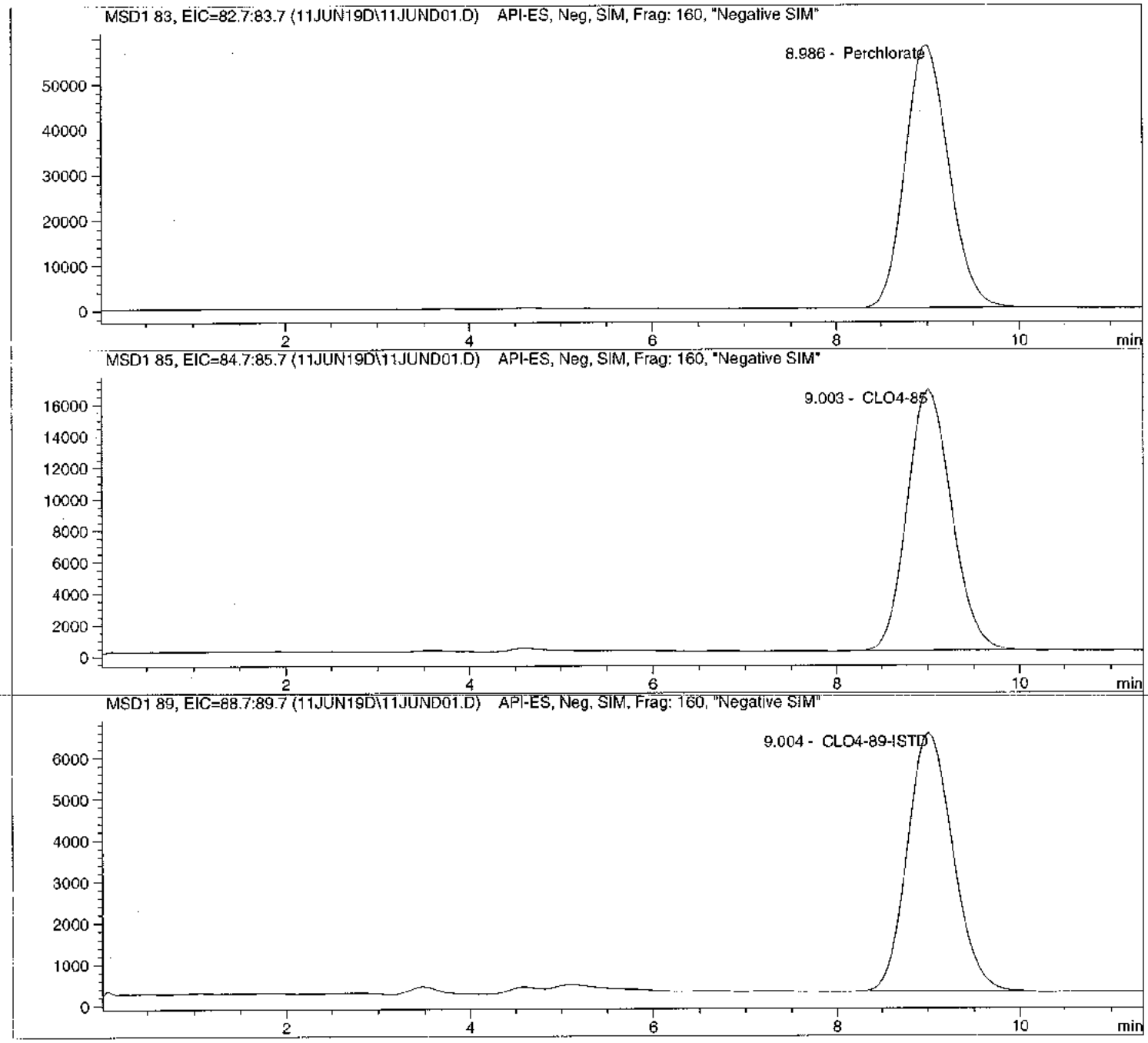
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	657794 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	657798 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	657796 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	657797 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1915802001	CLO4-AQN	1	Sample		
6	Vial 76	657799 158021S	CLO4-AQN	1	Sample		
7	Vial 77	657800 158021D	CLO4-AQN	1	Sample		
8	Vial 78	1915803001	CLO4-AQN	1	Sample		
9	Vial 79	1915852001 1K	CLO4-AQN	1	Sample		
10	Vial 80	1916229001 1K	CLO4-AQN	1	Sample		
11	Vial 81	1916231001	CLO4-AQN	1	Sample		
12	Vial 82	1916232001	CLO4-AQN	1	Sample		
13	Vial 71	657801 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND01.D Sample Name: 657794 CCV@25

Injection Date:	6/11/2019 08:44:35	Seq Line:	1
Sample Name:	657794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.986	PBA	1902575.4	26.9493	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.003	PBA	556916.8	26.6091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.004	PBA	213798.0	5.0000	CLO4-89-ISTD

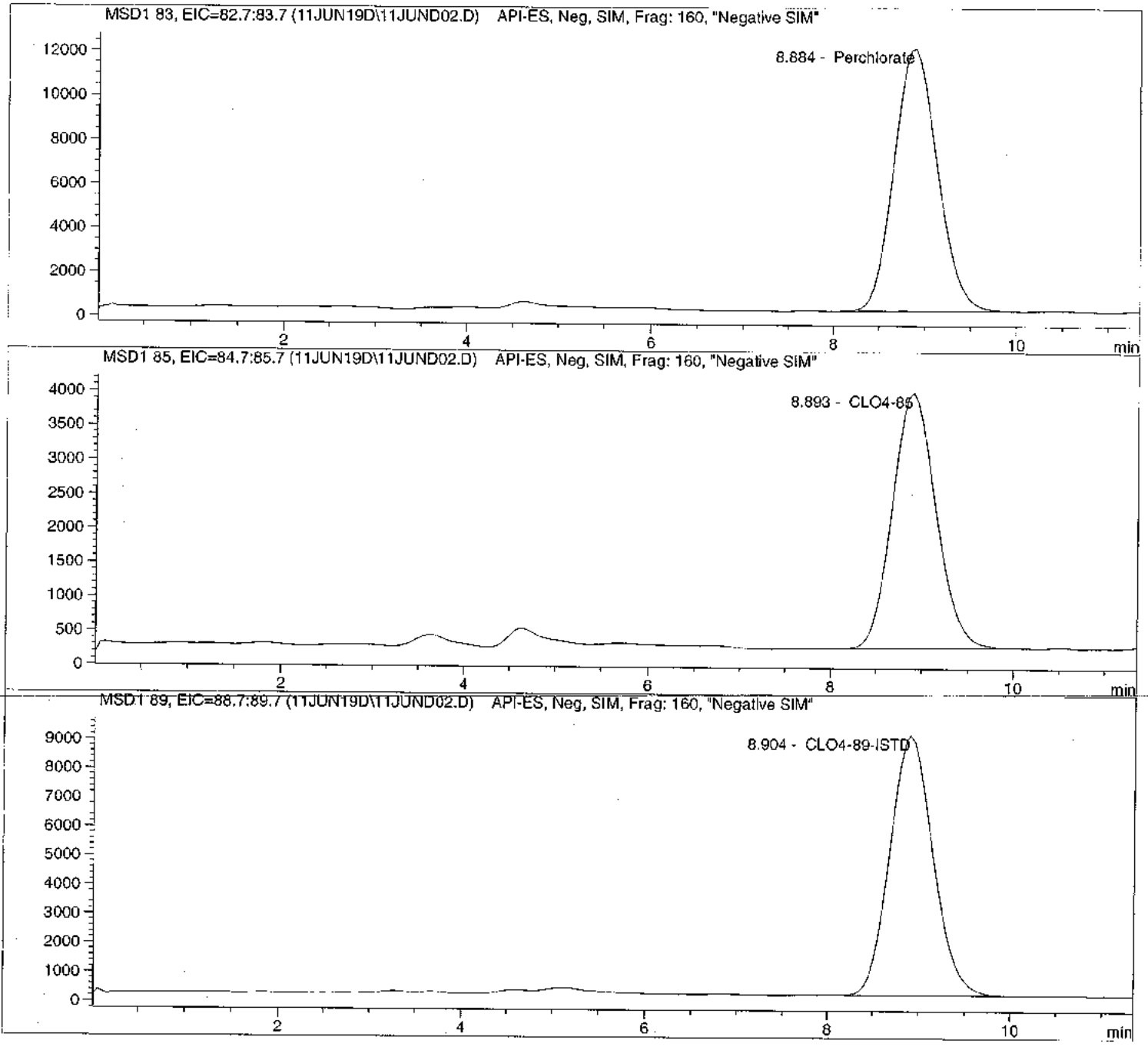
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND02.D Sample Name: 657798 QC@4.0

Injection Date:	6/11/2019 09:04:55	Seq Line:	2
Sample Name:	657798 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.884	PBA	385541.7	4.3412	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.893	BBA	122598.4	4.5011	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.904	BBA	291480.6	5.0000	CLO4-89-ISTD

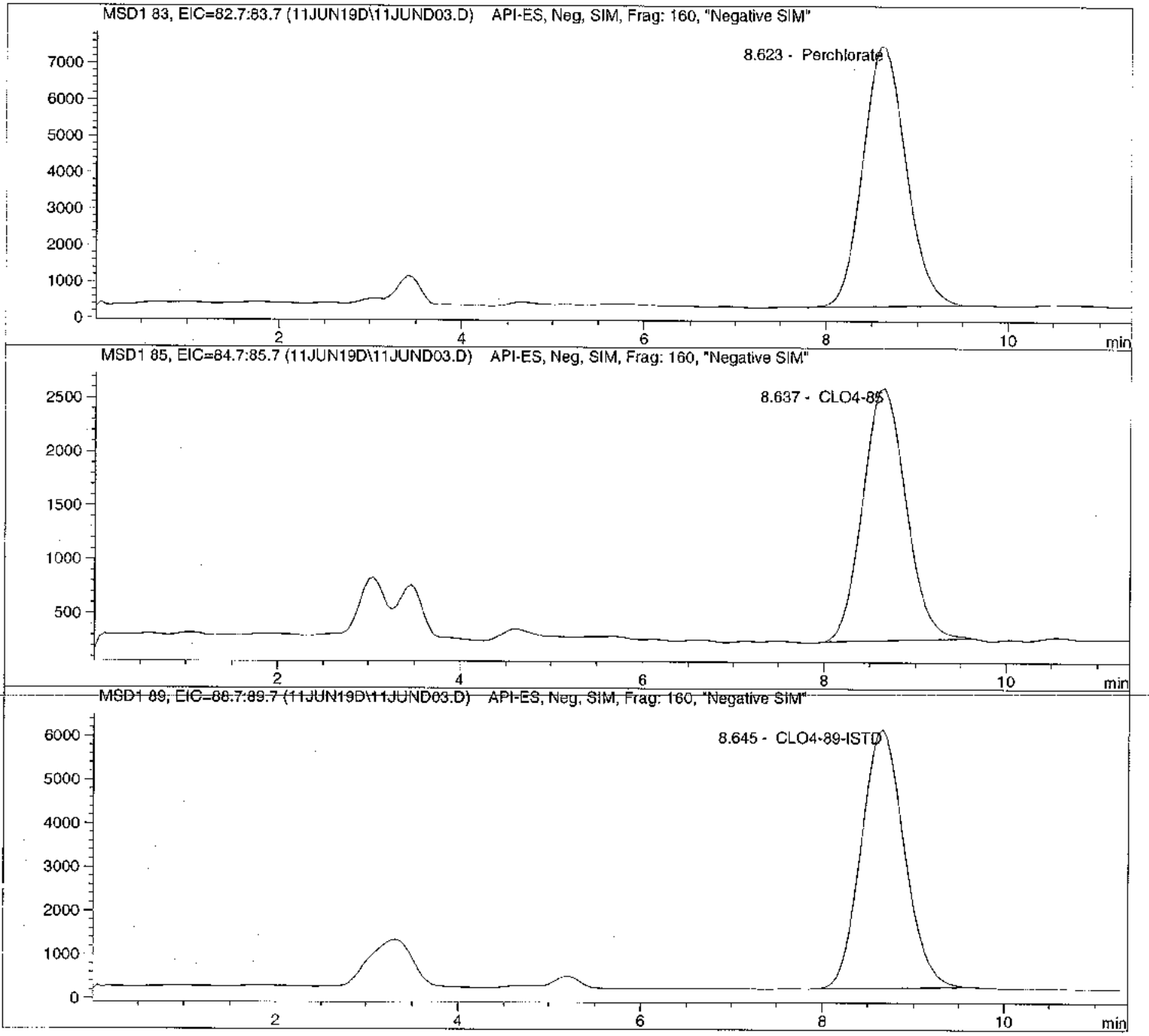
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND03.D Sample Name: 657796 ICS@4.0

Injection Date:	6/11/2019 09:18:21	Seq Line:	3
Sample Name:	657796 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.623	PBA	232261.2	3.9823	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.637	PBA	76292.0	4.2493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.645	PBA	192224.9	5.0000	CLO4-89-ISTD

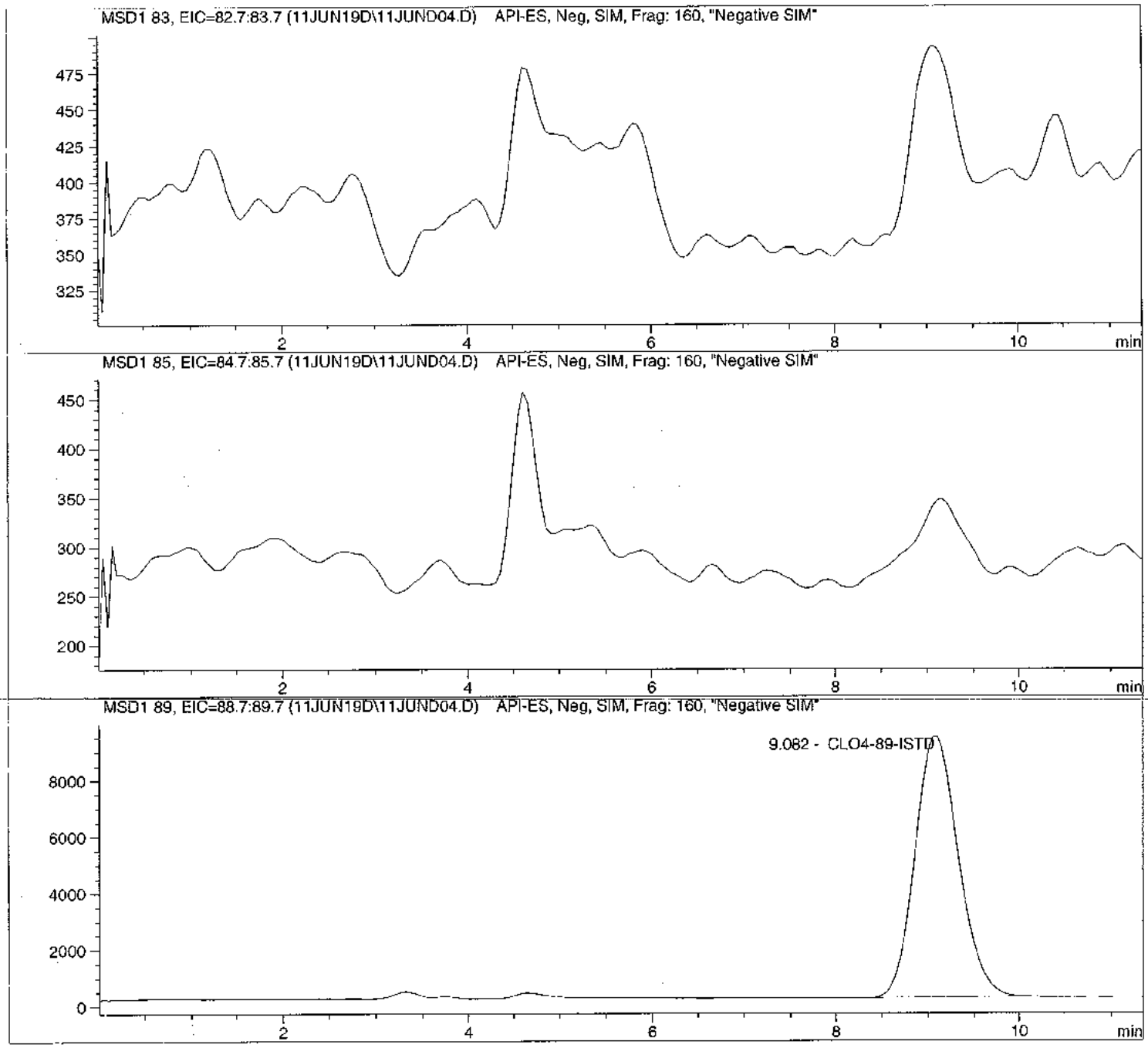
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND04.D Sample Name: 657797 LMB

Injection Date:	6/11/2019 09:31:47	Seq Line:	4
Sample Name:	657797 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.082	PBA	301883.5	5.0000	CLO4-89-ISTD

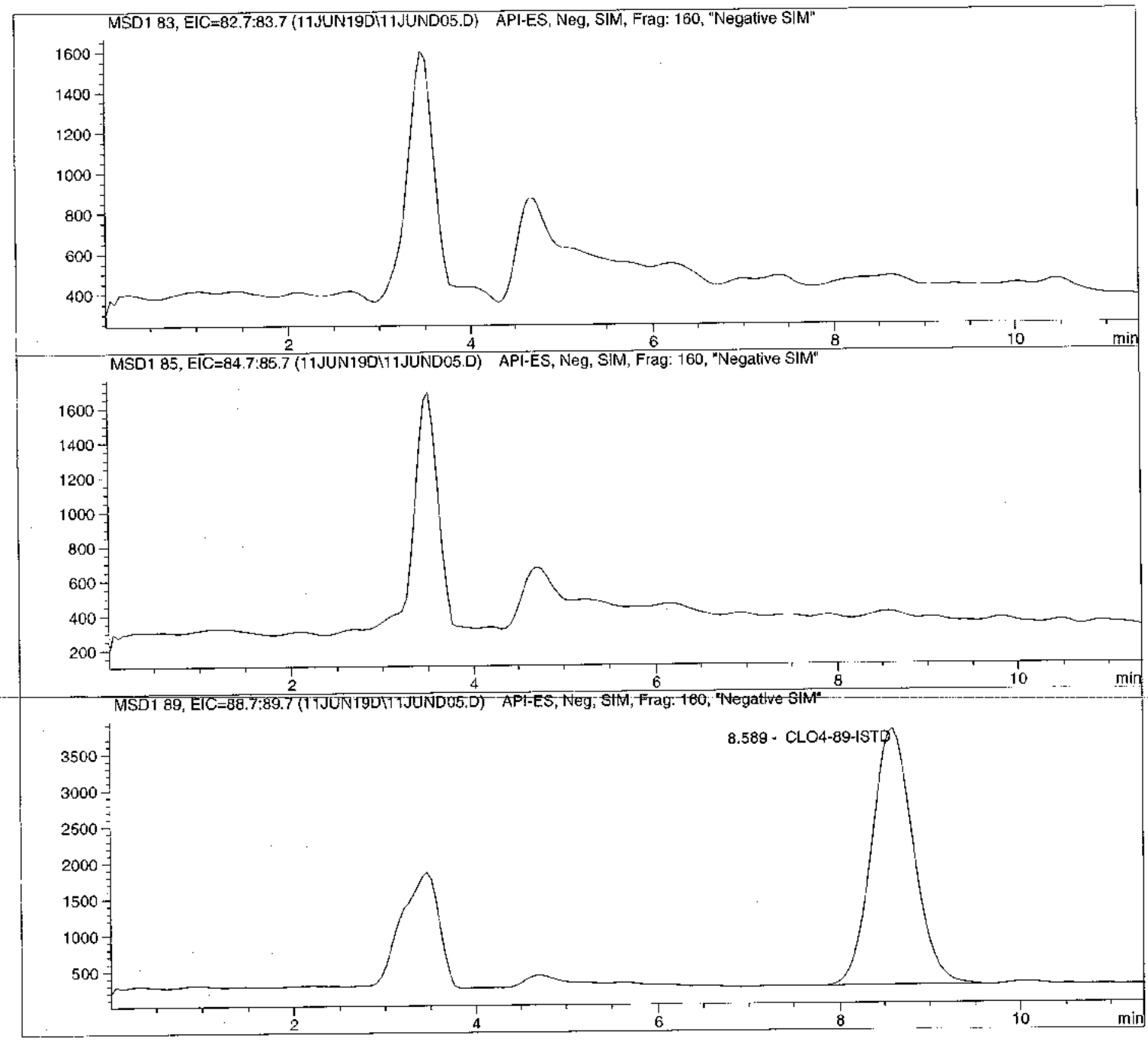
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND05.D Sample Name: 1915802001

Injection Date:	6/11/2019 09:45:13	Seq Line:	5
Sample Name:	1915802001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.589	PBA	112941.5	5.0000	CLO4-89-ISTD

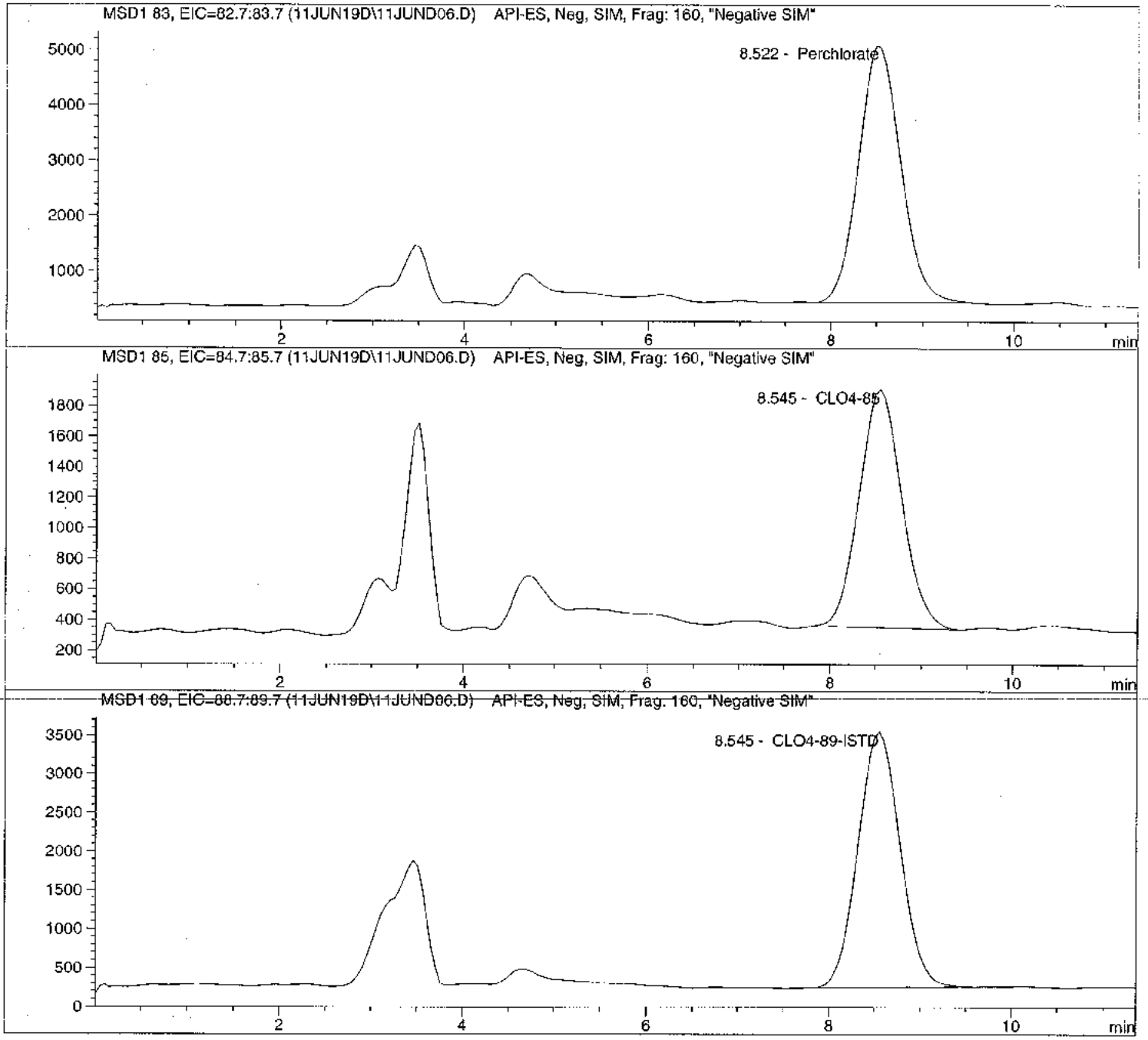
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND06.D Sample Name: 657799 158021S

Injection Date:	6/11/2019 09:58:38	Seq Line:	6
Sample Name:	657799 158021S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.522	BBA	146622.1	4.5674	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	50109.7	5.0958	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.545	PBA	105110.4	5.0000	CLO4-89-ISTD

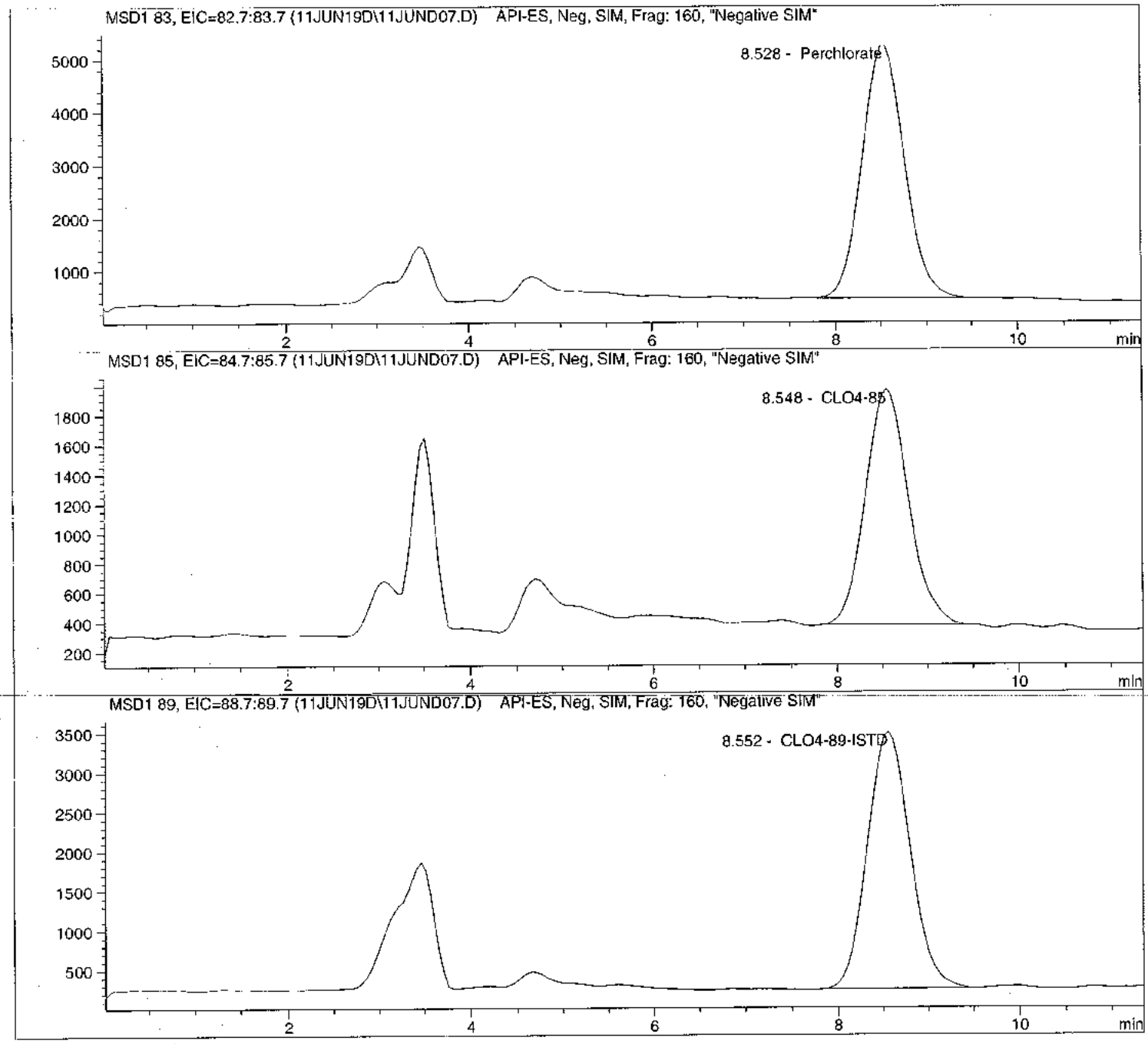
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND07.D Sample Name: 657800 158021D

Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	6/11/2019 10:12:09	Seq Line:	7
Sample Name:	657800 158021D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.528	BBA	154645.8	4.7847	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.548	PBA	52435.8	5.3052	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.552	PBA	105604.1	5.0000	CLO4-89-ISTD

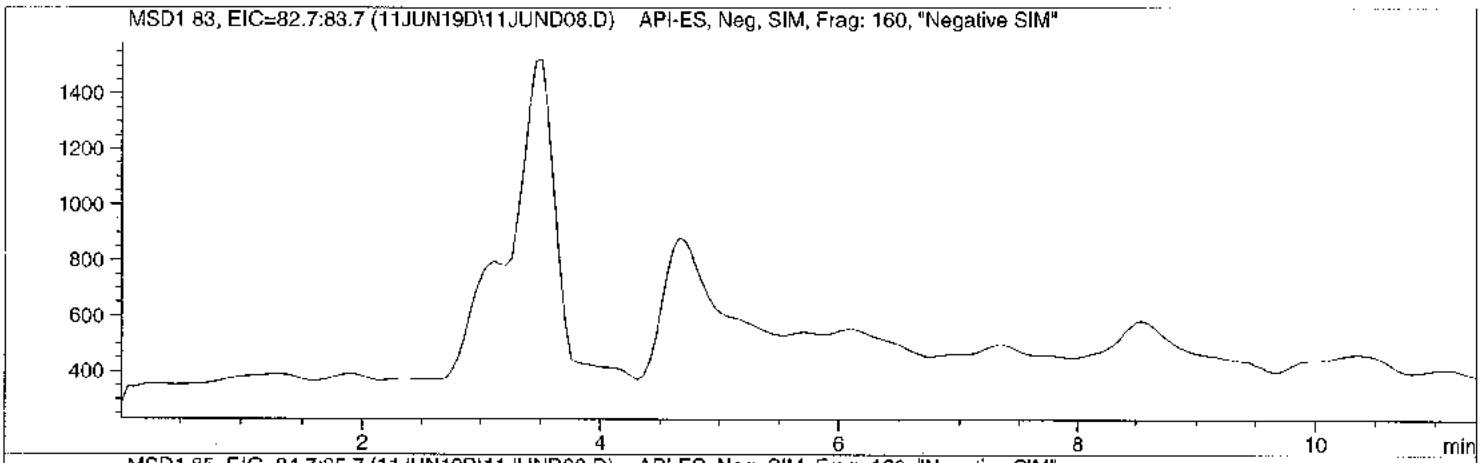
*** End of Report ***

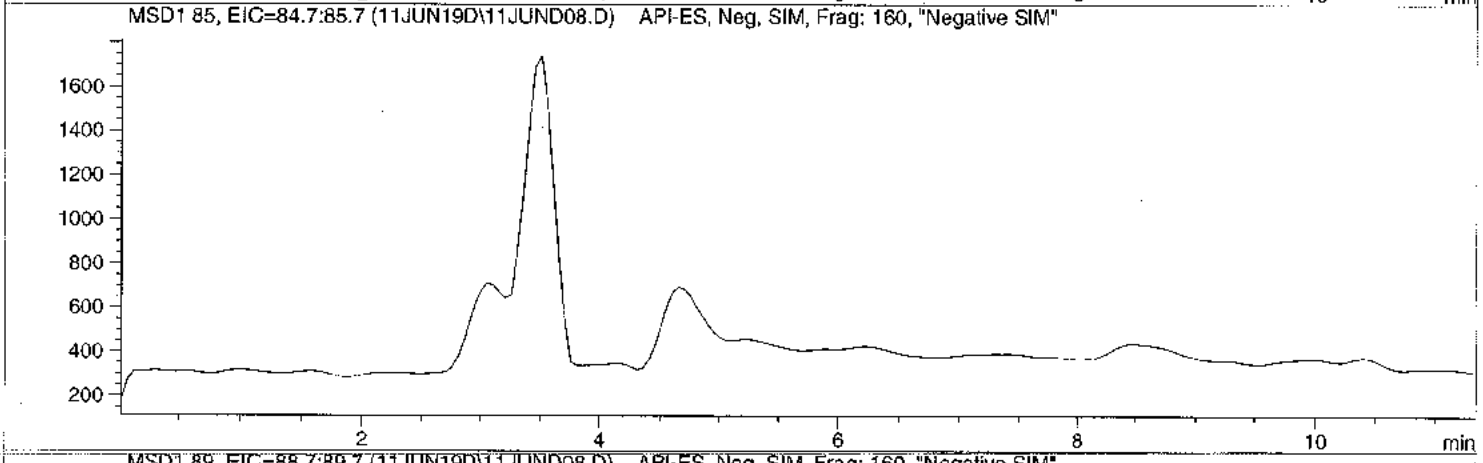
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

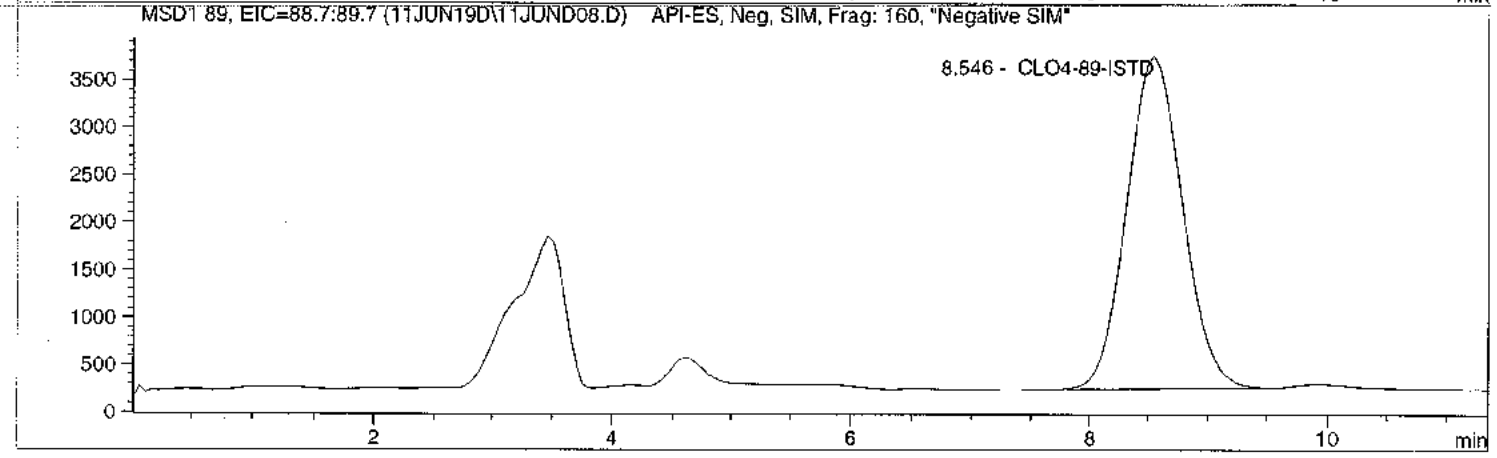
Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND08.D Sample Name: 1915803001

Injection Date:	6/11/2019 10:25:32	Seq Line:	8
Sample Name:	1915803001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.546	BBA	114182.4	5.0000	CLO4-89-ISTD

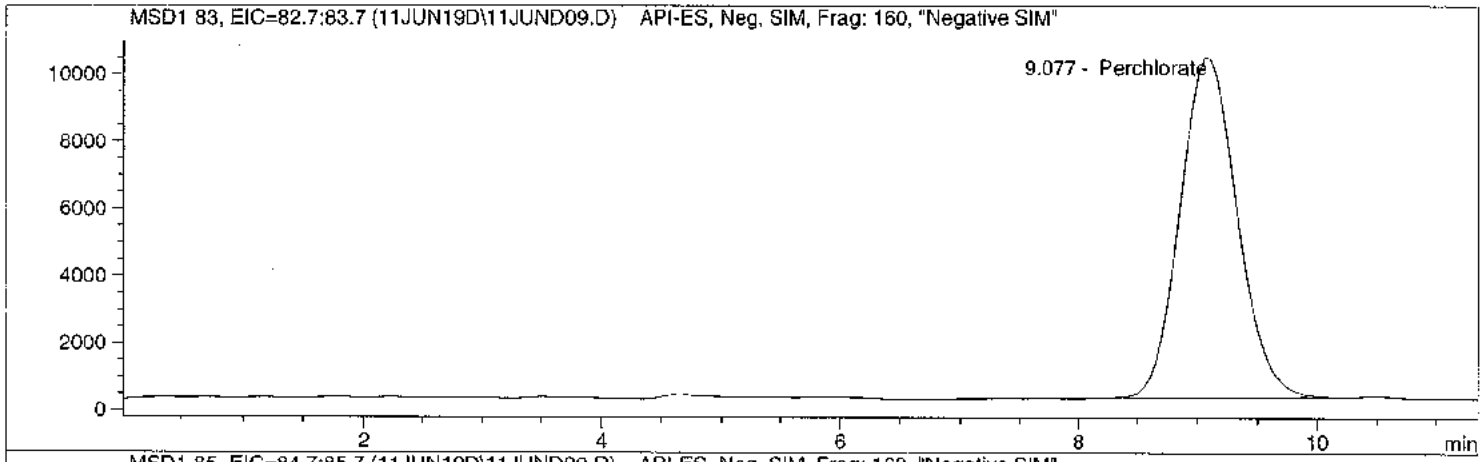
*** End of Report ***

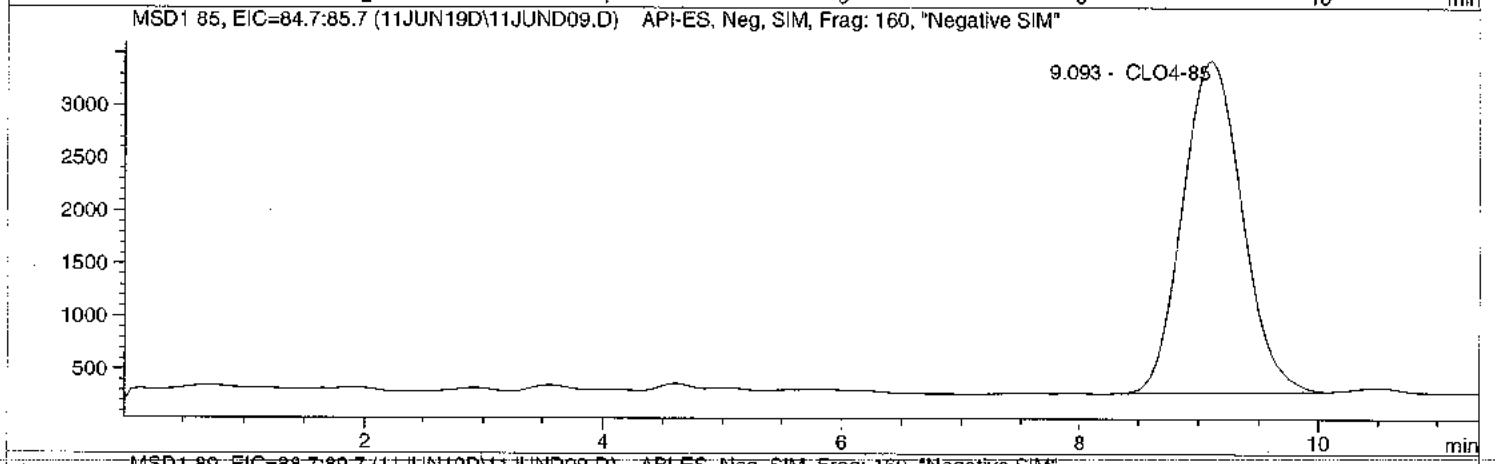
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

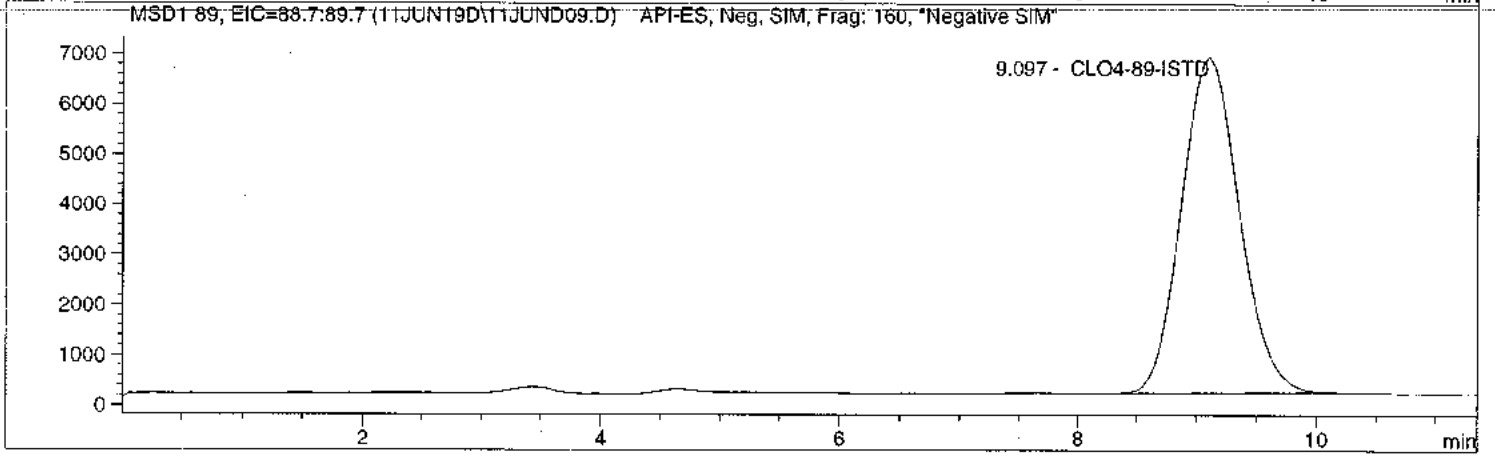
Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND09.D Sample Name: 1915852001 1K

Injection Date:	6/11/2019 10:38:54	Seq Line:	9
Sample Name:	1915852001 1K	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1000.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.077	BBA	332187.1	4885.0237	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.093	PBA	107205.2	5161.4923	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.097	PBA	221981.4	5000.0000	CLO4-89-ISTD

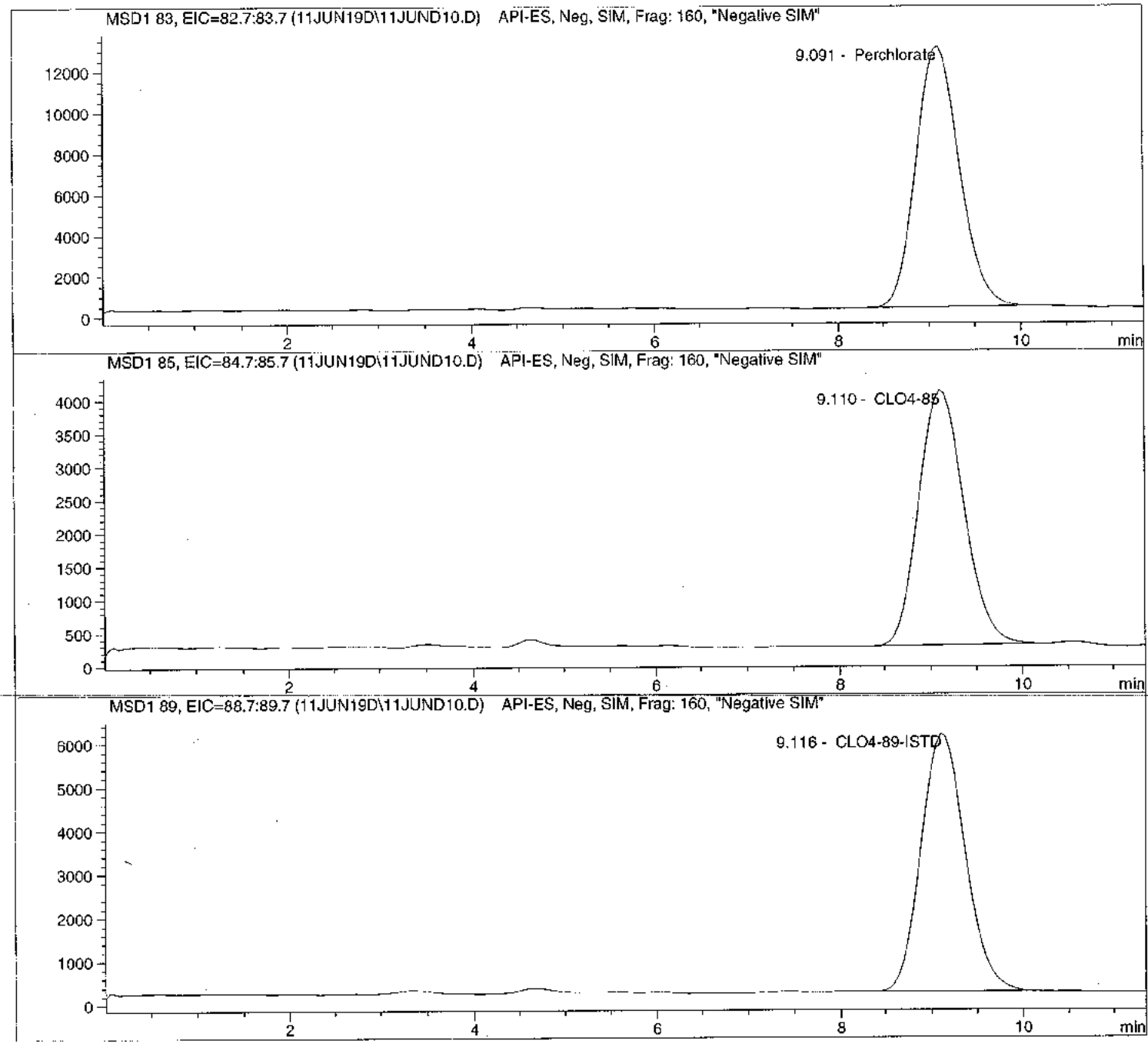
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND10.D Sample Name: 1916229001 1K

Injection Date:	6/11/2019 10:52:22	Seq Line:	10
Sample Name:	1916229001 1K	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.091	BBA	413978.8	6820.0559	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.110	PBA	130297.0	7096.6957	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.116	BBA	195449.6	5000.0000	CLO4-89-ISTD

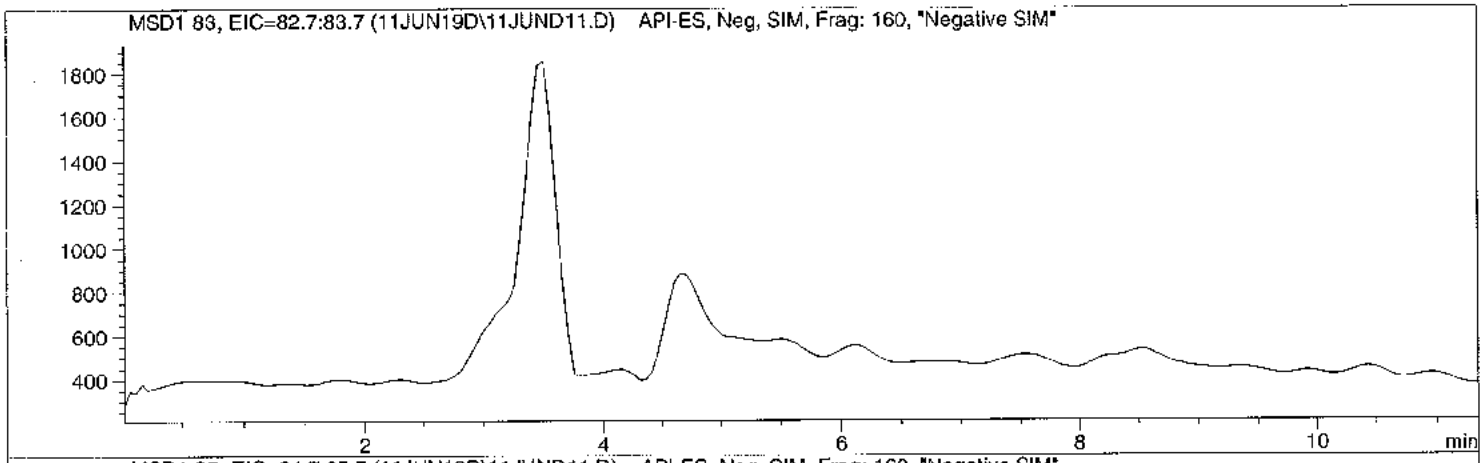
*** End of Report ***

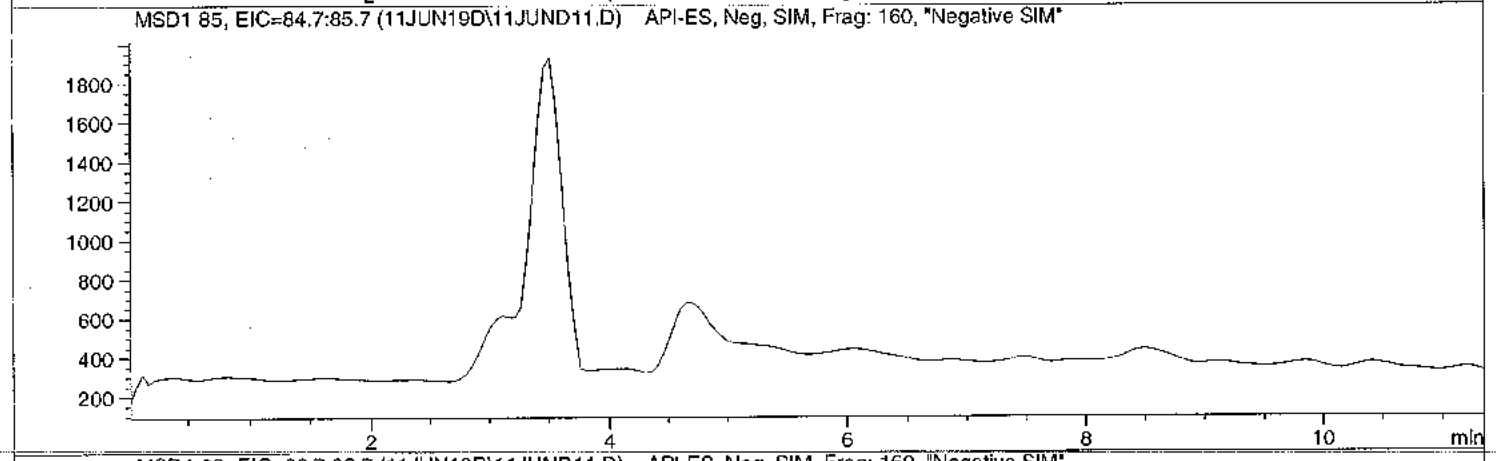
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

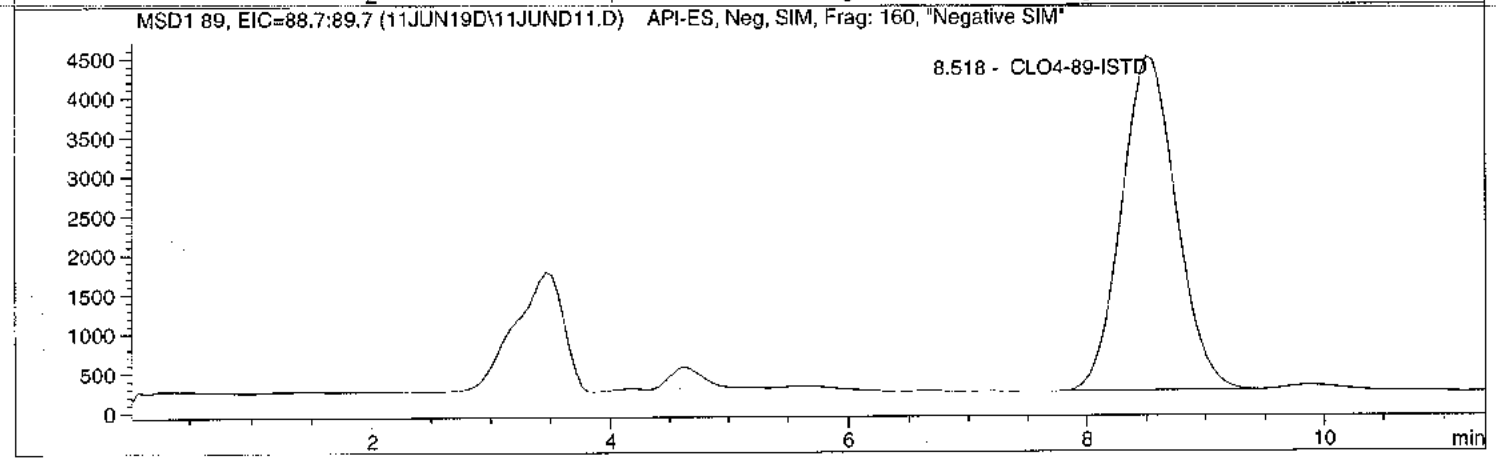
Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND11.D Sample Name: 1916231001

Injection Date:	6/11/2019 11:05:44	Seq Line:	11
Sample Name:	1916231001	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.518	PBA	133827.9	5.0000	CLO4-89-ISTD

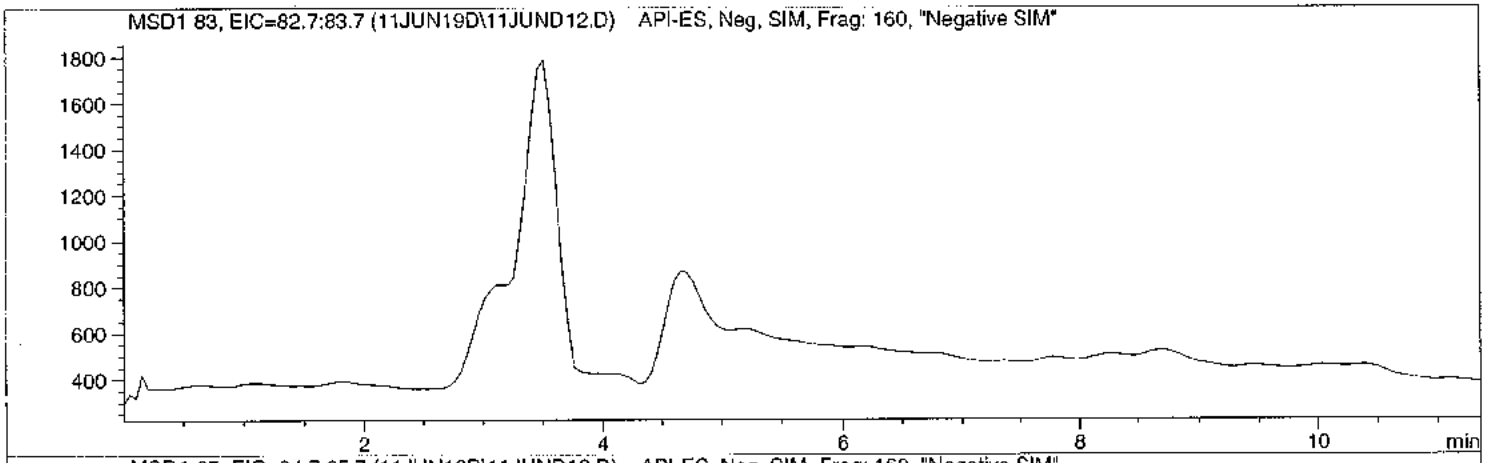
*** End of Report ***

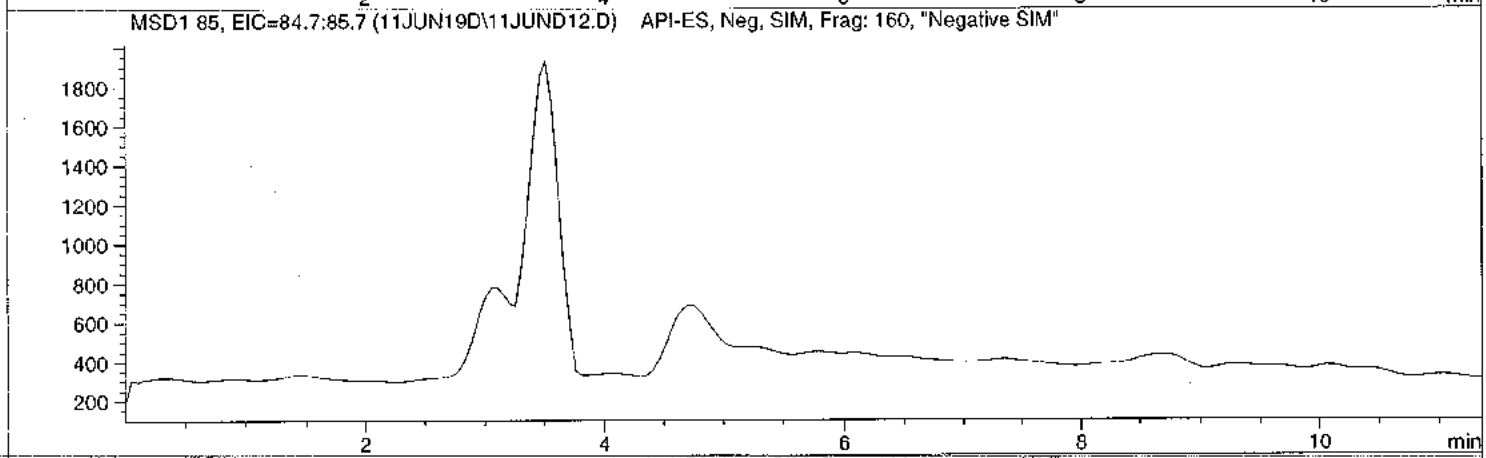
Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

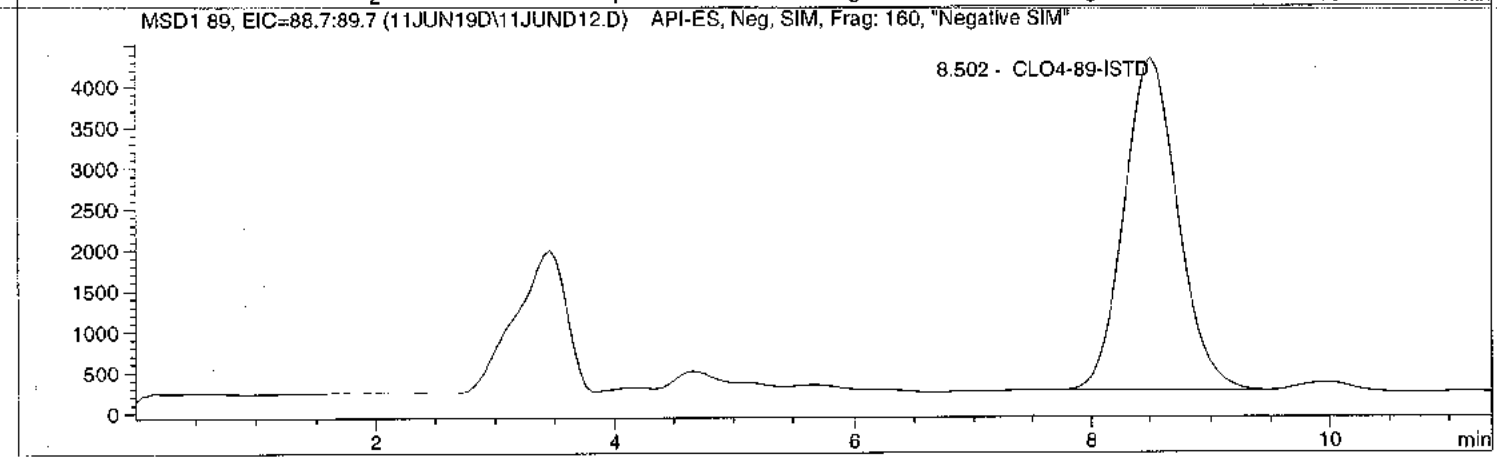
Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND12.D Sample Name: 1916232001

Injection Date:	6/11/2019 11:19:06	Seq Line:	12
Sample Name:	1916232001	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	BBA	127033.7	5.0000	CLO4-89-ISTD

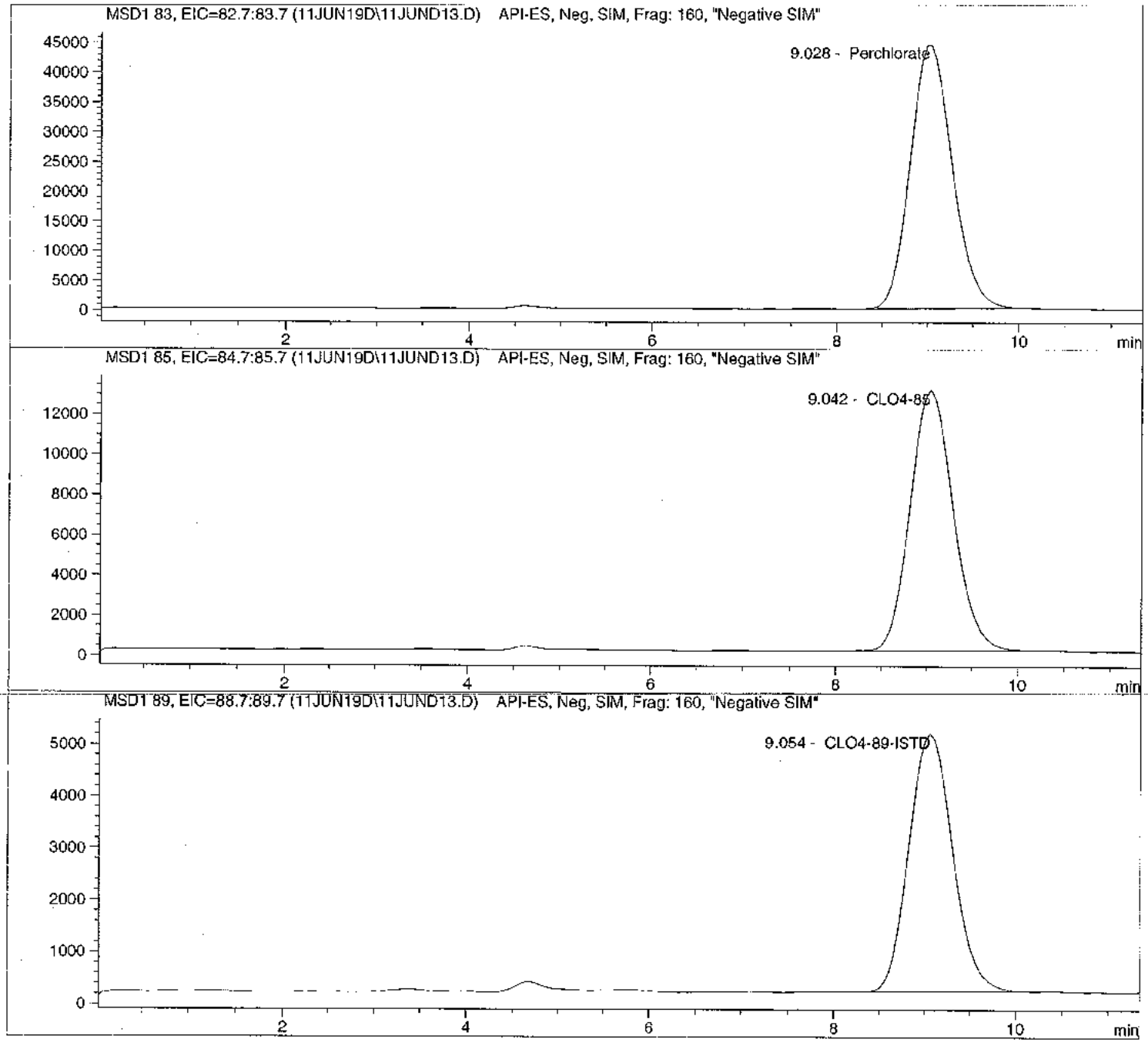
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUN19D\11JUND13.D Sample Name: 657801 CCV@25

Injection Date:	6/11/2019 11:34:17	Seq Line:	13
Sample Name:	657801 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.028	PBA	1423337.3	25.9807	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.042	BBA	426236.8	26.2061	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.054	BBA	166286.8	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

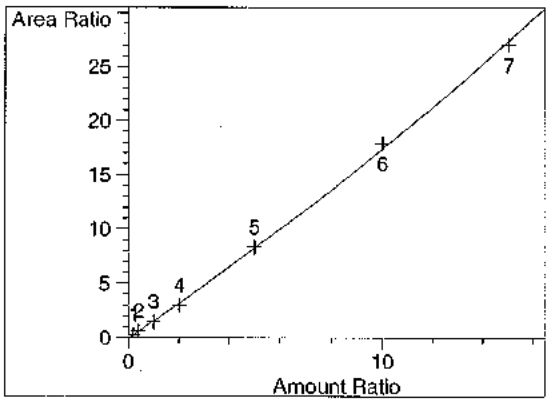
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

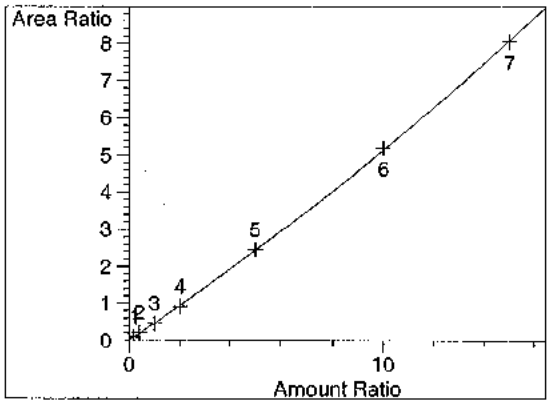
Peak Sum Table

No Entries in table

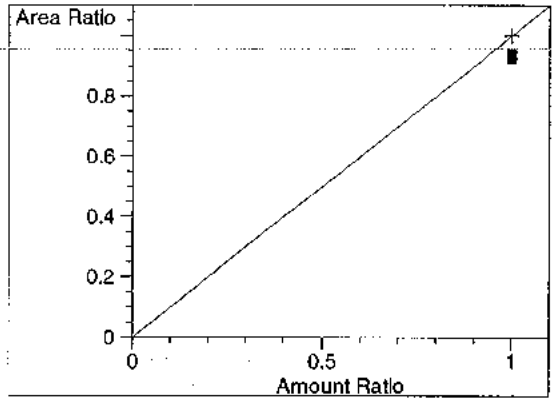
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

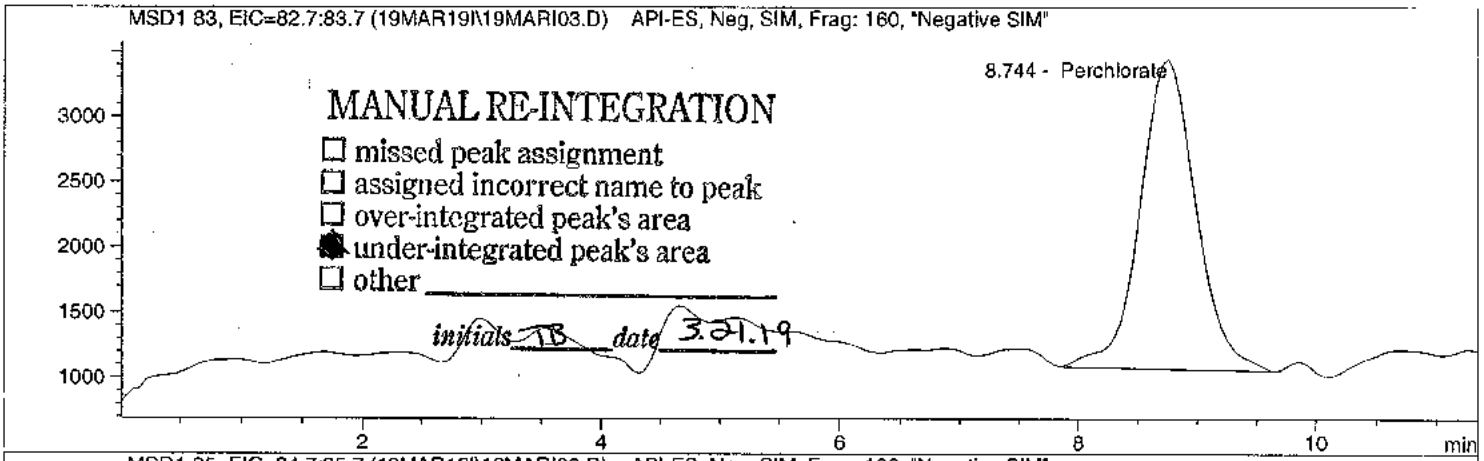
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

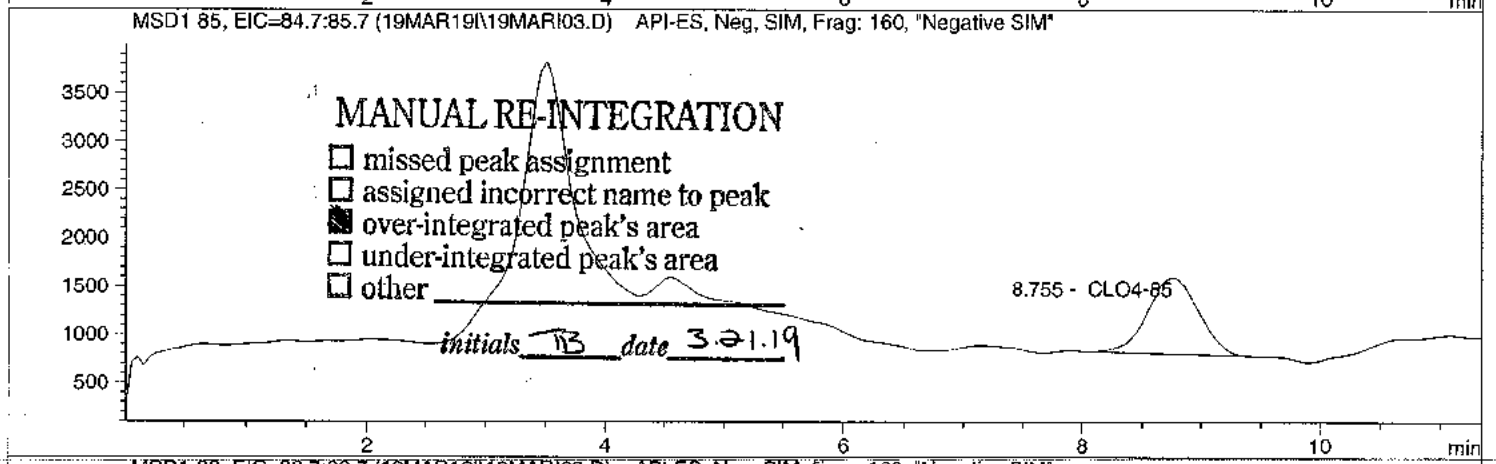
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

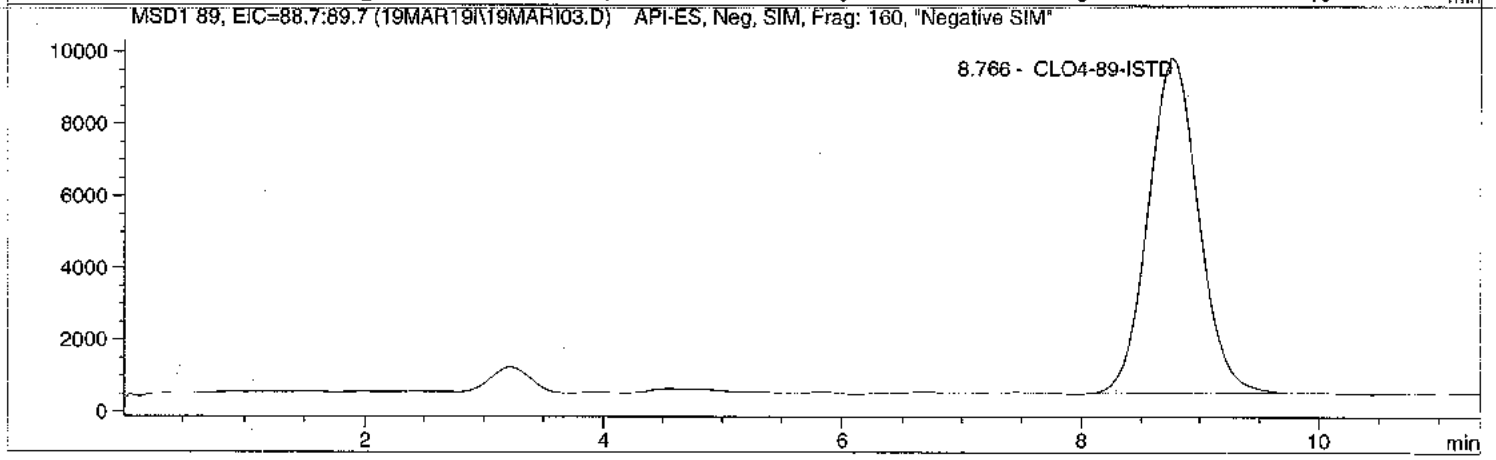
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

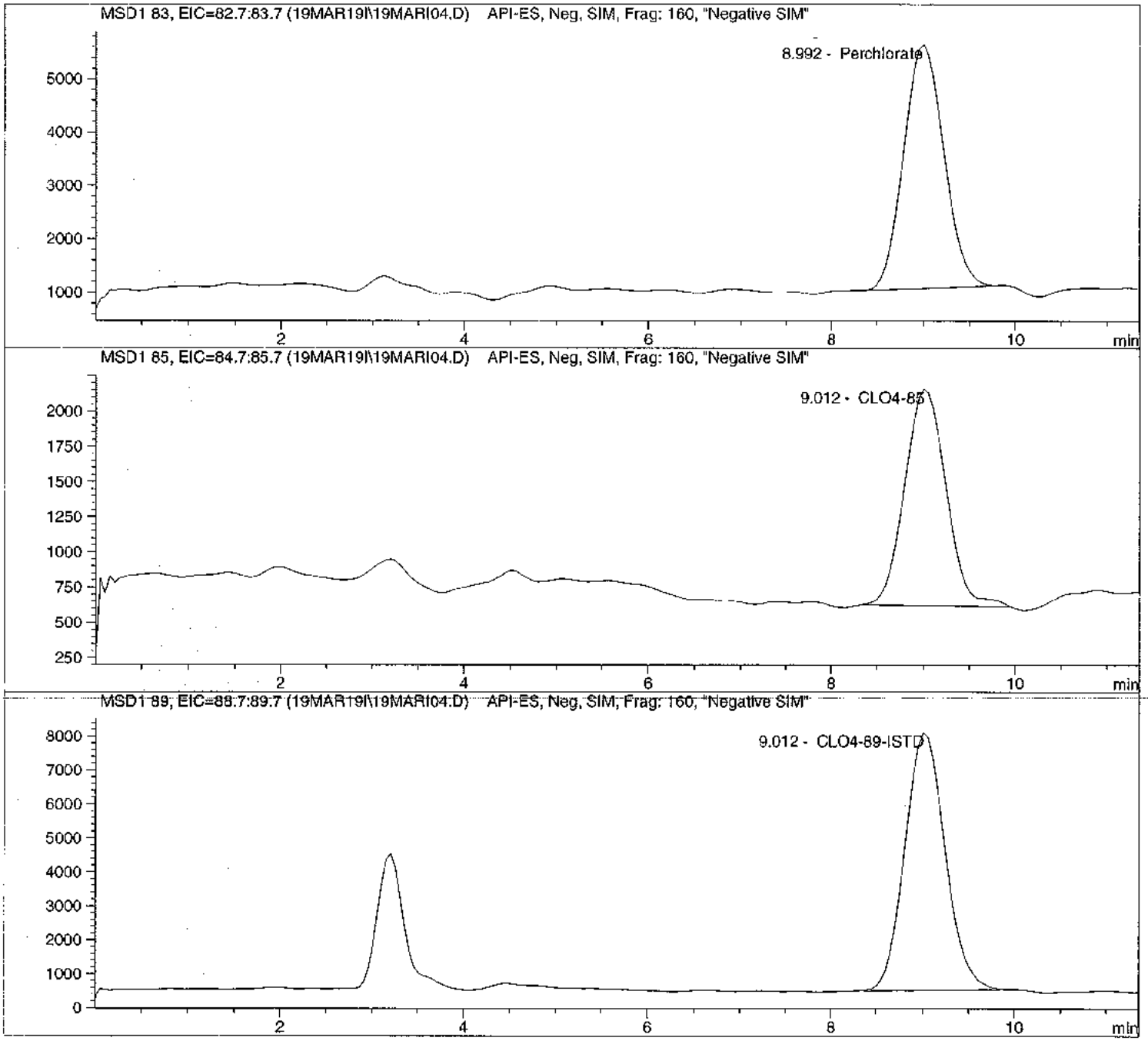
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

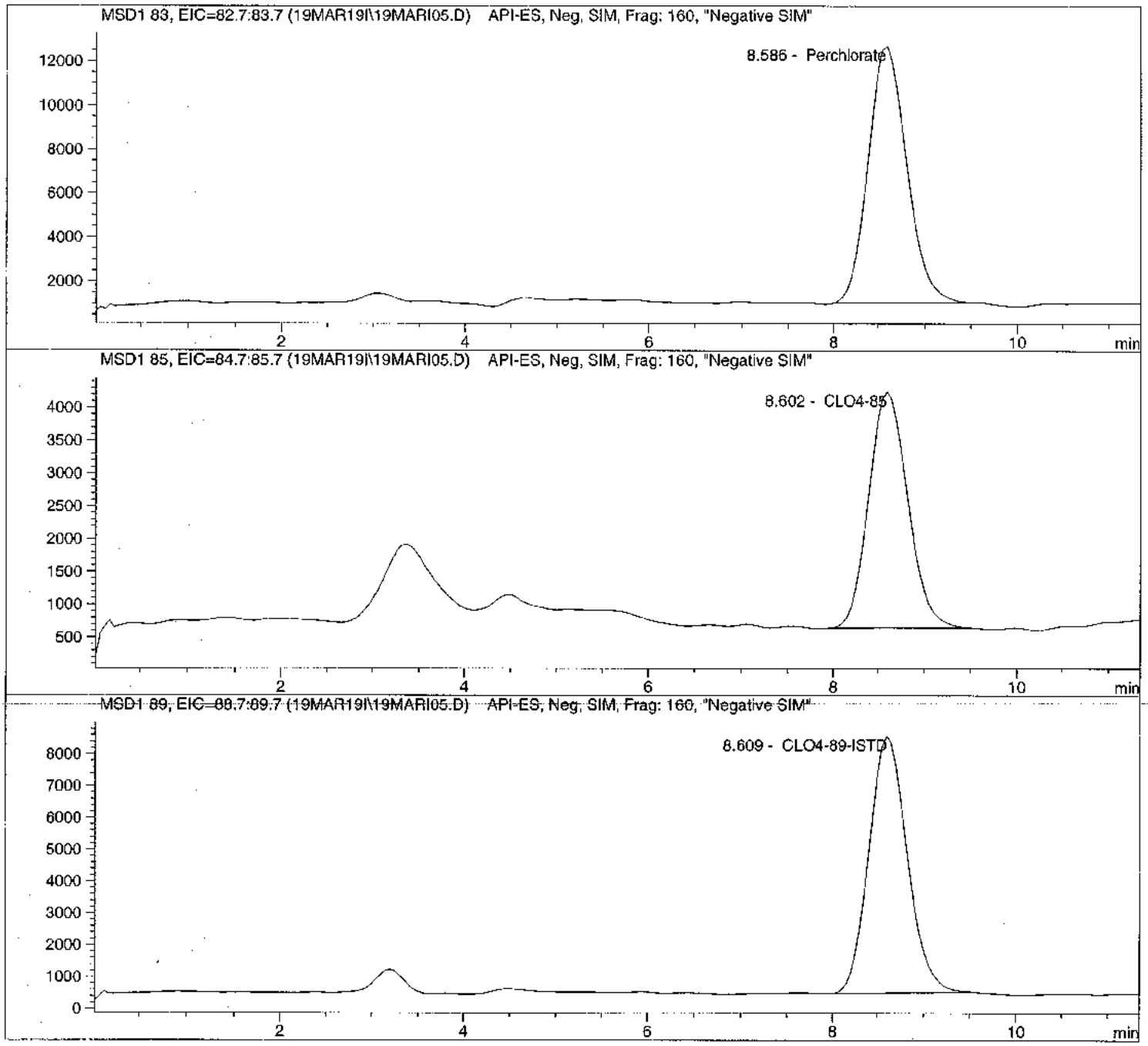
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

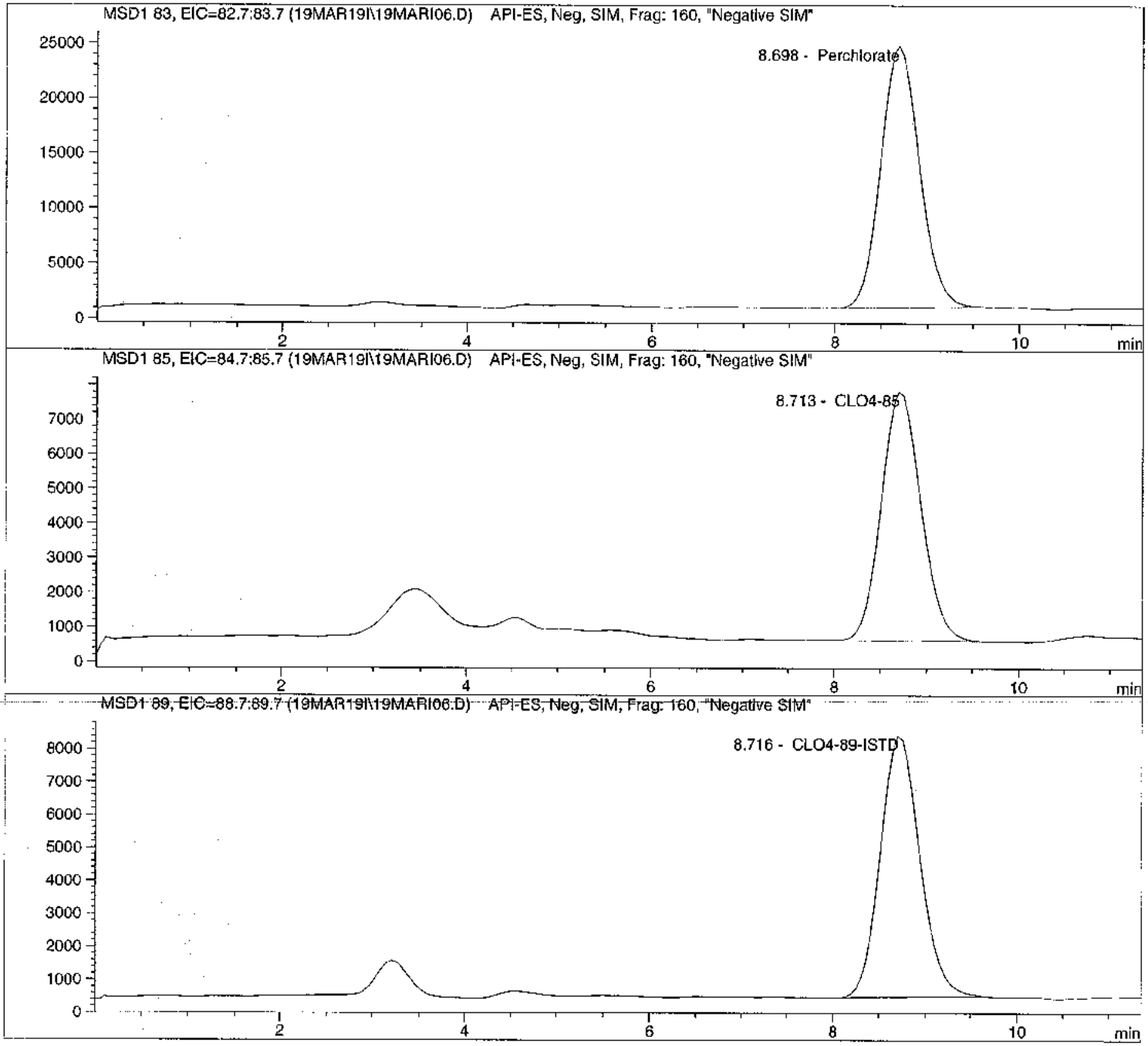
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

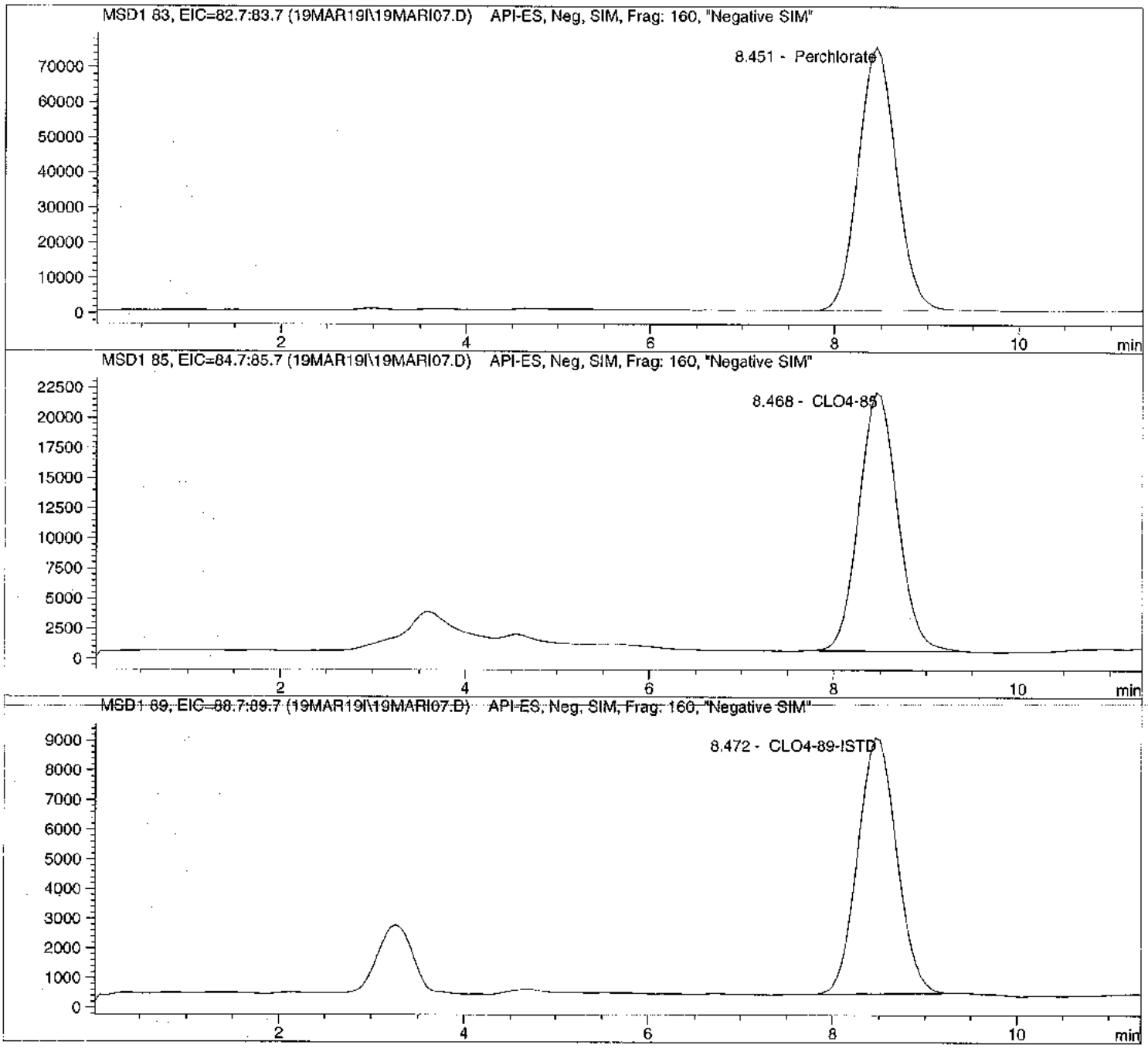
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

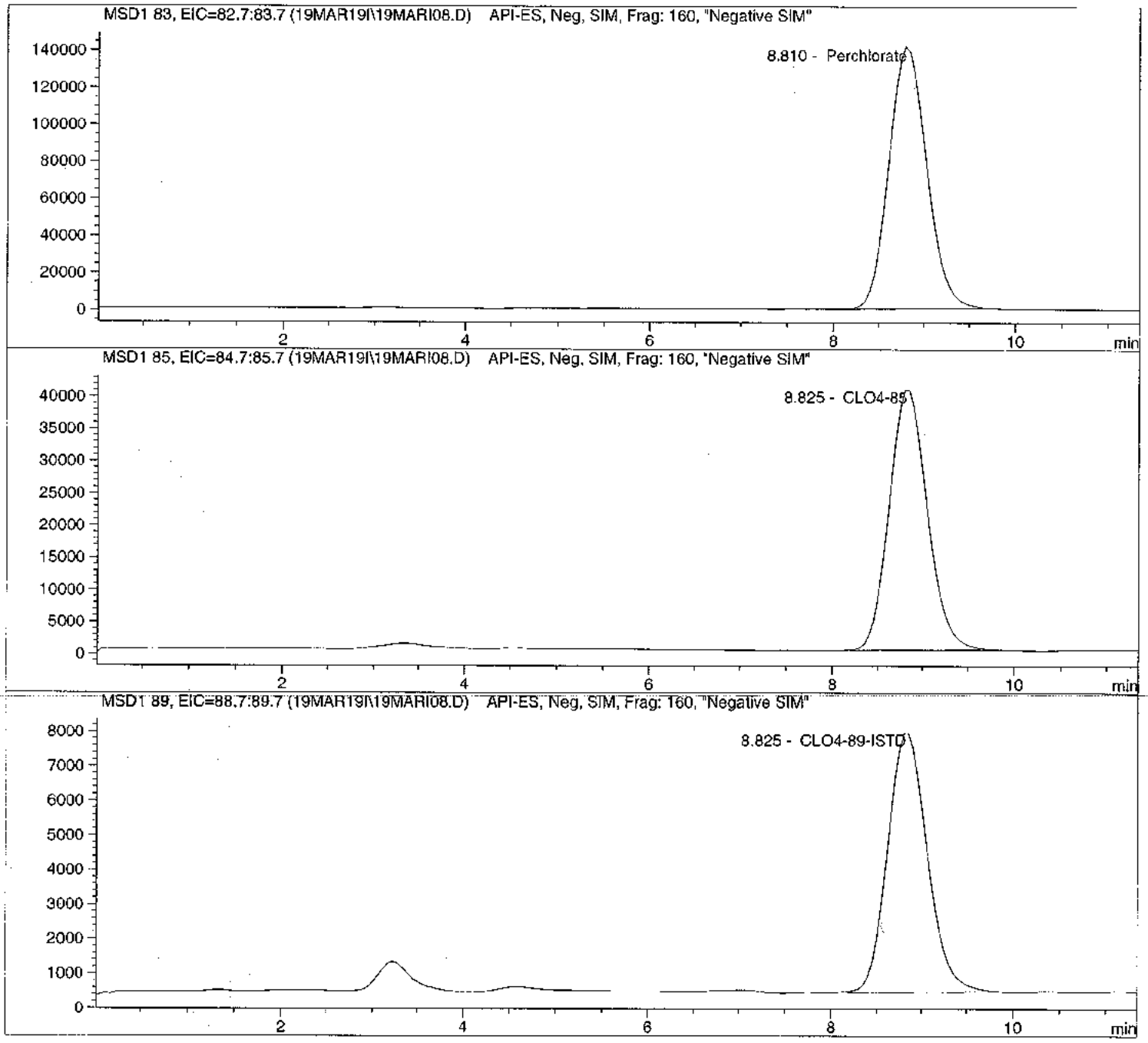
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

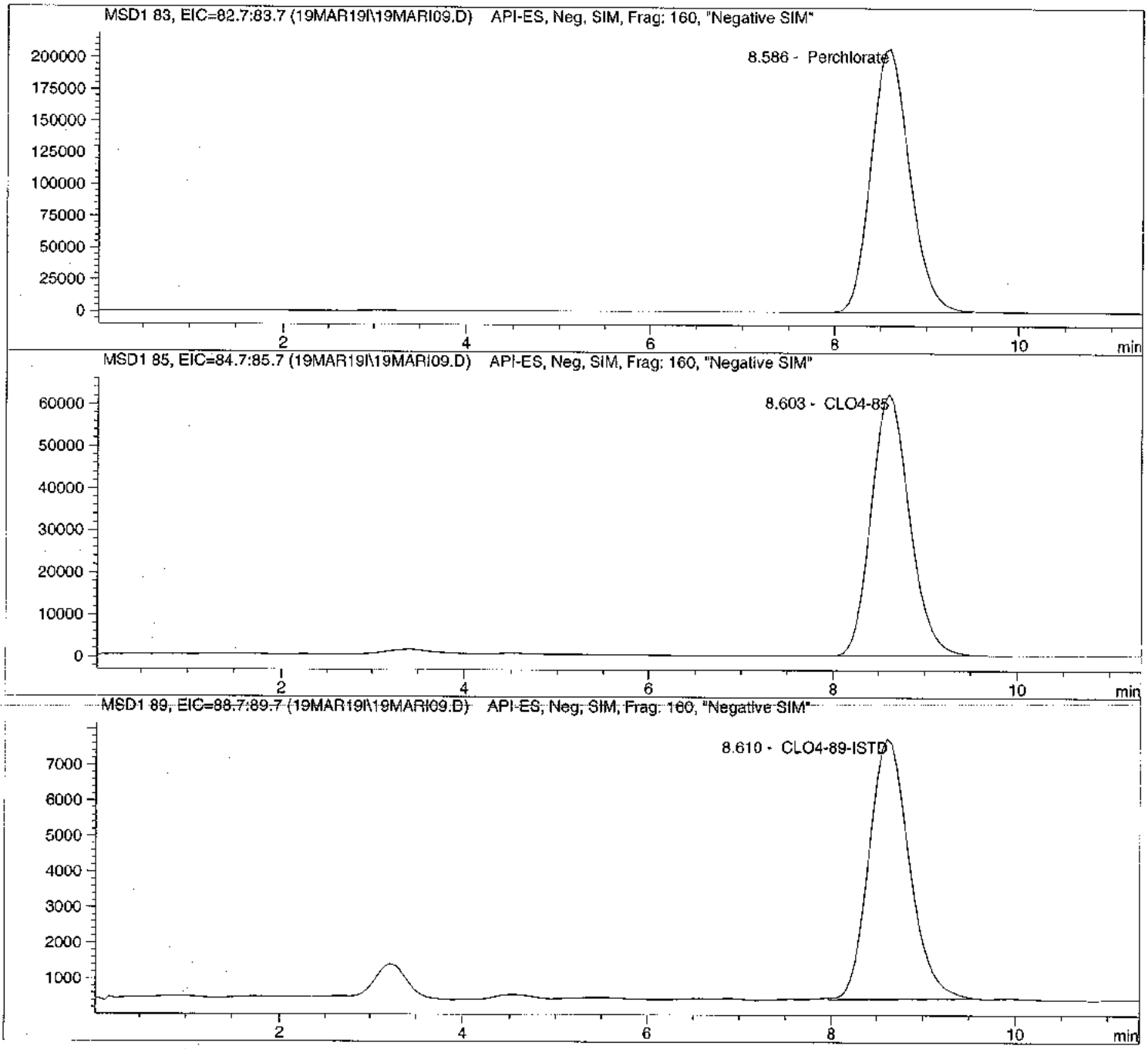
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

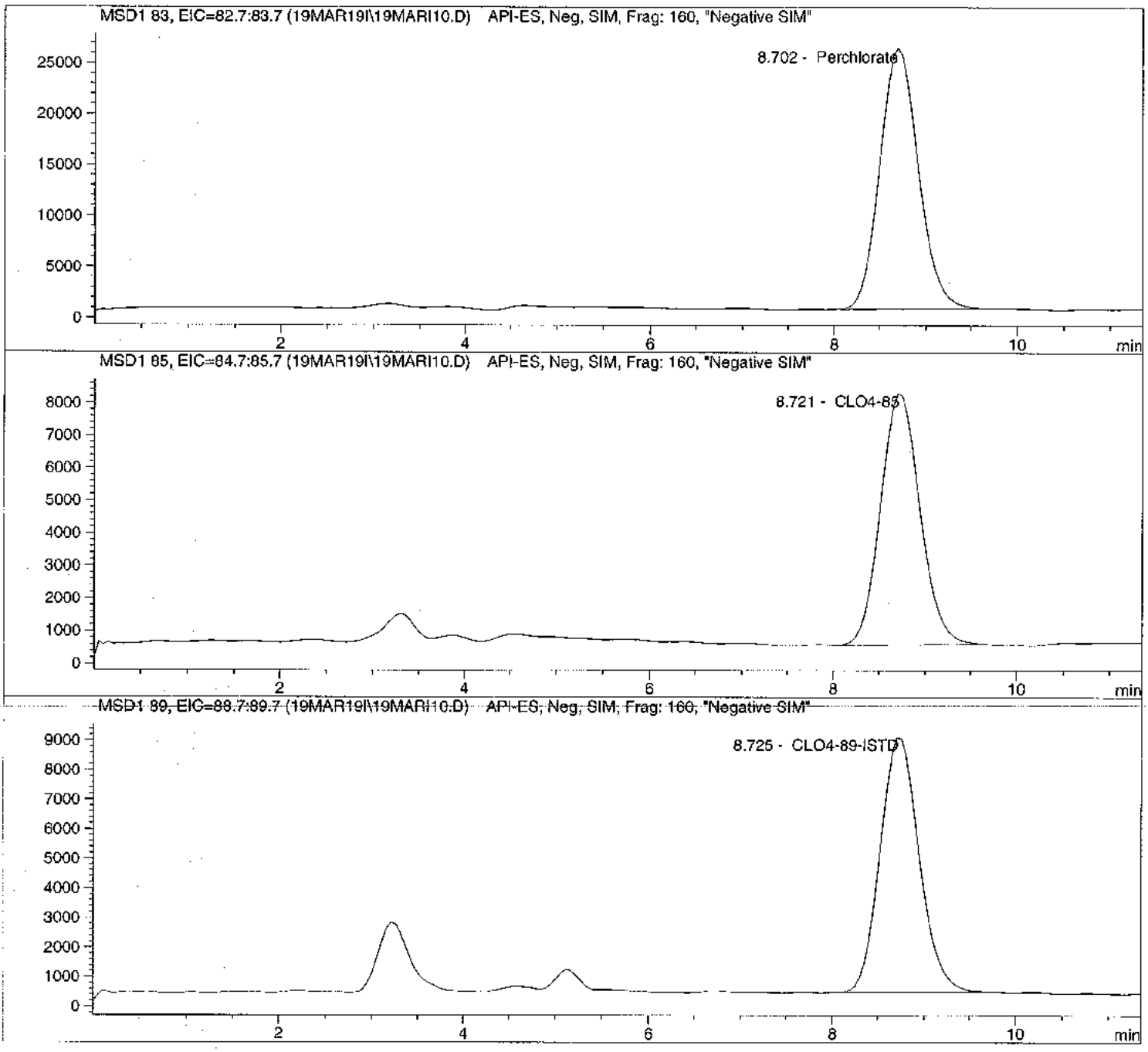
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

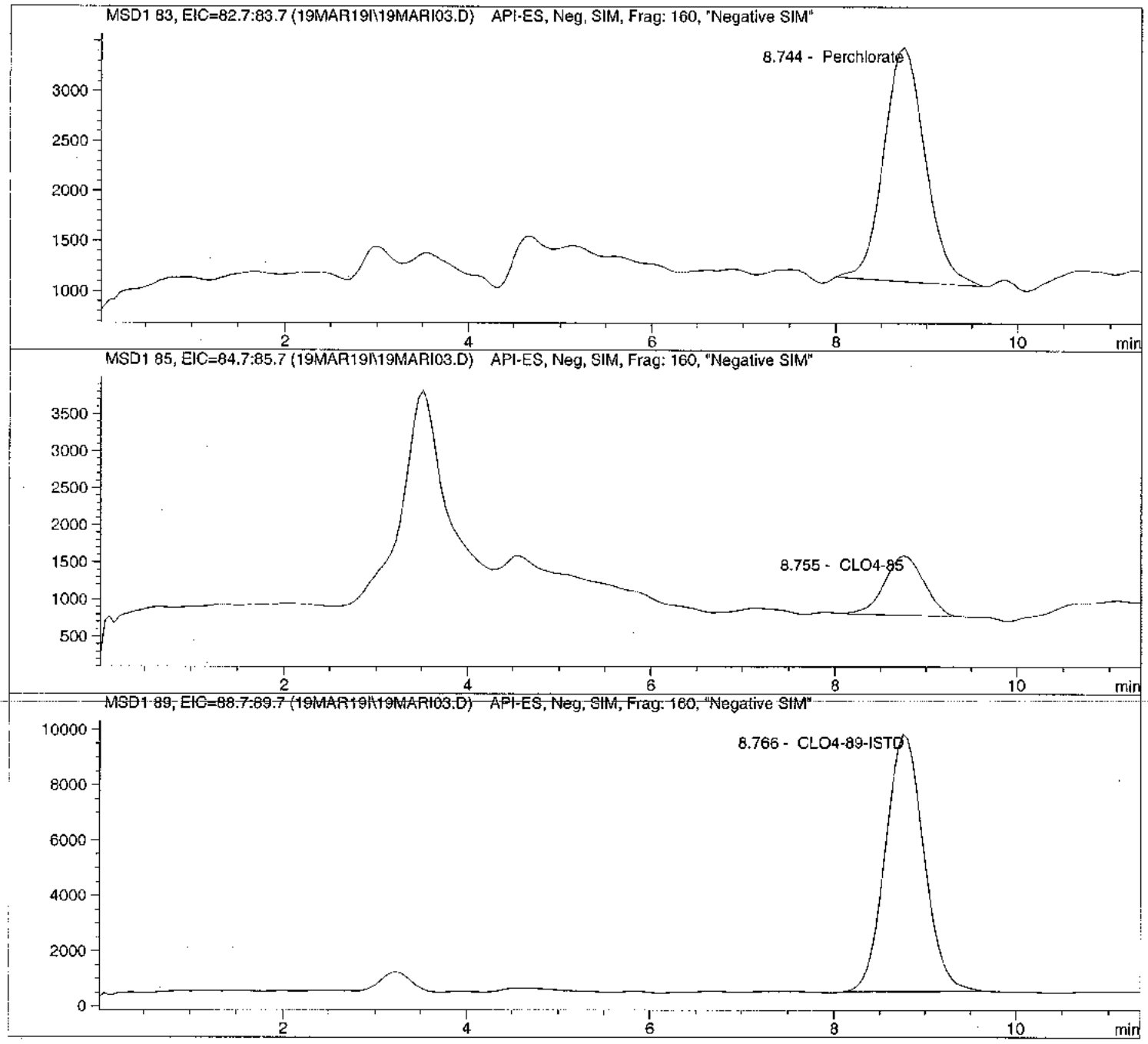
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

July 03, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19060672**

Laboratory Results for: **LH18/24 Longhorn GW Treatment Plant Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Jun 13, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 03-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19060672

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060672-01	LH18/24-SP650_061219	Water		12-Jun-2019 14:00	13-Jun-2019 08:45	☐
HS19060672-02	LH18/24-SP650_061219_BIX	Water		12-Jun-2019 14:00	13-Jun-2019 08:45	☐

ALS Houston, US Date: 03-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order:

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

  The analysis for TOC was subcontracted to ALS Kelso, WA. Final report attached.

WetChemistry by Method E350.3

Batch ID: R340700

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

WetChemistry by Method E365.3

Batch ID: R340526

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 03-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19060672

Sample ID: LH18/24-SP650_061219 Lab ID:HS19060672-01

Collection Date: 12-Jun-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
AMMONIA AS N BY E350.3(ISE)		**Method:E350.3**						Analyst: RG
Nitrogen, Ammonia (As N)	**10.0**		**0.20**	**0.10**	**0.20**	**mg/L**	1	18-Jun-2019 11:15
ORTHO PHOSPHATE (PO4) AS P BY E365.3		**Method:E365.3**						Analyst: MZD
Phosphorus, Total Orthophosphate (As P)	**2.37**		**0.100**	**0.200**	**0.250**	**mg/L**	10	14-Jun-2019 11:52
SUBCONTRACT ANALYSIS - TOC ANALYSIS		**Method:NA**						Analyst: SUBK
Subcontract Analysis	See Attached		0	0		NA	1	27-Jun-2019 12:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 03-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples WorkOrder:HS19060672

Sample ID: LH18/24-SP650_061219_BIX Lab ID:HS19060672-02

Collection Date: 12-Jun-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 03-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19060672

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R340526	**Test Name :** ORTHO PHOSPHATE (PO4) AS P BY E365.3			**Matrix:** Water		
HS19060672-01	LH18/24-SP650_061219	12 Jun 2019 14:00			14 Jun 2019 11:52	10
Batch ID R340700	**Test Name :** AMMONIA AS N BY E350.3(ISE)			**Matrix:** Water		
HS19060672-01	LH18/24-SP650_061219	12 Jun 2019 14:00			18 Jun 2019 11:15	1
Batch ID R341377	**Test Name :** SUBCONTRACT ANALYSIS - TOC ANALYSIS			**Matrix:** Water		
HS19060672-01	LH18/24-SP650_061219	12 Jun 2019 14:00			27 Jun 2019 12:27	1
Batch ID R341759	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)			**Matrix:** Water		
HS19060672-02	LH18/24-SP650_061219_BIX	12 Jun 2019 14:00			03 Jul 2019 09:32	1

ALS Houston, US Date: 03-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19060672

QC BATCH REPORT

Batch ID: R340526 (0) **Instrument: UV-2450** **Method: ORTHO PHOSPHATE (PO4) AS P BY E365.3**

MBLK Sample ID: **MBLK-340526** Units: **mg/L** Analysis Date: **14-Jun-2019 11:52**
Client ID: Run ID: **UV-2450_340526** SeqNo: **5122835** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.0200	0.0250								U

LCS Sample ID: **LCS-340526** Units: **mg/L** Analysis Date: **14-Jun-2019 11:52**
Client ID: Run ID: **UV-2450_340526** SeqNo: **5122836** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	0.238	0.0250	0.25	0	95.2	85 - 115				

MS Sample ID: **HS19060672-01MS** Units: **mg/L** Analysis Date: **14-Jun-2019 11:52**
Client ID: **LH18/24-SP650_061219** Run ID: **UV-2450_340526** SeqNo: **5122838** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	4.55	0.250	2.5	2.37	87.2	80 - 120				

MSD Sample ID: **HS19060672-01MSD** Units: **mg/L** Analysis Date: **14-Jun-2019 11:52**
Client ID: **LH18/24-SP650_061219** Run ID: **UV-2450_340526** SeqNo: **5122839** PrepDate: DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Phosphorus, Total Orthophosphate (As P)	4.63	0.250	2.5	2.37	90.4	80 - 120	4.55	1.74	20	

The following samples were analyzed in this batch: HS19060672-01

ALS Houston, US Date: 03-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: HS19060672

QC BATCH REPORT

Batch ID: R340700 (0) **Instrument: WetChem_HS** **Method: AMMONIA AS N BY E350.3(ISE)**

MBLK Sample ID: **MBLK-R340700** Units: **mg/L** Analysis Date: **18-Jun-2019 11:15**
Client ID: Run ID: **WetChem_HS_340700** SeqNo: **5127307** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	0.10	0.20								U

LCS Sample ID: **LCS-R340700** Units: **mg/L** Analysis Date: **18-Jun-2019 11:15**
Client ID: Run ID: **WetChem_HS_340700** SeqNo: **5127306** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.17	0.20	10	0	102	80 - 120				

MS Sample ID: **HS19060356-01MS** Units: **mg/L** Analysis Date: **18-Jun-2019 11:15**
Client ID: Run ID: **WetChem_HS_340700** SeqNo: **5127309** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.18	0.20	10	0.2194	99.6	80 - 120				

MSD Sample ID: **HS19060356-01MSD** Units: **mg/L** Analysis Date: **18-Jun-2019 11:15**
Client ID: Run ID: **WetChem_HS_340700** SeqNo: **5127308** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Nitrogen, Ammonia (As N)	10.28	0.20	10	0.2194	101	80 - 120	10.18	0.978	20	

The following samples were analyzed in this batch: HS19060672-01

ALS Houston, US Date: 03-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
WorkOrder: **HS19060672**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 03-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LH18/24 Longhorn GW Treatment Plant Weekly Samples
Work Order: HS19060672

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19060672-01	LH18/24-SP650_061219	Login	13/06/2019 16:48:39	JRM	WET286
HS19060672-01	LH18/24-SP650_061219	Login	13/06/2019 16:48:39	JRM	WET286
HS19060672-01	LH18/24-SP650_061219	Login	13/06/2019 16:48:39	JRM	Sub
HS19060672-02	LH18/24-SP650_061219_BIX	Login	13/06/2019 16:48:39	JRM	Sub

ALS Houston, US Date: 03-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060672
Date/Time Received: **13-Jun-2019 08:45**
Received by: **NDD**

Checklist completed by: *Jared R. Makan* eSignature 14-Jun-2019 Date
Reviewed by: *Corey Grandits* eSignature 14-Jun-2019 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.8c/1.8c UC/C	IR25	
Cooler(s)/Kit(s):	25344		
Date/Time sample(s) sent to storage:	06/13/2019 17:00		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210 Houston, TX. 77099 (281) 530-5656 ATTN: R.J Modshia

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No.
NWO1312.0150.0
16.0001

Job:
GROUNDWATER TREATMENT PLANT WEEKLY SAMPLES

Prepared By:
Scott Beesinger

P.O. Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: AMMONIA-N	TOTAL ORGANIC CARBON	ORTHO-PHOSPHATE	PERCHLORATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_061219	Water	06/12/19 / 14:00		2	X	X			H2SO4	
LH18/24-SP650_061219	Water	06/12/19 / 14:00		1			X		NONE	
LH18/24-SP650_061219_BIX	Water	06/12/19 / 14:00		1				X	NONE	

Additional Remarks: **Standard TAT on all parameters**

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	06/12/19	14:30	ND	6/13/19	08:45						

For Lab Use Only

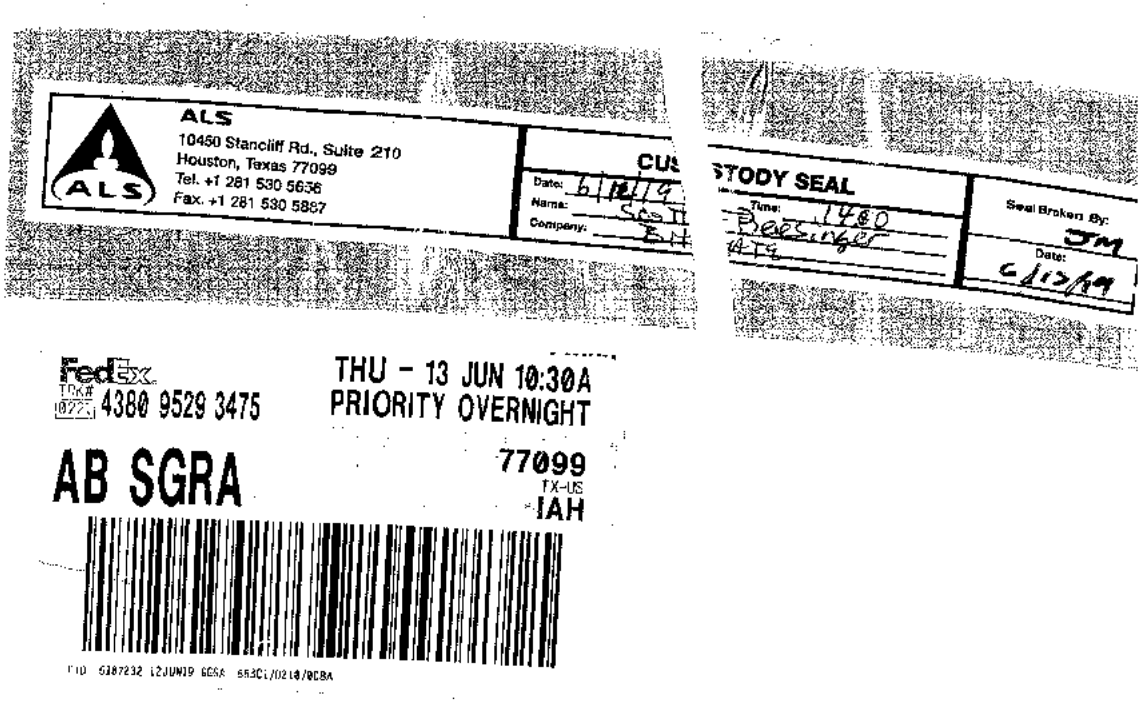
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition

Remarks: Cooler - 25344 1125
Temp 1.8 0500

HS19060672

Bhate Environmental Associates, Inc.
I18/24 Longhorn GW Treatment Plant Weekly Sampl

(Word) S:\1-ces\Forms\Chain of Custody - BiWeekly



ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CUS
Date: 6/12/19
Name: Scott
Company: BH

STODY SEAL
Time: 1430
Bessinger
HTS

Seal Broken By:
JM
Date:
6/13/19

FedEx
TRK# 4380 9529 3475

THU - 13 JUN 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

PID 5187232 12JUN19 GCSA 553C1/0218/0CBA

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

June 27, 2019

Analytical Report for Service Request No: K1905676

RJ Modashia
ALS Laboratory Group
10450 Stancliff Road
Suite 210
Houston, TX 77099-4338

RE: HS19060672

Dear RJ,

Enclosed are the results of the sample(s) submitted to our laboratory June 18, 2019
For your reference, these analyses have been assigned our service request number **K1905676.**

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. The test results meet requirements of the current NELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. All results are intended to be considered in their entirety, and ALS Group USA Corp. dba ALS Environmental (ALS) is not responsible for use of less than the complete report. Results apply only to the items submitted to the laboratory for analysis and individual items (samples) analyzed, as listed in the report.

Please contact me if you have any questions. My extension is 3350. You may also contact me via email at Kelley.Lovejoy@alsglobal.com.

Respectfully submitted,

ALS Group USA, Corp. dba ALS Environmental

Kelley Lovejoy

Kelley Lovejoy
Project Manager

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental
ALS Group USA, Corp
1317 South 13th Avenue
Kelso, WA 98626
T : +1 360 577 7222
F : +1 360 636 1068
www.alsglobal.com

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Acronyms

ASTM	American Society for Testing and Materials
A2LA	American Association for Laboratory Accreditation
CARB	California Air Resources Board
CAS Number	Chemical Abstract Service registry Number
CFC	Chlorofluorocarbon
CFU	Colony-Forming Unit
DEC	Department of Environmental Conservation
DEQ	Department of Environmental Quality
DHS	Department of Health Services
DOE	Department of Ecology
DOH	Department of Health
EPA	U. S. Environmental Protection Agency
ELAP	Environmental Laboratory Accreditation Program
GC	Gas Chromatography
GC/MS	Gas Chromatography/Mass Spectrometry
LOD	Limit of Detection
LOQ	Limit of Quantitation
LUFT	Leaking Underground Fuel Tank
M	Modified
MCL	Maximum Contaminant Level is the highest permissible concentration of a substance allowed in drinking water as established by the USEPA.
MDL	Method Detection Limit
MPN	Most Probable Number
MRL	Method Reporting Limit
NA	Not Applicable
NC	Not Calculated
NCASI	National Council of the Paper Industry for Air and Stream Improvement
ND	Not Detected
NIOSH	National Institute for Occupational Safety and Health
PQL	Practical Quantitation Limit
RCRA	Resource Conservation and Recovery Act
SIM	Selected Ion Monitoring
TPH	Total Petroleum Hydrocarbons
tr	Trace level is the concentration of an analyte that is less than the PQL but greater than or equal to the MDL.

Inorganic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
E	The result is an estimate amount because the value exceeded the instrument calibration range.
J	The result is an estimated value.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.
H	The holding time for this test is immediately following sample collection. The samples were analyzed as soon as possible after receipt by the laboratory.

Metals Data Qualifiers

#	The control limit criteria is not applicable. See case narrative.
J	The result is an estimated value.
E	The percent difference for the serial dilution was greater than 10%, indicating a possible matrix interference in the sample.
M	The duplicate injection precision was not met.
N	The Matrix Spike sample recovery is not within control limits. See case narrative.
S	The reported value was determined by the Method of Standard Additions (MSA).
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
W	The post-digestion spike for furnace AA analysis is out of control limits, while sample absorbance is less than 50% of spike absorbance.
i	The MRL/MDL or LOQ/LOD is elevated due to a matrix interference.
X	See case narrative.
+	The correlation coefficient for the MSA is less than 0.995.
Q	See case narrative. One or more quality control criteria was outside the limits.

Organic Data Qualifiers

*	The result is an outlier. See case narrative.
#	The control limit criteria is not applicable. See case narrative.
A	A tentatively identified compound, a suspected aldol-condensation product.
B	The analyte was found in the associated method blank at a level that is significant relative to the sample result as defined by the DOD or NELAC standards.
C	The analyte was qualitatively confirmed using GC/MS techniques, pattern recognition, or by comparing to historical data.
D	The reported result is from a dilution.
E	The result is an estimated value.
J	The result is an estimated value.
N	The result is presumptive. The analyte was tentatively identified, but a confirmation analysis was not performed.
P	The GC or HPLC confirmation criteria was exceeded. The relative percent difference is greater than 40% between the two analytical results.
U	The analyte was analyzed for, but was not detected ("Non-detect") at or above the MRL/MDL. *DOD-QSM 4.2 definition* : Analyte was not detected and is reported as less than the LOD or as defined by the project. The detection limit is adjusted for dilution.
i	The MRL/MDL or LOQ/LOD is elevated due to a chromatographic interference.
X	See case narrative.
Q	See case narrative. One or more quality control criteria was outside the limits.

Additional Petroleum Hydrocarbon Specific Qualifiers

F	The chromatographic fingerprint of the sample matches the elution pattern of the calibration standard.
L	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of lighter molecular weight constituents than the calibration standard.
H	The chromatographic fingerprint of the sample resembles a petroleum product, but the elution pattern indicates the presence of a greater amount of heavier molecular weight constituents than the calibration standard.
O	The chromatographic fingerprint of the sample resembles an oil, but does not match the calibration standard.
Y	The chromatographic fingerprint of the sample resembles a petroleum product eluting in approximately the correct carbon range, but the elution pattern does not match the calibration standard.
Z	The chromatographic fingerprint does not resemble a petroleum product.

ALS Group USA Corp. dba ALS Environmental (ALS) - Kelso
State Certifications, Accreditations, and Licenses

Agency	Web Site	Number
Alaska DEH	http://dec.alaska.gov/eh/lab/cs/csapproval.htm	UST-040
Arizona DHS	http://www.azdhs.gov/lab/license/env.htm	AZ0339
Arkansas - DEQ	http://www.adeq.state.ar.us/techsvs/labcert.htm	88-0637
California DHS (ELAP)	http://www.cdph.ca.gov/certlic/labs/Pages/ELAP.aspx	2795
DOD ELAP	http://www.denix.osd.mil/edqw/Accreditation/AccreditedLabs.cfm	L16-58-R4
Florida DOH	http://www.doh.state.fl.us/lab/EnvLabCert/WaterCert.htm	E87412
Hawaii DOH	http://health.hawaii.gov/	-
ISO 17025	http://www.pjlabs.com/	L16-57
Louisiana DEQ	http://www.deq.louisiana.gov/page/la-lab-accreditation	03016
Maine DHS	http://www.maine.gov/dhhs/	WA01276
Minnesota DOH	http://www.health.state.mn.us/accreditation	053-999-457
Nevada DEP	http://ndep.nv.gov/bsdw/labservice.htm	WA01276
New Jersey DEP	http://www.nj.gov/dep/enforcement/oqa.html	WA005
New York - DOH	https://www.wadsworth.org/regulatory/elap	12060
North Carolina DEQ	https://deq.nc.gov/about/divisions/water-resources/water-resources-data/water-sciences-home-page/laboratory-certification-branch/non-field-lab-certification	605
Oklahoma DEQ	http://www.deq.state.ok.us/CSDnew/labcert.htm	9801
Oregon – DEQ (NELAP)	http://public.health.oregon.gov/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	WA100010
South Carolina DHEC	http://www.scdhec.gov/environment/EnvironmentalLabCertification/	61002
Texas CEQ	http://www.tceq.texas.gov/field/qa/env_lab_accreditation.html	T104704427
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C544
Wyoming (EPA Region 8)	https://www.epa.gov/region8-waterops/epa-region-8-certified-drinking-water-	-
Kelso Laboratory Website	www.alsglobal.com	NA

Analyses were performed according to our laboratory's NELAP-approved quality assurance program. A complete listing of specific NELAP-certified analytes, can be found in the certification section at www.ALSGlobal.com or at the accreditation bodies web site.
Please refer to the certification and/or accreditation body's web site if samples are submitted for compliance purposes. The states highlighted above, require the analysis be listed on the state certification if used for compliance purposes and if the method/anlayte is offered by that state.

Case Narrative

ALS Environmental—Kelso Laboratory
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ALS Environmental

Client: ALS Environmental - US
Project: HS19060672
Sample Matrix: Water

Service Request: K1905676
Date Received: 06/18/2019

CASE NARRATIVE

All analyses were performed consistent with the quality assurance program of ALS Environmental. This report contains analytical results for samples for the Tier level IV requested by the client.

Sample Receipt:

One water sample was received for analysis at ALS Environmental on 06/18/2019. Any discrepancies upon initial sample inspection are annotated on the sample receipt and preservation form included within this report. The sample was stored at minimum in accordance with the analytical method requirements.

General Chemistry:

No significant anomalies were noted with this analysis.

Approved by Kelley Lovejoy Date 06/27/2019

Chain of Custody

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Houston, TX 77099
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F: +1 281 530 5887
www.alsglobal.com

11905676

Subcontract Chain of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **11589**

SUBCONTRACT TO:

ALS Environmental Kelso
1317 S. 13th Avenue
Kelso, WA 98626

Phone: +1 360 501 3312

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19060672
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060672-01**	**LH18/24-SP650_061219**	**Water**	**12 Jun 2019 14:00**
	TOC Analysis for DOD Level IV			21 Jun 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 6/17/19 1800

Received By: _____ Date/Time: 6/18/19 0915

Cooler ID(s): _____ Temperature(s): _____

00939941

PC Kelly

Cooler Receipt and Preservation Form

Client AIS Houston Service Request *K19* 05676

Received: 6·18·19 Opened: 6·18·19 By: AP Unloaded: 6·18·19 By: AP

1. Samples were received via? *USPS* (*Fed Ex*) *UPS* *DHL* *PDX* *Courier* *Hand Delivered*
2. Samples were received in: (circle) (*Cooler*) *Box* *Envelope* *Other* _____ *NA*
3. Were custody seals on coolers? NA (Y) N If yes, how many and where? 2 Front
   If present, were custody seals intact? (Y) N If present, were they signed and dated? (Y) N

Raw Cooler Temp	Corrected Cooler Temp	Raw Temp Blank	Corrected Temp Blank	Corr. Factor	Thermometer ID	Cooler/COC ID NA	Tracking Number NA	Filed
-0.7	-0.6	0.5	0.6	0.1	360	11589	4809 7835 0562	

4. Packing material: *Inserts* (*Baggies*) (*Bubble Wrap*) *Gel Packs* (*Wet Ice*) *Dry Ice* *Sleeves* _____
5. Were custody papers properly filled out (ink, signed, etc.)? NA (Y) N
6. Were samples received in good condition (temperature, unbroken)? *Indicate in the table below.* NA (Y) N
   If applicable, tissue samples were received: *Frozen* *Partially Thawed* *Thawed*
7. Were all sample labels complete (i.e analysis, preservation, etc.)? NA (Y) N
8. Did all sample labels and tags agree with custody papers? *Indicate major discrepancies in the table on page 2.* NA (Y) N
9. Were appropriate bottles/containers and volumes received for the tests indicated? NA (Y) N
10. Were the pH-preserved bottles (*see SMO GEN SOP*) received at the appropriate pH? *Indicate in the table below* NA (Y) N
11. Were VOA vials received without headspace? *Indicate in the table below.* (NA) Y N
12. Was C12/Res negative? (NA) Y N

Sample ID on Bottle	Sample ID on COC	Identified by:

Sample ID	Bottle Count Bottle Type	Out of Temp	Head-space	Broke	pH	Reagent	Volume added	Reagent Lot Number	Initials	Time

Notes, Discrepancies, & Resolutions: _____

General Chemistry

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www.alsglobal.com

ALS Group USA, Corp.
dba ALS Environmental

Analytical Report

Client:	ALS Environmental - US	**Service Request:**	K1905676
Project:	HS19060672	**Date Collected:**	06/12/19
Sample Matrix:	Water	**Date Received:**	06/18/19
Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA

Carbon, Total Organic

Sample Name	Lab Code	Result	LOQ	LOD	MDL	Dil.	Date Analyzed	Q
LH18/24-SP650_061219	K1905676-001	**2.04**	0.50	0.20	0.07	1	06/20/19 05:08	
Method Blank	K1905676-MB	ND U	0.50	0.20	0.07	1	06/19/19 17:34	

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1905676
Project	HS19060672	**Date Collected:**	06/12/19
Sample Matrix:	Water	**Date Received:**	06/18/19
		Date Analyzed:	06/20/19

Replicate Sample Summary
General Chemistry Parameters

Sample Name:	LH18/24-SP650_061219	**Units:**	mg/L
Lab Code:	K1905676-001	**Basis:**	NA

Analyte Name	Analysis Method	LOQ	LOD	MDL	Sample Result	Duplicate Sample K1905676-001DUP Result	Average	RPD	RPD Limit
Carbon, Total Organic	SM 5310 C	0.50	0.20	0.07	2.04	1.97	2.01	3	10

Results flagged with an asterisk (*) indicate values outside control criteria.

Results flagged with a pound (#) indicate the control criteria is not applicable.

Percent recoveries and relative percent differences (RPD) are determined by the software using values in the calculation which have not been rounded.

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client:	ALS Environmental - US	**Service Request:**	K1905676
Project:	HS19060672	**Date Analyzed:**	06/19/19
Sample Matrix:	Water	**Date Extracted:**	NA

Lab Control Sample Summary
Carbon, Total Organic

Analysis Method:	SM 5310 C	**Units:**	mg/L
Prep Method:	None	**Basis:**	NA
		Analysis Lot:	640162

Sample Name	Lab Code	Result	Spike Amount	% Rec	% Rec Limits
Lab Control Sample	K1905676-LCS	24.0	25.0	96	83-117

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:** K1905676
Project: HS19060672

Continuing Calibration Verification (CCV) Summary

Carbon, Total Organic

Analysis Method: SM 5310 C **Units:** mg/L

	Analysis Lot	Lab Code	Date Analyzed	True Value	Measured Value	Percent Recovery	Acceptance Limits
CCV1	640162	KQ1908617-20	06/19/19 17:05	25.0	23.7	95	90-110
CCV2	640162	KQ1908617-21	06/19/19 21:36	25.0	24.2	97	90-110
CCV3	640162	KQ1908617-22	06/20/19 02:18	25.0	24.2	97	90-110
CCV4	640162	KQ1908617-23	06/20/19 07:57	25.0	24.2	97	90-110

ALS Group USA, Corp.
dba ALS Environmental

QA/QC Report

Client: ALS Environmental - US **Service Request:**K1905676
Project: HS19060672

Continuing Calibration Blank (CCB) Summary
Carbon, Total Organic

Analysis Method: SM 5310 C **Units:**mg/L

	Analysis Lot	Lab Code	Date Analyzed	LOQ	LOD	MDL	Result	Q
CCB1	640162	KQ1908617-24	06/19/19 17:19	0.50	0.20	0.07	ND	U
CCB2	640162	KQ1908617-25	06/19/19 21:50	0.50	0.20	0.07	ND	U
CCB3	640162	KQ1908617-26	06/20/19 02:33	0.50	0.20	0.07	ND	U
CCB4	640162	KQ1908617-27	06/20/19 08:11	0.50	0.20	0.07	ND	U

Raw Data

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General Chemistry

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Work Request # (Original) K1905420, 562, 5649, 5652, 5665, 5676, 5696, 5595, 5633, 5675, 5679, 5436

Tier: II II II I II IV II I III II II IV

Date Analyzed: 6/19/19 / 6/20/19

Analyst: HLM / BCP

Analysis: TOC/DOC

TOC: 640162, 640173,

Run # DOC: 640170

DATA QUALITY REPORT
INORGANICS

Explain any "no" responses to questions below, and any corrective actions in the comments section below.

1.	Is the method name and number correct and appropriate?	yes/no/NA
2.	Holding times met for all analyses and for all samples?	yes/no/NA
3.	Are calculations correct?	yes/no/NA
4.	Is the reporting basis correct? (Dry Weight)	yes/no/NA
5.	All quality control criteria met?	yes/no
6.	Is the calibration curve correlation coefficient ≥ 0.995?	yes/no/NA
7.	MBs, CCVs, CCBs, LCSs, Dups, and Spikes, analyzed at proper frequency?	yes/no/NA
8.	Are ICVs, CCVs, and CCBs all within acceptance limits?	yes/no/NA
9.	Are results for methods blanks all ND?	yes/no/NA
10.	Are all QC samples within acceptance criteria? (LCS % rec, MS/DMS % rec, DUP or MS/DMS RPDs, etc.)	yes/no/NA
11.	Are all exceptions explained?	yes/no/NA
12.	Have all applicable service requests been reviewed?	yes/no/NA
13.	Are all samples labeled correctly?	yes/no/NA
14.	Have all instructions on the service request been followed? (e.g. Special MRLs, QC on a specific sample, Form V)	yes/no/NA
15.	Are detection limits and units reported correctly?	yes/no/NA
16.	Is the unused space on the benchsheet crossed out?	yes/no/NA
17.	Was analysis turned in by the due date? (n-2) (If not record SR#)	yes/no/NA

COMMENTS: K1905612-2/2d, 5679-1/1d, 5436-1/1d report a high %RSD. However, these samples are less than 5x the MRL.
K1905696-2/3 sent for RA due to being higher than calibration.

Final Approved by: [signature] Date: 06/26/19

DQREPORT

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 640162 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1905420-001	Carbon, Total Organic	N/A		Water	3.19 mg/L	10 mL	64 mg/L	20	2	10			6/19/19 20:11:00	N	II
K1905612-001	Carbon, Total Organic	N/A		Water	15.16 mg/L	10 mL	15.2 mg/L	1	0.07	0.50			6/20/19 00:25:00	N	II
K1905612-002	Carbon, Total Organic	N/A		Water	0.67 mg/L	10 mL	0.67 mg/L	1	0.07	0.50			6/20/19 00:53:00	N	II
K1905649-001	Carbon, Total Organic	N/A		Water	5.94 mg/L	10 mL	594 mg/L	100	7	50			6/20/19 01:50:00	N	II
K1905649-002	Carbon, Total Organic	N/A		Water	6.70 mg/L	10 mL	670 mg/L	100	7	50			6/20/19 04:39:00	N	II
K1905652-001	Carbon, Total Organic	N/A		Drinking Water	0.56 mg/L	10 mL	0.56 mg/L	1	0.07	0.50			6/19/19 20:39:00	N	I
K1905666-001	Carbon, Total Organic	N/A		Ground Water	1.82 mg/L	10 mL	1.82 mg/L	1	0.07	0.50			6/19/19 21:07:00	N	II
K1905666-002	Carbon, Total Organic	N/A		Ground Water	0.99 mg/L	10 mL	0.99 mg/L	1	0.07	0.50			6/19/19 22:05:00	N	II
K1905666-003	Carbon, Total Organic	N/A		Ground Water	2.18 mg/L	10 mL	10.9 mg/L	5	0.4	2.5			6/19/19 22:33:00	N	II
K1905666-004	Carbon, Total Organic	N/A		Ground Water	0.39 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/19/19 23:01:00	N	II
K1905666-005	Carbon, Total Organic	N/A		Ground Water	1.90 mg/L	10 mL	1.90 mg/L	1	0.07	0.50			6/19/19 23:29:00	N	II
K1905666-006	Carbon, Total Organic	N/A		Surface Water	11.07 mg/L	10 mL	11.1 mg/L	1	0.07	0.50			6/19/19 23:57:00	N	II
K1905676-001	Carbon, Total Organic	N/A		Water	2.04 mg/L	10 mL	2.04 mg/L	1	0.07	0.50			6/20/19 05:08:00	N	IV
K1905696-001	Carbon, Total Organic	N/A		Water	2.85 mg/L	10 mL	143 mg/L	50	4	25			6/19/19 18:18:00	N	II
K1905696-002	Carbon, Total Organic	N/A		Water	60.28 mg/L	10 mL	121 mg/L	2	0.2	1.0			6/19/19 18:47:00	N	II
K1905696-003	Carbon, Total Organic	N/A		Water	50.96 mg/L	10 mL	102 mg/L	2	0.2	1.0			6/19/19 19:15:00	N	II
KQ1908617-01	Carbon, Total Organic	DUP	K1905612-002	Water	0.52 mg/L	10 mL	0.52 mg/L	1	0.07	0.50		26*	6/20/19 00:53:00	N	II
KQ1908617-02	Carbon, Total Organic	MS	K1905612-002	Water	25.64 mg/L	10 mL	25.6 mg/L	1	0.07	0.50	100		6/20/19 01:21:00	N	II
KQ1908617-03	Carbon, Total Organic	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/19/19 17:34:00	N	II
KQ1908617-04	Carbon, Total Organic	LCS		Water	24.04 mg/L	10 mL	24.0 mg/L	1	0.07	0.50	96		6/19/19 17:49:00	N	II
KQ1908617-05	Carbon, Total Organic	DUP	K1905696-001	Water	2.89 mg/L	10 mL	144 mg/L	50	4	25		1	6/19/19 18:18:00	N	II
KQ1908617-06	Carbon, Total Organic	DUP	K1905696-002	Water	63.21 mg/L	10 mL	126 mg/L	2	0.2	1.0		5	6/19/19 18:47:00	N	II
KQ1908617-07	Carbon, Total Organic	DUP	K1905696-003	Water	50.76 mg/L	10 mL	102 mg/L	2	0.2	1.0		<1	6/19/19 19:15:00	N	II
KQ1908617-08	Carbon, Total Organic	DUP	K1905420-001	Water	3.19 mg/L	10 mL	64 mg/L	20	2	10		NC	6/19/19 20:11:00	N	II
KQ1908617-09	Carbon, Total Organic	DUP	K1905652-001	Drinking Water	0.56 mg/L	10 mL	0.56 mg/L	1	0.07	0.50		<1	6/19/19 20:39:00	N	I
KQ1908617-10	Carbon, Total Organic	DUP	K1905666-001	Ground Water	1.79 mg/L	10 mL	1.79 mg/L	1	0.07	0.50		2	6/19/19 21:07:00	N	II
KQ1908617-11	Carbon, Total Organic	DUP	K1905666-002	Ground Water	0.97 mg/L	10 mL	0.97 mg/L	1	0.07	0.50		1	6/19/19 22:05:00	N	II
KQ1908617-12	Carbon, Total Organic	DUP	K1905666-003	Ground Water	2.09 mg/L	10 mL	10.5 mg/L	5	0.4	2.5		4	6/19/19 22:33:00	N	II
KQ1908617-13	Carbon, Total Organic	DUP	K1905666-004	Ground Water	0.37 mg/L	10 mL	0.37 mg/L J	1	0.07	0.50		NC	6/19/19 23:01:00	N	II
KQ1908617-14	Carbon, Total Organic	DUP	K1905666-005	Ground Water	1.90 mg/L	10 mL	1.90 mg/L	1	0.07	0.50		<1	6/19/19 23:29:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

06/26/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 640162 **Method/Testcode:** SM 5310 C/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1908617-15	Carbon, Total Organic	DUP	K1905666-006	Surface Water	11.15 mg/L	10 mL	11.2 mg/L	1	0.07	0.50		<1	6/19/19 23:57:00	N	II
KQ1908617-16	Carbon, Total Organic	DUP	K1905612-001	Water	15.06 mg/L	10 mL	15.1 mg/L	1	0.07	0.50		<1	6/20/19 00:25:00	N	II
KQ1908617-17	Carbon, Total Organic	DUP	K1905649-001	Water	6.11 mg/L	10 mL	611 mg/L	100	7	50		3	6/20/19 01:50:00	N	II
KQ1908617-18	Carbon, Total Organic	DUP	K1905649-002	Water	6.74 mg/L	10 mL	674 mg/L	100	7	50		<1	6/20/19 04:39:00	N	II
KQ1908617-19	Carbon, Total Organic	DUP	K1905676-001	Water	1.97 mg/L	10 mL	1.97 mg/L	1	0.07	0.50		3	6/20/19 05:08:00	N	IV
KQ1908617-20	Carbon, Total Organic	CCV		Water	23.70 mg/L	10 mL	23.7 mg/L	1					6/19/19 17:05:00	N	II
KQ1908617-21	Carbon, Total Organic	CCV		Water	24.21 mg/L	10 mL	24.2 mg/L	1					6/19/19 21:36:00	N	II
KQ1908617-22	Carbon, Total Organic	CCV		Water	24.22 mg/L	10 mL	24.2 mg/L	1					6/20/19 02:18:00	N	II
KQ1908617-23	Carbon, Total Organic	CCV		Water	24.15 mg/L	10 mL	24.2 mg/L	1					6/20/19 07:57:00	N	II
KQ1908617-24	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/19/19 17:19:00	N	II
KQ1908617-25	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/19/19 21:50:00	N	II
KQ1908617-26	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/20/19 02:33:00	N	II
KQ1908617-27	Carbon, Total Organic	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/20/19 08:11:00	N	II

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 640170 **Method/Testcode:** SM 5310 C/TOC D

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1905595-002	Carbon, Dissolved Organic (DOC)	N/A		Water	33.33 mg/L	10 mL	33.3 mg/L	1	0.07	0.50			6/20/19 06:18:00	N	I
K1905633-001	Carbon, Dissolved Organic (DOC)	N/A		Surface Water	8.82 mg/L	10 mL	8.82 mg/L	1	0.07	0.50			6/20/19 07:01:00	N	III
K1905675-001	Carbon, Dissolved Organic (DOC)	N/A		Water	5.20 mg/L	10 mL	5.20 mg/L	1	0.07	0.50			6/20/19 08:26:00	N	II
K1905679-001	Carbon, Dissolved Organic (DOC)	N/A		Water	1.85 mg/L	10 mL	1.85 mg/L	1	0.07	0.50			6/20/19 05:50:00	N	II
KQ1908621-01	Carbon, Dissolved Organic (DOC)	CCV		Water	24.22 mg/L	10 mL	24.2 mg/L	1					6/20/19 02:18:00	N	II
KQ1908621-02	Carbon, Dissolved Organic (DOC)	CCV		Water	24.15 mg/L	10 mL	24.2 mg/L	1					6/20/19 07:57:00	N	II
KQ1908621-03	Carbon, Dissolved Organic (DOC)	CCV		Water	24.53 mg/L	10 mL	24.5 mg/L	1					6/20/19 13:07:00	N	II
KQ1908621-04	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/20/19 02:33:00	N	II
KQ1908621-05	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/20/19 08:11:00	N	II
KQ1908621-06	Carbon, Dissolved Organic (DOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/20/19 13:21:00	N	II
KQ1908621-07	Carbon, Dissolved Organic (DOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1	0.07	0.50			6/20/19 17:34:00	N	II
KQ1908621-08	Carbon, Dissolved Organic (DOC)	LCS		Water	24.04 mg/L	10 mL	24.0 mg/L	1	0.07	0.50	96		6/20/19 17:49:00	N	II
KQ1908621-09	Carbon, Dissolved Organic (DOC)	DUP	K1905679-001	Water	2.13 mg/L	10 mL	2.13 mg/L	1	0.07	0.50		14*	6/20/19 05:50:00	N	II
KQ1908621-10	Carbon, Dissolved Organic (DOC)	DUP	K1905595-002	Water	32.64 mg/L	10 mL	32.6 mg/L	1	0.07	0.50		2	6/20/19 06:18:00	N	I
KQ1908621-11	Carbon, Dissolved Organic (DOC)	MS	K1905633-001	Surface Water	32.78 mg/L	10 mL	32.8 mg/L	1	0.07	0.50	96		6/20/19 07:29:00	N	III
KQ1908621-12	Carbon, Dissolved Organic (DOC)	DUP	K1905633-001	Surface Water	8.51 mg/L	10 mL	8.51 mg/L	1	0.07	0.50		4	6/20/19 07:01:00	N	III
KQ1908621-13	Carbon, Dissolved Organic (DOC)	DUP	K1905675-001	Water	5.29 mg/L	10 mL	5.29 mg/L	1	0.07	0.50		2	6/20/19 08:26:00	N	II

06/26/19

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 640173 **Method/Testcode:** 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
K1905436-001	Carbon, Total Organic (TOC)	N/A		Water	0.76 mg/L	10 mL	0.76 mg/L	1		0.50			6/20/19 09:09:00	N	IV
K1905436-002	Carbon, Total Organic (TOC)	N/A		Water	15.16 mg/L	10 mL	15.2 mg/L	1		0.50			6/20/19 10:04:00	N	IV
K1905436-003	Carbon, Total Organic (TOC)	N/A		Water	15.52 mg/L	10 mL	15.5 mg/L	1		0.50			6/20/19 11:01:00	N	IV
KQ1908622-01	Carbon, Total Organic (TOC)	CCV		Water	24.15 mg/L	10 mL	24.2 mg/L	1					6/20/19 07:57:00	N	IV
KQ1908622-02	Carbon, Total Organic (TOC)	CCV		Water	24.53 mg/L	10 mL	24.5 mg/L	1					6/20/19 13:07:00	N	IV
KQ1908622-03	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			6/20/19 08:11:00	N	IV
KQ1908622-04	Carbon, Total Organic (TOC)	CCB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			6/20/19 13:21:00	N	IV
KQ1908622-05	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			6/20/19 02:48:00	N	IV
KQ1908622-07	Carbon, Total Organic (TOC)	DUP	K1905436-001	Water	0.58 mg/L	10 mL	0.58 mg/L	1		0.50		26*	6/20/19 09:09:00	N	IV
KQ1908622-08	Carbon, Total Organic (TOC)	TRP	K1905436-001	Water	0.63 mg/L	10 mL	0.63 mg/L	1		0.50		14	6/20/19 09:09:00	N	IV
KQ1908622-09	Carbon, Total Organic (TOC)	QUAD	K1905436-001	Water	0.57 mg/L	10 mL	0.57 mg/L	1		0.50		13	6/20/19 09:09:00	N	IV
KQ1908622-10	Carbon, Total Organic (TOC)	DUP	K1905436-002	Water	15.32 mg/L	10 mL	15.3 mg/L	1		0.50		1	6/20/19 10:04:00	N	IV
KQ1908622-11	Carbon, Total Organic (TOC)	TRP	K1905436-002	Water	15.11 mg/L	10 mL	15.1 mg/L	1		0.50		<1	6/20/19 10:04:00	N	IV
KQ1908622-12	Carbon, Total Organic (TOC)	QUAD	K1905436-002	Water	15.28 mg/L	10 mL	15.3 mg/L	1		0.50		<1	6/20/19 10:04:00	N	IV
KQ1908622-13	Carbon, Total Organic (TOC)	MS	K1905436-003	Water	37.62 mg/L	10 mL	37.6 mg/L	1		0.50	88		6/20/19 11:56:00	N	IV
KQ1908622-14	Carbon, Total Organic (TOC)	MS	K1905436-003	Water	37.65 mg/L	10 mL	37.6 mg/L	1		0.50	89		6/20/19 11:56:00	N	IV
KQ1908622-15	Carbon, Total Organic (TOC)	MS	K1905436-003	Water	38.79 mg/L	10 mL	38.8 mg/L	1		0.50	93		6/20/19 11:56:00	N	IV
KQ1908622-16	Carbon, Total Organic (TOC)	MS	K1905436-003	Water	38.06 mg/L	10 mL	38.1 mg/L	1		0.50	90		6/20/19 11:56:00	N	IV
KQ1908622-17	Carbon, Total Organic (TOC)	DUP	K1905436-003	Water	15.38 mg/L	10 mL	15.4 mg/L	1		0.50		<1	6/20/19 11:01:00	N	IV
KQ1908622-18	Carbon, Total Organic (TOC)	TRP	K1905436-003	Water	15.59 mg/L	10 mL	15.6 mg/L	1		0.50		<1	6/20/19 11:01:00	N	IV
KQ1908622-19	Carbon, Total Organic (TOC)	QUAD	K1905436-003	Water	14.97 mg/L	10 mL	15.0 mg/L	1		0.50		2	6/20/19 11:01:00	N	IV
KQ1908622-20	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			6/20/19 02:48:00	N	IV
KQ1908622-21	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			6/20/19 02:48:00	N	IV

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# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

06/26/19

Analytical Results Summary

Instrument Name: K-TOC-03 **Analyst:** BDITZLER **Analysis Lot:** 640173 **Method/Testcode:** 9060A/TOC T

Lab Code	Target Analytes	QC	Parent Sample	Matrix	Raw Result	Sample Amt.	Final Result	Dil	MDL	PQL	% Rec	% RSD	Date Analyzed	QC?	Tier
KQ1908622-22	Carbon, Total Organic (TOC)	MB		Water	0.00 mg/L	10 mL	0.50 mg/L U	1		0.50			6/20/19 02:48:00	N	IV
KQ1908622-23	Carbon, Total Organic (TOC)	LCS		Water	24.40 mg/L	10 mL	24.4 mg/L	1		0.50	98		6/20/19 03:44:00	N	IV
KQ1908622-24	Carbon, Total Organic (TOC)	LCS		Water	24.37 mg/L	10 mL	24.4 mg/L	1		0.50	97		6/20/19 03:44:00	N	IV
KQ1908622-25	Carbon, Total Organic (TOC)	LCS		Water	24.58 mg/L	10 mL	24.6 mg/L	1		0.50	98		6/20/19 03:44:00	N	IV
KQ1908622-26	Carbon, Total Organic (TOC)	LCS		Water	25.13 mg/L	10 mL	25.1 mg/L	1		0.50	101		6/20/19 03:44:00	N	IV

# indicates Final Result is not yet adjusted for Solids because it has not yet been determined.

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	C] CCV 25 ppm [25 p	1	23.703	0.0000	23.7028	23.7028	23.7	6/19/2019
3	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/19/2019
4	MB1	1	0.000	0.0000	0.0000	0	<0.5	6/19/2019
5	[TOC] LCS [24ppm]	1	24.040	0.0000	24.0395	24.0395	24.0	6/19/2019
6	K1905696-001	50	2.851	0.0000	2.8507	142.535	142.54	6/19/2019
7	K1905696-001d	50	2.889	0.0000	2.8893	144.465	144.5	6/19/2019
8	K1905696-002	2	60.276	0.0000	60.2758	120.5516	121	6/19/2019
9	K1905696-002d	2	63.213	0.0000	63.2132	126.4264	126.43	6/19/2019
10	K1905696-003	2	50.960	0.0000	50.9603	101.9206	101.92	6/19/2019
11	K1905696-003d	2	50.762	0.0000	50.7621	101.5242	101.5	6/19/2019
12	K1905420-001	20	3.186	0.0000	3.1857	63.714	63.71	6/19/2019
13	K1905420-001d	20	3.188	0.0000	3.1876	63.752	63.75	6/19/2019
14	K1905652-001	1	0.559	0.0000	0.5588	0.5588	0.56	6/19/2019
15	K1905652-001d	1	0.555	0.0000	0.5553	0.5553	0.6	6/19/2019
16	K1905666-001	1	1.825	0.0000	1.8248	1.8248	1.8	6/19/2019
17	K1905666-001d	1	1.786	0.0000	1.7856	1.7856	1.79	6/19/2019
18	C] CCV 25 ppm [25 p	1	24.206	0.0000	24.2059	24.2059	24.2	6/19/2019
19	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/19/2019
20	K1905666-002	1	0.987	0.0000	0.9868	0.9868	0.99	6/19/2019
21	K1905666-002d	1	0.972	0.0000	0.9722	0.9722	0.97	6/19/2019
22	K1905666-003	5	2.182	0.0000	2.1820	10.91	10.9	6/19/2019
23	K1905666-003d	5	2.095	0.0000	2.0945	10.4725	10.5	6/19/2019
24	K1905666-004	1	0.386	0.0000	0.3856	0.3856	<0.5	6/19/2019
25	K1905666-004d	1	0.373	0.0000	0.3734	0.3734	<0.5	6/19/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date / time
Analyzed By: RD	Date Analyzed 6/20/19	
Reviewed By:	Date Reviewed 06/26/19	

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ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1905666-005	1	1.899	0.0000	1.8986	1.8986	1.90	6/19/2019
27	K1905666-005d	1	1.903	0.0000	1.9028	1.9028	1.90	6/19/2019
28	K1905666-006	1	11.070	0.0000	11.0697	11.0697	11.1	6/19/2019
29	K1905666-006d	1	11.154	0.0000	11.1544	11.1544	11.2	6/19/2019
30	K1905612-001	1	15.159	0.0000	15.1586	15.1586	15.2	6/20/2019
31	K1905612-001d	1	15.061	0.0000	15.0612	15.0612	15.1	6/20/2019
32	K1905612-002	1	0.670	0.0000	0.6698	0.6698	0.7	6/20/2019
33	K1905612-002d	1	0.518	0.0000	0.5177	0.5177	0.5	6/20/2019
34	K1905612-002ms	1	25.640	0.0000	25.6395	25.6395	25.6	6/20/2019
35	K1905649-001	100	5.941	0.0000	5.9406	594.06	594.1	6/20/2019
36	K1905649-001d	100	6.113	0.0000	6.1125	611.25	611.3	6/20/2019
37	C] CCV 25 ppm [25 p	1	24.215	0.0000	24.2154	24.2154	24.2	6/20/2019
38	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
39	K1905649-002	100	6.702	0.0000	6.7019	670.19	670.2	6/20/2019
40	K1905649-002d	100	6.736	0.0000	6.7361	673.61	673.6	6/20/2019
41	K1905676-001	1	2.039	0.0000	2.0387	2.0387	2.0	6/20/2019
42	K1905676-001d	1	1.973	0.0000	1.9730	1.973	2.0	6/20/2019
43	C] CCV 25 ppm [25 p	1	24.152	0.0000	24.1517	24.1517	24.2	6/20/2019
44	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By: [illegible]	Date Analyzed 6/20/19
Reviewed By: [illegible]	Date Reviewed 06/26/19

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	MB1	1	0.000	0.0000	0.0000	0	<0.5	6/19/2019
3	[TOC] LCS [24ppm]	1	24.040	0.0000	24.0395	24.0395	24.0	6/19/2019
4	C] CCV 25 ppm [25 p	1	24.215	0.0000	24.2154	24.2154	24.2	6/20/2019
5	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
6	K1905679-001	1	1.847	0.0000	1.8474	1.8474	1.85	6/20/2019
7	K1905679-001d	1	2.126	0.0000	2.1259	2.1259	2.1	6/20/2019
8	K1905595-002	1	33.327	0.0000	33.3272	33.3272	33	6/20/2019
9	K1905595-002d	1	32.641	0.0000	32.6406	32.6406	32.64	6/20/2019
10	K1905633-001	1	8.820	0.0000	8.8200	8.82	8.82	6/20/2019
11	K1905633-001d	1	8.512	0.0000	8.5115	8.5115	8.5	6/20/2019
12	K1905633-001ms	1	32.783	0.0000	32.7829	32.7829	32.78	6/20/2019
13	C] CCV 25 ppm [25 p	1	24.152	0.0000	24.1517	24.1517	24.15	6/20/2019
14	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
15	K1905675-001	1	5.197	0.0000	5.1974	5.1974	5.2	6/20/2019
16	K1905675-001d	1	5.289	0.0000	5.2894	5.2894	5.3	6/20/2019
17	C] CCV 25 ppm [25 p	1	24.534	0.0000	24.5337	24.5337	24.53	6/20/2019
18	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
19		1		0.0000	0.0000	0	<0.5	
20		1		0.0000	0.0000	0	<0.5	
21		1		0.0000	0.0000	0	<0.5	
22		1		0.0000	0.0000	0	<0.5	
23		1		0.0000	0.0000	0	<0.5	
24		1		0.0000	0.0000	0	<0.5	
25		1		0.0000	0.0000	0	<0.5	

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

		date	time
Analyzed By:	BP	Date Analyzed	6/20/19
Reviewed By:		Date Reviewed	06/26/19

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ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
CBA	RB	1			0.0000	0	<0.5	
2	MB2	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
3	MB2d	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
4	MB2t	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
5	MB2q	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
6	[TOC] LCS [24ppm]	1	24.396	0.0000	24.3955	24.3955	24.40	6/20/2019
7	[TOC] LCS [24ppm]d	1	24.371	0.0000	24.3706	24.3706	24.4	6/20/2019
8	[TOC] LCS [24ppm]t	1	24.577	0.0000	24.5773	24.5773	25	6/20/2019
9	[TOC] LCS [24ppm]q	1	25.130	0.0000	25.1299	25.1299	25.13	6/20/2019
10	C] CCV 25 ppm [25 p	1	24.152	0.0000	24.1517	24.1517	24.15	6/20/2019
11	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
12	K1905436-001	1	0.756	0.0000	0.7564	0.7564	0.76	6/20/2019
13	K1905436-001d	1	0.584	0.0000	0.5842	0.5842	0.58	6/20/2019
14	K1905436-001t	1	0.632	0.0000	0.6315	0.6315	0.63	6/20/2019
15	K1905436-001q	1	0.572	0.0000	0.5717	0.5717	0.6	6/20/2019
16	K1905436-002	1	15.158	0.0000	15.1581	15.1581	15.2	6/20/2019
17	K1905436-002d	1	15.322	0.0000	15.3222	15.3222	15.32	6/20/2019
18	K1905436-002t	1	15.114	0.0000	15.1136	15.1136	15.1	6/20/2019
19	K1905436-002q	1	15.284	0.0000	15.2844	15.2844	15.3	6/20/2019
20	K1905436-003	1	15.516	0.0000	15.5164	15.5164	15.52	6/20/2019
21	K1905436-003d	1	15.378	0.0000	15.3778	15.3778	15.38	6/20/2019
22	K1905436-003t	1	15.587	0.0000	15.5870	15.587	15.6	6/20/2019
23	K1905436-003q	1	14.969	0.0000	14.9685	14.9685	15.0	6/20/2019
24	K1905436-003ms	1	38.057	0.0000	38.0574	38.0574	38.06	6/20/2019
25	K1905436-003msd	1	38.794	0.0000	38.7936	38.7936	38.79	6/20/2019

ICAL Date 10/20/16 ICAL ID#:11-GEN-05-51A

LCS =24.0 ppm APG 4013 Lot #010615 (REF# 11-GEN-05-50N)

CCV = 25.0 ppm (Ref.#11-GEN-05-52E)

Spike: 0.05 ml of 5000 ppm stock ----> 10.0 ml =25.0 ppm x Dilution Factor (Ref.# 11-GEN-05-51M)

	date	time
Analyzed By: RD	Date Analyzed 6/20/19	
Reviewed By: [signature]	Date Reviewed 06/20/19	

ALS ENVIRONMENTAL

Matrix: WATER

Analysis: Total Organic Carbon (WATER) Method:Oxidation EPA 415.1/9060/5310C

Printout	Sample #	Dil. Factor	Solution Conc.,mg/L	Blank Correction, mg/L	Net mg/L	TOC mg/L	Reported TOC mg/L	
26	K1905436-003	1	37.649	0.0000	37.6492	37.6492	37.65	6/20/2019
27	K1905436-003	1	37.625	0.0000	37.6247	37.6247	37.62	6/20/2019
28	C] CCV 25 ppm [25 p	1	24.534	0.0000	24.5337	24.5337	24.5	6/20/2019
29	[TOC] CCB [0 ppm]	1	0.000	0.0000	0.0000	0	<0.5	6/20/2019
30		1		0.0000	0.0000	0	<0.5	
31		1		0.0000	0.0000	0	<0.5	
32		1		0.0000	0.0000	0	<0.5	
33		1		0.0000	0.0000	0	<0.5	
34		1		0.0000	0.0000	0	<0.5	
35		1		0.0000	0.0000	0	<0.5	
36		1		0.0000	0.0000	0	<0.5	
37		1		0.0000	0.0000	0	<0.5	
38		1		0.0000	0.0000	0	<0.5	
39		1		0.0000	0.0000	0	<0.5	
40		1		0.0000	0.0000	0	<0.5	
41		1		0.0000	0.0000	0	<0.5	
42		1		0.0000	0.0000	0	<0.5	
43		1		0.0000	0.0000	0	<0.5	
44		1		0.0000	0.0000	0	<0.5	
45		1		0.0000	0.0000	0	<0.5	
46		1		0.0000	0.0000	0	<0.5	
47		1		0.0000	0.0000	0	<0.5	
48		1		0.0000	0.0000	0	<0.5	
49		1		0.0000	0.0000	0	<0.5	
50		1		0.0000	0.0000	0	<0.5	

Analyzed By:	Bel	Date Analyzed	6/20/19
Reviewed By:		Date Reviewed	06/20/19

TOC: 640162, 640173
DOC: 640170

Schedule: 06192019

Version: 2
Instrument: Fusion1
Last Saved by: Fusion1 (Fusion1)
Last Saved on: 2019/06/19 15:32 - Wednesday

Position	Sample Type	Sample ID	Method ID (Calibration ID)	Reps	Use	State
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Clean)	Clean	Clean		1	True	Ready
(Blank)	Blank	Reagent/Acid Blank		1	True	Ready
D	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
1	Sample	MB1	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
2	Sample	ICS	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
3	Sample	K1905696-001.08 50x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
4	Sample	K1905696-002.08 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
5	Sample	K1905696-003.08 2x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
6	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
7	Sample	K1905420-001.02 20x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
8	Sample	K1905652-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
9	Sample	K1905666-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
10	Sample	K1905666-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
11	Sample	K1905666-003.01 5x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
12	Sample	K1905666-004.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
13	Sample	K1905666-005.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
14	Sample	K1905666-006.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
15	Sample	K1905612-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
16	Sample	K1905612-002.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
17	Sample	K1905612-002.01 ms	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
18	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
19	Sample	K1905649-001.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
20	Sample	MB2	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
C	Check Standard	[TOC] LCS [24.0 ppm]	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
21	Sample	K1905649-002.01 100x	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
22	Sample	K1905676-001.01	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
23	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
24	Sample	K1905679-001.05 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
25	Sample	K1905595-002 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
26	Sample	FB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
27	Sample	K1905633-001.15 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
28	Sample	K1905633-001.15 ms doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
29	Sample	K1905675-001.02 doc	CAS_salt_010711 (CAS_salt_010711)	2	True	Ready
30	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
31	Sample	K1905436-001.01	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
32	Sample	K1905436-002.01	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
33	Sample	K1905436-003.01	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
34	Sample	K1905436-003.01 ms	CAS_salt_010711 (CAS_salt_010711)	4	True	Ready
35	Sample	RB	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
B	Check Standard	[TOC] CCV 25 ppm [25 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
D	Check Standard	[TOC] CCB [0 ppm]	CAS_salt_010711 (CAS_salt_010711)	1	True	Ready
					False	

Fusion Report - 06192019
Wednesday, June 19, 2019 02:52 PM

(View - Reps, Unused Reps, Meta-Data, Signature, History)
Printed on 2019/06/24 14:49 - Monday

Report Summary Information

Company Location:	Gen Chem Lab		
Schedule Name:	06192019	Engine Version:	1.1.5.1
Instrument Name:	Fusion1	Firmware Version:	1.2.0696
Report Version:	1 of 1	Connection:	RS232 COM1
Report Creation by Operators (schedule version):	Fusion1 (Fusion1) (v1) Fusion1 (Fusion1) (v2)		
Comment:			

Report Results

06/20/19

Sample Type: Clean — From Schedule Version 1

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/06/19 14:52

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	8.76	19.59	10.83	49.44	05:22
2	TC Clean	10.59	14.04	3.45	50.49	04:02
3	TC Clean	2.18	5.58	3.40	50.33	03:44
4	TC Clean	1.63	4.83	3.20	50.68	03:45

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
◆	(clean)		Clean	2019/06/19 15:32

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	11.74	14.96	3.22	49.78	05:23
2	TC Clean	4.41	7.63	3.22	50.65	04:03
3	TC Clean	1.69	4.97	3.28	50.82	03:47
4	TC Clean	1.18	4.56	3.38	50.79	03:49

Sample Type: Clean — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
*	(clean)		Clean	2019/06/19 15:54

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.83	4.15	3.32	49.83	05:23
2	TC Clean	3.04	6.29	3.25	50.23	04:05
3	TC Clean	1.33	4.50	3.18	50.38	03:48
4	TC Clean	1.16	4.35	3.19	50.64	03:51

Sample Type: Blank (Creating v1267) — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Start Time
*	(blank)		Reagent/Acid Blank	2019/06/19 16:16

Rep #	Base Analysis Type	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	IC Clean	0.73	3.88	3.14	49.26	05:14
2	TC Clean	2.78	6.04	3.27	50.81	04:04
3	TC Clean	1.31	4.64	3.33	50.62	03:48
4	TC Clean	1.38	4.45	3.07	50.57	03:57
5	Reagent Blank	3.58	6.84	3.26	50.32	05:09
6	Acid Blank	0.94	4.17	3.23	49.42	05:28

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	D	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/19 16:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	8.62	11.97	3.35	51.11	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	23.7028 ppm (PASS)	0.0000 ppm	0%	2019/06/19 17:05

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	23.7028	237.0285	170.36	173.70	3.34	51.18	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/19 17:19

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.01	9.33	3.32	51.16	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	1	TOC	MB1	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/19 17:34

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.78	8.93	3.15	51.16	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.0395 ppm (PASS)	0.0000 ppm	0%	2019/06/19 17:49

Pos	Base Analysis	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time

	Type									
C	TOC	25.0 ppm	1	24.0395	240.3947	172.64	175.86	3.21	51.19	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	2	TOC	ICS	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/19 18:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.90	11.08	3.18	51.07	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	3	TOC	K1905696-001.08 50x	2.8700 ppm	0.0273 ppm	0.9500%	2019/06/19 18:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.8507	28.5070	28.10	31.40	3.29	50.97	10:32
2	TOC	2.8893	28.8929	28.37	31.46	3.10	50.92	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	4	TOC	K1905696-002.08 2x	61.7445 ppm	2.0771 ppm	3.3600%	2019/06/19 18:47

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	60.2758	602.7577	417.90	421.01	3.11	50.80	10:27
2	TOC	63.2132	632.1319	437.84	441.24	3.40	50.71	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	5	TOC	K1905696-003.08 2x	50.8612 ppm	0.1401 ppm	0.2800%	2019/06/19 19:15

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	50.9603	509.6028	354.67	358.07	3.40	50.63	10:31
2	TOC	50.7621	507.6213	353.32	356.69	3.36	50.55	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC)	CAS_salt_010711	CAS_salt_010711

(v1267) (v4) (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	6	TOC	RB	0.0769 ppm	0.1087 ppm	141.4200%	2019/06/19 19:43

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.1537	1.5371	9.80	12.92	3.12	50.47	10:29
2	TOC	0.0000	0.0000	7.54	10.77	3.23	50.40	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	7	TOC	K1905420-001.02 20x	3.1867 ppm	0.0014 ppm	0.0400%	2019/06/19 20:11

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	3.1857	31.8570	30.38	33.55	3.17	50.36	10:30
2	TOC	3.1876	31.8762	30.39	33.32	2.93	50.32	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	8	TOC	K1905652-001.01	0.5571 ppm	0.0025 ppm	0.4500%	2019/06/19 20:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5588	5.5884	12.55	15.66	3.11	50.28	10:30
2	TOC	0.5553	5.5530	12.52	15.58	3.06	50.25	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◉	9	TOC	K1905666-001.01	1.8052 ppm	0.0277 ppm	1.5400%	2019/06/19 21:07

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8248	18.2476	21.14	24.37	3.23	50.25	10:29
2	TOC	1.7856	17.8557	20.88	24.05	3.18	50.23	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time

◈	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.2059 ppm (PASS)	0.0000 ppm	0%	2019/06/19 21:36

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2059	242.0594	173.77	176.94	3.17	50.25	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◈	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/19 21:50

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	6.15	9.44	3.29	50.25	10:27

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample

From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	10	TOC	K1905666-002.01	0.9795 ppm	0.0103 ppm	1.0500%	2019/06/19 22:05

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.9868	9.8680	15.45	18.61	3.16	50.25	10:27
2	TOC	0.9722	9.7222	15.35	18.56	3.20	50.24	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◈	11	TOC	K1905666-003.01 5x	2.1383 ppm	0.0619 ppm	2.8900%	2019/06/19 22:33

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.1820	21.8201	23.57	26.76	3.19	50.27	10:25
2	TOC	2.0945	20.9450	22.97	26.09	3.11	50.26	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	12	TOC	K1905666-004.01	0.3795 ppm	0.0086 ppm	2.2800%	2019/06/19 23:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.3856	3.8559	11.37	14.58	3.20	50.27	10:28
2	TOC	0.3734	3.7336	11.29	14.44	3.16	50.26	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	13	TOC	K1905666-005.01	1.9007 ppm	0.0030 ppm	0.1600%	2019/06/19 23:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8986	18.9857	21.64	24.80	3.16	50.26	10:29
2	TOC	1.9028	19.0284	21.67	24.86	3.19	50.27	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	14	TOC	K1905666-006.01	11.1120 ppm	0.0599 ppm	0.5400%	2019/06/19 23:57

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	11.0697	110.6968	83.90	87.12	3.22	50.29	10:28
2	TOC	11.1544	111.5439	84.47	87.68	3.21	50.27	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	15	TOC	K1905612-001.01	15.1099 ppm	0.0689 ppm	0.4600%	2019/06/20 00:25

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.1586	151.5855	111.65	114.59	2.94	50.27	10:30
2	TOC	15.0612	150.6117	110.99	113.91	2.92	50.26	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	16	TOC	K1905612-002.01	0.5938 ppm	0.1075 ppm	18.1100%	2019/06/20 00:53

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.6698	6.6977	13.30	16.42	3.12	50.27	10:27

2	TOC	0.5177	5.1774	12.27	15.48	3.22	50.21	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	17	TOC	K1905612-002.01 ms	25.6395 ppm	0.0000 ppm	0.0000%	2019/06/20 01:21

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	25.6395	256.3949	182.79	185.79	3.00	50.23	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	18	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/20 01:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.50	9.51	3.00	50.26	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	19	TOC	K1905649-001.01 100x	6.0265 ppm	0.1216 ppm	2.0200%	2019/06/20 01:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.9406	59.4059	49.08	52.23	3.15	50.28	10:26
2	TOC	6.1125	61.1251	50.25	53.41	3.17	50.28	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
◆	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.2154 ppm (PASS)	0.0000 ppm	0%	2019/06/20 02:18

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.2154	242.1537	173.84	176.87	3.04	50.29	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB

From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/20 02:33

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	5.85	9.22	3.37	50.32	10:34

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample

From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	20	TOC	MB2	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/20 02:48

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	5.16	8.40	3.24	50.32	10:29
2	TOC	0.0000	0.0000	5.09	8.28	3.19	50.31	10:28
3	TOC	0.0000	0.0000	4.93	8.25	3.32	50.31	10:23
4	TOC	0.0000	0.0000	5.00	8.18	3.18	50.34	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> LCS

From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	C	TOC	25.0000	1:1	[TOC] LCS [24.0 ppm]	0 / infinity (NA / NA)	24.6184 ppm (PASS)	0.3533 ppm	1.43%	2019/06/20 03:44

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
C	TOC	25.0 ppm	1	24.3955	243.9554	175.06	178.27	3.21	50.33	10:30
C	TOC	25.0 ppm	2	24.3706	243.7065	174.89	178.24	3.35	50.33	10:27
C	TOC	25.0 ppm	3	24.5773	245.7734	176.29	179.65	3.36	50.34	10:26
C	TOC	25.0 ppm	4	25.1299	251.2994	180.04	183.46	3.42	50.42	10:28

Completion State	Success Action	Method	Calibration	STD Conc - Pos C
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	25 ppmC

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	21	TOC	K1905649-002.01 100x	6.7190 ppm	0.0242 ppm	0.3600%	2019/06/20 04:39

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	6.7019	67.0194	54.25	57.45	3.21	50.35	10:29
2	TOC	6.7361	67.3612	54.48	57.65	3.17	50.34	10:31

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	22	TOC	K1905676-001.01	2.0058 ppm	0.0465 ppm	2.3200%	2019/06/20 05:08

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0387	20.3867	22.59	25.87	3.28	50.40	10:25
2	TOC	1.9730	19.7296	22.15	25.40	3.25	50.37	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	23	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/20 05:36

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	6.38	9.66	3.28	50.37	10:32

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	24	TOC	K1905679-001.05 doc	1.9867 ppm	0.1969 ppm	9.9100%	2019/06/20 05:50

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	1.8474	18.4745	21.30	24.55	3.26	50.44	10:29
2	TOC	2.1259	21.2588	23.18	26.53	3.34	50.37	10:25

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
◆	25	TOC	K1905595-002 doc	32.9839 ppm	0.4855 ppm	1.4700%	2019/06/20 06:18

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	33.3272	333.2724	234.98	238.25	3.27	50.38	10:27

2	TOC	32.6406	326.4059	230.32	233.48	3.17	50.36	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	26	TOC	FB	2.0731 ppm	0.0000 ppm	0.0000%	2019/06/20 06:46

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	2.0731	20.7314	22.83	26.20	3.38	50.37	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	27	TOC	K1905633-001.15 doc	8.6657 ppm	0.2181 ppm	2.5200%	2019/06/20 07:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	8.8200	88.1996	68.62	71.92	3.29	50.38	10:27
2	TOC	8.5115	85.1147	66.53	69.73	3.20	50.35	10:24

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	28	TOC	K1905633-001.15 ms doc	28.8315 ppm	5.5882 ppm	19.3800%	2019/06/20 07:29

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	32.7829	327.8290	231.28	234.56	3.28	50.35	10:26
2	TOC	24.8801	248.8006	177.64	181.15	3.51	50.33	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.1517 ppm (PASS)	0.0000 ppm	0%	2019/06/20 07:57

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.1517	241.5173	173.40	176.64	3.24	50.33	10:35

Completion State	Success Action	Method	Calibration	STD Conc - Pos B

Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/20 08:11

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	7.36	10.52	3.15	50.33	10:31

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Sample Type: Sample — From Schedule Version 2

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	29	TOC	K1905675-001.02	5.2434 ppm	0.0651 ppm	1.2400%	2019/06/20 08:26

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	5.1974	51.9736	44.03	47.27	3.24	50.30	10:31
2	TOC	5.2894	52.8943	44.66	47.83	3.17	50.30	10:26

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	30	TOC	RB	0.0000 ppm	0.0000 ppm	0.0000%	2019/06/20 08:54

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.0000	0.0000	7.04	10.17	3.12	50.29	10:30

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	31	TOC	K1905436-001.01	0.6359 ppm	0.0843 ppm	13.2600%	2019/06/20 09:09

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.7564	7.5639	13.89	16.99	3.10	50.25	10:25
2	TOC	0.5842	5.8418	12.72	15.96	3.24	50.24	10:30
3	TOC	0.6315	6.3147	13.04	16.19	3.15	50.21	10:29

4	TOC	0.5717	5.7165	12.64	15.78	3.14	50.23	10:28

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	32	TOC	K1905436-002.01	15.2196 ppm	0.0996 ppm	0.6500%	2019/06/20 10:04

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.1581	151.5811	111.65	114.73	3.08	50.19	10:29
2	TOC	15.3222	153.2223	112.76	116.06	3.30	50.18	10:25
3	TOC	15.1136	151.1362	111.34	114.71	3.36	50.14	10:29
4	TOC	15.2844	152.8436	112.50	115.59	3.09	50.11	10:29

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	33	TOC	K1905436-003.01	15.3624 ppm	0.2766 ppm	1.8000%	2019/06/20 11:01

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	15.5164	155.1639	114.08	117.10	3.02	50.06	10:29
2	TOC	15.3778	153.7777	113.14	116.13	2.99	50.04	10:25
3	TOC	15.5870	155.8696	114.56	117.59	3.03	50.07	10:29
4	TOC	14.9685	149.6851	110.36	113.47	3.11	50.04	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	34	TOC	K1905436-003.01 ms	38.0312 ppm	0.5456 ppm	1.4300%	2019/06/20 11:56

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	38.0574	380.5740	267.09	270.20	3.11	49.97	10:26
2	TOC	38.7936	387.9356	272.08	275.30	3.21	49.98	10:26
3	TOC	37.6492	376.4917	264.32	267.59	3.27	49.97	10:31
4	TOC	37.6247	376.2472	264.15	267.34	3.19	49.99	10:27

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

	Pos	Analysis Type	Sample ID	Result (ppmC)	Std. Dev. (ppmC)	RSD	Start Time
*	35	TOC	RB	0.5487 ppm	0.0000 ppm	0.0000%	2019/06/20 12:52

Rep #	Base Analysis Type	ppm	µg	Adjusted (Abs)	NDIR (Abs)	Baseline (Abs)	Pressure (psig)	Run Time
1	TOC	0.5487	5.4867	12.48	15.66	3.18	49.97	10:33

Dilution	Blank Contribution	Method	Calibration
1:10	(TC) 8.7546 (IC) (v1267)	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)

Sample Type: Check Standard --> CCV 25 ppm — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	B	TOC	25.0000	1:2	[TOC] CCV 25 ppm [25 ppm]	0 / infinity (NA / NA)	24.5337 ppm (PASS)	0.0000 ppm	0%	2019/06/20 13:07

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
B	TOC	25 ppm	1	24.5337	245.3373	176.00	178.99	2.99	49.93	10:29

Completion State	Success Action	Method	Calibration	STD Conc - Pos B
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	50 ppmC

Sample Type: Check Standard --> CCB — From Schedule Version 2

	Pos	BAT	Concentration (ppm)	Dil	Sample ID	Min / Max (% dev)	Result	Std. Dev.	RSD	Start Time
*	D	TOC	0.0000	1:1	[TOC] CCB [0 ppm]	0 / infinity (NA / NA)	0.0000 ppm (PASS)	0.0000 ppm	0%	2019/06/20 13:21

Pos	Base Analysis Type	ID	Rep #	ppm	µg	Adjusted	NDIR	Baseline	Pressure	Run Time
D	TOC	0 ppm	1	0.0000	0.0000	8.01	11.36	3.35	49.91	10:33

Completion State	Success Action	Method	Calibration	STD Conc - Pos D
Success - Criteria met.	Do Nothing	CAS_salt_010711 (v4)	CAS_salt_010711 (v30)	0 ppmC

Meta Data Used in this Report

Blanks

Version	Reagent (Abs)	Acid (Abs)	DI IC (Abs)	DI TC (Abs)	DI TOC (Abs)	Save Time	Operator
v1266	2.2187	1.4940	0.0000	0.0000	0.0000	2019/06/14 17:57	Fusion1 (Fusion1)
v1267	1.1920	0.9390	0.0000	0.0000	0.0000	2019/06/19 16:50	Fusion1 (Fusion1)

Calibrations

Name: CAS_salt_010711 (TOC)

Version:	v30	Calibration curve formula:	TOC: y = 6.788x + 9.463
Ver Creation:	2019/03/05 17:42	r^2 value:	TOC: r^2 = 0.99963
Comment:			
Operator:	Fusion1 (Fusion1)		
Basic Analysis Type	TOC		

Basic Analysis Type: TOC

Sample ID	Y Raw Value	X Expected	Message	End Time
DI Water	7.8970	0.0000		2019/03/05 16:15
0.500 ppm	11.5280	0.5000		2019/03/05 16:29
1.0 ppm	14.9760	1.0000		2019/03/05 16:44
5.0 ppm	43.6500	5.0000		2019/03/05 16:58
10 ppm	79.6020	10.0000		2019/03/05 17:12
25 ppm	183.3580	25.0000		2019/03/05 17:26
50 ppm	346.3230	50.0000		2019/03/05 17:40

Methods

Name: CAS_salt_010711 (TOC)

Version:	v4	Operator:	Fusion1 (Fusion1)
Ver Creation:	2019/02/21 17:57		
Comment:			

Parameter	Value
SampleVolume	10.0 mL
Dilution	1:10
AcidVolume	0.5 ml
ReagentVolume	2.0 ml
UVReactorPrerinse	Off
UVReactorPrerinseVolume	5.0
NumberOfUVReactorPrerinses	1
ICSpargeTime	1.00 mins
DetectorSweepFlow	500 ml/min
PreSpargeTime	2.00 mins
SystemFlow	500 ml/min

Advanced Parameter	Value
NeedleRinseVolume	5.0 ml
VialPrimeVolume	2.0 ml
ICSamplePrimeVolume	2.0 ml
ICSpargeRinseVolume	12.0 ml
BaselineStabilizeTime	0.70 min
DetectorPressureFlow	150 ml/min
SyringeSpeedWaste	10
SyringeSpeedAcid	7
SyringeSpeedReagent	7
SyringeSpeedDIWater	7
NDIRPressurization	60 psig
SyringeSpeedSampleDispense	5
SyringeSpeedSampleAspirate	4
SyringeSpeedUVDispense	5
SyringeSpeedUVAspirate	5
SyringeSpeedICDispense	5
SyringeSpeedICAspirate	5
NDIRPressureStabilize	1.75 min
SampleMixing	Off
SampleMixingCycles	1

SampleMixingVolume	10.0
LowLevelFilterNDIR	Off

Acceptance / Approval

Electronic Signatures

Report Version	User Name	Acceptance	Reason	Date

Report History

Report History

Report Version	User Name	System Reason	User Reason	Date
1	Fusion1 (Fusion1)	Schedule completed	Schedule completed	2019/06/20 13:37

StarLIMS Run: 640162, 640173, 640170

Analysis: TOC/DOC

Method: 415.1, SM 5310 C, 9060, 9060A

CCV: 11-GEN-05-77K 50 ppm LCS: 11-GEN-05-77D 25.0 ppm

ICAL Date: 3/6/19

ICAL ID: 11-GEN-05-76H

ICS ID: 11-GEN-05-74A

ICS TV: 25.0 ppm ICS % R = 2

Spike ID: 11-GEN-05-77J 0.05 ml of 5000 ppm stock ---> 10.0 ml = 25.0 ppm x dilution factor

Sodium Persulfate: 11-GEN-05-78I

21 % H3PO4: 11-GEN-05-78H

Equipment ID: K-TOC-03

PIPETTE ID: 124276B, 129001F, N11314F, Marge

FILTER ID: FE1165 6/15/19

Analyzed By:	BCD / HLM	Date Analyzed:	6/19/19
Reviewed By:	[signature]	Date Reviewed:	06/20/19

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1917488, 1917489, 1917672

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2264 (242398)

General Set Information: There were thirteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 660892) was less than 1/2 the CRDL. The recovery for the LCS (660893) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1917488001 (Client ID: LH18/24-SP650_061219_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5.µg/L. The MS/MSD percent recoveries were within the performance limits. The MS/MSD failed QC acceptance criteria for relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 660890) is reported from the analysis of the Laboratory Control Sample (LCS – 660893) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 27JUND03/12/20.

Thomas Bosch July 1, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: July 01, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1917488**
Project ID: HS19060672
Purchase Order: HS19060672
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
LH18/24-SP650_061219_BIX	1917488001	06/12/19	06/18/19	

ANALYTICAL REPORT

Workorder: 34-1917488
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID:	LH18/24-SP650_061219_BIX	Sampling Site:	NA	Collected:	06/12/2019
Lab ID:	1917488001	Media:	125 mL Nalgene	Received:	06/18/2019
Matrix:	Water	Sampling Parameter:	NA		

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:**	LCMS04
	Batch: ELMS/2264 (HBN: 242398)	**Percent Solid:**	NA
	Analyzed: 06/27/2019 09:42	**Report Basis:**	Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 242398)

Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/01/2019 10:47	/S/ Stephen Brose 07/01/2019 13:43

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1917488
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1917488

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2264 (HBN: 242398)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 660892
Analyzed: 06/27/2019 09:28
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 660893
Analyzed: 06/27/2019 09:00
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.27	4.00	107	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1917488001	**MS:**	660894	**MSD:**	660895
Analyzed:	06/27/2019 09:42	**Analyzed:**	06/27/2019 09:56	**Analyzed:**	06/27/2019 10:10
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	5.13	5	103	78.8	123.8	4.06	81.2	# 23.3	0.0	20.0

Comments

Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/01/2019 10:55	07/01/2019 13:43

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

18698/2

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

# of Custody

SAMPLING STATE: **Dept of Defense** **COC ID:** **11595**

1917488

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123 **Phone:** +1 801 266 7700

CUSTOMER INFORMATION:		**INVOICE INFORMATION:**	
Company:	ALS Houston	**Company:**	ALS Houston
Contact:	RJ Modashia	**Contact:**	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210	**Address:**	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656	**Phone:**	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com	**Reference:**	HS19060672
Alternate Contact:		**TSR:**	Danielle Winnings
Email:			

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060672-02**	**LH18/24-SP650_061219_BIX**	**Water**	**12 Jun 2019 14:00**
	SUB_Perch-6850			21 Jun 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 6/17/19 1800.

Received By: Jennifer Jassel Date/Time: 06-18-19 9:58

Cooler ID(s): _____ Temperature(s): _____

RECEIPT OF SAMPLES SUBJECT TO TERMS

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19060672	*Split:*	**Workorder ID:** 1917488	Level: ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	Type: 125Poly
Comments:			Preservatives

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850_DoD QSM
1	06/12/2019 14:00	LH18/24-SP650_061219_BIX	1917488001		Water	A	1	A
2								
3								
4								
5								
6								
7								
8								
9								
10								

69 of 166

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Walath, Julie	06/18/2019 09:58	ALS Sample Receiving	Sample Login
[signature]	6/18/19 1435	HC	Storage
R-33.1	6/26/19/08:22	T. Brooks	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00939986

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston — Project/Task/Site: 191488

Date/Time of Receipt: 06-18-19 9:58 — Number of Coolers Received: 1

Condition of Coolers:	(Acceptable)/Unacceptable	Temperature Control:	(Present)/Not Included
Cooler Custody Seals:	(Present)/Absent/NA	Location Temp Taken:	(Cooler)/Between Samples
	(Intact)/Broken/NA		
Container Custody Seals:	Present/(Absent)/NA	Are all temperatures within project specific guidelines?	Yes/No/(NA)
	Intact/Broken/(NA)		
Ice Present:	(Yes)/No/NA	VOA Headspace Present?	Yes/No/(NA)
	Frozen/Melted/NA		

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9706	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Tamara Jassell (Signature) — T. Ventassell (Printed Name) — 06-18-19 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 17JUN19
ACTWGT: 11.25 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19060672/835 - RJ

FedEx Express

TUE - 18 JUN 3:00P
STANDARD OVERNIGHT

TRK# 0201 4809 7835 0551

AX BTFA

84123
UT-US SLC

Batch Worklist

Batch: ELMS/ 2264 **Created:** 6/27/2019 07:47 **Instrument:** **HBN:** 242398
Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1917488 [ENV_LVL4]
Workorder: 1917489 [ENV_LVL4]
Workorder: 1917672 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	660889	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	
2	660890	RLVS for HBN 242398 [ELMS/2264				RLVS	3		E685041C3Q	5311		7/1/2019	
3	660891	ICS for HBN 242398 [ELMS/2264]				ICS	3		E6850..D3Q	5311		7/1/2019	
4	660892	LMB for HBN 242398 [ELMS/2264]				LMB	3		E6850Q413Q	5311		7/1/2019	
5	660893	LCS for HBN 242398 [ELMS/2264]				LCS	3		E6850Q413Q	5311		7/1/2019	
6	1917488001	LH18/24-SP650_061219_BIX				SAMPLE	3	1917488001-A	E6850Q41.3	5480	7/10/2019	7/1/2019	
7	660894	LH18/24-SP650...(1917488001MS)				MS	3		E6850Q413Q	5311		7/1/2019	
8	660895	LH18/24-SP65...(1917488001MSD)				MSD	3		E6850Q413Q	5311		7/1/2019	
9	1917489001	18CPTMW22SW_061319				SAMPLE	3	1917489001-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
10	1917489002	18CPTMW22DW_061319				SAMPLE	3	1917489002-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
11	1917489003	18CPTMW22R_061319				SAMPLE	3	1917489003-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
12	1917489004	MW20_061319				SAMPLE	3	1917489004-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
13	1917489005	18CPTMW26SW_061319				SAMPLE	3	1917489005-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
14	1917672001	MW7_061719				SAMPLE	3	1917672001-A	E6850Q41.3	5480	7/15/2019	7/3/2019	
15	1917672002	18CPTMW12DW_061719				SAMPLE	3	1917672002-A	E6850Q41.3	5480	7/15/2019	7/3/2019	
16	660896	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	
17	1917672003	18CPTMW12SW_061719				SAMPLE	3	1917672003-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
18	1917672004	18CPTMW12SW_061719_a				SAMPLE	3	1917672004-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
19	1917672005	18CPTMW23SW_061719				SAMPLE	3	1917672005-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
20	1917672006	18CPTMW23_061719				SAMPLE	3	1917672006-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
21	1917672007	18W14_061719W_061719				SAMPLE	3	1917672007-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
22	660897	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	

00939989

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1917488 (001), 1917489 (001-05), 1917672 (001-07)
ELMS Batch/HBN ID: 2264 (242398)
Prep Date: 06/26/2019 Analysis Date: 06/27/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\27JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 660893; Target = 4.0µg/L. ASTM type II water was used for LMB 660892.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1917488001 (Client ID: LH18/24-SP650_061219_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD – 660894/95 failed QC acceptance criteria for relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\242398-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 660890) is reported from the analysis of the Laboratory Control Sample (LCS – 660893) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 27JUND03/12/20.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2264 HBN: 242398 Sample Set IDs if Applicable: 1917488/1917489/1917672	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	/
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR# _____	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK		Description - 6850 WKG Std 100.ug/L
Standard: 43702	**Created By:** Thomas Bosch	**Amount:** 10 mL
MFG: ALS/SLC	**Create Date:** 09/18/2018 02:09PM	**Expires:** 09/18/2019
MFG Lot: TNB: 09/18/2018		**Usable:** Yes
Pipette ID: Not Provided		**Lab Lot:** CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL
Standard: 43659	Created By: Thomas Bosch	Amount: 100 mL
MFG: AccuStandard	Create Date: 09/17/2018 09:09AM	Expires: 07/25/2020
MFG Lot: 218065075		Usable: No
Part ID: IC-PER-10X-1		Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration 1000 ug/mL
1	14797-73-0	Perchlorate	

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
			10 ug/mL
1	14797-73-0	Perchlorate	

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description - 6850 QC WKG STD 100ug/L

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK	Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK	Description - Perchlorate ISTD Stock

Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED TESTING LABORATORY

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

AccuStandard

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Report: C:\HPCHEM\1\DATA\27JUN19D\27JUN19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	660889 CCV@25	Vial 71	1	Control	1	1.82515e6	8.439	25.67350
*	660893 QC@4.0	Vial 72	1	Control	2	3.38083e5	8.214	4.26890
*	660891 ICS@4.0	Vial 73	1	Control	3	2.57330e5	7.965	3.92512
*	660892 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917488001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	660894 174881S	Vial 76	1	Sample	6	2.62640e5	7.903	5.12768
*	660895 174881D	Vial 77	1	Sample	7	2.64844e5	7.941	4.05844
*	1917489001 100	Vial 78	1	Sample	8	4.17326e5	8.686	591.94538
*	1917489002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1917489003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1917489004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1917489005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1917672001 1K	Vial 83	1	Sample	13	1.57532e6	8.712	2.61220e4
*	1917672002	Vial 84	1	Sample	14	6.54028e4	7.973	1.24787
*	660896 CCV@25	Vial 71	1	Control	15	1.48921e6	8.624	25.51318
*	1917672003	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1917672004	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1917672005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917672006 100	Vial 88	1	Sample	19	1.71986e6	8.736	2534.96449
*	1917672007	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	660897 CCV@25	Vial 71	1	Control	21	1.42516e6	8.651	24.42440

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	660889 CCV@25	Vial 71	1	Control	1	5.48361e5	8.454	25.97496
*	660893 QC@4.0	Vial 72	1	Control	2	1.12796e5	8.202	4.63897
*	660891 ICS@4.0	Vial 73	1	Control	3	8.93833e4	7.980	4.42426
*	660892 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917488001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	660894 174881S	Vial 76	1	Sample	6	8.68330e4	7.935	5.55768
*	660895 174881D	Vial 77	1	Sample	7	8.75585e4	7.960	4.36181
*	1917489001 100	Vial 78	1	Sample	8	1.40501e5	8.696	655.91363
*	1917489002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1917489003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1917489004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1917489005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1917672001 1K	Vial 83	1	Sample	13	4.80693e5	8.744	2.68224e4
*	1917672002	Vial 84	1	Sample	14	2.29889e4	7.974	1.29323
*	660896 CCV@25	Vial 71	1	Control	15	4.52707e5	8.622	26.10046
*	1917672003	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1917672004	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1917672005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917672006 100	Vial 88	1	Sample	19	5.21595e5	8.762	2587.43586
*	1917672007	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	660897 CCV@25	Vial 71	1	Control	21	4.30118e5	8.688	24.80913

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	660889 CCV@25	Vial 71	1	Control	1	2.15939e5	8.466	5.00000
*	660893 QC@4.0	Vial 72	1	Control	2	2.60134e5	8.243	5.00000
*	660891 ICS@4.0	Vial 73	1	Control	3	2.16232e5	7.969	5.00000
*	660892 LMB	Vial 74	1	Control	4	2.72547e5	8.630	5.00000
*	1917488001	Vial 75	1	Sample	5	2.27402e5	7.920	5.00000
*	660894 174881S	Vial 76	1	Sample	6	1.66848e5	7.932	5.00000
*	660895 174881D	Vial 77	1	Sample	7	2.14876e5	7.954	5.00000
*	1917489001 100	Vial 78	1	Sample	8	2.28283e5	8.729	500.00000
*	1917489002	Vial 79	1	Sample	9	2.07849e5	7.985	5.00000
*	1917489003	Vial 80	1	Sample	10	2.26487e5	8.403	5.00000

00940009

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	1917489004	Vial 81	1	Sample	11	1.93008e5	7.993	5.00000
*	1917489005	Vial 82	1	Sample	12	1.81500e5	7.840	5.00000
*	1917672001 1K	Vial 83	1	Sample	13	1.82987e5	8.737	5000.00000
*	1917672002	Vial 84	1	Sample	14	1.91018e5	8.001	5.00000
*	660896 CCV@25	Vial 71	1	Control	15	1.77368e5	8.624	5.00000
*	1917672003	Vial 85	1	Sample	16	1.65261e5	7.950	5.00000
*	1917672004	Vial 86	1	Sample	17	1.47928e5	7.939	5.00000
*	1917672005	Vial 87	1	Sample	18	1.93450e5	8.278	5.00000
*	1917672006 100	Vial 88	1	Sample	19	2.06241e5	8.740	500.00000
*	1917672007	Vial 89	1	Sample	20	1.87344e5	7.970	5.00000
*	660897 CCV@25	Vial 71	1	Control	21	1.77769e5	8.693	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

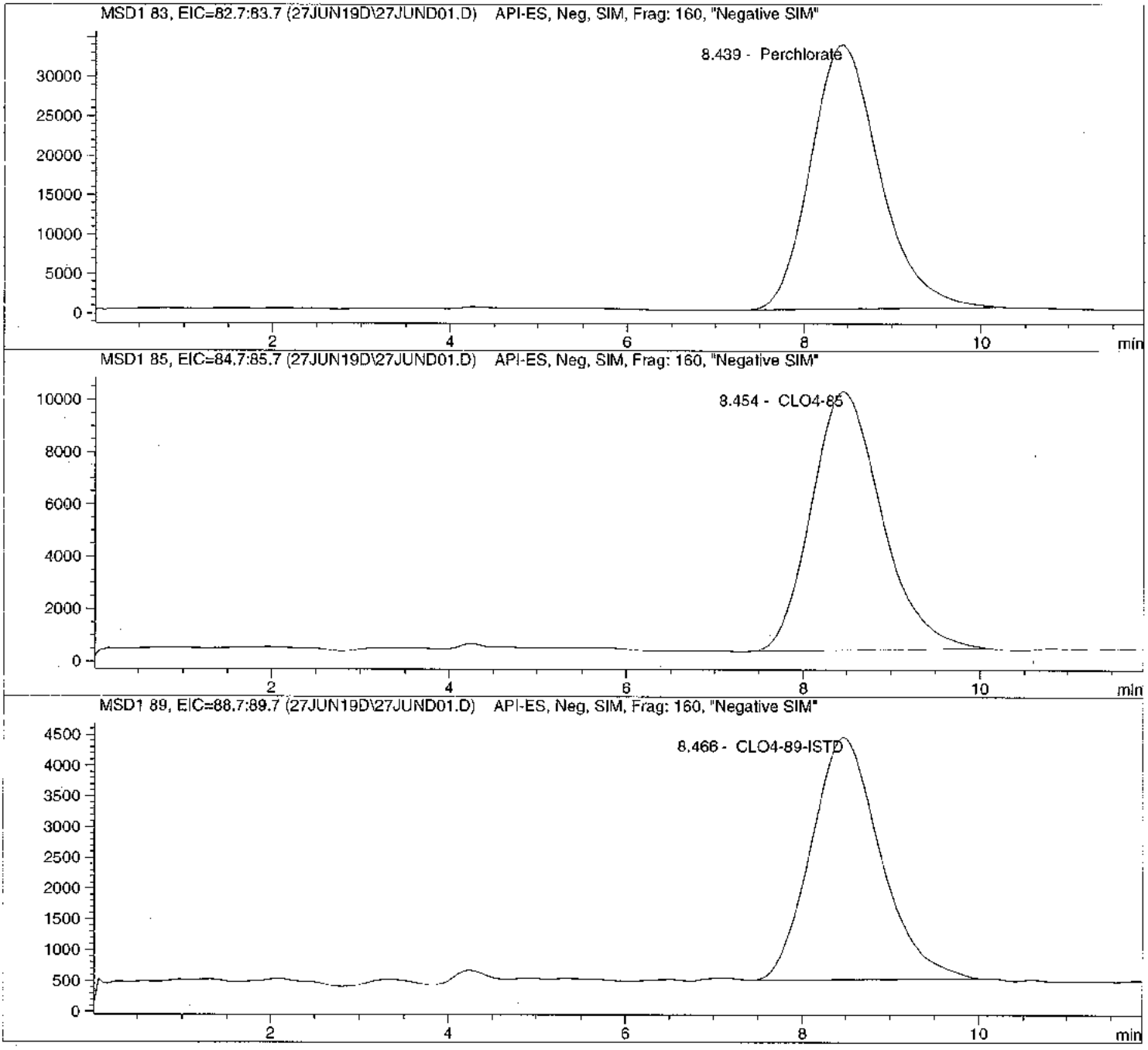
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	660889 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	660893 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	660891 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	660892 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1917488001	CLO4-AQN	1	Sample		
6	Vial 76	660894 174881S	CLO4-AQN	1	Sample		
7	Vial 77	660895 174881D	CLO4-AQN	1	Sample		
8	Vial 78	1917489001 100	CLO4-AQN	1	Sample		
9	Vial 79	1917489002	CLO4-AQN	1	Sample		
10	Vial 80	1917489003	CLO4-AQN	1	Sample		
11	Vial 81	1917489004	CLO4-AQN	1	Sample		
12	Vial 82	1917489005	CLO4-AQN	1	Sample		
13	Vial 83	1917672001 1K	CLO4-AQN	1	Sample		
14	Vial 84	1917672002	CLO4-AQN	1	Sample		
15	Vial 71	660896 CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1917672003	CLO4-AQN	1	Sample		
17	Vial 86	1917672004	CLO4-AQN	1	Sample		
18	Vial 87	1917672005	CLO4-AQN	1	Sample		
19	Vial 88	1917672006 100	CLO4-AQN	1	Sample		
20	Vial 89	1917672007	CLO4-AQN	1	Sample		
21	Vial 71	660897 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND01.D Sample Name: 660889 CCV@25

Injection Date:	6/27/2019 08:45:38	Seq Line:	1
Sample Name:	660889 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND01.D Sample Name: 660889 CCV@25

Injection Date:	6/27/2019 08:45:38	Seq Line:	1
Sample Name:	660889 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.439	PBA	1825148.0	25.6735	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.454	PBA	548361.0	25.9750	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.466	PBA	215939.1	5.0000	CLO4-89-ISTD

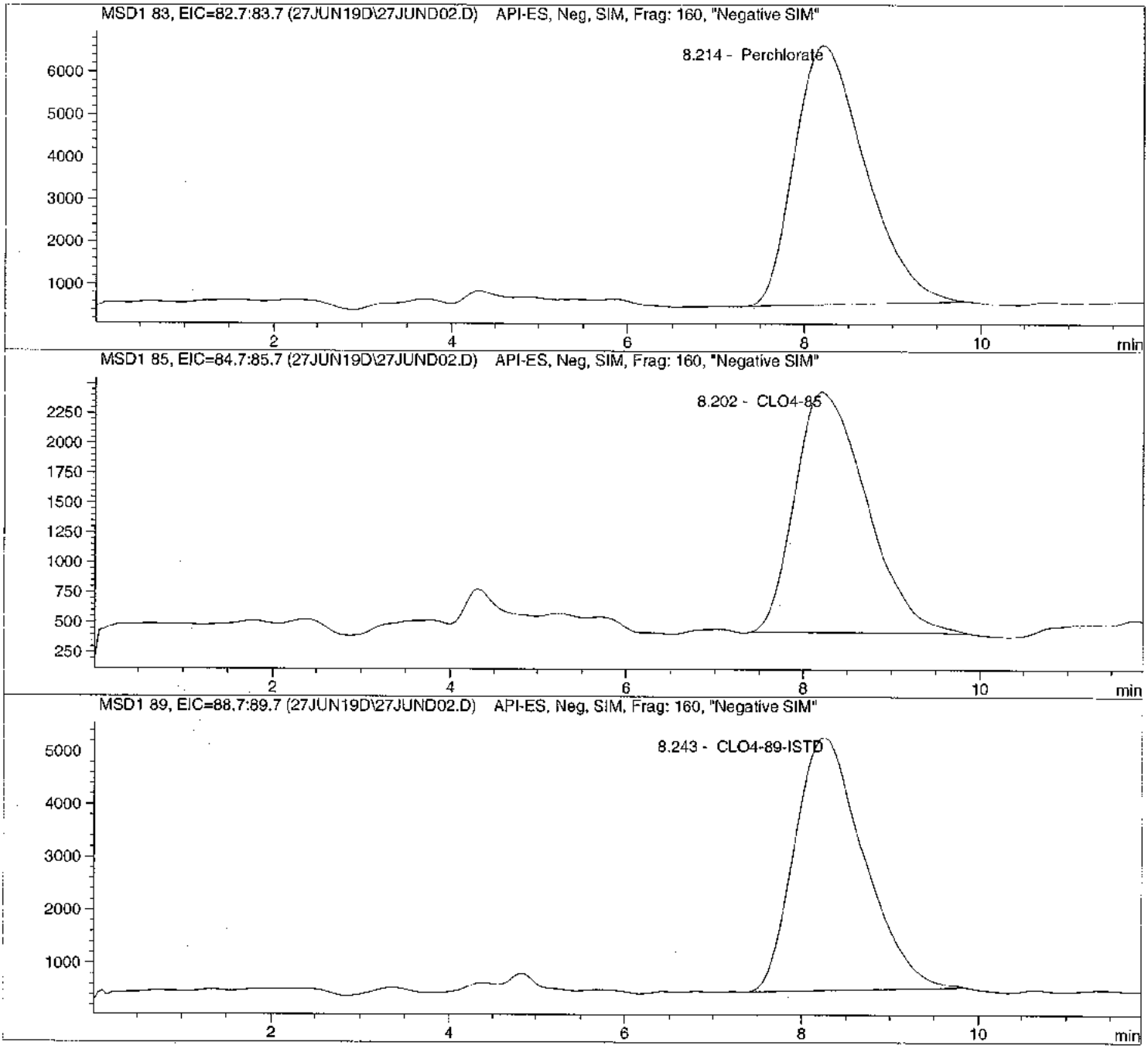
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND02.D Sample Name: 660893 QC@4.0

Injection Date:	6/27/2019 09:00:21	Seq Line:	2
Sample Name:	660893 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND02.D Sample Name: 660893 QC@4.0

Injection Date:	6/27/2019 09:00:21	Seq Line:	2
Sample Name:	660893 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.214	PBA	338083.1	4.2689	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.202	PBA	112796.3	4.6390	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.243	PBA	260134.2	5.0000	CLO4-89-ISTD

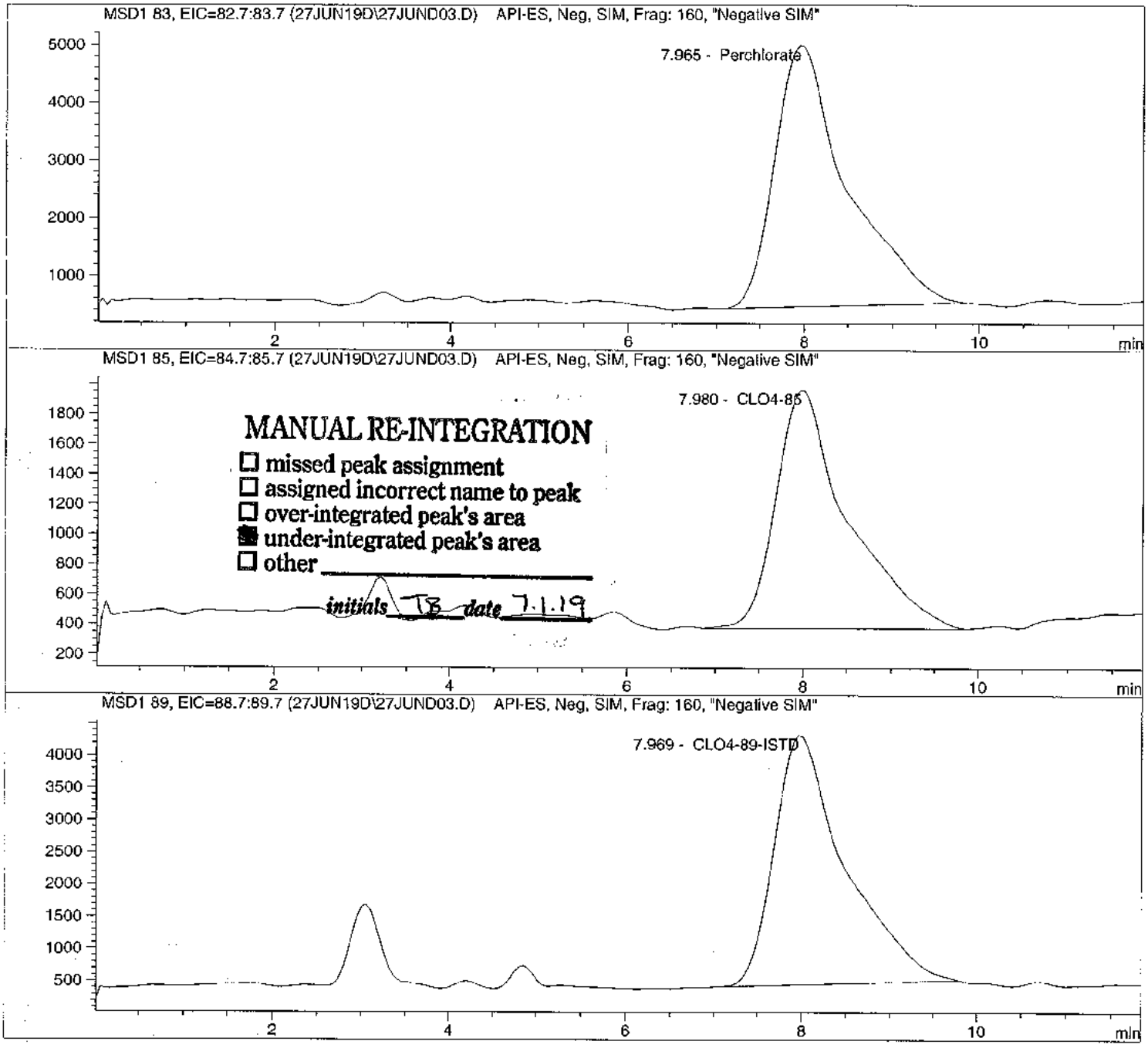
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.965	PBA	257330.2	3.9251	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.980	MM	89383.3	4.4243	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.969	BBA	216232.2	5.0000	CLO4-89-ISTD

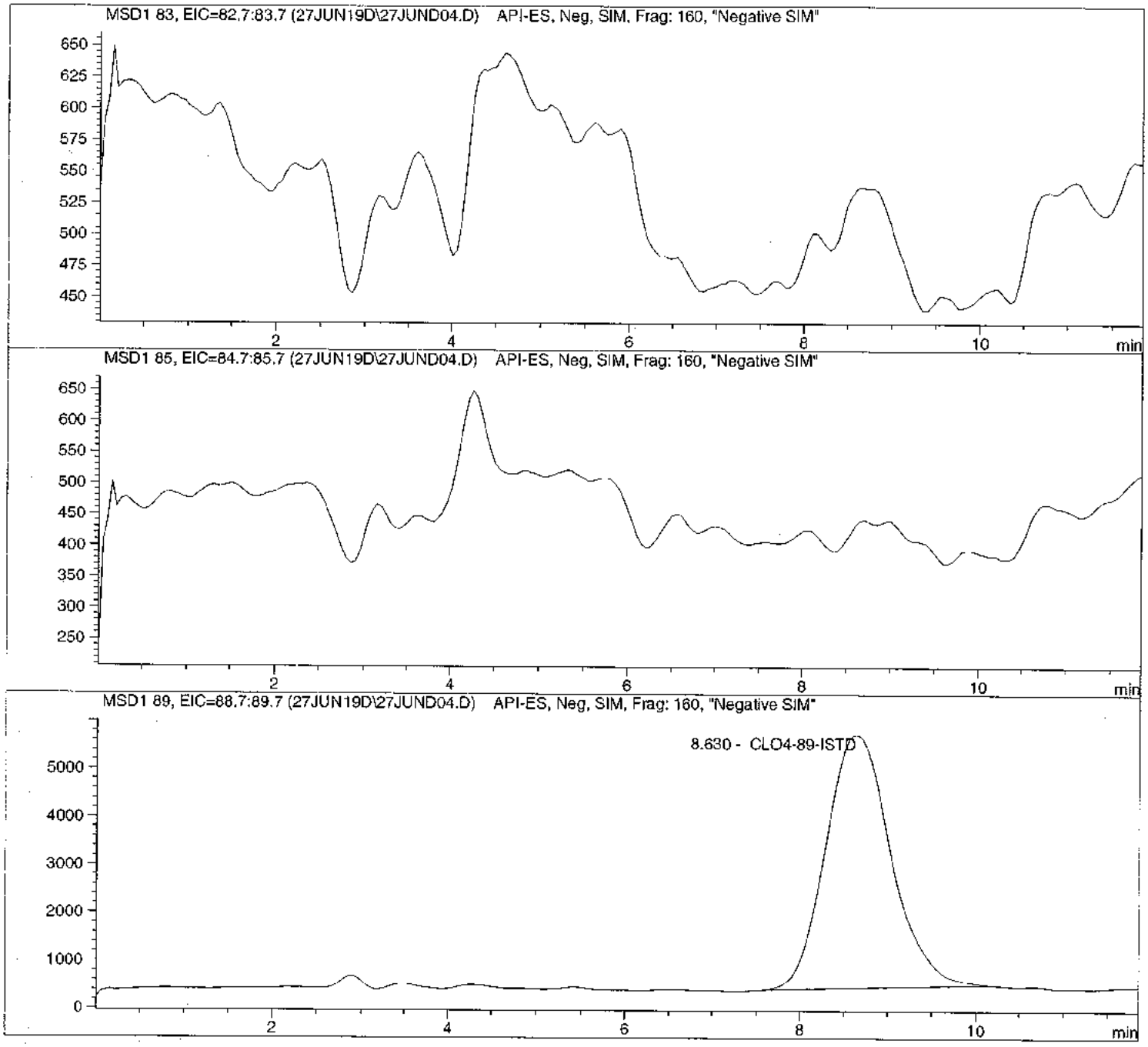
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND04.D Sample Name: 660892 LMB

Injection Date:	6/27/2019 09:28:13	Seq Line:	4
Sample Name:	660892 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND04.D Sample Name: 660892 LMB

Injection Date:	6/27/2019 09:28:13	Seq Line:	4
Sample Name:	660892 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.630	PBA	272546.7	5.0000	CLO4-89-ISTD

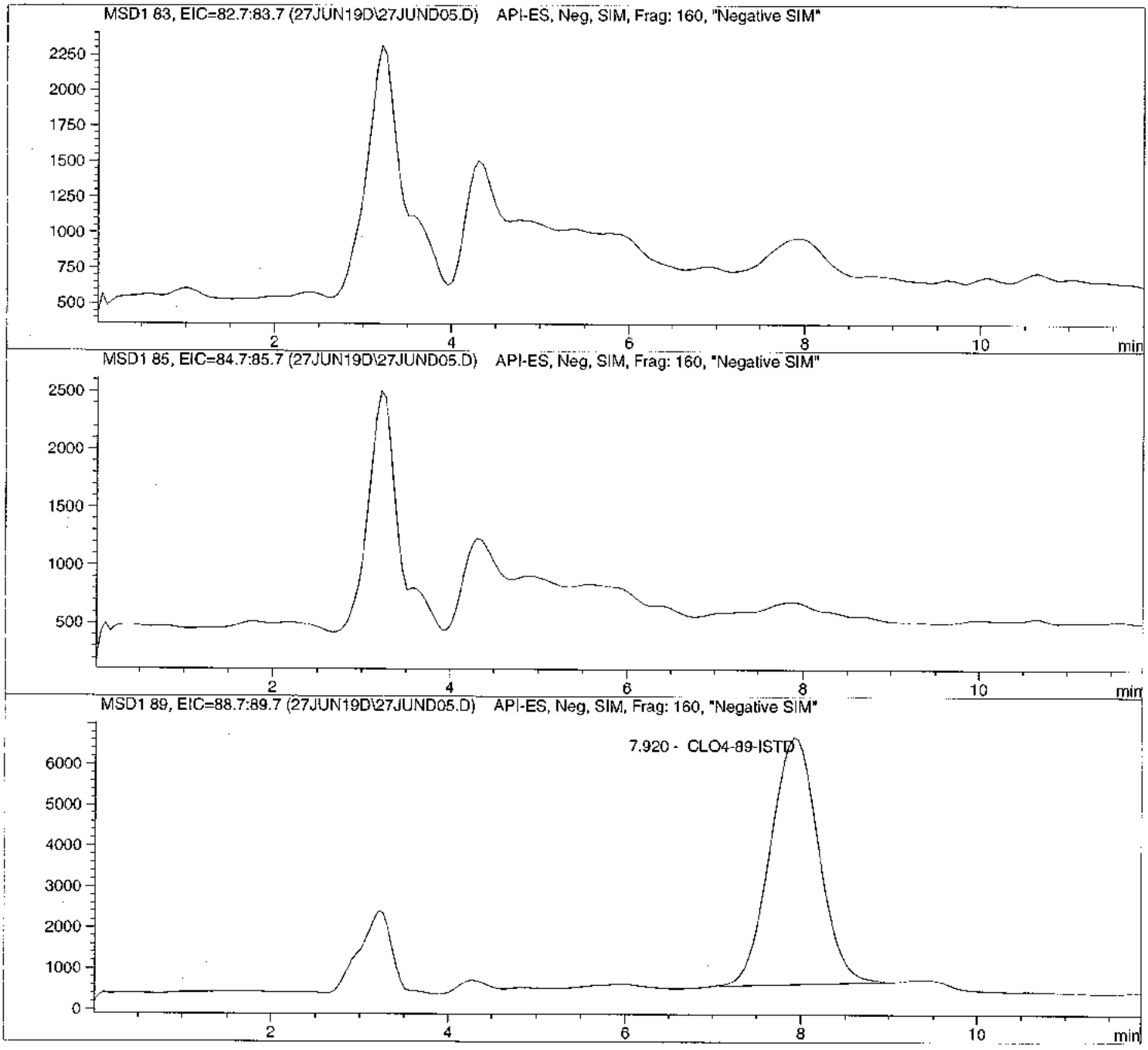
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND05.D Sample Name: 1917488001

Injection Date:	6/27/2019 09:42:40	Seq Line:	5
Sample Name:	1917488001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND05.D Sample Name: 1917488001

Injection Date:	6/27/2019 09:42:40	Seq Line:	5
Sample Name:	1917488001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.920	PBA	227402.2	5.0000	CLO4-89-ISTD

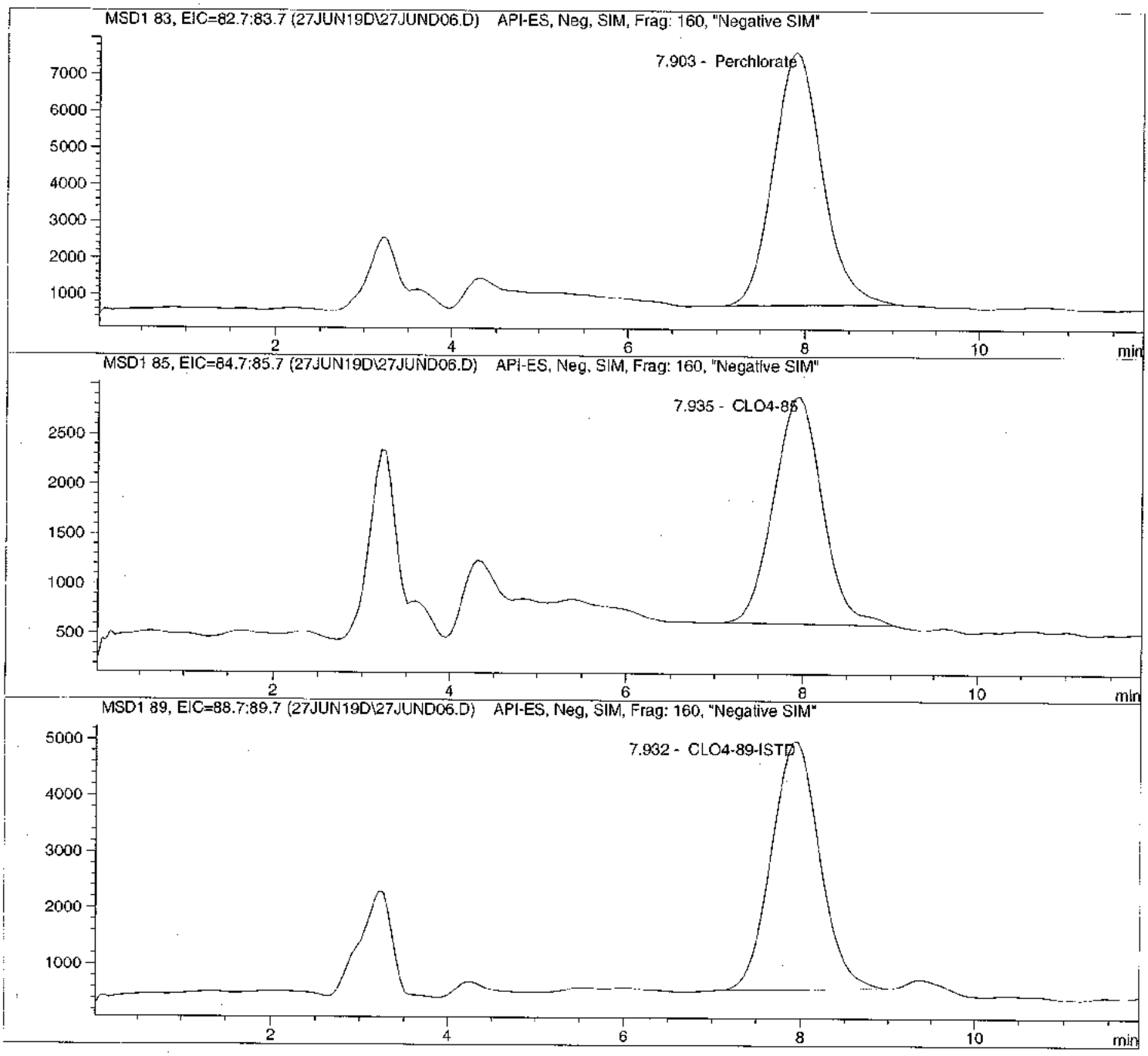
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND06.D Sample Name: 660894 174881S

Injection Date:	6/27/2019 09:56:36	Seq Line:	6
Sample Name:	660894 174881S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND06.D Sample Name: 660894 174881S

Injection Date:	6/27/2019 09:56:36	Seq Line:	6
Sample Name:	660894 174881S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.903	PBA	262639.7	5.1277	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.935	BBA	86833.0	5.5577	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.932	PBA	166848.2	5.0000	CLO4-89-ISTD

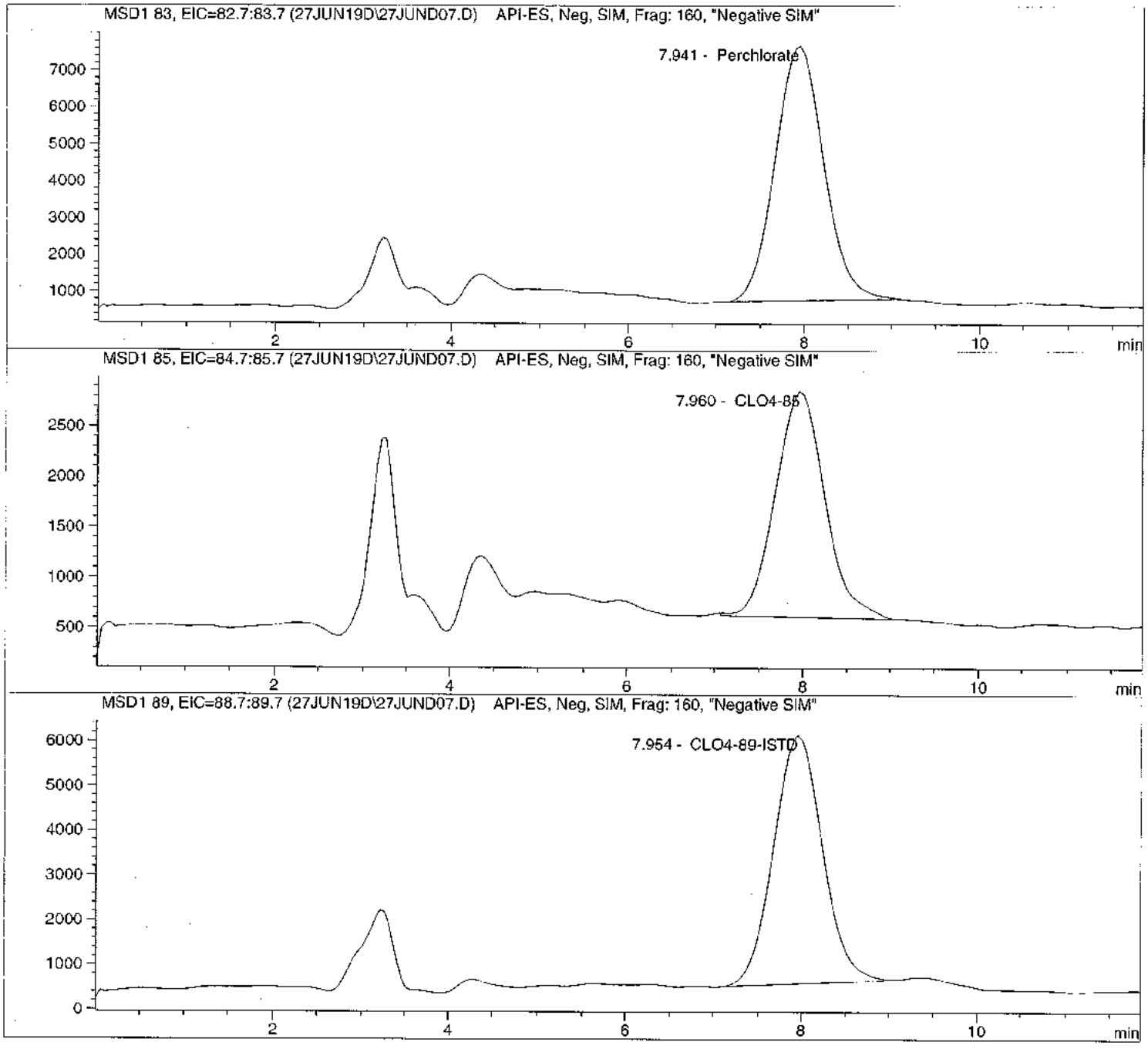
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND07.D Sample Name: 660895 174881D

Injection Date:	6/27/2019 10:10:32	Seq Line:	7
Sample Name:	660895 174881D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND07.D Sample Name: 660895 174881D

Injection Date:	6/27/2019 10:10:32	Seq Line:	7
Sample Name:	660895 174881D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.941	PBA	264844.2	4.0584	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.960	BBA	87558.5	4.3618	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.954	PBA	214876.4	5.0000	CLO4-89-ISTD

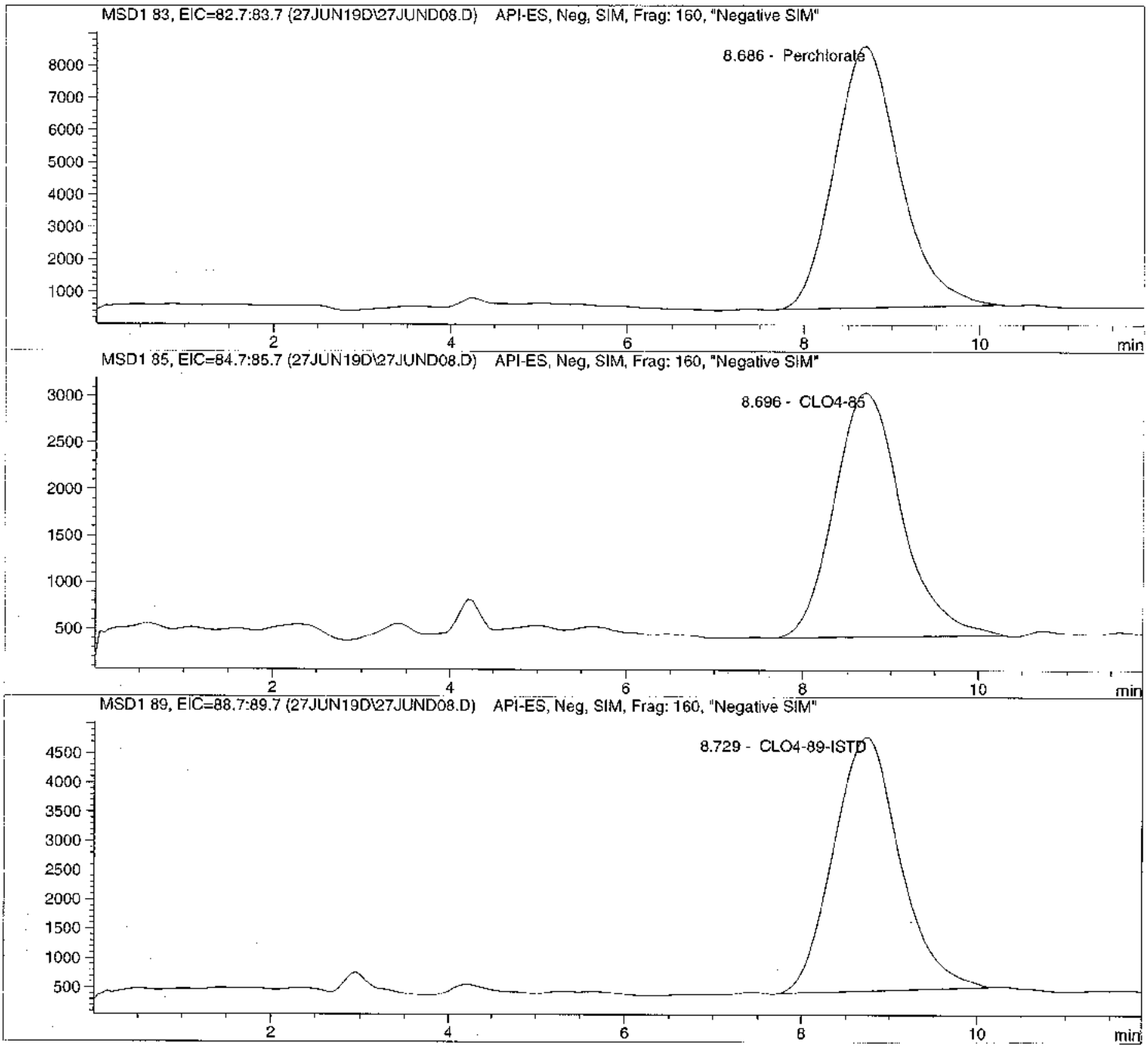
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND08.D Sample Name: 1917489001 100

Injection Date:	6/27/2019 10:24:27	Seq Line:	8
Sample Name:	1917489001 100	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND08.D Sample Name: 1917489001 100

Injection Date:	6/27/2019 10:24:27	Seq Line:	8
Sample Name:	1917489001 100	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.686	PBA	417326.3	591.9454	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.696	PBA	140501.0	655.9136	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.729	PBA	228282.9	500.0000	CLO4-89-ISTD

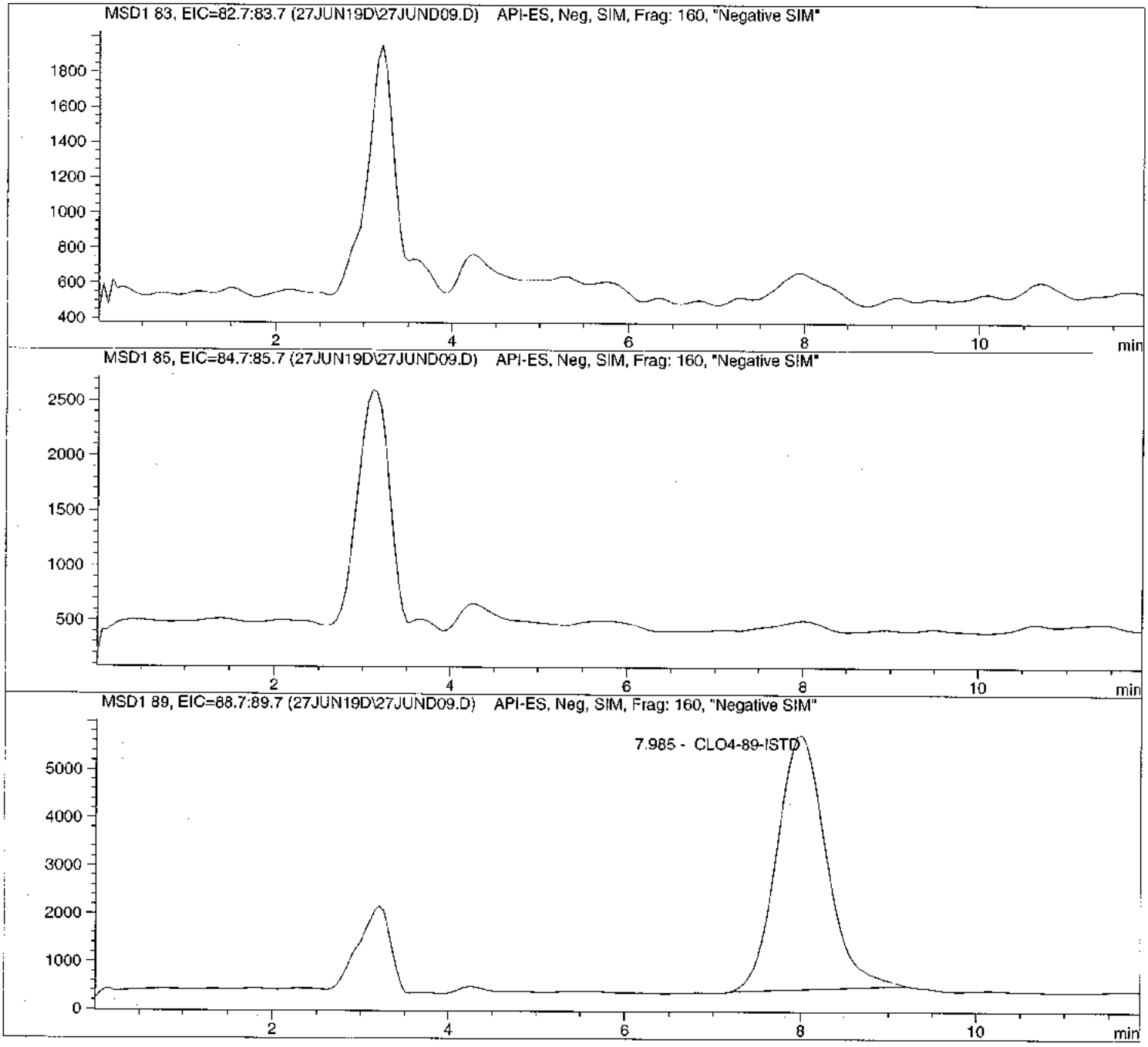
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND09.D Sample Name: 1917489002

Injection Date:	6/27/2019 10:38:23	Seq Line:	9
Sample Name:	1917489002	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND09.D Sample Name: 1917489002

Injection Date:	6/27/2019 10:38:23	Seq Line:	9
Sample Name:	1917489002	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.985	BBA	207849.5	5.0000	CLO4-89-ISTD

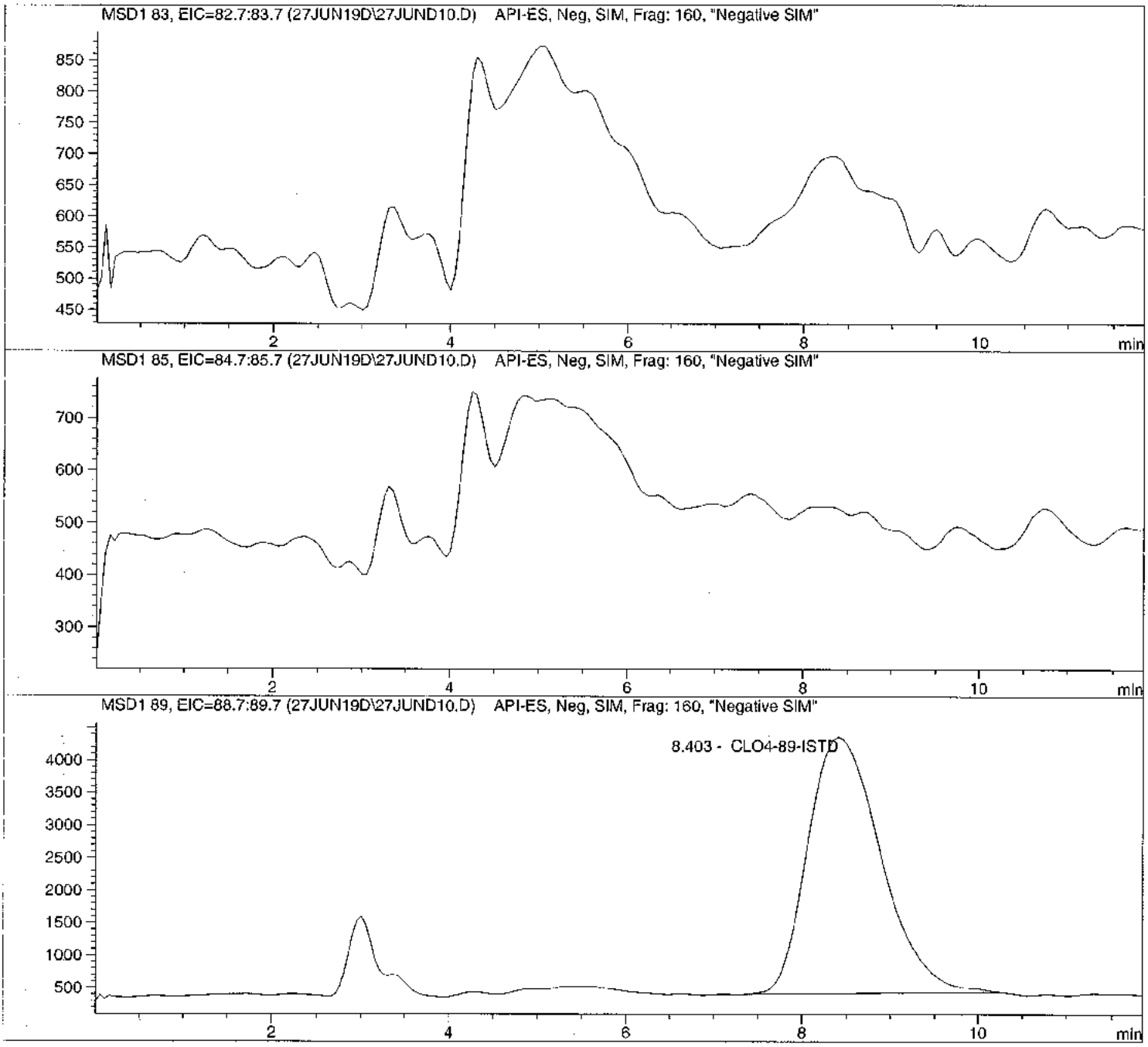
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND10.D Sample Name: 1917489003

Injection Date:	6/27/2019 10:52:17	Seq Line:	10
Sample Name:	1917489003	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND10.D Sample Name: 1917489003

Injection Date:	6/27/2019 10:52:17	Seq Line:	10
Sample Name:	1917489003	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.403	PBA	226487.0	5.0000	CLO4-89-ISTD

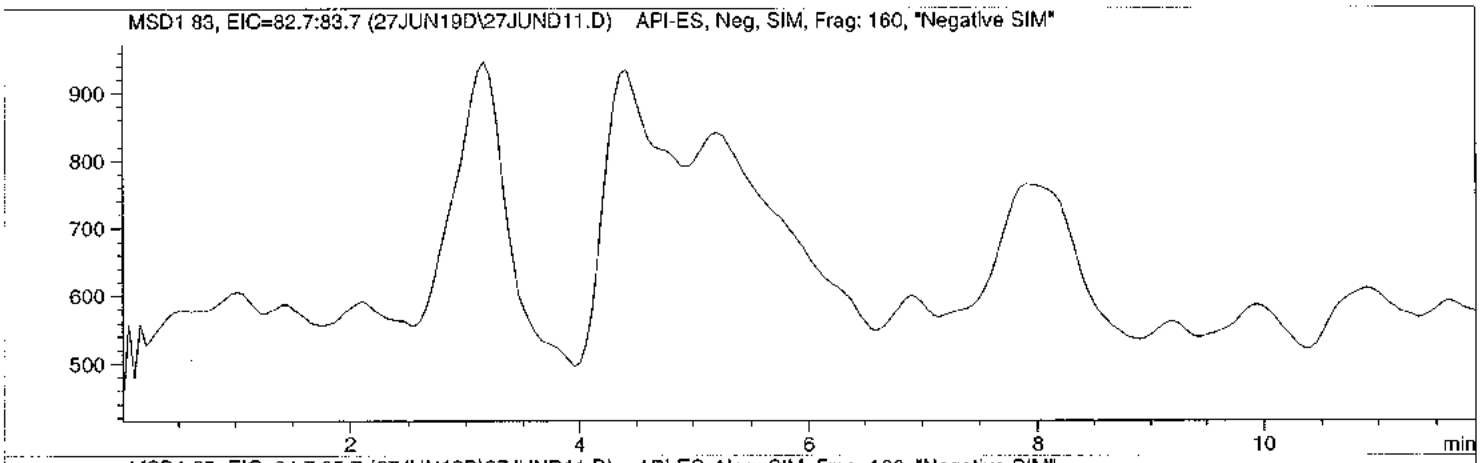
*** End of Report ***

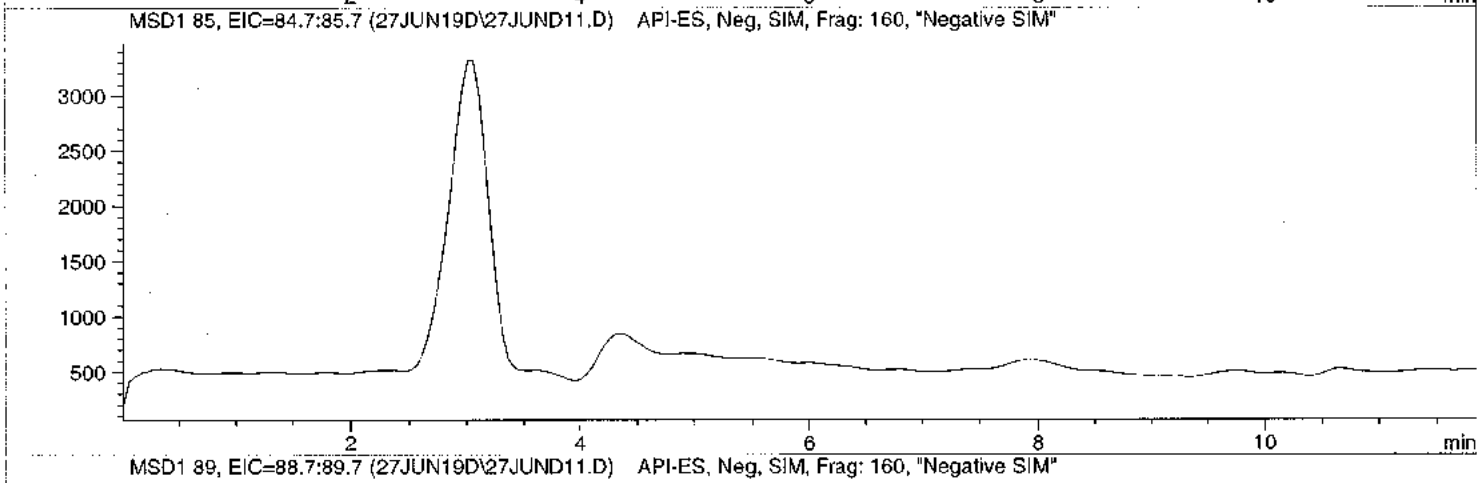
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND11.D Sample Name: 1917489004

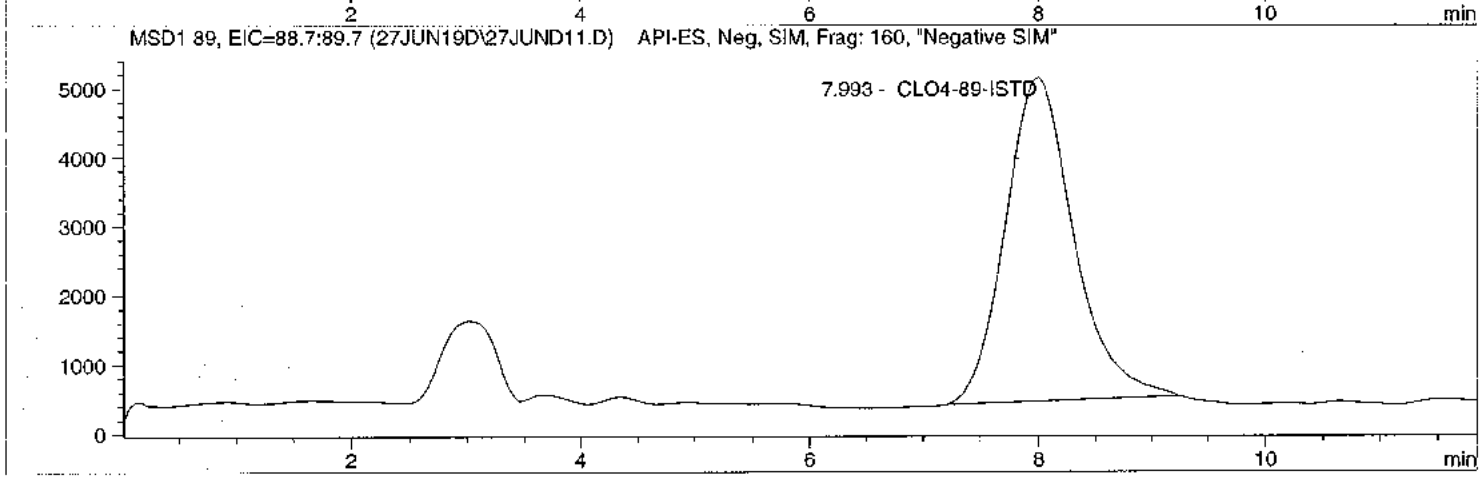
Injection Date:	6/27/2019 11:06:11	Seq Line:	11
Sample Name:	1917489004	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND11.D Sample Name: 1917489004

Injection Date:	6/27/2019 11:06:11	Seq Line:	11
Sample Name:	1917489004	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.993	BBA	193007.7	5.0000	CLO4-89-ISTD

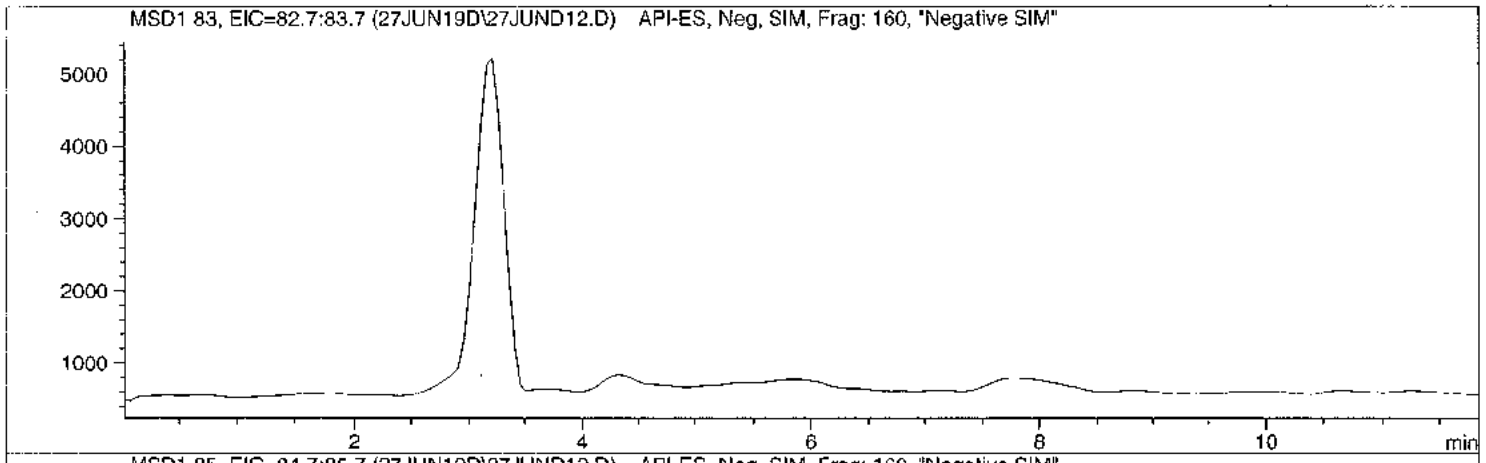
*** End of Report ***

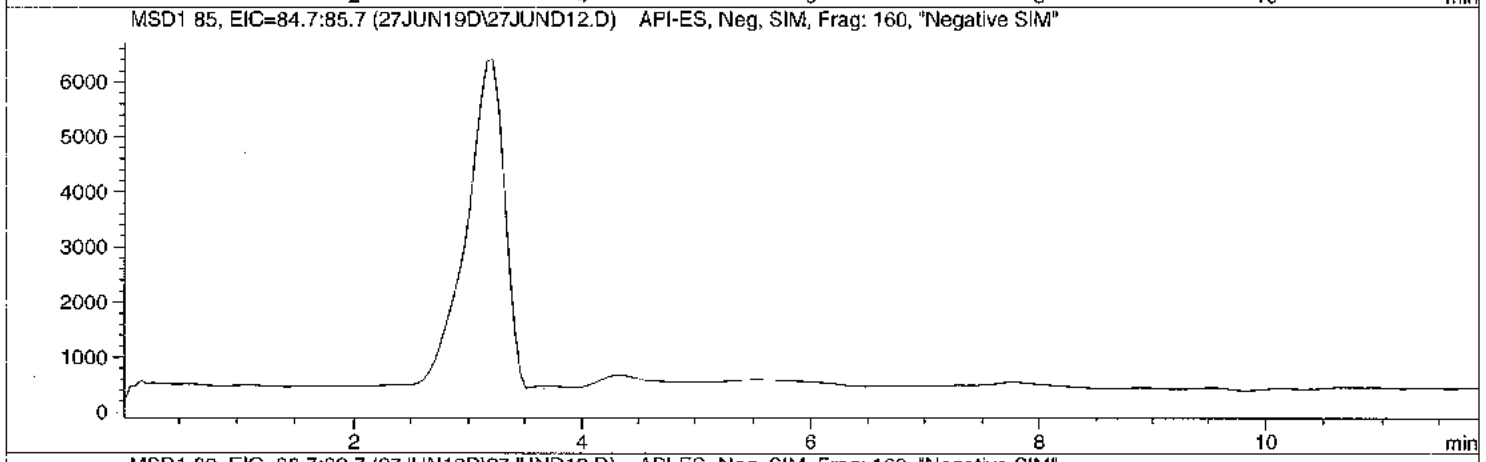
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

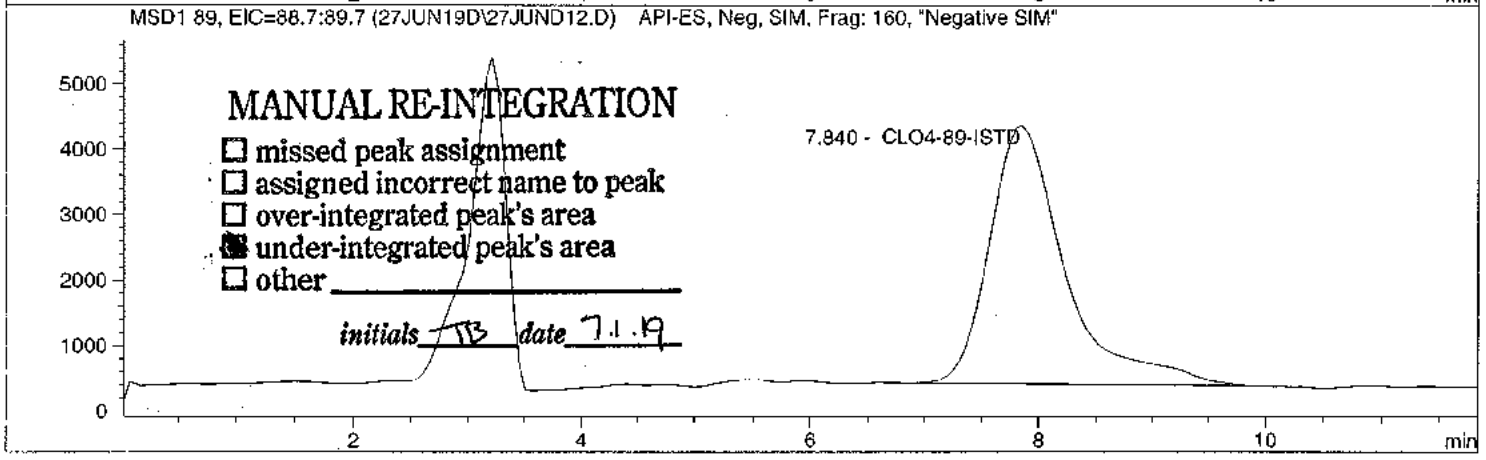
Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.840	MM	181499.8	5.0000	CLO4-89-ISTD

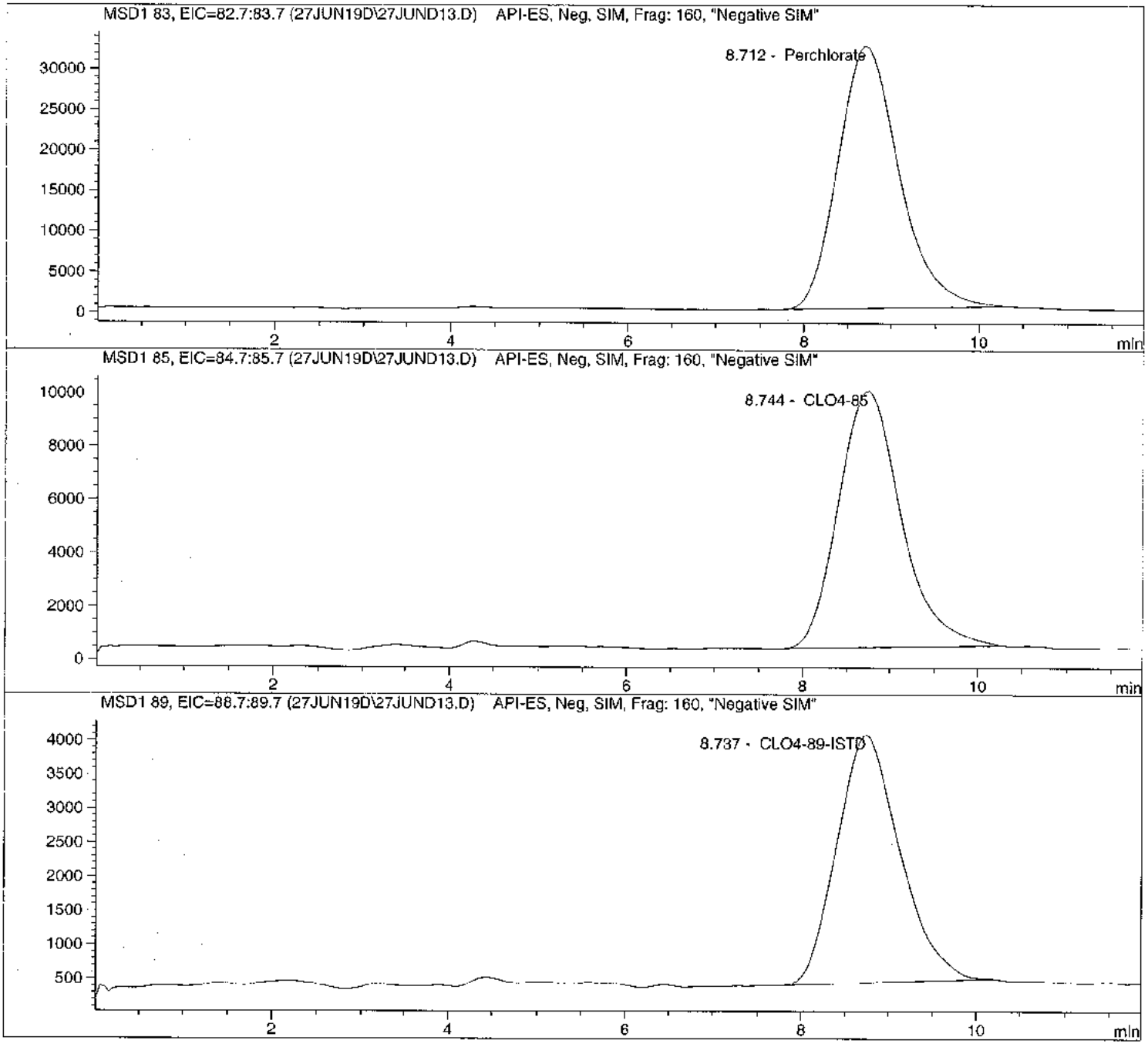
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND13.D Sample Name: 1917672001 1K

Injection Date:	6/27/2019 11:33:53	Seq Line:	13
Sample Name:	1917672001 1K	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND13.D Sample Name: 1917672001 1K

Injection Date:	6/27/2019 11:33:53	Seq Line:	13
Sample Name:	1917672001 1K	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.712	PBA	1575319.3	26121.9614	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	PBA	480692.7	26822.4361	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.737	PBA	182986.5	5000.0000	CLO4-89-ISTD

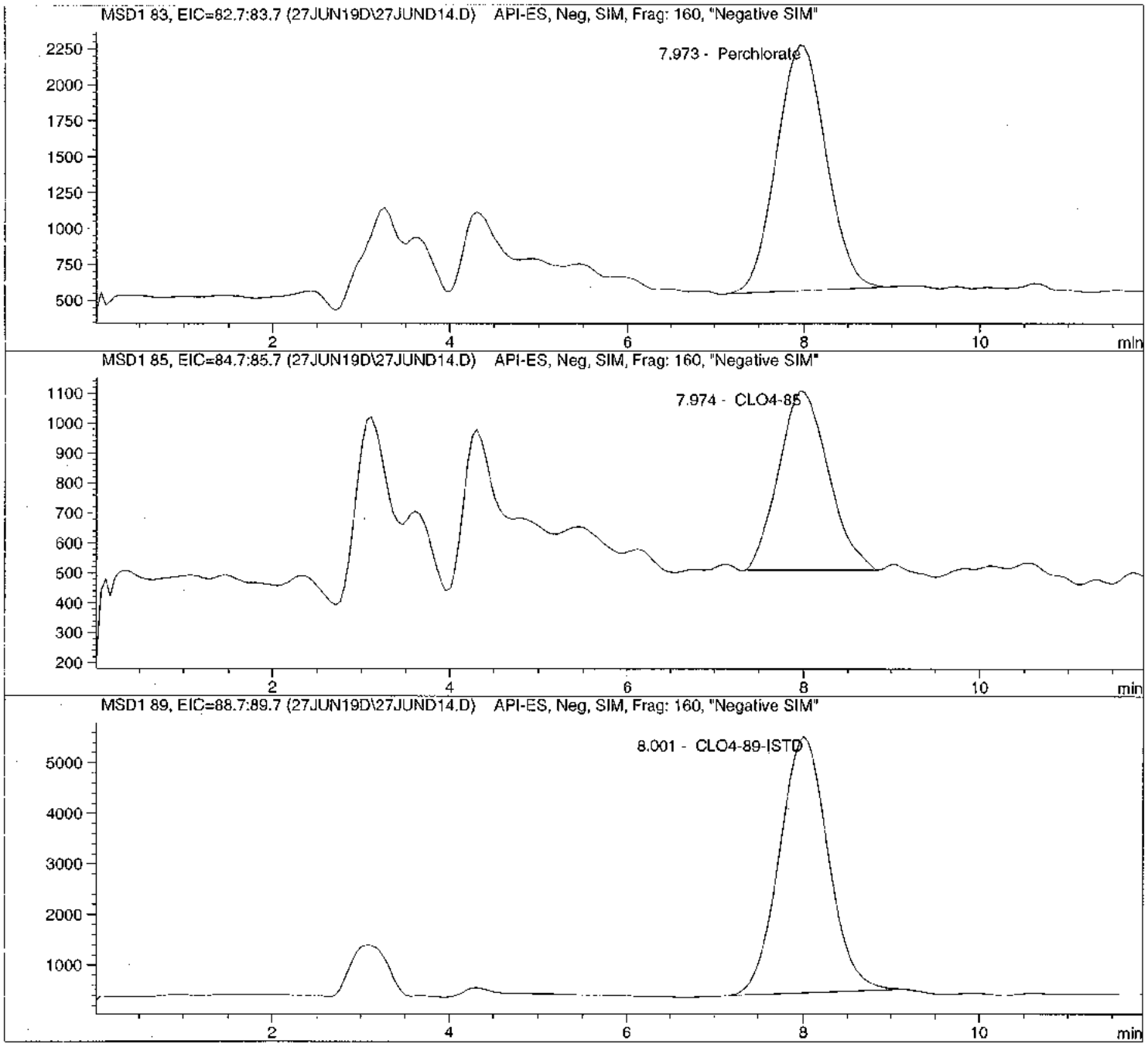
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND14.D Sample Name: 1917672002

Injection Date:	6/27/2019 11:47:53	Seq Line:	14
Sample Name:	1917672002	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND14.D Sample Name: 1917672002

Injection Date:	6/27/2019 11:47:53	Seq Line:	14
Sample Name:	1917672002	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.973	PBA	65402.8	1.2479	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.974	PBA	22988.9	1.2932	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.001	PBA	191017.5	5.0000	CLO4-89-ISTD

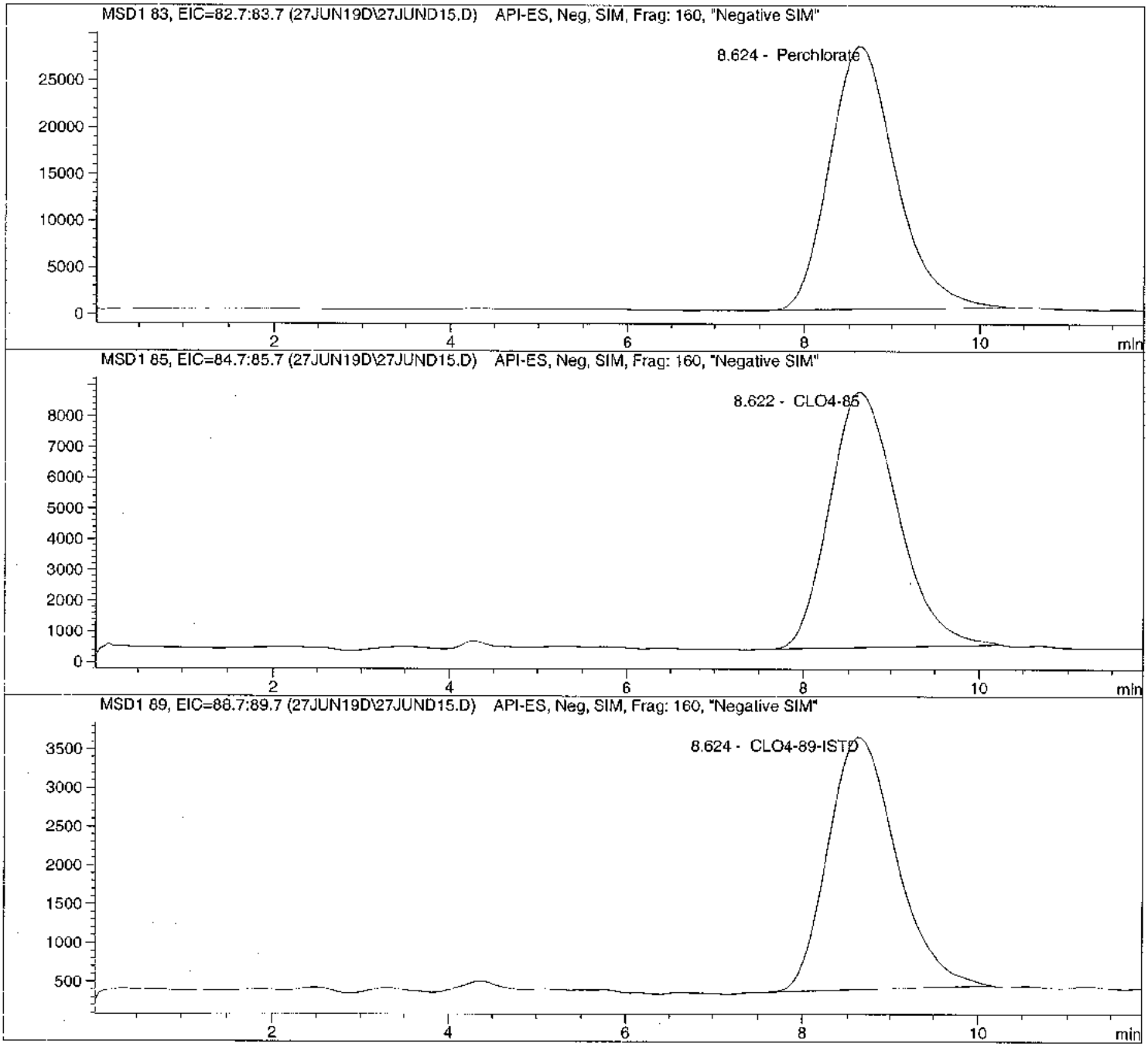
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND15.D Sample Name: 660896 CCV@25

Injection Date:	6/27/2019 12:01:48	Seq Line:	15
Sample Name:	660896 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND15.D Sample Name: 660896 CCV@25

Injection Date:	6/27/2019 12:01:48	Seq Line:	15
Sample Name:	660896 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.624	PBA	1489207.3	25.5132	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.622	PBA	452707.0	26.1005	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.624	PBA	177367.7	5.0000	CLO4-89-ISTD

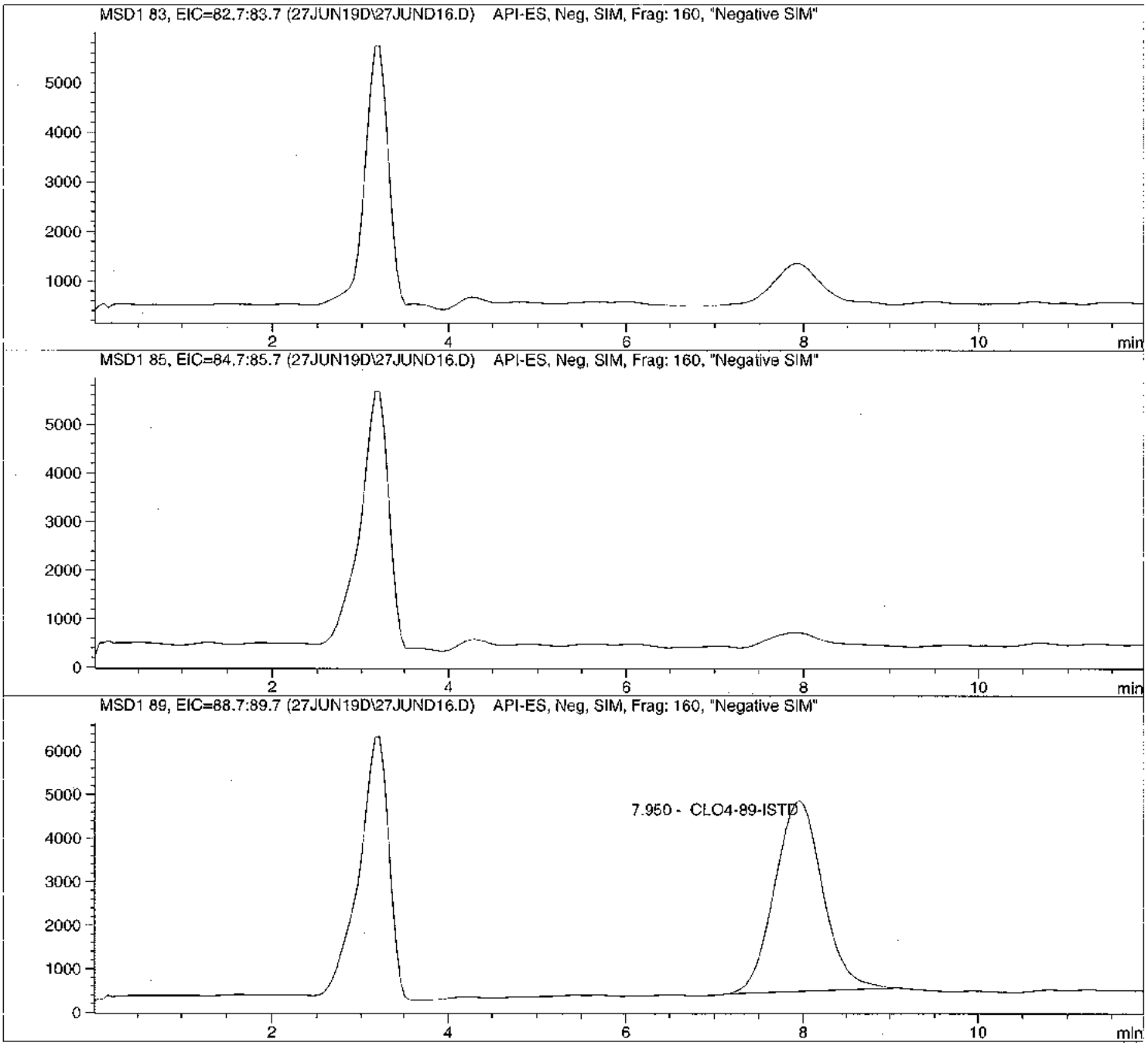
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND16.D Sample Name: 1917672003

Injection Date:	6/27/2019 12:15:39	Seq Line:	16
Sample Name:	1917672003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND16.D Sample Name: 1917672003

Injection Date:	6/27/2019 12:15:39	Seq Line:	16
Sample Name:	1917672003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.950	PBA	165260.9	5.0000	CLO4-89-ISTD

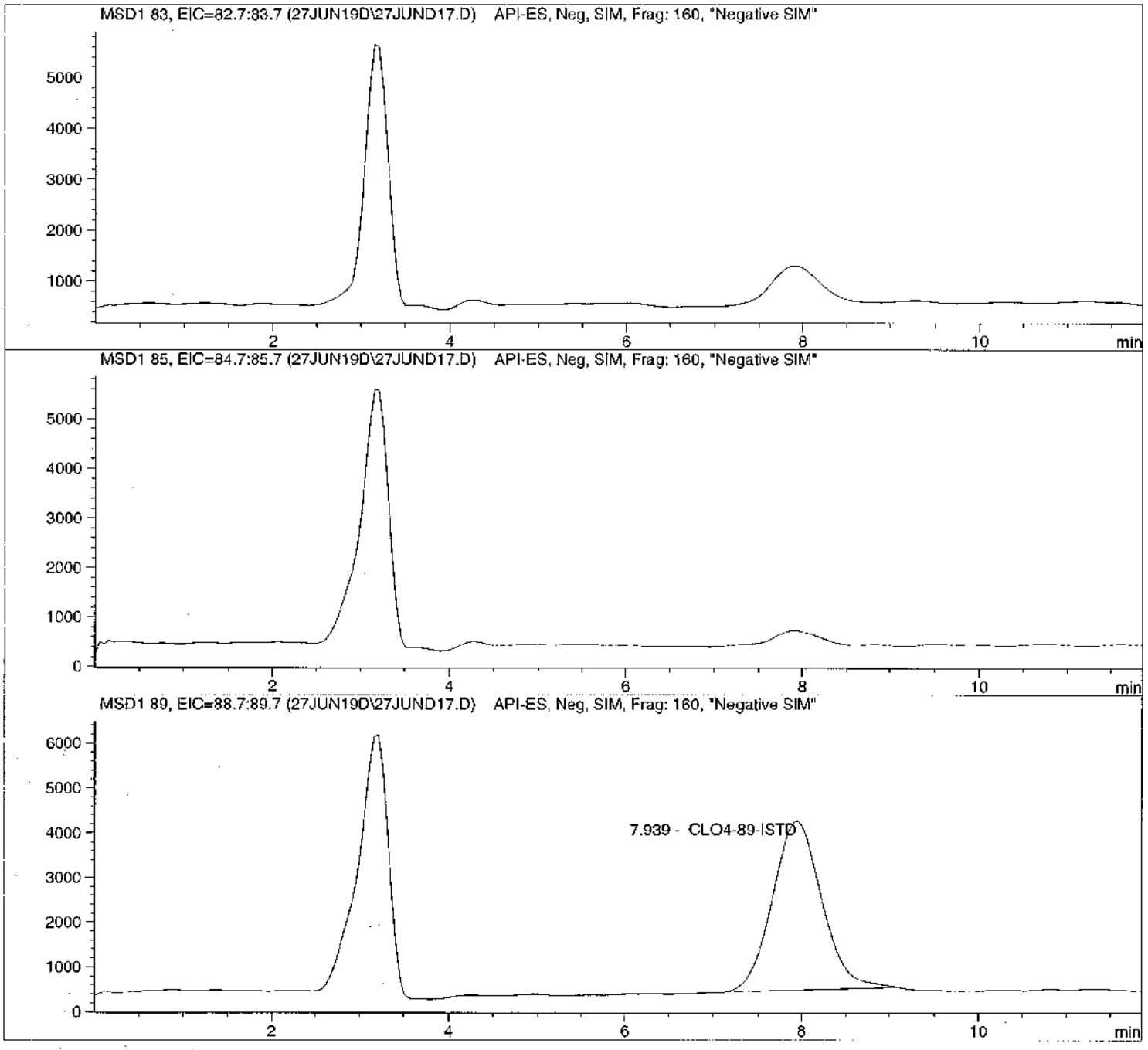
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND17.D Sample Name: 1917672004

Injection Date:	6/27/2019 12:29:33	Seq Line:	17
Sample Name:	1917672004	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND17.D Sample Name: 1917672004

Injection Date:	6/27/2019 12:29:33	Seq Line:	17
Sample Name:	1917672004	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.939	BBA	147927.7	5.0000	CLO4-89-ISTD

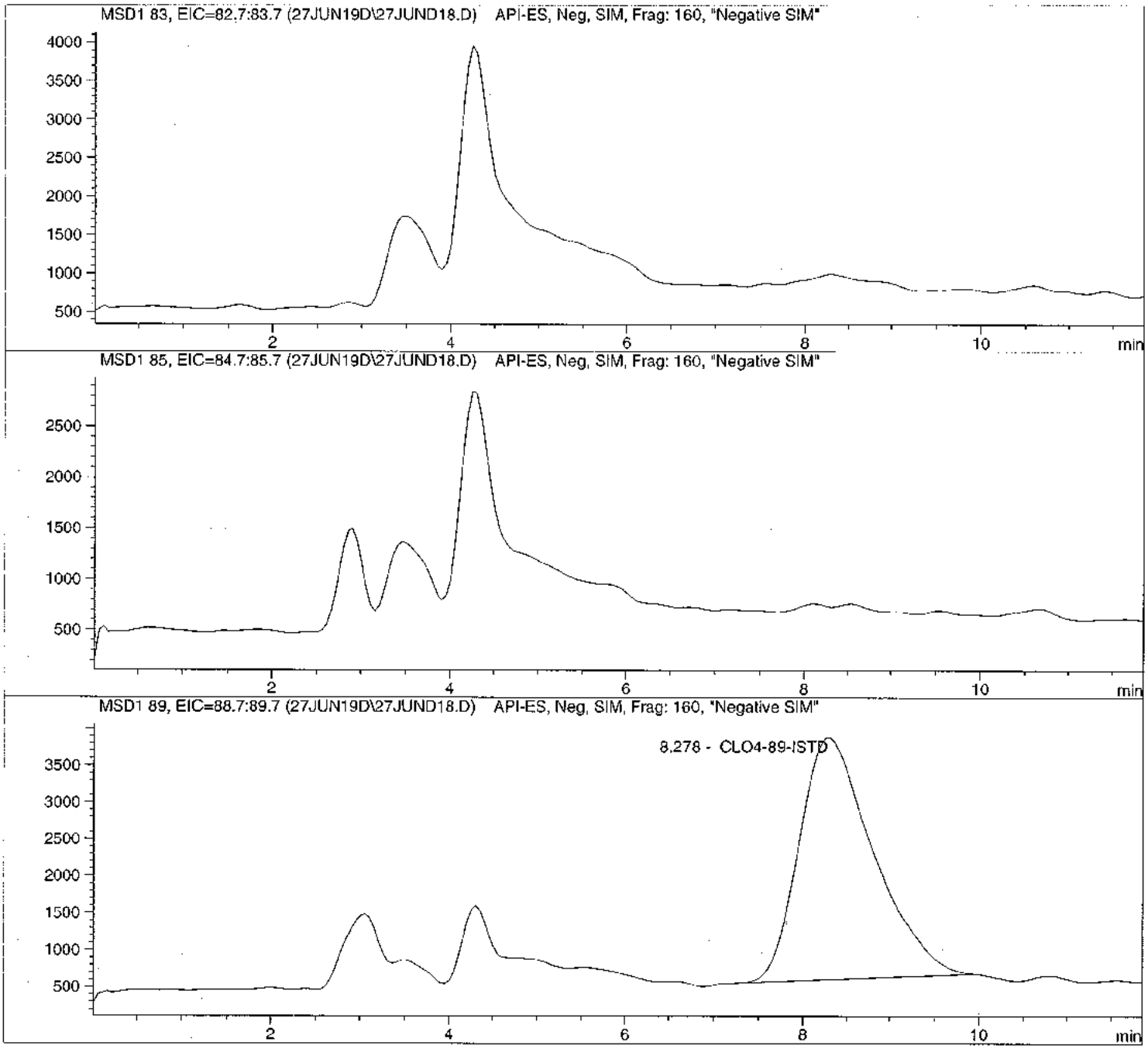
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND18.D Sample Name: 1917672005

Injection Date:	6/27/2019 12:43:25	Seq Line:	18
Sample Name:	1917672005	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND18.D Sample Name: 1917672005

Injection Date:	6/27/2019 12:43:25	Seq Line:	18
Sample Name:	1917672005	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.278	PBA	193450.5	5.0000	CLO4-89-ISTD

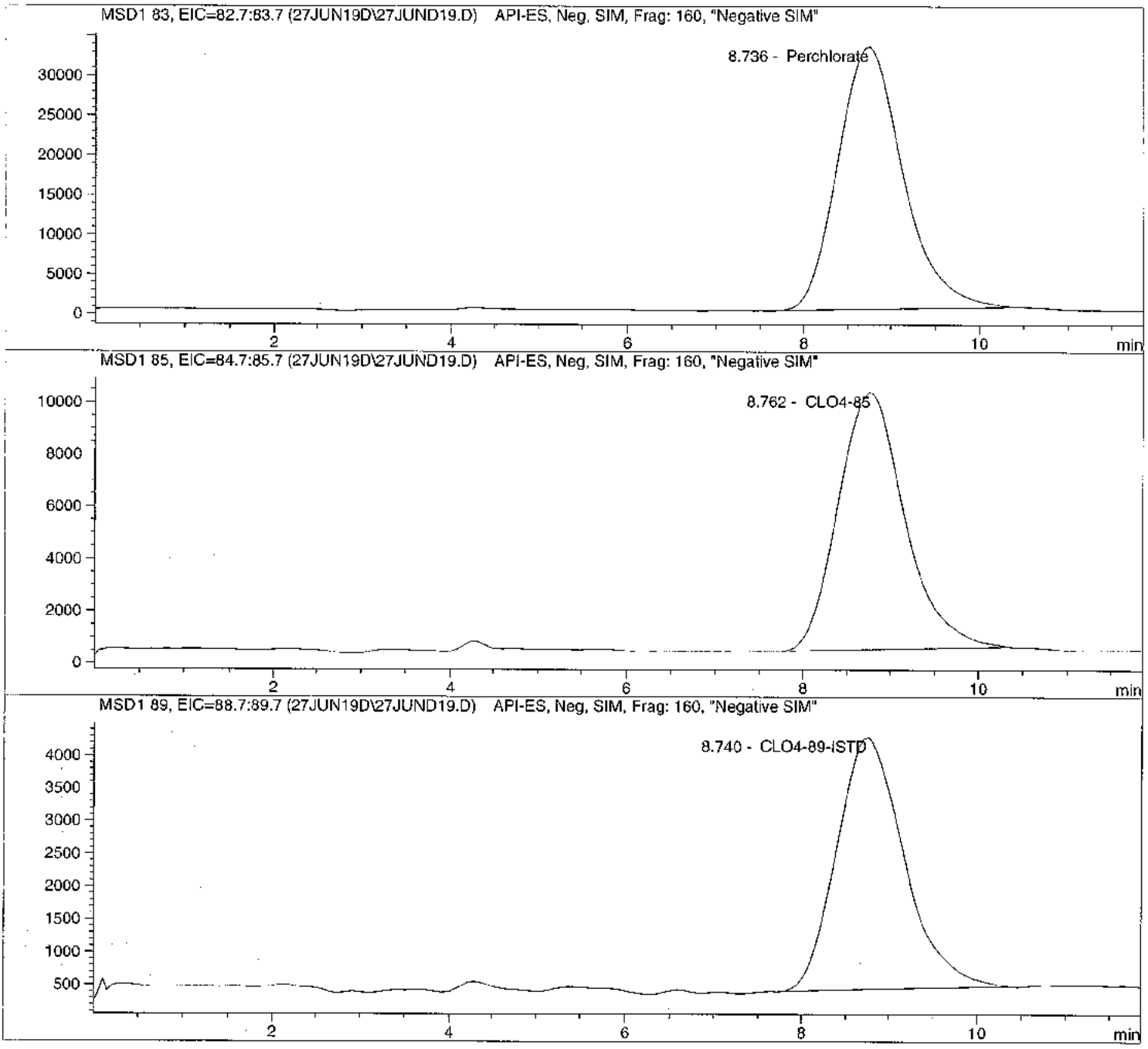
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND19.D Sample Name: 1917672006 100

Injection Date:	6/27/2019 12:57:19	Seq Line:	19
Sample Name:	1917672006 100	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND19.D Sample Name: 1917672006 100

Injection Date:	6/27/2019 12:57:19	Seq Line:	19
Sample Name:	1917672006 100	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.736	PBA	1719861.8	2534.9645	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.762	PBA	521595.0	2587.4359	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.740	BBA	206241.0	500.0000	CLO4-89-ISTD

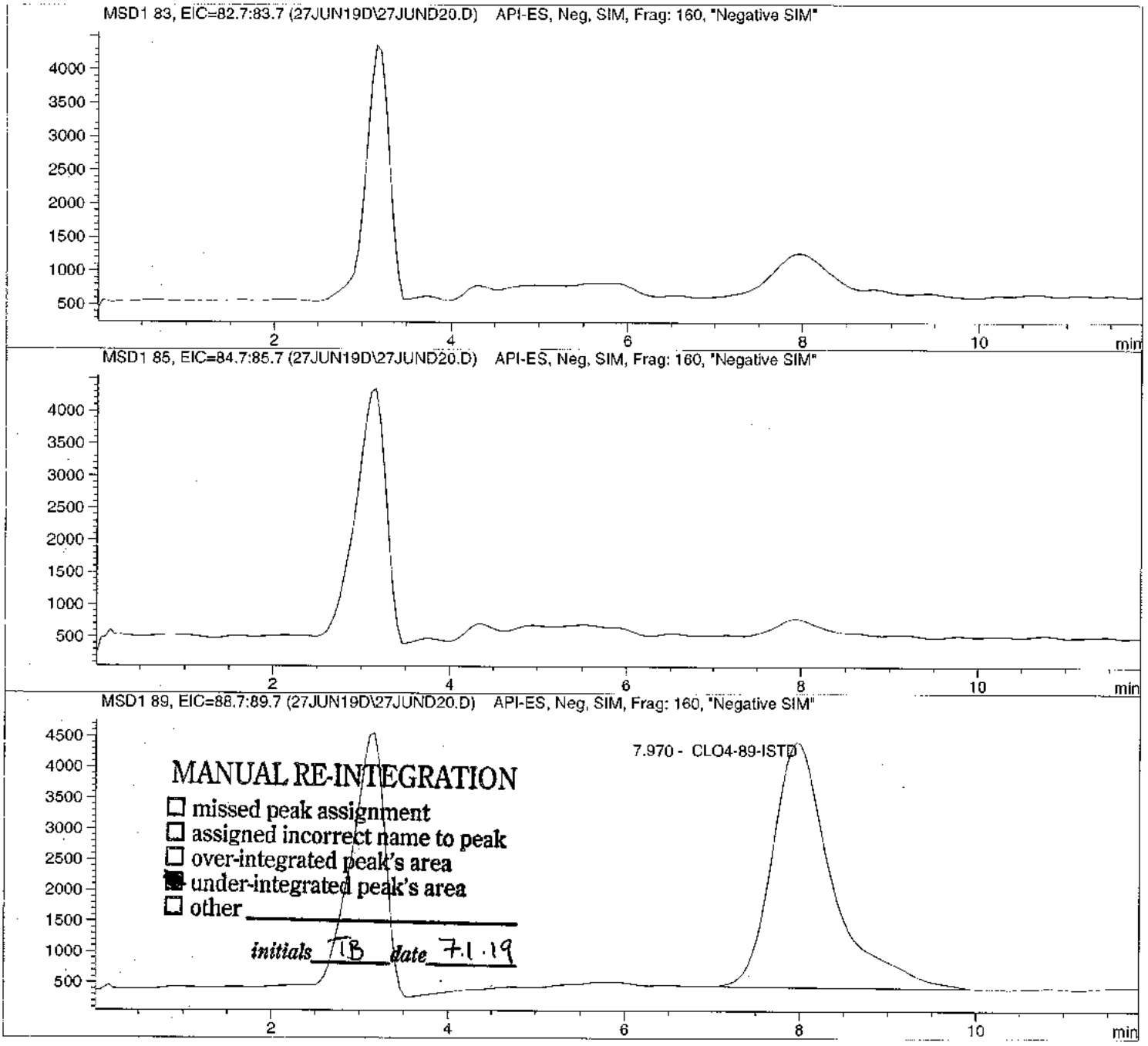
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.970	MM	187343.8	5.0000	CLO4-89-ISTD

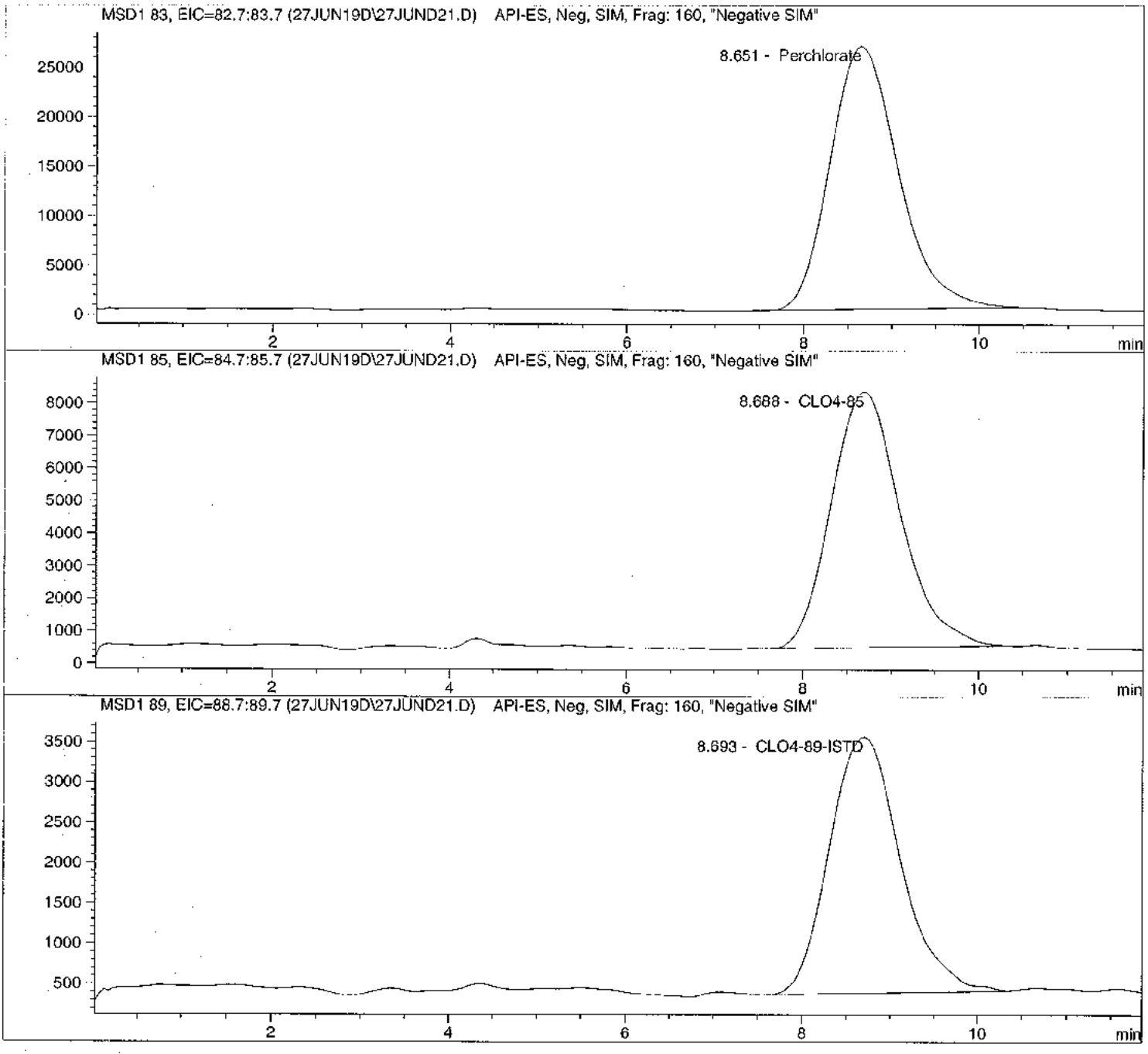
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND21.D Sample Name: 660897 CCV@25

Injection Date:	6/27/2019 13:28:58	Seq Line:	21
Sample Name:	660897 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND21.D Sample Name: 660897 CCV@25

Injection Date:	6/27/2019 13:28:58	Seq Line:	21
Sample Name:	660897 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.651	PBA	1425160.6	24.4244	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.688	PBA	430117.7	24.8091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.693	PBA	177769.0	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

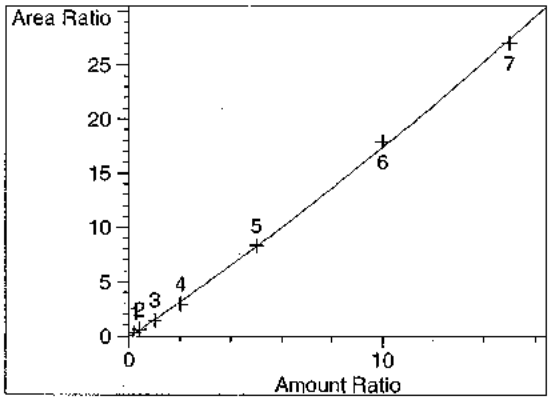
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

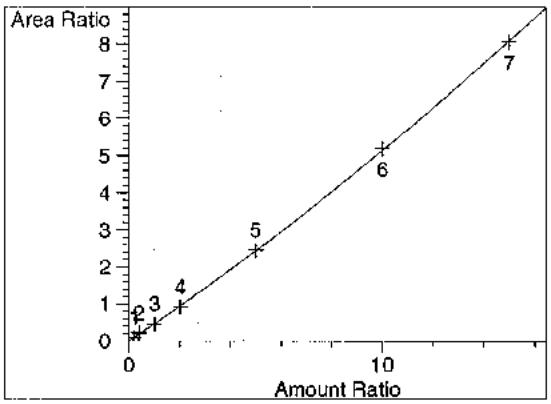
Peak Sum Table

No Entries in table

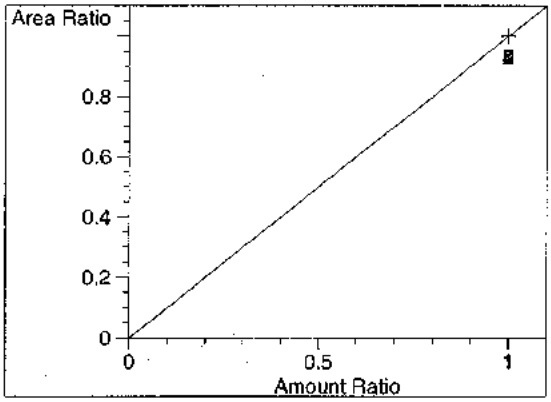
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

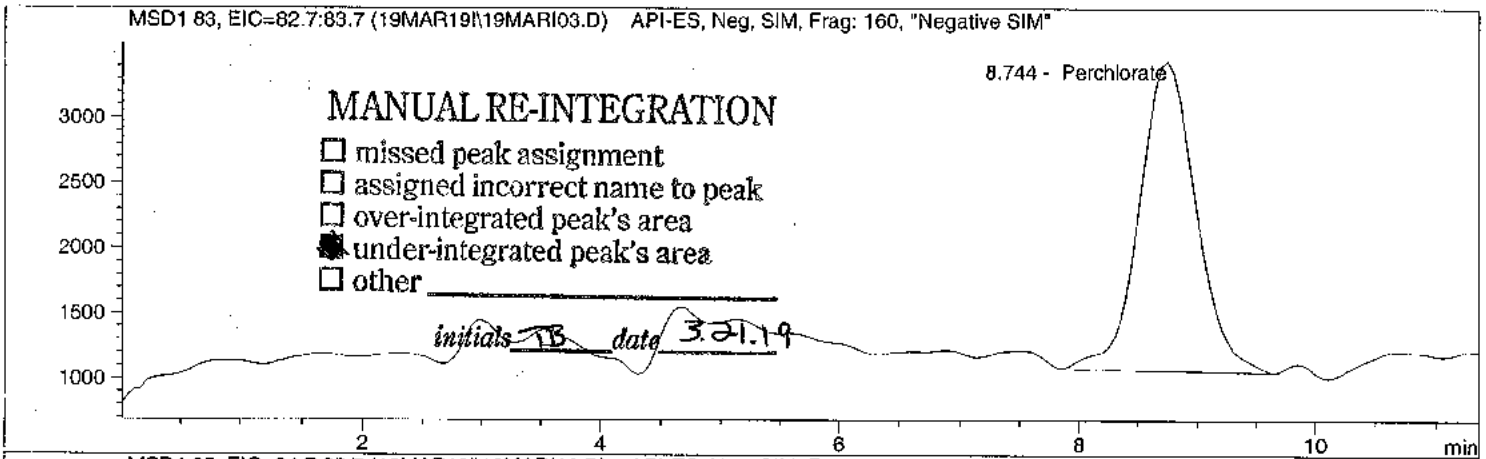
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

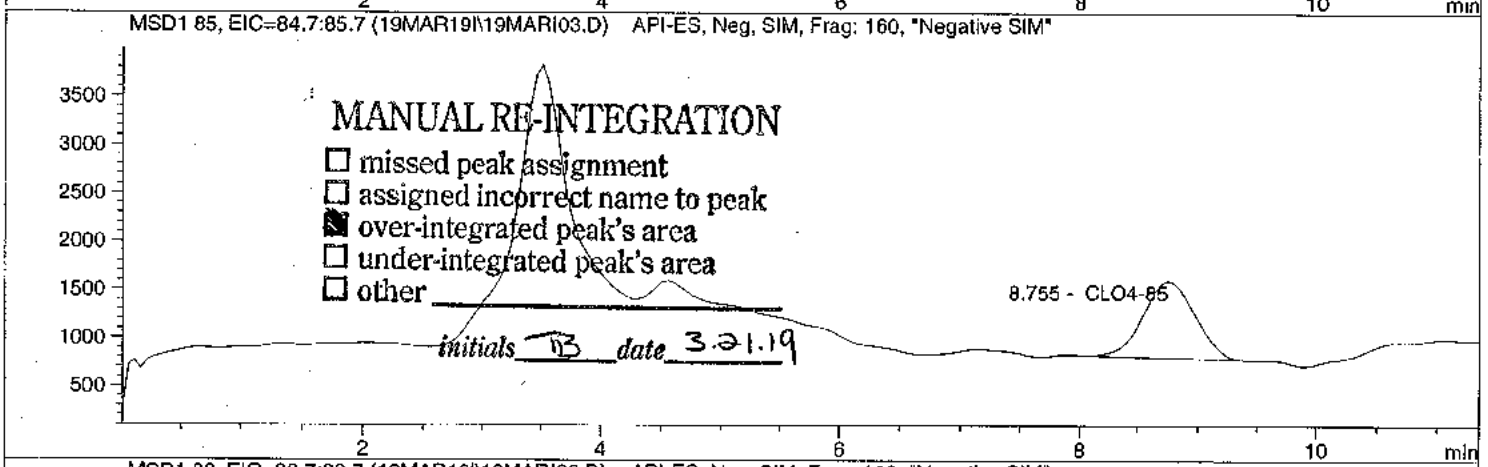
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

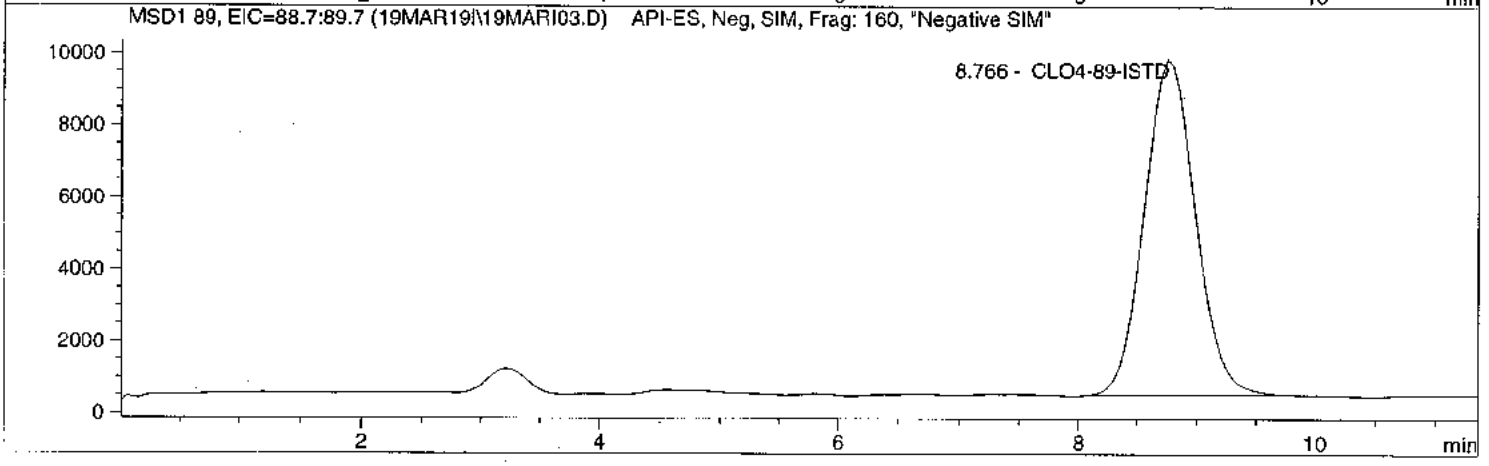
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

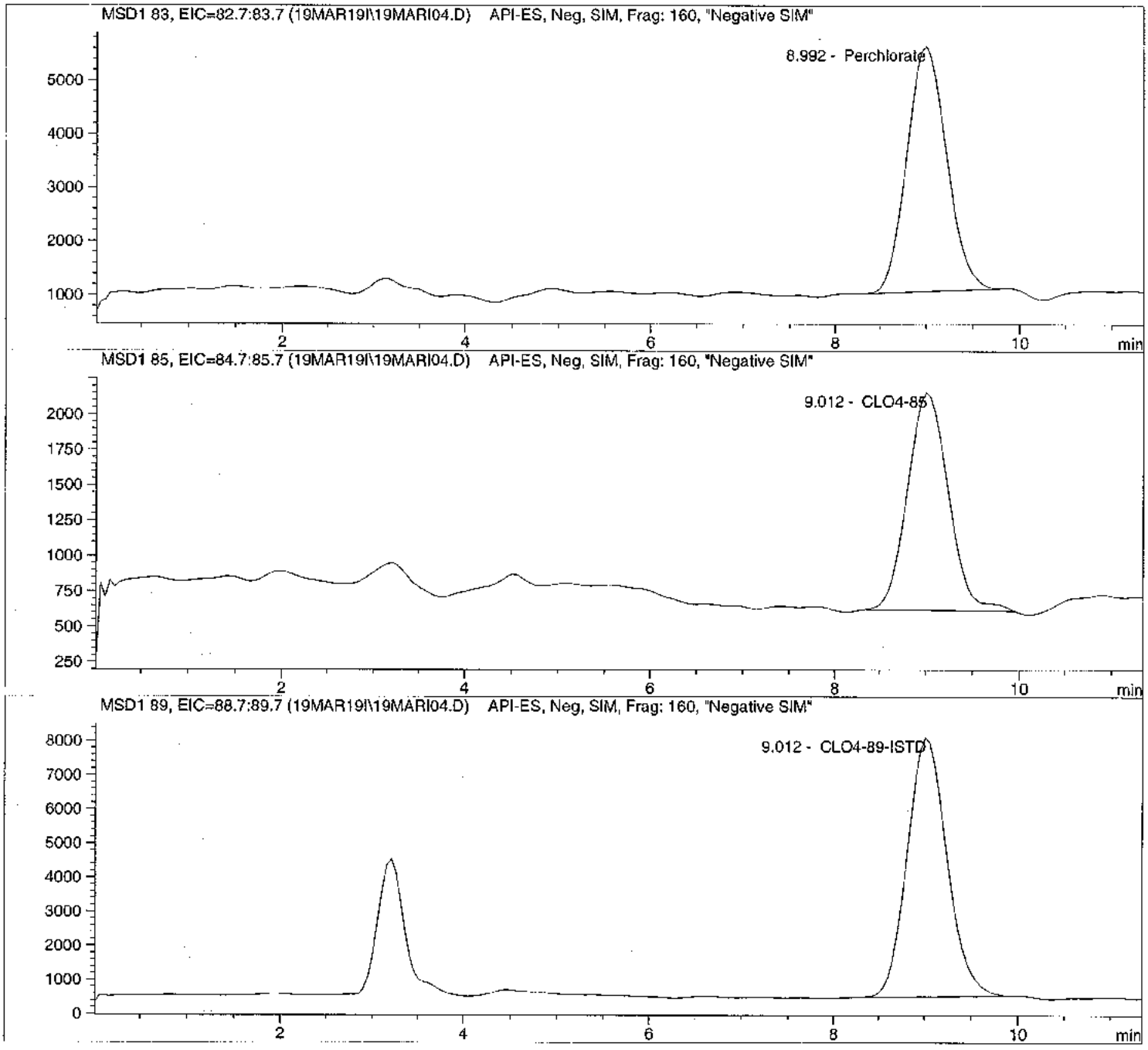
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

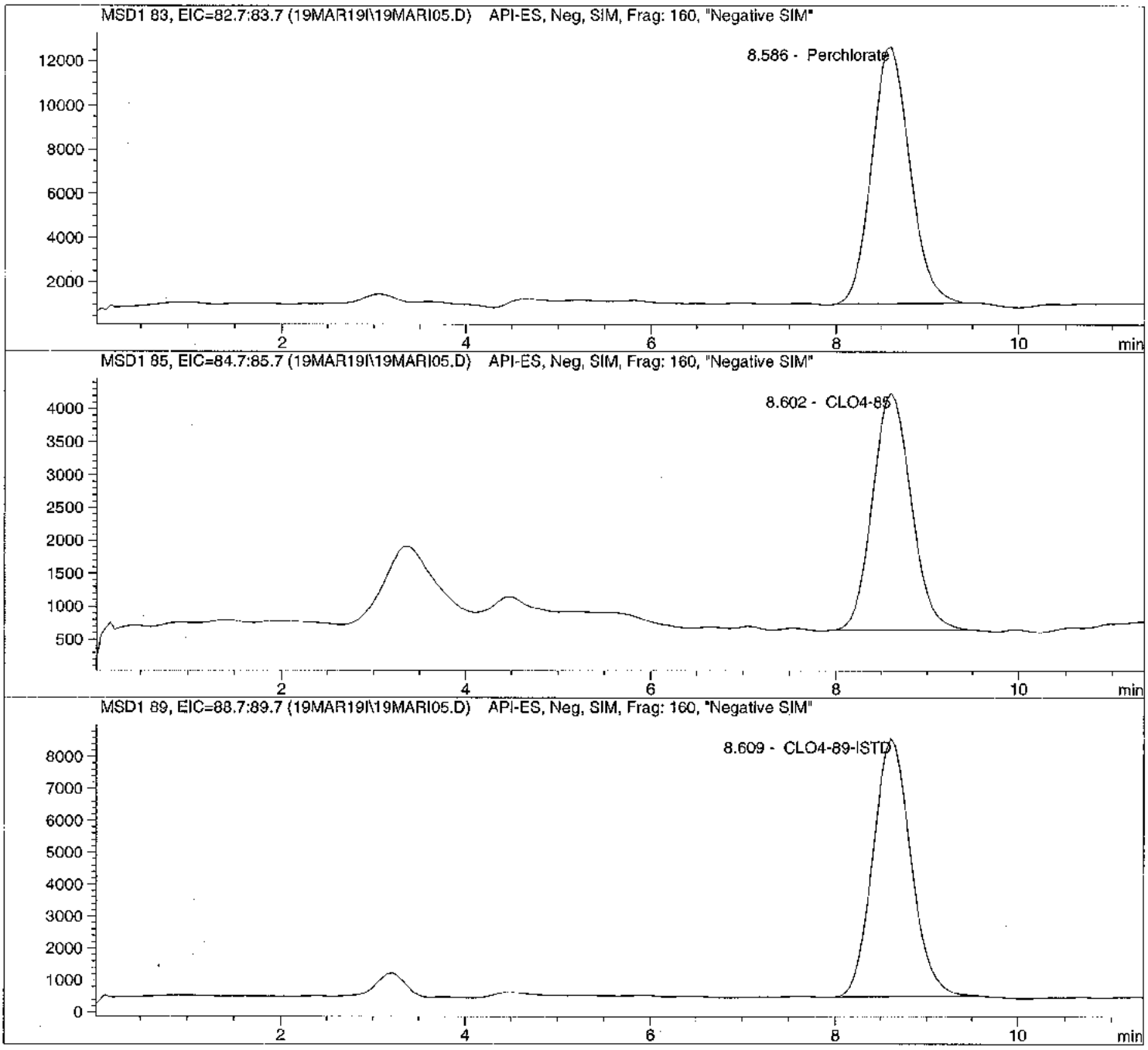
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

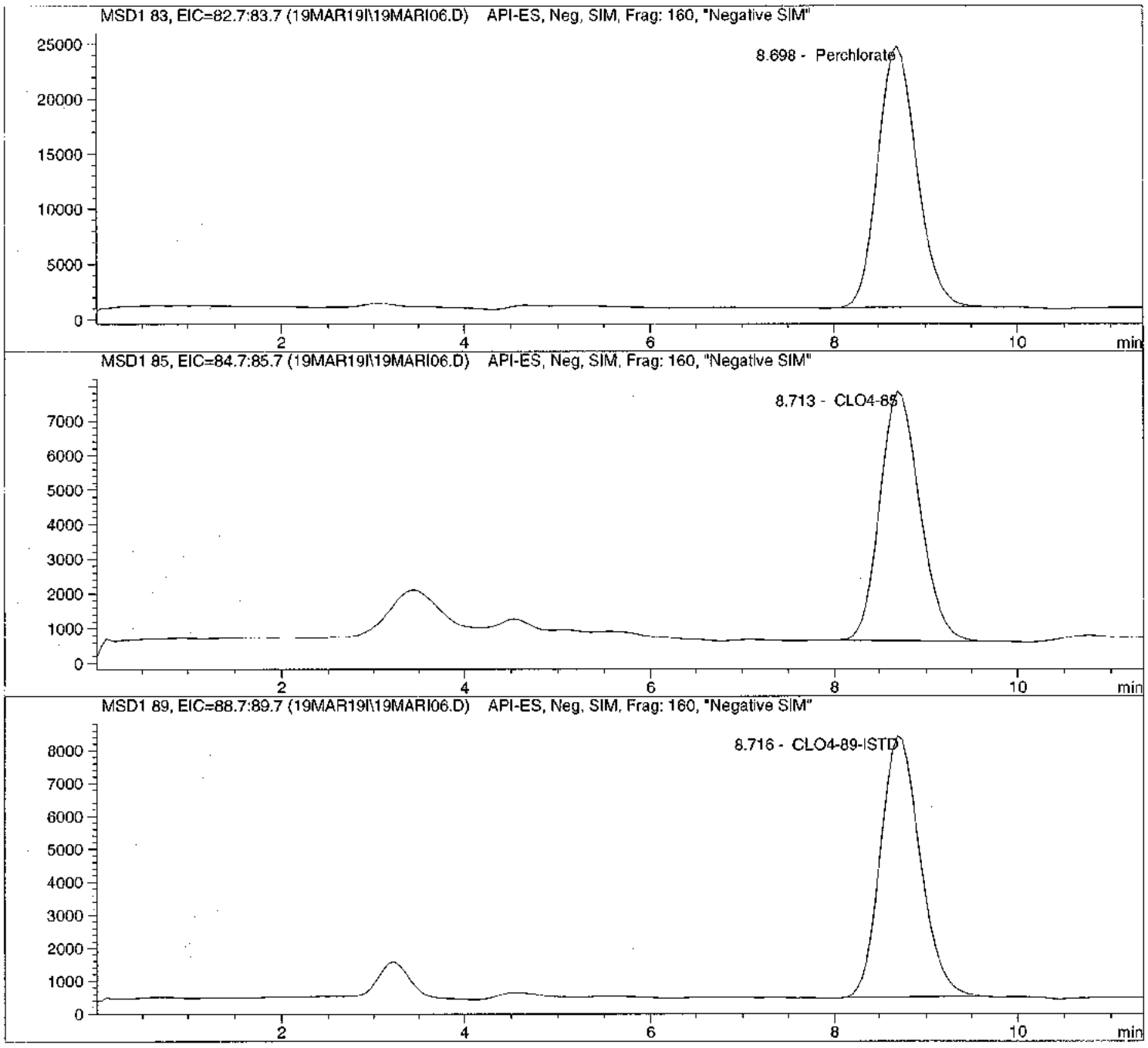
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

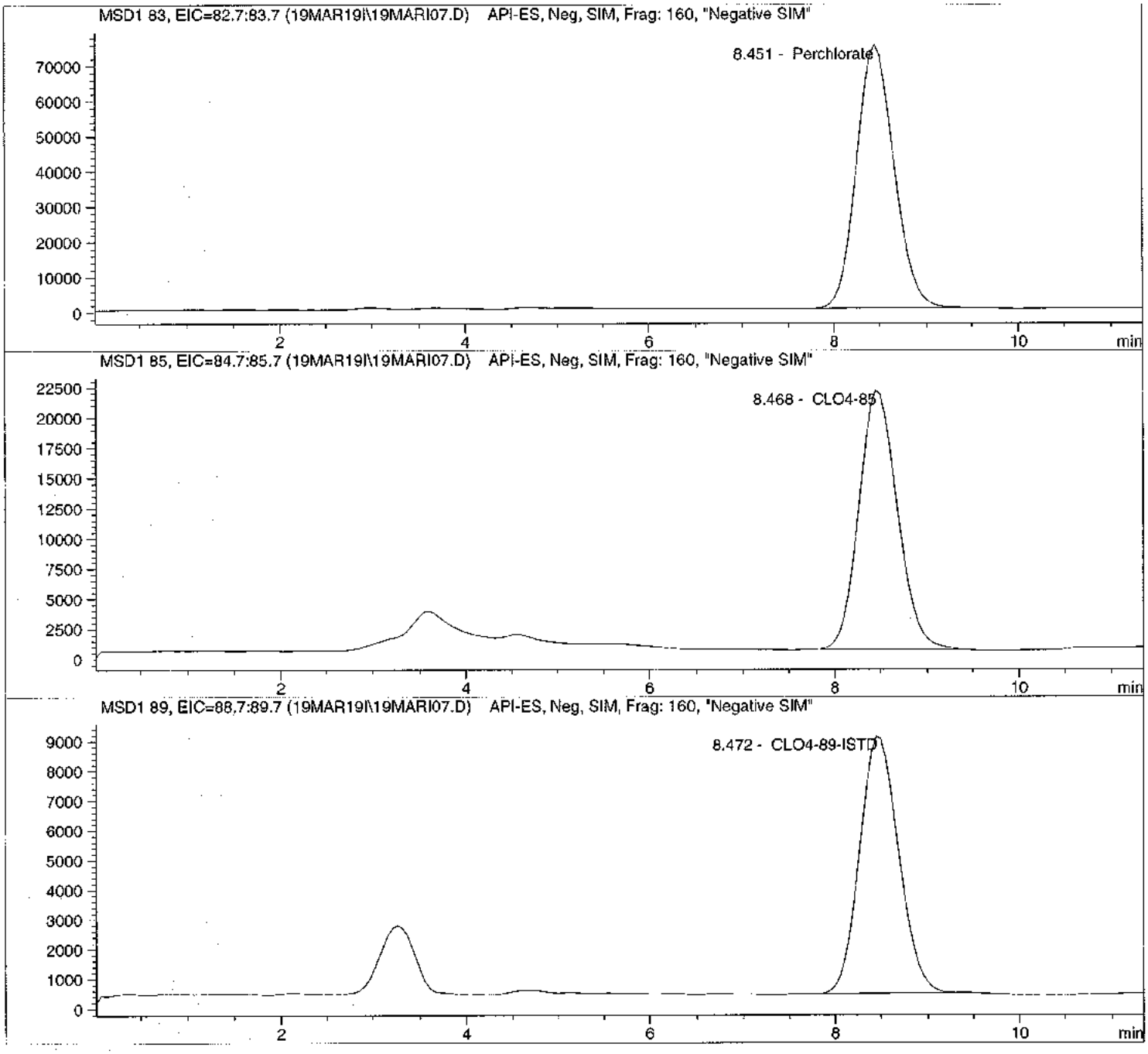
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

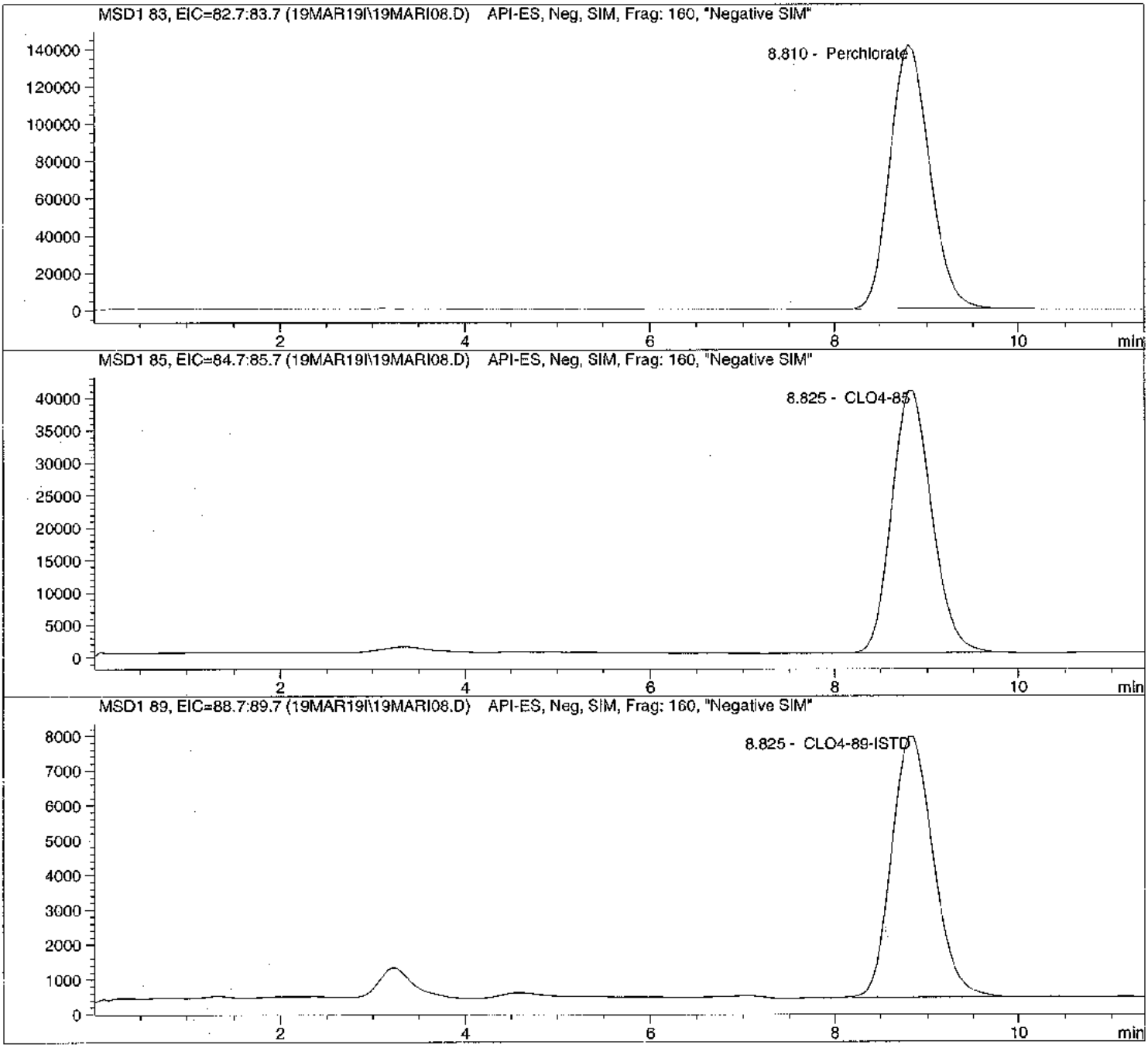
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

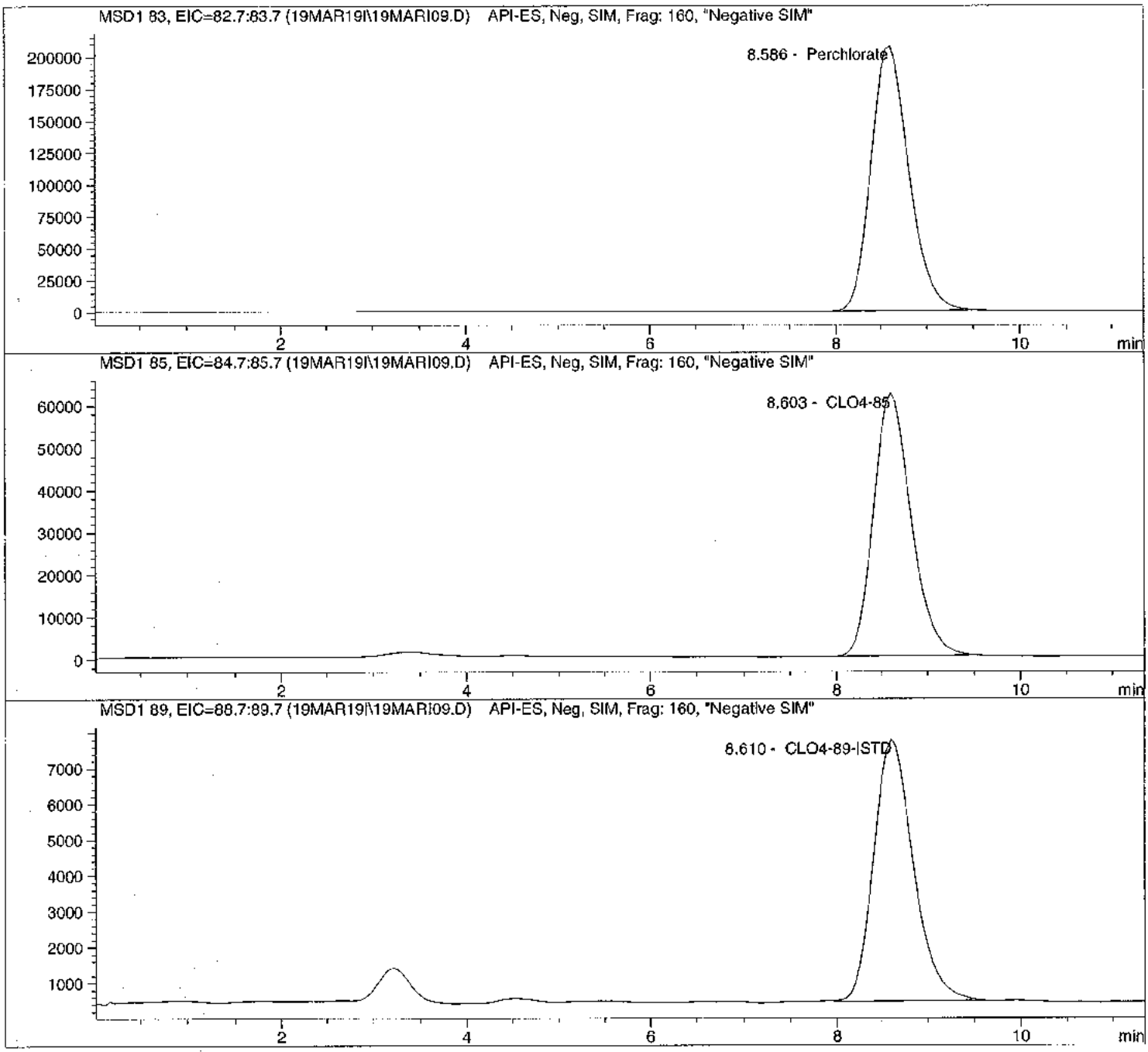
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

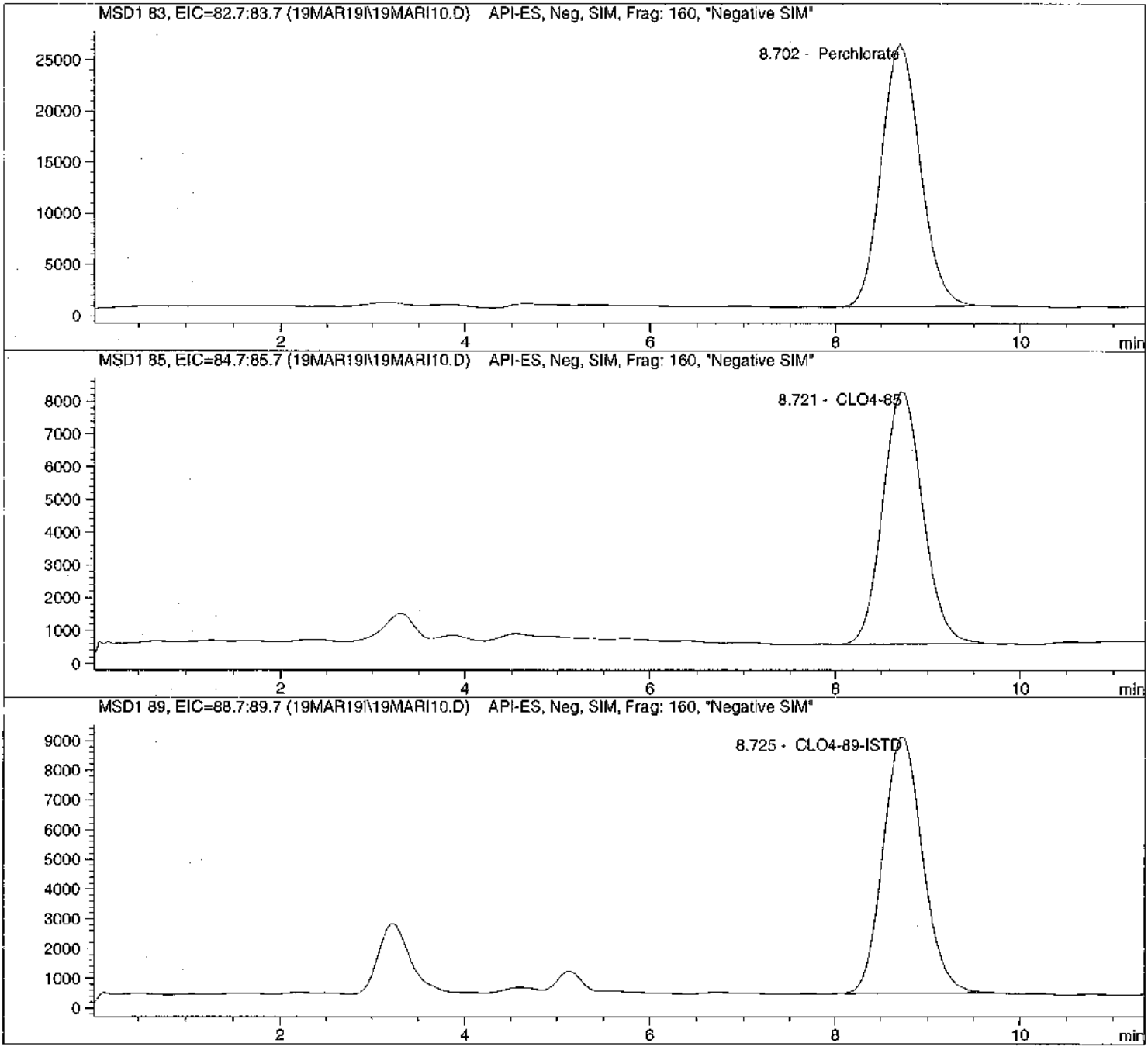
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

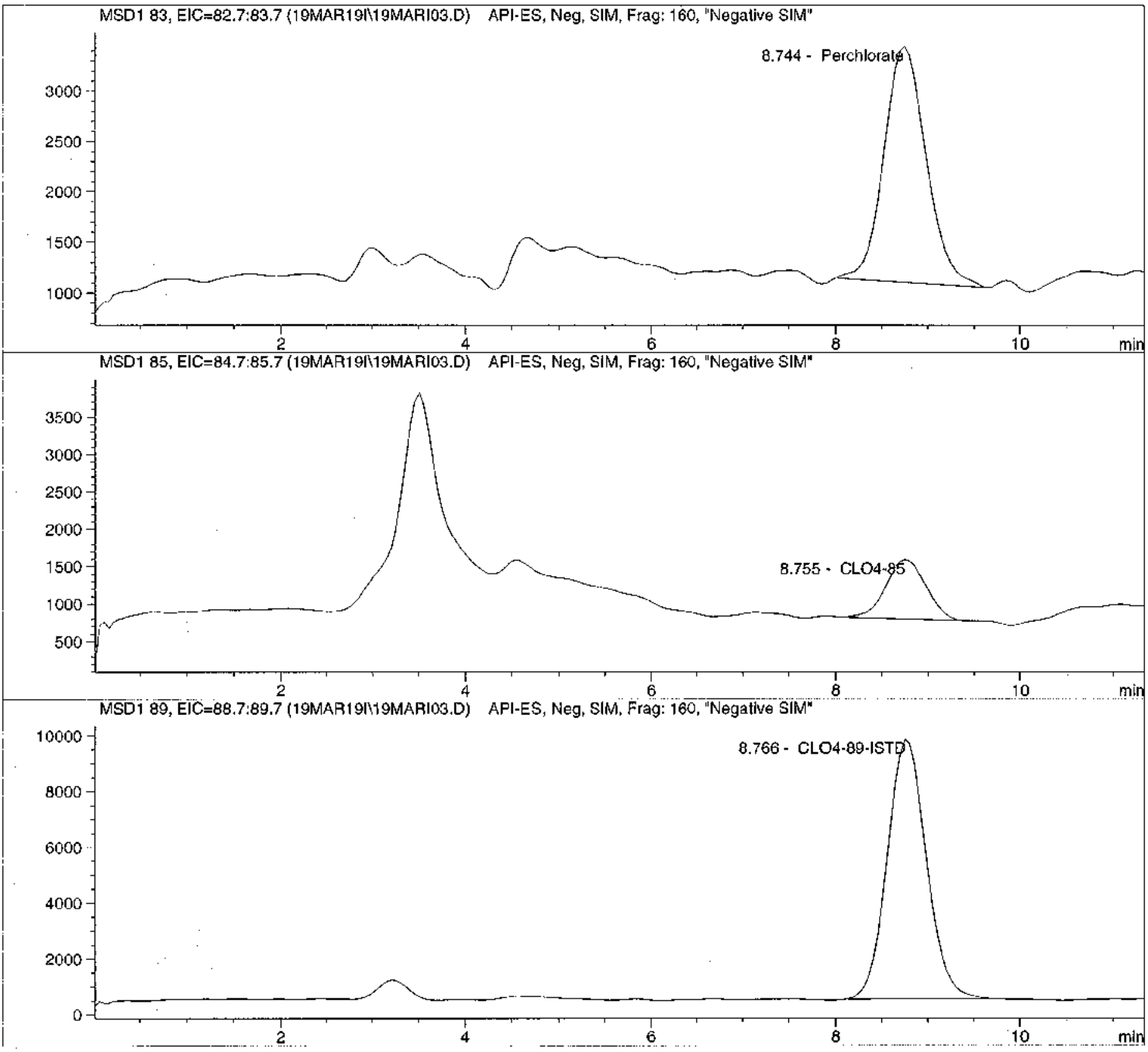
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

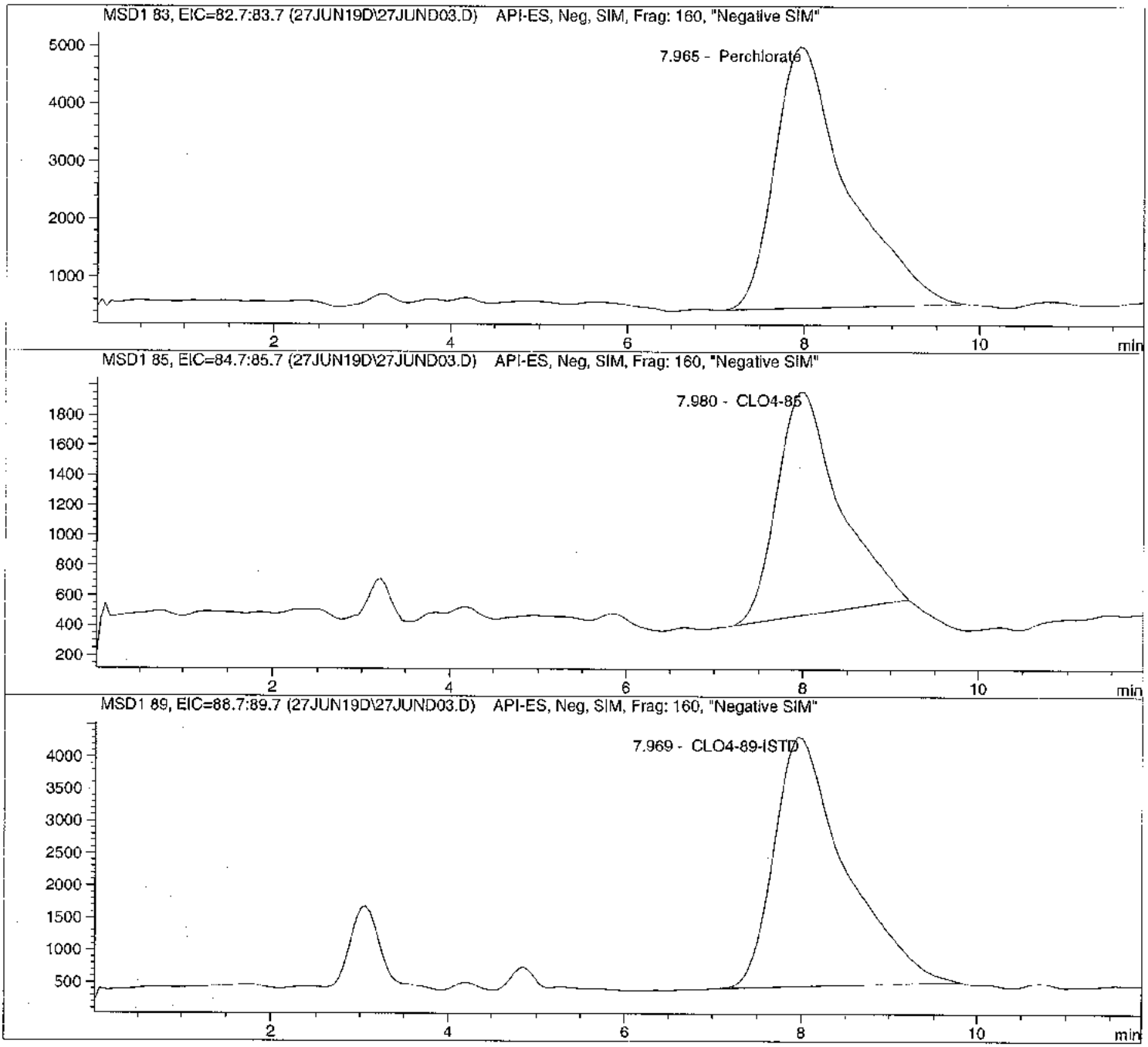
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.965	PBA	257330.2	3.9251	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.980	PBA	71973.3	3.5682	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.969	BBA	216232.2	5.0000	CLO4-89-ISTD

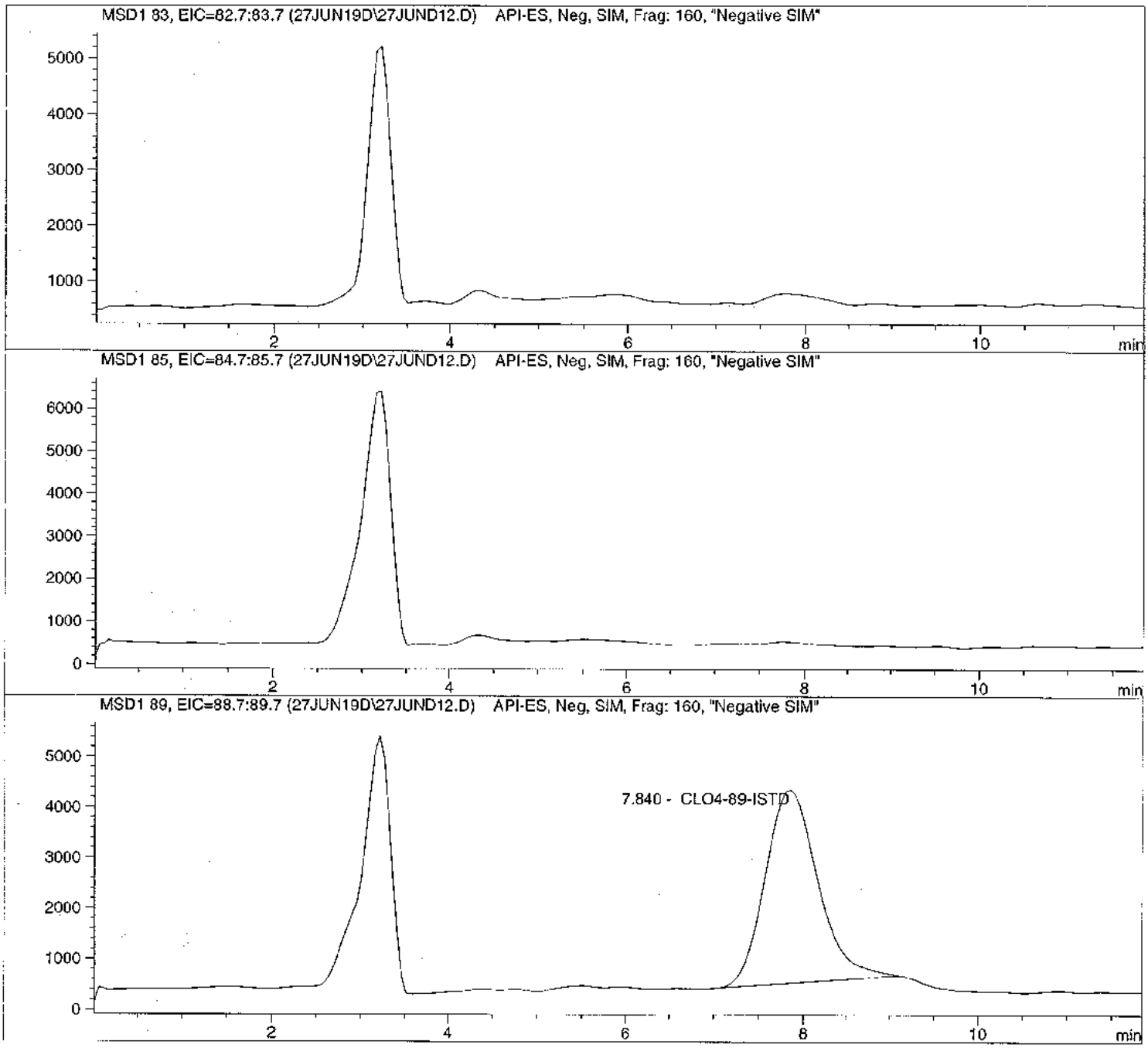
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.840	PBA	156379.6	5.0000	CLO4-89-ISTD

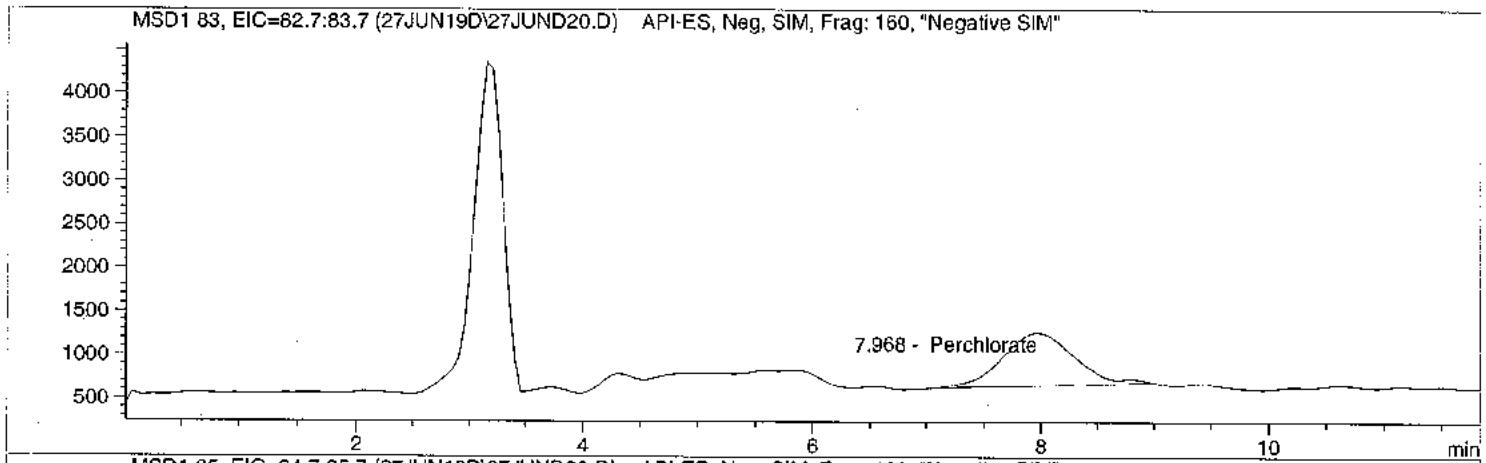
*** End of Report ***

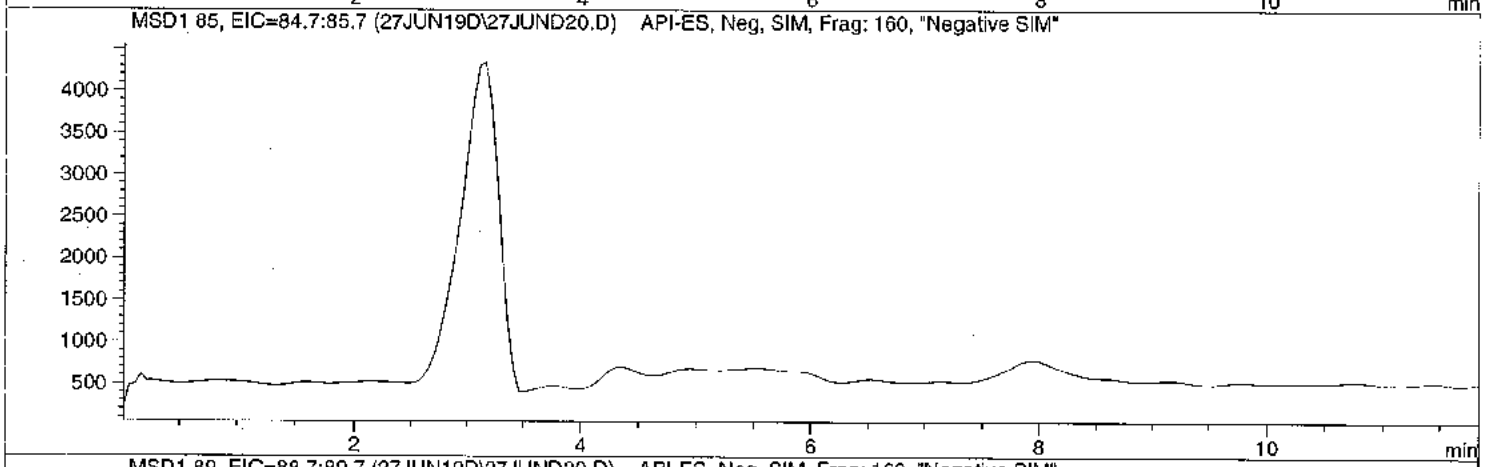
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

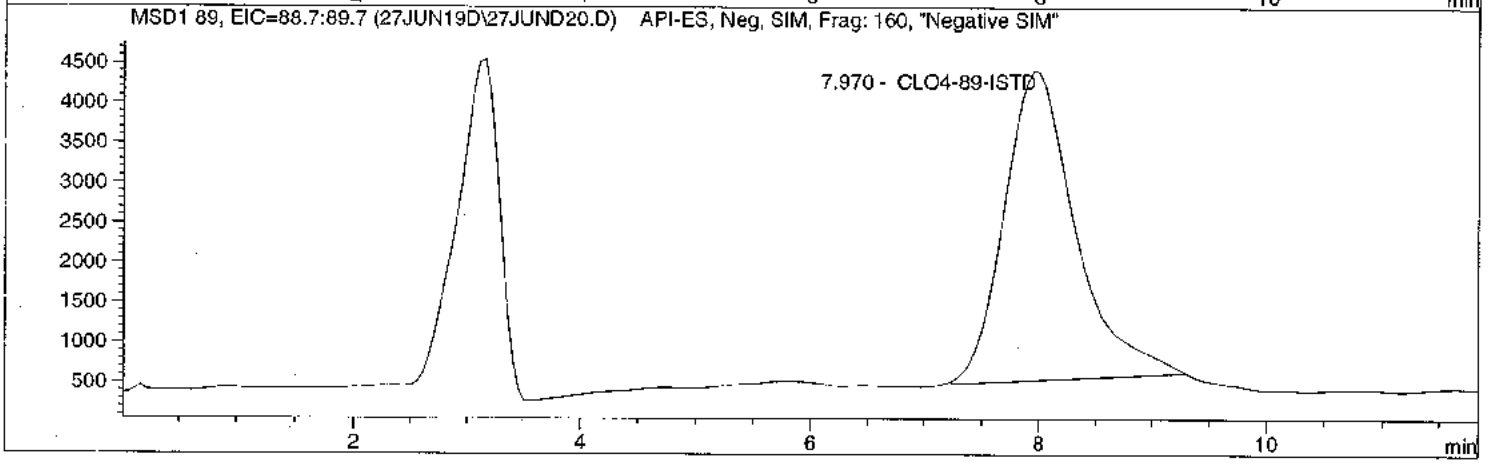
Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.968	PBA	26504.7	0.6583	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.970	PBA	168729.9	5.0000	CLO4-89-ISTD

*** End of Report ***

10450 Stancliff Rd. Suite 210
Houston, TX 77099
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June 27, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19060699**

Laboratory Results for: **Longhorn GW Treatment Plant Bi-Weekly Samples**

Dear Marcia,

ALS Environmental received 2 sample(s) on Jun 13, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

ALS Houston, US Date: 27-jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19060699

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060699-01	LH18/24-SP650_061219	Water		12-Jun-2019 14:00	13-Jun-2019 08:45	☐
HS19060699-02	Trip Blank	Water	CG 052219 -10	12-Jun-2019 14:00	13-Jun-2019 08:45	☐

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19060699

CASE NARRATIVE

GCMS Volatiles by Method SW8260

Batch ID: R341360

Sample ID: CCV

- Acetone exceeded %D limits for CCV. Samples are ND for this compound.

Sample ID: HS19060820-02MS

- MS and MSD are for an unrelated sample

Sample ID: VLCSW-190626

- 1,2,3_Trichlorobenzene exceeded QC limits for LCS. CCV is OK.

WetChemistry by Method SW9056

Batch ID: R340983

Sample ID: HS19060404-07MS

- MS and MSD are for an unrelated sample (Chloride,Sulfate)

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19060699
Sample ID: LH18/24-SP650_061219 Lab ID:HS19060699-01
Collection Date: 12-Jun-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,2-Dichloroethane	**0.46**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Jun-2019 15:19
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	26-Jun-2019 15:19
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	26-Jun-2019 15:19
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	26-Jun-2019 15:19
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	26-Jun-2019 15:19
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	26-Jun-2019 15:19
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19060699
Sample ID: LH18/24-SP650_061219 Lab ID:HS19060699-01
Collection Date: 12-Jun-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
cis-1,2-Dichloroethene	**0.49**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Jun-2019 15:19
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	26-Jun-2019 15:19
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	26-Jun-2019 15:19
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Jun-2019 15:19
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 15:19
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Trichloroethene	**0.64**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	26-Jun-2019 15:19
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 15:19
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*26-Jun-2019 15:19*
Surr: 4-Bromofluorobenzene	*94.8*			**0**	*85-114*	*%REC*	*1*	*26-Jun-2019 15:19*
Surr: Dibromofluoromethane	*94.0*			**0**	*80-119*	*%REC*	*1*	*26-Jun-2019 15:19*
Surr: Toluene-d8	*99.0*			**0**	*89-112*	*%REC*	*1*	*26-Jun-2019 15:19*
ANIONS BY SW9056A		**Method:SW9056**						Analyst: KMU
Chloride	**362**		**2.00**	**5.00**	**5.00**	**mg/L**	10	20-Jun-2019 23:13
Sulfate	**33.4**		**2.00**	**5.00**	**5.00**	**mg/L**	10	20-Jun-2019 23:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19060699
Sample ID: Trip Blank Lab ID:HS19060699-02
Collection Date: 12-Jun-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	26-Jun-2019 14:55
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	26-Jun-2019 14:55
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	26-Jun-2019 14:55
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	26-Jun-2019 14:55
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	26-Jun-2019 14:55
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**

Project: Longhorn GW Treatment Plant Bi-Weekly Samples WorkOrder:HS19060699

Sample ID: Trip Blank Lab ID:HS19060699-02

Collection Date: 12-Jun-2019 14:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	26-Jun-2019 14:55
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	26-Jun-2019 14:55
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	26-Jun-2019 14:55
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	26-Jun-2019 14:55
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	26-Jun-2019 14:55
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*26-Jun-2019 14:55*
Surr: 4-Bromofluorobenzene	*95.1*			**0**	*85-114*	*%REC*	*1*	*26-Jun-2019 14:55*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*1*	*26-Jun-2019 14:55*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*26-Jun-2019 14:55*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 27-jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID R340983	**Test Name :** ANIONS BY SW9056A			**Matrix:** Water		
HS19060699-01	LH18/24-SP650_061219	12 Jun 2019 14:00			20 Jun 2019 23:13	10
Batch ID R341360	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C			**Matrix:** Water		
HS19060699-01	LH18/24-SP650_061219	12 Jun 2019 14:00			26 Jun 2019 15:19	1
HS19060699-02	Trip Blank	12 Jun 2019 14:00			26 Jun 2019 14:55	1

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190626** Units: **UG/L** Analysis Date: **26-Jun-2019 14:07**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142418** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190626** Units: **UG/L** Analysis Date: **26-Jun-2019 14:07**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142418** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*52.89*	*1.0*	*50*	*0*	*106*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.84*	*1.0*	*50*	*0*	*97.7*	*85 - 114*				
Surr: Dibromofluoromethane	*48.56*	*1.0*	*50*	*0*	*97.1*	*80 - 119*				
Surr: Toluene-d8	*51.5*	*1.0*	*50*	*0*	*103*	*89 - 112*				

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190626** Units: **UG/L** Analysis Date: **26-Jun-2019 10:46**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142459** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.84	1.0	20	0	94.2	78 - 124				
1,1,1-Trichloroethane	19.78	1.0	20	0	98.9	74 - 131				
1,1,2,2-Tetrachloroethane	22.25	1.0	20	0	111	71 - 121				
1,1,2-Trichloroethane	20.42	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.97	1.0	20	0	99.8	77 - 125				
1,1-Dichloroethene	20.91	1.0	20	0	105	71 - 131				
1,1-Dichloropropene	20.26	1.0	20	0	101	78 - 125				
1,2,3-Trichlorobenzene	26.83	1.0	20	0	134	69 - 129				S
1,2,3-Trichloropropane	22.17	1.0	20	0	111	73 - 122				
1,2,4-Trichlorobenzene	23.48	1.0	20	0	117	69 - 130				
1,2,4-Trimethylbenzene	19.07	1.0	20	0	95.4	76 - 124				
1,2-Dibromo-3-chloropropane	23.99	1.0	20	0	120	62 - 128				
1,2-Dibromoethane	20.16	1.0	20	0	101	77 - 121				
1,2-Dichlorobenzene	19.03	1.0	20	0	95.1	80 - 119				
1,2-Dichloroethane	19.06	1.0	20	0	95.3	73 - 128				
1,2-Dichloropropane	19.61	1.0	20	0	98.1	78 - 122				
1,3,5-Trimethylbenzene	18.48	1.0	20	0	92.4	75 - 124				
1,3-Dichlorobenzene	18.67	1.0	20	0	93.4	80 - 119				
1,3-Dichloropropane	20.69	1.0	20	0	103	80 - 119				
1,4-Dichlorobenzene	20.22	1.0	20	0	101	79 - 118				
2,2-Dichloropropane	20.47	1.0	20	0	102	60 - 139				
2-Butanone	48.73	2.0	40	0	122	56 - 143				
2-Chlorotoluene	19.97	1.0	20	0	99.9	79 - 122				
2-Hexanone	43.71	2.0	40	0	109	57 - 139				
4-Chlorotoluene	20.01	1.0	20	0	100	78 - 122				
4-Isopropyltoluene	19.25	1.0	20	0	96.2	77 - 127				
4-Methyl-2-pentanone	42.69	2.0	40	0	107	67 - 130				
Acetone	60.02	2.0	40	0	150	39 - 160				
Benzene	19.84	1.0	20	0	99.2	79 - 120				
Bromobenzene	18.23	1.0	20	0	91.2	80 - 120				
Bromochloromethane	18.66	1.0	20	0	93.3	78 - 123				
Bromodichloromethane	20.01	1.0	20	0	100	79 - 125				
Bromoform	20.17	1.0	20	0	101	66 - 130				
Bromomethane	23.22	1.0	20	0	116	53 - 141				

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190626** Units: **UG/L** Analysis Date: **26-Jun-2019 10:46**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142459** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	37.14	2.0	40	0	92.9	64 - 133				
Carbon tetrachloride	19.18	1.0	20	0	95.9	72 - 136				
Chlorobenzene	18.99	1.0	20	0	95.0	82 - 118				
Chloroethane	20.85	1.0	20	0	104	60 - 138				
Chloroform	20.12	1.0	20	0	101	79 - 124				
Chloromethane	19.19	1.0	20	0	95.9	50 - 139				
cis-1,2-Dichloroethene	20.09	1.0	20	0	100	78 - 123				
cis-1,3-Dichloropropene	19.73	1.0	20	0	98.7	75 - 124				
Dibromochloromethane	19.32	1.0	20	0	96.6	74 - 126				
Dibromomethane	19.89	1.0	20	0	99.4	79 - 123				
Dichlorodifluoromethane	21.08	1.0	20	0	105	32 - 152				
Ethylbenzene	19.09	1.0	20	0	95.4	79 - 121				
Hexachlorobutadiene	25.13	1.0	20	0	126	66 - 134				
Isopropylbenzene	18.93	1.0	20	0	94.7	72 - 131				
m,p-Xylene	37.87	2.0	40	0	94.7	80 - 121				
Methylene chloride	19.61	2.0	20	0	98.1	74 - 124				
Naphthalene	25.38	1.0	20	0	127	61 - 128				
n-Butylbenzene	19.73	1.0	20	0	98.7	75 - 128				
n-Propylbenzene	20.02	1.0	20	0	100	76 - 126				
o-Xylene	18.63	1.0	20	0	93.2	78 - 122				
sec-Butylbenzene	20.39	1.0	20	0	102	77 - 126				
Styrene	19.72	1.0	20	0	98.6	78 - 123				
tert-Butylbenzene	19.99	1.0	20	0	99.9	78 - 124				
Tetrachloroethene	18.27	1.0	20	0	91.3	74 - 129				
Toluene	18.59	1.0	20	0	93.0	80 - 121				
trans-1,2-Dichloroethene	19.79	1.0	20	0	99.0	75 - 124				
trans-1,3-Dichloropropene	20.03	1.0	20	0	100	73 - 127				
Trichloroethene	18.47	1.0	20	0	92.3	79 - 123				
Trichlorofluoromethane	21.23	1.0	20	0	106	65 - 141				
Vinyl chloride	21.22	1.0	20	0	106	58 - 137				
Surr: 1,2-Dichloroethane-d4	*55.24*	*1.0*	*50*	*0*	*110*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.28*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*51.71*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*48.04*	*1.0*	*50*	*0*	*96.1*	*89 - 112*				

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19060820-02MS** Units: **UG/L** Analysis Date: **26-Jun-2019 16:09**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142423** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.67	1.0	20	0	88.3	78 - 124				
1,1,1-Trichloroethane	18.91	1.0	20	0	94.5	74 - 131				
1,1,2,2-Tetrachloroethane	19.66	1.0	20	0	98.3	71 - 121				
1,1,2-Trichloroethane	18.63	1.0	20	0	93.2	80 - 119				
1,1-Dichloroethane	17.86	1.0	20	0	89.3	77 - 125				
1,1-Dichloroethene	19.89	1.0	20	0	99.5	71 - 131				
1,1-Dichloropropene	19.78	1.0	20	0	98.9	78 - 125				
1,2,3-Trichlorobenzene	20.97	1.0	20	0	105	69 - 129				
1,2,3-Trichloropropane	19.77	1.0	20	0	98.9	73 - 122				
1,2,4-Trichlorobenzene	20.11	1.0	20	0	101	69 - 130				
1,2,4-Trimethylbenzene	18.69	1.0	20	0	93.5	76 - 124				
1,2-Dibromo-3-chloropropane	20.24	1.0	20	0	101	62 - 128				
1,2-Dibromoethane	18.03	1.0	20	0	90.1	77 - 121				
1,2-Dichlorobenzene	18.15	1.0	20	1.556	83.0	80 - 119				
1,2-Dichloroethane	17.35	1.0	20	0	86.7	73 - 128				
1,2-Dichloropropane	17.99	1.0	20	0	90.0	78 - 122				
1,3,5-Trimethylbenzene	18.65	1.0	20	0	93.3	75 - 124				
1,3-Dichlorobenzene	17.91	1.0	20	0	89.5	80 - 119				
1,3-Dichloropropane	18.53	1.0	20	0	92.7	80 - 119				
1,4-Dichlorobenzene	19.27	1.0	20	0	96.3	79 - 118				
2,2-Dichloropropane	17.96	1.0	20	0	89.8	60 - 139				
2-Butanone	37.47	2.0	40	0	93.7	56 - 143				
2-Chlorotoluene	19.71	1.0	20	0	98.6	79 - 122				
2-Hexanone	35.3	2.0	40	0	88.3	57 - 139				
4-Chlorotoluene	19.56	1.0	20	0	97.8	78 - 122				
4-Isopropyltoluene	19.52	1.0	20	0	97.6	77 - 127				
4-Methyl-2-pentanone	35.89	2.0	40	0	89.7	67 - 130				
Acetone	39.11	2.0	40	0	97.8	39 - 160				
Benzene	18.78	1.0	20	0.9822	89.0	79 - 120				
Bromobenzene	17.32	1.0	20	0	86.6	80 - 120				
Bromochloromethane	16.53	1.0	20	0	82.6	78 - 123				
Bromodichloromethane	18.02	1.0	20	0	90.1	79 - 125				
Bromoform	17.93	1.0	20	0	89.6	66 - 130				
Bromomethane	19.78	1.0	20	0	98.9	53 - 141				

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19060820-02MS** Units: **UG/L** Analysis Date: **26-Jun-2019 16:09**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142423** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	34.97	2.0	40	0	87.4	64 - 133				
Carbon tetrachloride	19.18	1.0	20	0	95.9	72 - 136				
Chlorobenzene	17.82	1.0	20	0	89.1	82 - 118				
Chloroethane	19.6	1.0	20	0	98.0	60 - 138				
Chloroform	17.92	1.0	20	0	89.6	79 - 124				
Chloromethane	19.69	1.0	20	0	98.4	50 - 139				
cis-1,2-Dichloroethene	17.5	1.0	20	0	87.5	78 - 123				
cis-1,3-Dichloropropene	17.36	1.0	20	0	86.8	75 - 124				
Dibromochloromethane	17.47	1.0	20	0	87.4	74 - 126				
Dibromomethane	17.67	1.0	20	0	88.3	79 - 123				
Dichlorodifluoromethane	18.66	1.0	20	0	93.3	32 - 152				
Ethylbenzene	18.77	1.0	20	2.723	80.2	79 - 121				
Hexachlorobutadiene	23.24	1.0	20	0	116	66 - 134				
Isopropylbenzene	75.9	1.0	20	607.3	-2660	72 - 131				SO
m,p-Xylene	37.56	2.0	40	3.202	85.9	80 - 121				
Methylene chloride	17.2	2.0	20	0	86.0	74 - 124				
Naphthalene	20.29	1.0	20	0	101	61 - 128				
n-Butylbenzene	20	1.0	20	0	100	75 - 128				
n-Propylbenzene	21.79	1.0	20	13.14	43.3	76 - 126				S
o-Xylene	18.03	1.0	20	0	90.2	78 - 122				
sec-Butylbenzene	21.32	1.0	20	5.569	78.7	77 - 126				
Styrene	18.46	1.0	20	0	92.3	78 - 123				
tert-Butylbenzene	20.97	1.0	20	6.016	74.8	78 - 124				S
Tetrachloroethene	18.14	1.0	20	0	90.7	74 - 129				
Toluene	18.17	1.0	20	0	90.8	80 - 121				
trans-1,2-Dichloroethene	18.53	1.0	20	0	92.7	75 - 124				
trans-1,3-Dichloropropene	17.51	1.0	20	0	87.5	73 - 127				
Trichloroethene	17.6	1.0	20	0	88.0	79 - 123				
Trichlorofluoromethane	20.23	1.0	20	0	101	65 - 141				
Vinyl chloride	19.48	1.0	20	0	97.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.6*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.21*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*49.32*	*1.0*	*50*	*0*	*98.6*	*80 - 119*				
Surr: Toluene-d8	*50.02*	*1.0*	*50*	*0*	*100*	*89 - 112*				

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19060820-02MSD** Units: **UG/L** Analysis Date: **26-Jun-2019 16:33**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142424** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.82	1.0	20	0	89.1	78 - 124	17.67	0.896	20	
1,1,1-Trichloroethane	18.71	1.0	20	0	93.5	74 - 131	18.91	1.08	20	
1,1,2,2-Tetrachloroethane	20.11	1.0	20	0	101	71 - 121	19.66	2.24	20	
1,1,2-Trichloroethane	19.08	1.0	20	0	95.4	80 - 119	18.63	2.41	20	
1,1-Dichloroethane	18.09	1.0	20	0	90.5	77 - 125	17.86	1.32	20	
1,1-Dichloroethene	19.82	1.0	20	0	99.1	71 - 131	19.89	0.373	20	
1,1-Dichloropropene	19.39	1.0	20	0	97.0	78 - 125	19.78	1.99	20	
1,2,3-Trichlorobenzene	20.85	1.0	20	0	104	69 - 129	20.97	0.551	20	
1,2,3-Trichloropropane	19.96	1.0	20	0	99.8	73 - 122	19.77	0.961	20	
1,2,4-Trichlorobenzene	19.85	1.0	20	0	99.3	69 - 130	20.11	1.28	20	
1,2,4-Trimethylbenzene	18.49	1.0	20	0	92.5	76 - 124	18.69	1.07	20	
1,2-Dibromo-3-chloropropane	20.53	1.0	20	0	103	62 - 128	20.24	1.44	20	
1,2-Dibromoethane	18.12	1.0	20	0	90.6	77 - 121	18.03	0.542	20	
1,2-Dichlorobenzene	18.44	1.0	20	1.556	84.4	80 - 119	18.15	1.55	20	
1,2-Dichloroethane	17.83	1.0	20	0	89.1	73 - 128	17.35	2.74	20	
1,2-Dichloropropane	18.34	1.0	20	0	91.7	78 - 122	17.99	1.89	20	
1,3,5-Trimethylbenzene	18.48	1.0	20	0	92.4	75 - 124	18.65	0.915	20	
1,3-Dichlorobenzene	17.77	1.0	20	0	88.8	80 - 119	17.91	0.763	20	
1,3-Dichloropropane	18.87	1.0	20	0	94.3	80 - 119	18.53	1.79	20	
1,4-Dichlorobenzene	18.93	1.0	20	0	94.6	79 - 118	19.27	1.78	20	
2,2-Dichloropropane	17.64	1.0	20	0	88.2	60 - 139	17.96	1.81	20	
2-Butanone	37.37	2.0	40	0	93.4	56 - 143	37.47	0.283	20	
2-Chlorotoluene	19.58	1.0	20	0	97.9	79 - 122	19.71	0.649	20	
2-Hexanone	36.91	2.0	40	0	92.3	57 - 139	35.3	4.45	20	
4-Chlorotoluene	19.6	1.0	20	0	98.0	78 - 122	19.56	0.209	20	
4-Isopropyltoluene	19.29	1.0	20	0	96.4	77 - 127	19.52	1.21	20	
4-Methyl-2-pentanone	36.02	2.0	40	0	90.0	67 - 130	35.89	0.353	20	
Acetone	40.74	2.0	40	0	102	39 - 160	39.11	4.09	20	
Benzene	18.92	1.0	20	0.9822	89.7	79 - 120	18.78	0.724	20	
Bromobenzene	17.44	1.0	20	0	87.2	80 - 120	17.32	0.709	20	
Bromochloromethane	16.95	1.0	20	0	84.7	78 - 123	16.53	2.49	20	
Bromodichloromethane	18.31	1.0	20	0	91.5	79 - 125	18.02	1.56	20	
Bromoform	18.34	1.0	20	0	91.7	66 - 130	17.93	2.26	20	
Bromomethane	19.43	1.0	20	0	97.2	53 - 141	19.78	1.78	20	

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R341360 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19060820-02MSD** Units: **UG/L** Analysis Date: **26-Jun-2019 16:33**
Client ID: Run ID: **VOA6_341360** SeqNo: **5142424** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.58	2.0	40	0	86.5	64 - 133	34.97	1.13	20	
Carbon tetrachloride	19.01	1.0	20	0	95.1	72 - 136	19.18	0.87	20	
Chlorobenzene	17.91	1.0	20	0	89.6	82 - 118	17.82	0.509	20	
Chloroethane	19.45	1.0	20	0	97.2	60 - 138	19.6	0.771	20	
Chloroform	18.29	1.0	20	0	91.5	79 - 124	17.92	2.07	20	
Chloromethane	19.17	1.0	20	0	95.8	50 - 139	19.69	2.69	20	
cis-1,2-Dichloroethene	18	1.0	20	0	90.0	78 - 123	17.5	2.77	20	
cis-1,3-Dichloropropene	17.2	1.0	20	0	86.0	75 - 124	17.36	0.955	20	
Dibromochloromethane	17.57	1.0	20	0	87.8	74 - 126	17.47	0.546	20	
Dibromomethane	17.8	1.0	20	0	89.0	79 - 123	17.67	0.745	20	
Dichlorodifluoromethane	18.21	1.0	20	0	91.0	32 - 152	18.66	2.44	20	
Ethylbenzene	18.53	1.0	20	2.723	79.0	79 - 121	18.77	1.3	20	
Hexachlorobutadiene	22.04	1.0	20	0	110	66 - 134	23.24	5.31	20	
Isopropylbenzene	73.92	1.0	20	607.3	-2670	72 - 131	75.9	2.65	20	SO
m,p-Xylene	37.14	2.0	40	3.202	84.8	80 - 121	37.56	1.12	20	
Methylene chloride	17.84	2.0	20	0	89.2	74 - 124	17.2	3.66	20	
Naphthalene	19.75	1.0	20	0	98.8	61 - 128	20.29	2.7	20	
n-Butylbenzene	19.51	1.0	20	0	97.5	75 - 128	20	2.51	20	
n-Propylbenzene	21.32	1.0	20	13.14	40.9	76 - 126	21.79	2.22	20	S
o-Xylene	18.11	1.0	20	0	90.5	78 - 122	18.03	0.412	20	
sec-Butylbenzene	20.96	1.0	20	5.569	76.9	77 - 126	21.32	1.71	20	S
Styrene	18.47	1.0	20	0	92.3	78 - 123	18.46	0.0121	20	
tert-Butylbenzene	20.83	1.0	20	6.016	74.0	78 - 124	20.97	0.695	20	S
Tetrachloroethene	17.85	1.0	20	0	89.3	74 - 129	18.14	1.58	20	
Toluene	18.02	1.0	20	0	90.1	80 - 121	18.17	0.831	20	
trans-1,2-Dichloroethene	18.4	1.0	20	0	92.0	75 - 124	18.53	0.701	20	
trans-1,3-Dichloropropene	17.73	1.0	20	0	88.7	73 - 127	17.51	1.29	20	
Trichloroethene	17.64	1.0	20	0	88.2	79 - 123	17.6	0.211	20	
Trichlorofluoromethane	19.91	1.0	20	0	99.5	65 - 141	20.23	1.61	20	
Vinyl chloride	19.04	1.0	20	0	95.2	58 - 137	19.48	2.32	20	
Surr: 1,2-Dichloroethane-d4	*52.28*	*1.0*	*50*	*0*	*105*	*81 - 118*	*50.6*	*3.26*	*20*	
Surr: 4-Bromofluorobenzene	*51.11*	*1.0*	*50*	*0*	*102*	*85 - 114*	*51.21*	*0.196*	*20*	
Surr: Dibromofluoromethane	*49.75*	*1.0*	*50*	*0*	*99.5*	*80 - 119*	*49.32*	*0.875*	*20*	
Surr: Toluene-d8	*49.96*	*1.0*	*50*	*0*	*99.9*	*89 - 112*	*50.02*	*0.111*	*20*	

ALS Houston, US Date: 27-Jun-19

Client:	Bhate Environmental Associates, Inc.
Project:	Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder:	HS19060699

QC BATCH REPORT

Batch ID:	**R341360 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch:	HS19060699-01	HS19060699-02

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R340983 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MBLK Sample ID: **WBLKW1-062019** Units: **mg/L** Analysis Date: **20-Jun-2019 19:04**
Client ID: Run ID: **ICS2100_340983** SeqNo: **5133579** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	0.500	0.500								U
Sulfate	0.500	0.500								U

LCS Sample ID: **WLCSW1-062019** Units: **mg/L** Analysis Date: **20-Jun-2019 19:19**
Client ID: Run ID: **ICS2100_340983** SeqNo: **5133580** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	20.61	0.500	20	0	103	80 - 120				
Sulfate	20.53	0.500	20	0	103	80 - 120				

LCSD Sample ID: **WLCSDW1-062019** Units: **mg/L** Analysis Date: **20-Jun-2019 19:34**
Client ID: Run ID: **ICS2100_340983** SeqNo: **5133581** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	21.75	0.500	20	0	109	80 - 120	20.61	5.39	20	
Sulfate	21.78	0.500	20	0	109	80 - 120	20.53	5.94	20	

MS Sample ID: **HS19060732-03MS** Units: **mg/L** Analysis Date: **21-Jun-2019 02:38**
Client ID: Run ID: **ICS2100_340983** SeqNo: **5133601** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1231	10.0	200	1061	84.9	80 - 120				O
Sulfate	199.9	10.0	200	7.734	96.1	80 - 120				

MS Sample ID: **HS19060404-07MS** Units: **mg/L** Analysis Date: **20-Jun-2019 22:15**
Client ID: Run ID: **ICS2100_340983** SeqNo: **5133585** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	711.7	10.0	200	447.1	132	80 - 120				S
Sulfate	476.2	10.0	200	226.8	125	80 - 120				S

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: HS19060699

QC BATCH REPORT

Batch ID: R340983 (0) **Instrument: ICS2100** **Method: ANIONS BY SW9056A**

MSD Sample ID: **HS19060732-03MSD** Units: **mg/L** Analysis Date: **21-Jun-2019 02:53**
Client ID: Run ID: **ICS2100_340983** SeqNo: **5133602** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	1297	10.0	200	1061	118	80 - 120	1231	5.21	20	O
Sulfate	213.2	10.0	200	7.734	103	80 - 120	199.9	6.44	20	

MSD Sample ID: **HS19060404-07MSD** Units: **mg/L** Analysis Date: **20-Jun-2019 22:29**
Client ID: Run ID: **ICS2100_340983** SeqNo: **5133586** PrepDate: DF: **20**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chloride	688.6	10.0	200	447.1	121	80 - 120	711.7	3.3	20	S
Sulfate	459.9	10.0	200	226.8	117	80 - 120	476.2	3.47	20	

The following samples were analyzed in this batch: HS19060699-01

ALS Houston, US Date: 27-Jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
WorkOrder: **HS19060699**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Houston, US Date: 27-Jun-19

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Illinois	004438	29-Jun-2019
Kansas	E-10352 2018-2019	31-Jul-2019
Louisiana	03087	30-Jun-2019
Maryland	343, 2018-2019	30-Jun-2019
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 27-jun-19

Client: Bhate Environmental Associates, Inc.
Project: Longhorn GW Treatment Plant Bi-Weekly Samples
Work Order: HS19060699

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19060699-01	LH18/24-SP650_061219	Login	14/06/2019 7:04:46	JRM	WET224
HS19060699-01	LH18/24-SP650_061219	Login	14/06/2019 7:04:46	JRM	VOA151
HS19060699-02	Trip Blank	Login	14/06/2019 7:04:46	JRM	VOA151

00940106

ALS Houston, US Date: 27-Jun-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060699
Date/Time Received: **13-Jun-2019 08:45**
Received by: **JRM**

Checklist completed by: *Jared R. Makan* eSignature 14-Jun-2019 Date
Reviewed by: *Corey Grandits* eSignature 14-Jun-2019 Date

Matrices: **Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:N/A
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.8c/1.8c UC/C	IR25	
Cooler(s)/Kit(s):	25344		
Date/Time sample(s) sent to storage:	06/14/2019 19:10		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

CHAIN OF CUSTODY

Name Of Lab Shipping To: ALS 10450 Stancliff Rd. Suite 210, Houston, Tx. 77099 ATTN: R.J. Modashia

Page 1 of 1

Project: BHATE
LONGHORN ARMY AMMN. PLANT (LHAAP)
GROUNDWATER TREATMENT PLANT (GWTP)
KARNACK, TEXAS

Project No. NWO1312.0150.0 16.0001

Job: GROUNDWATER TREATMENT PLANT BI-WEEKLY SAMPLES

Prepared By: Scott Beesinger

P.O Number

Field Sample I.D.	Sample Matrix	Date / Time	MS / MSD	No. OF CONTAINERS	Analyses: VOC	Analyses: CHLORIDE, SULFATE	Remarks (Preservatives, etc.)	Lab I.D.#
LH18/24-SP650_061219	Water	06/12/19 / 14:00		3	3		HCL	
LH18/24-SP650_061219	Water	06/12/19 / 14:00		1		1	NONE	
Trip Blank	Water	06/12/19		2	2		HCL	

Additional Remarks: STANDARD TAT ON ALL PARAMETERS.

Relinquished By:	Date	Time	Received By:	Date	Time	Relinquished By:	Date	Time	Received By:	Date	Time
Scott Beesinger	06/12/19	14:30									

For Lab Use Only

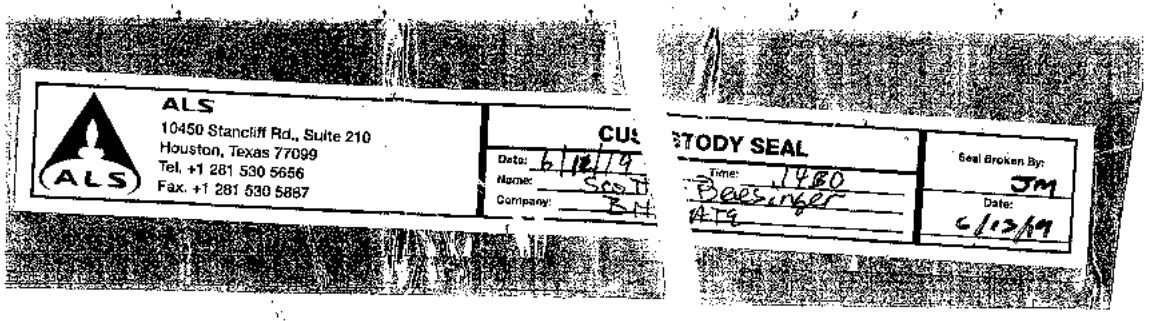
Received At Lab By:	Date	Time	Airbill No.	Opened By:	Date	Time	Temp of Container	Seal No.	Condition
ND	6/13/19	08:45							

Remarks: Cooler 25344 1225
Temp 1.8 CF0.0

HS19060699

Bhate Environmental Associates, Inc.
Longhorn GW Treatment Plant Bi-Weekly Samples

(Word) S:\I-ces\Forms\Chain of Custody - BiWeekly

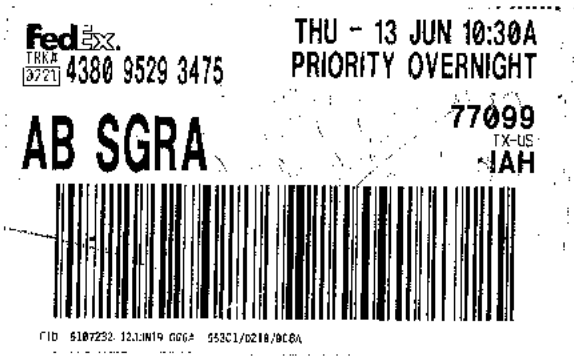


ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

CU
Date: 6/12/19
Name: Scott
Company: BH

STODY SEAL
Time: 1460
Beesinger
ATG

Seal Broken By:
JM
Date:
6/13/19



FedEx.
TRK# 4380 9529 3475
0221

THU - 13 JUN 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA

PID 5107292 12JUN19 0606 9530/0218/9C0A

APPENDIX D
ISOPLETH CONTOUR MAPS

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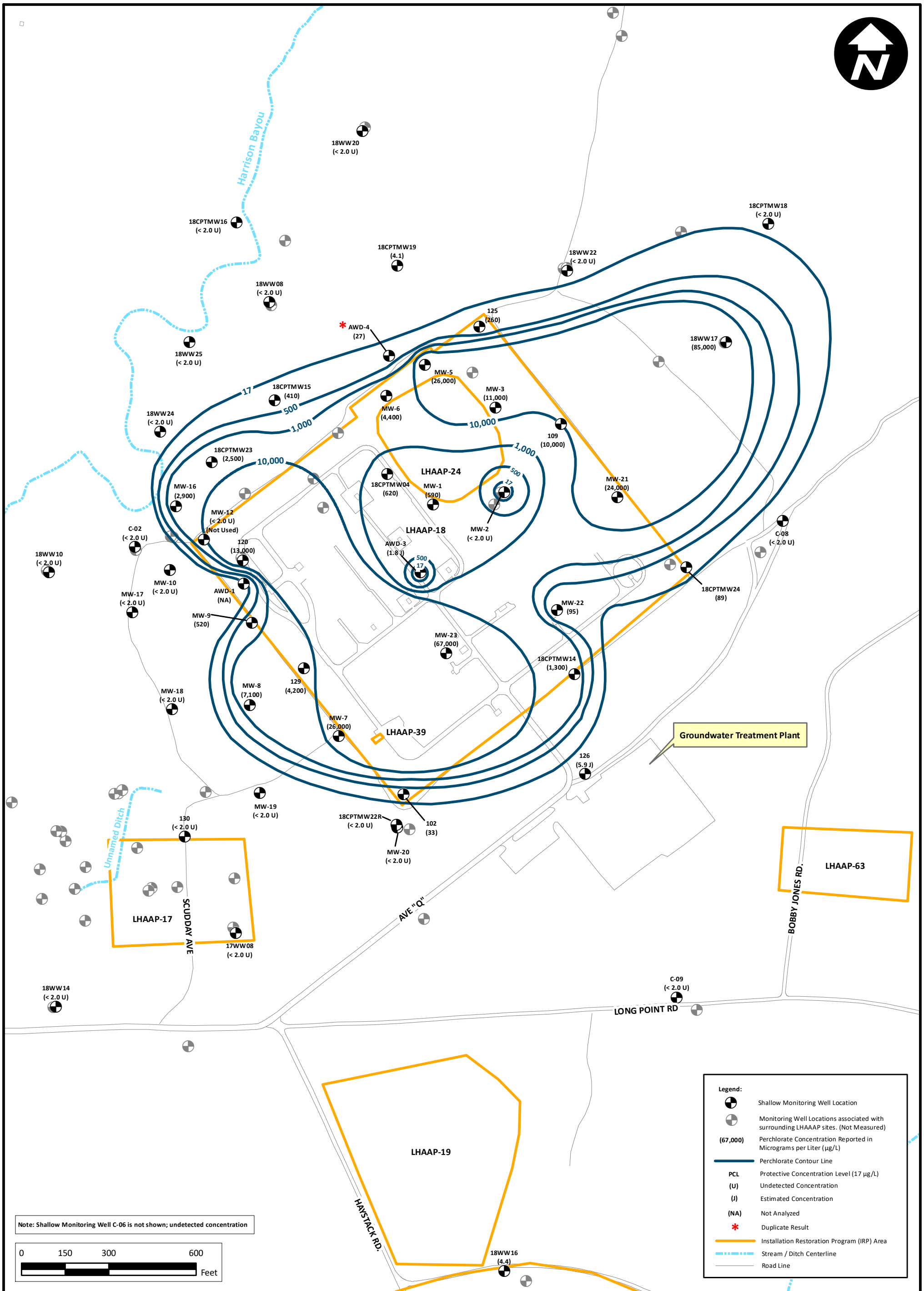


bhate

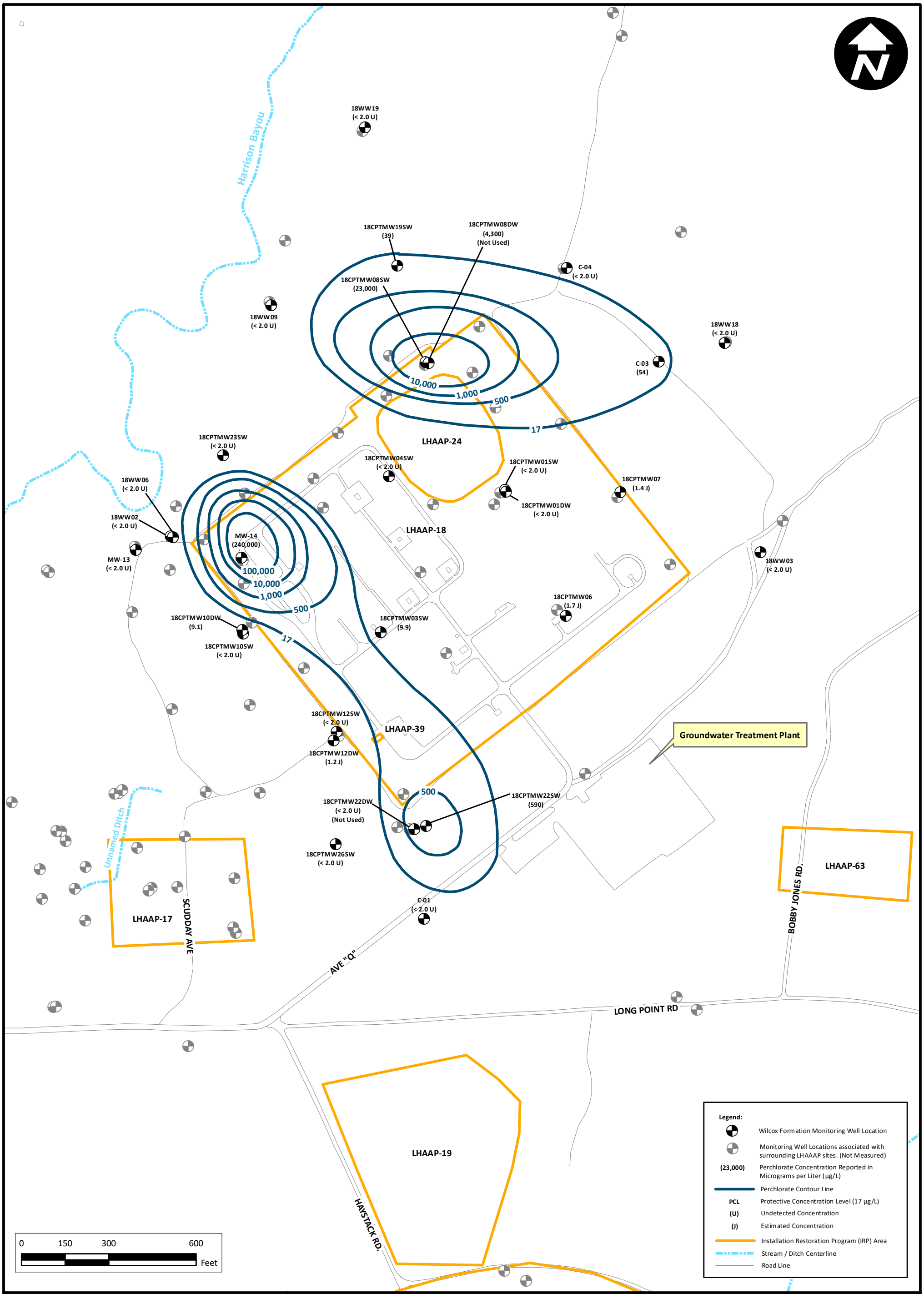
www.bhate.com

Quarterly Evaluation Report 2nd Quarter (April – June) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	10/7/2019	MRM

Perchlorate Isopleth Contours in Shallow Zone (June 2019)

Figure D-1



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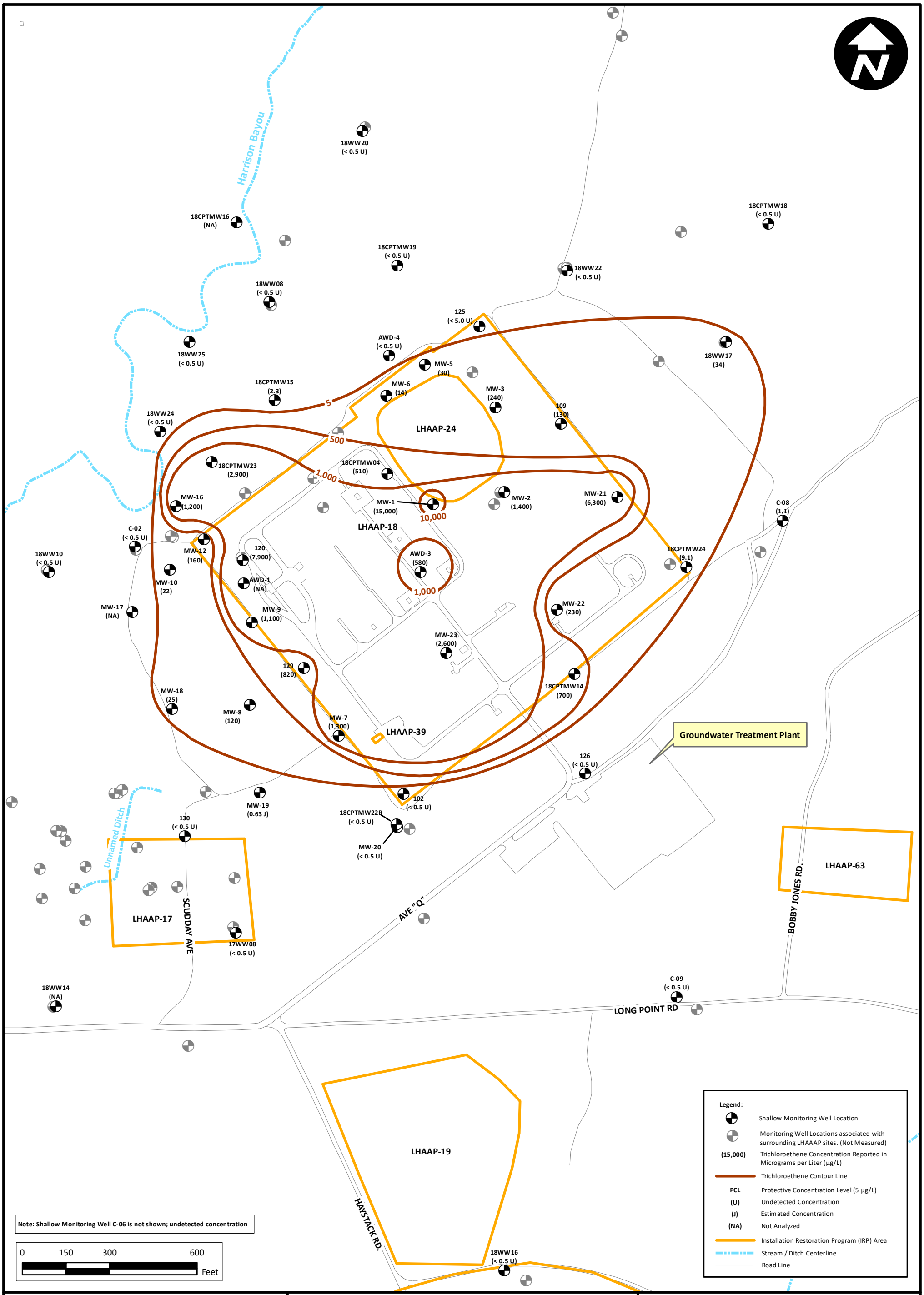
Quarterly Evaluation Report 2nd Quarter (April – June) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	10/7/2019	MRM

Perchlorate Isopleth Contours in Wilcox Formation (June 2019)

Figure D-2



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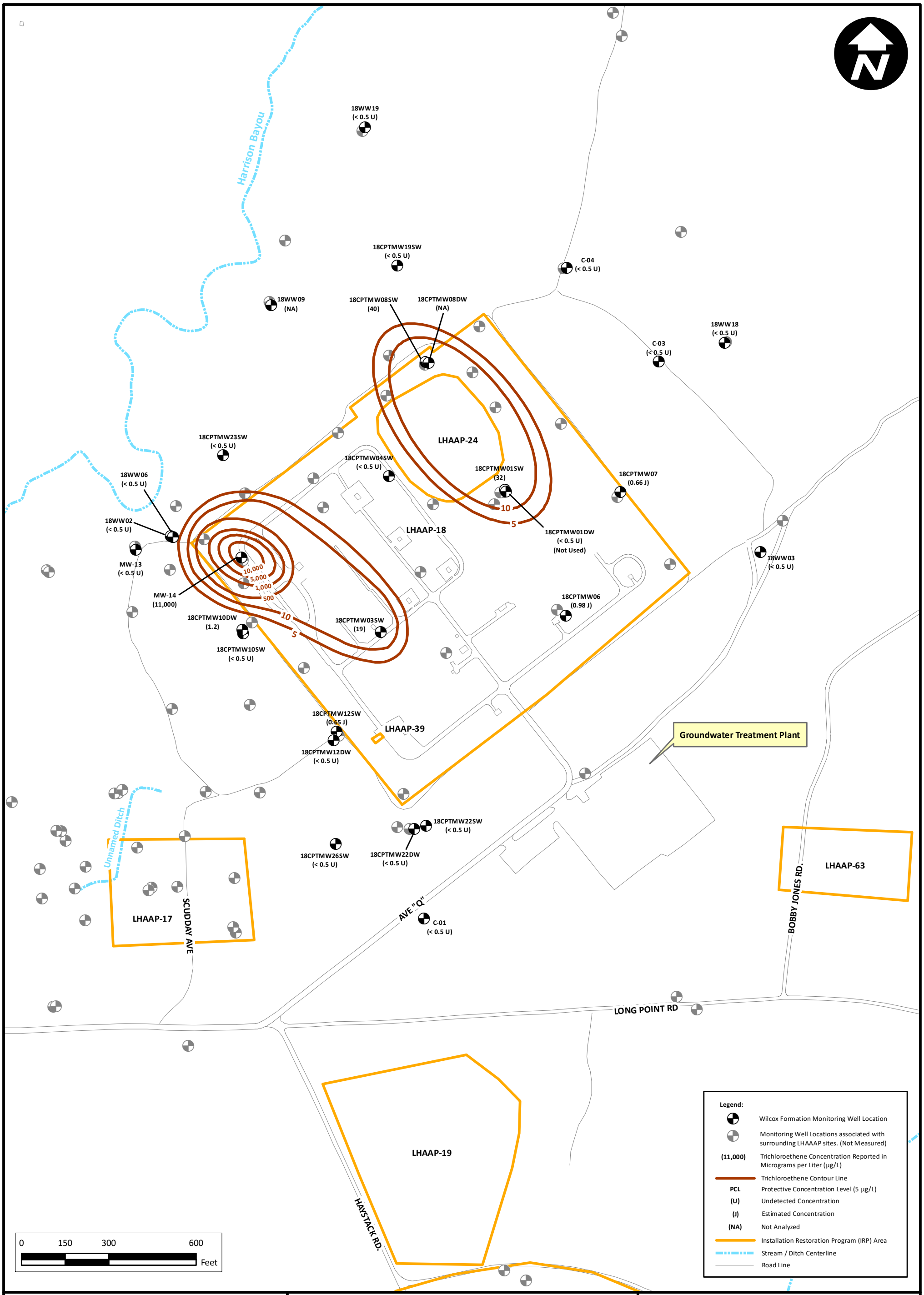
Quarterly Evaluation Report 2nd Quarter (April – June) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	10/7/2019	MRM

Trichloroethene Isopleth Contours in Shallow Zone (June 2019)

Figure D-3



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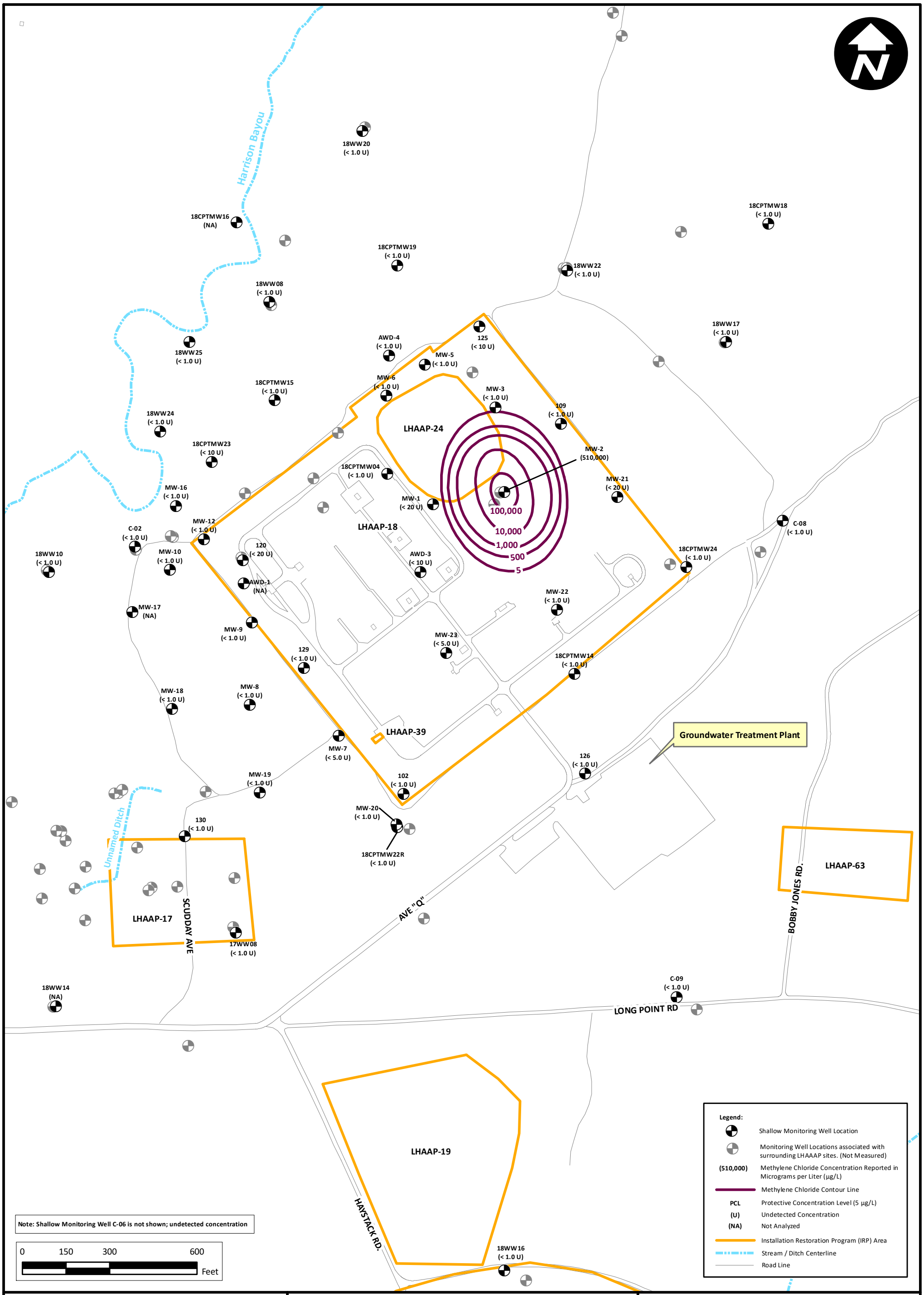
Quarterly Evaluation Report 2nd Quarter (April – June) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	10/7/2019	MRM

Trichloroethene Isopleth Contours in Wilcox Formation (June 2019)

Figure D-4



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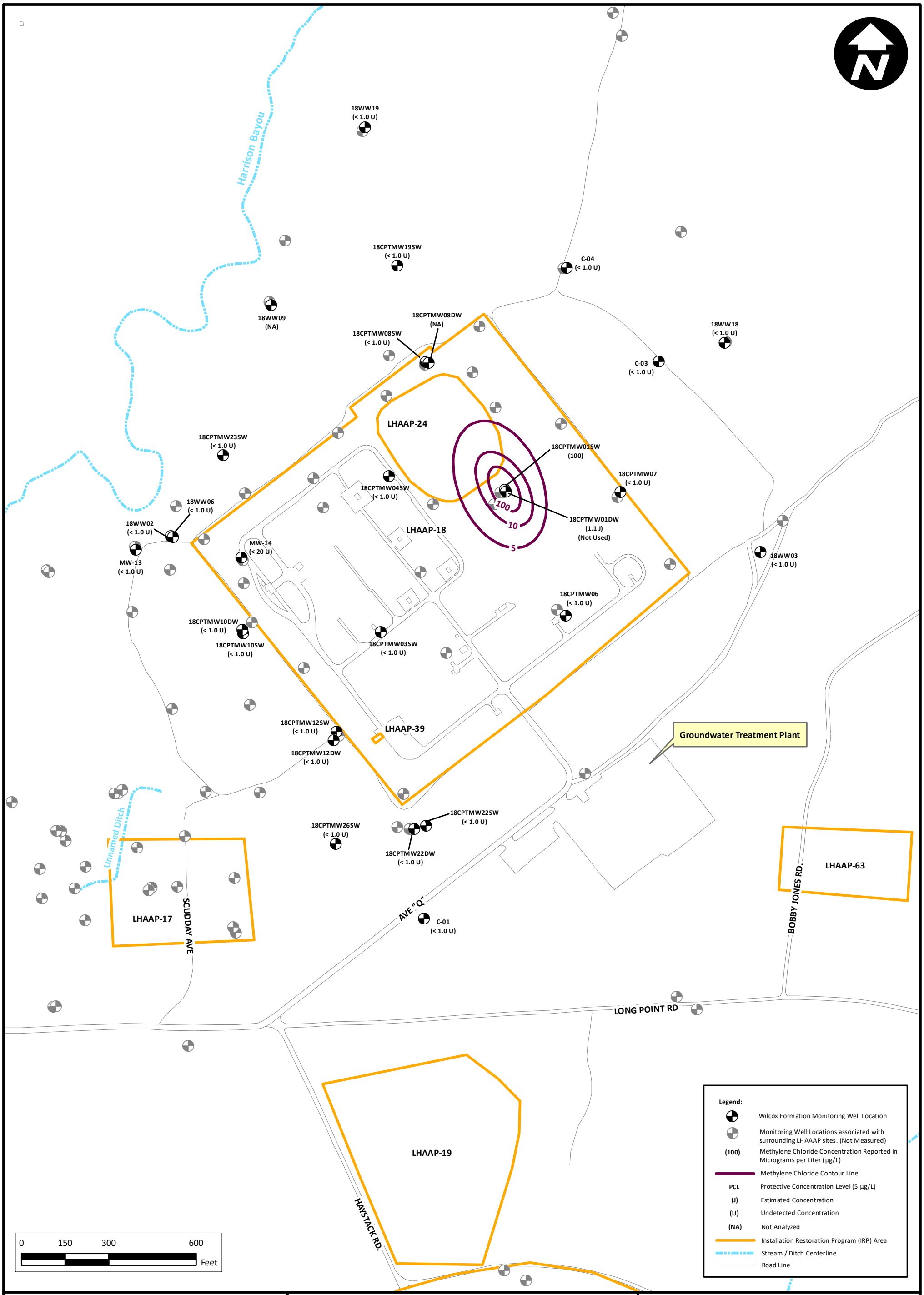
Quarterly Evaluation Report 2nd Quarter (April – June) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	10/7/2019	MRM

Methylene Chloride Isopleth Contours in Shallow Zone (June 2019)

Figure D-5



bhate

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Quarterly Evaluation Report 2nd Quarter (April – June) 2019
Groundwater Treatment Plant
Longhorn Army Ammunition Plant, Karnack, Texas

PROJECT NO:	SCALE:	DATE:	DRAWN BY:
NWO1312.0150	As Shown	10/7/2019	MRM

Methylene Chloride Isopleth Contours in Wilcox Formation (June 2019)

Figure D-6

APPENDIX E
MONITORING WELL TREND CHARTS

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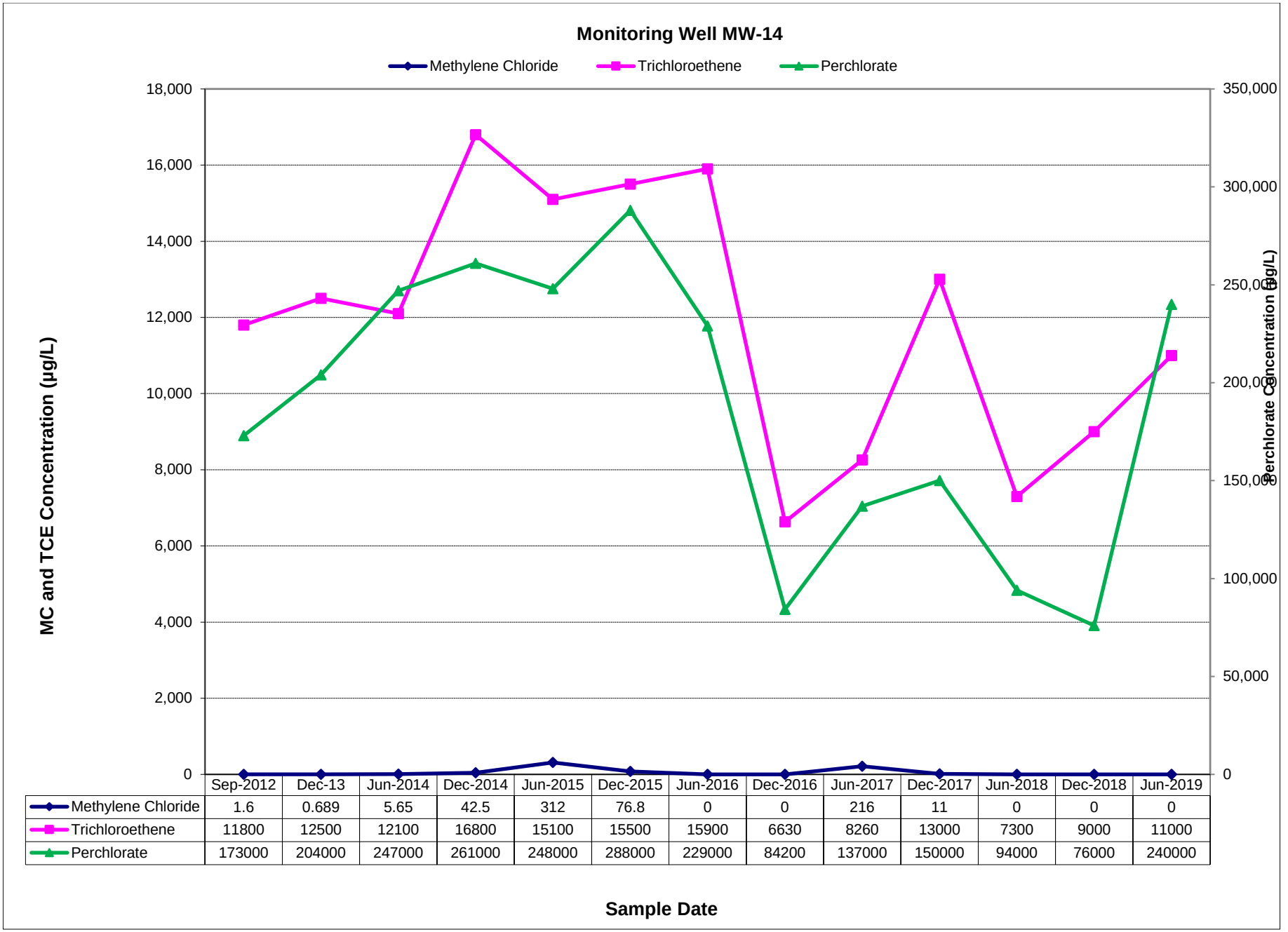
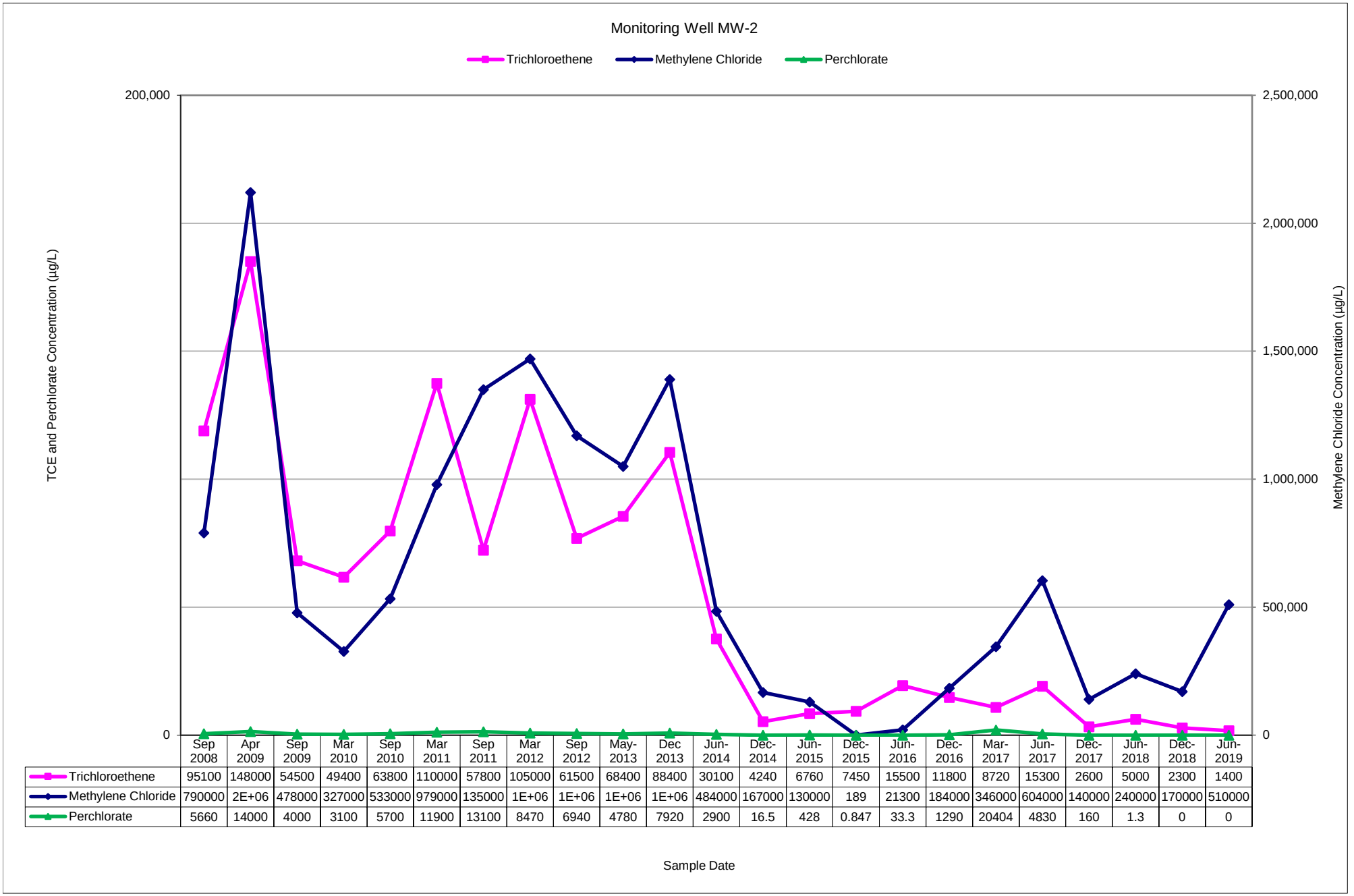
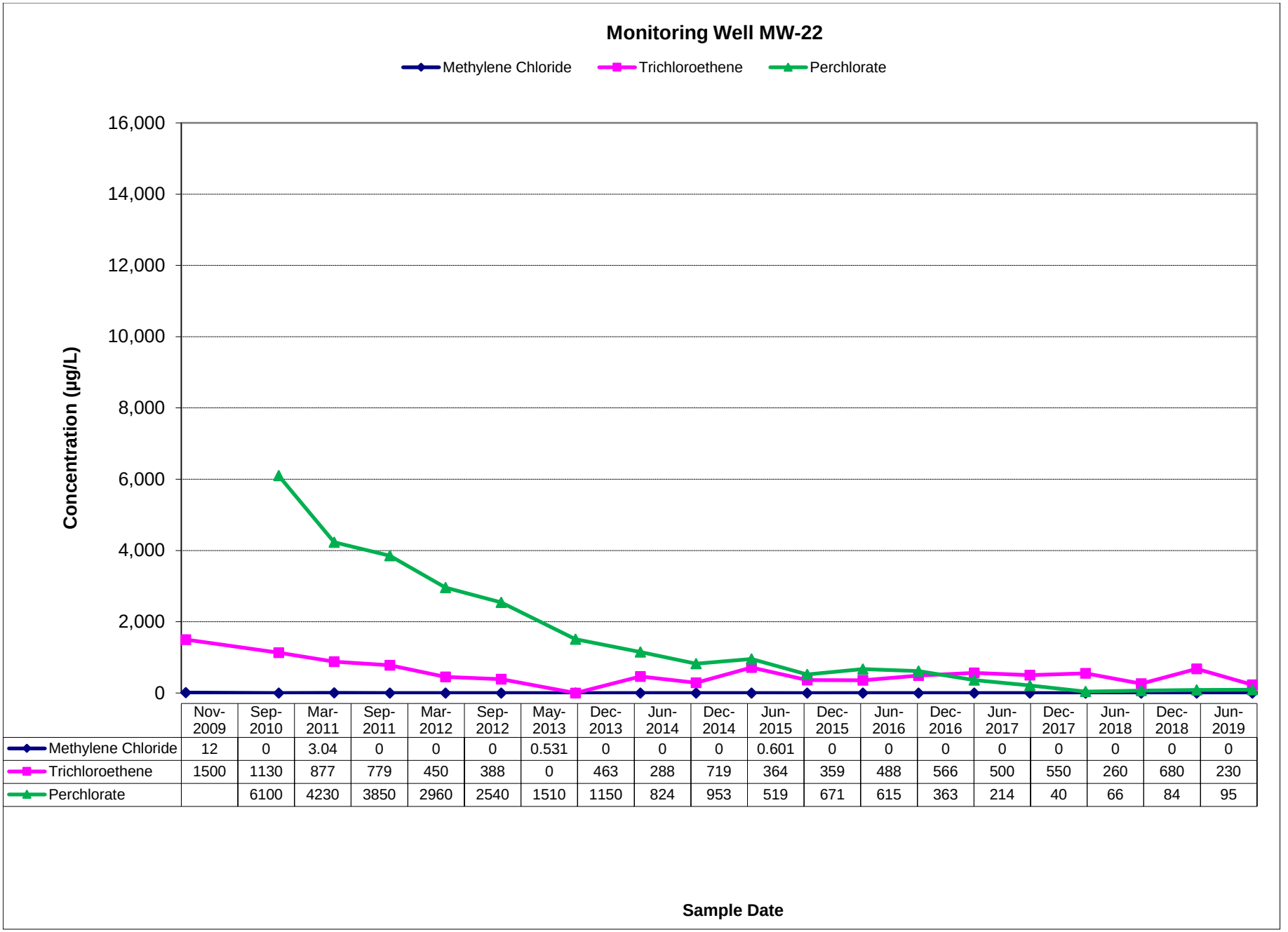


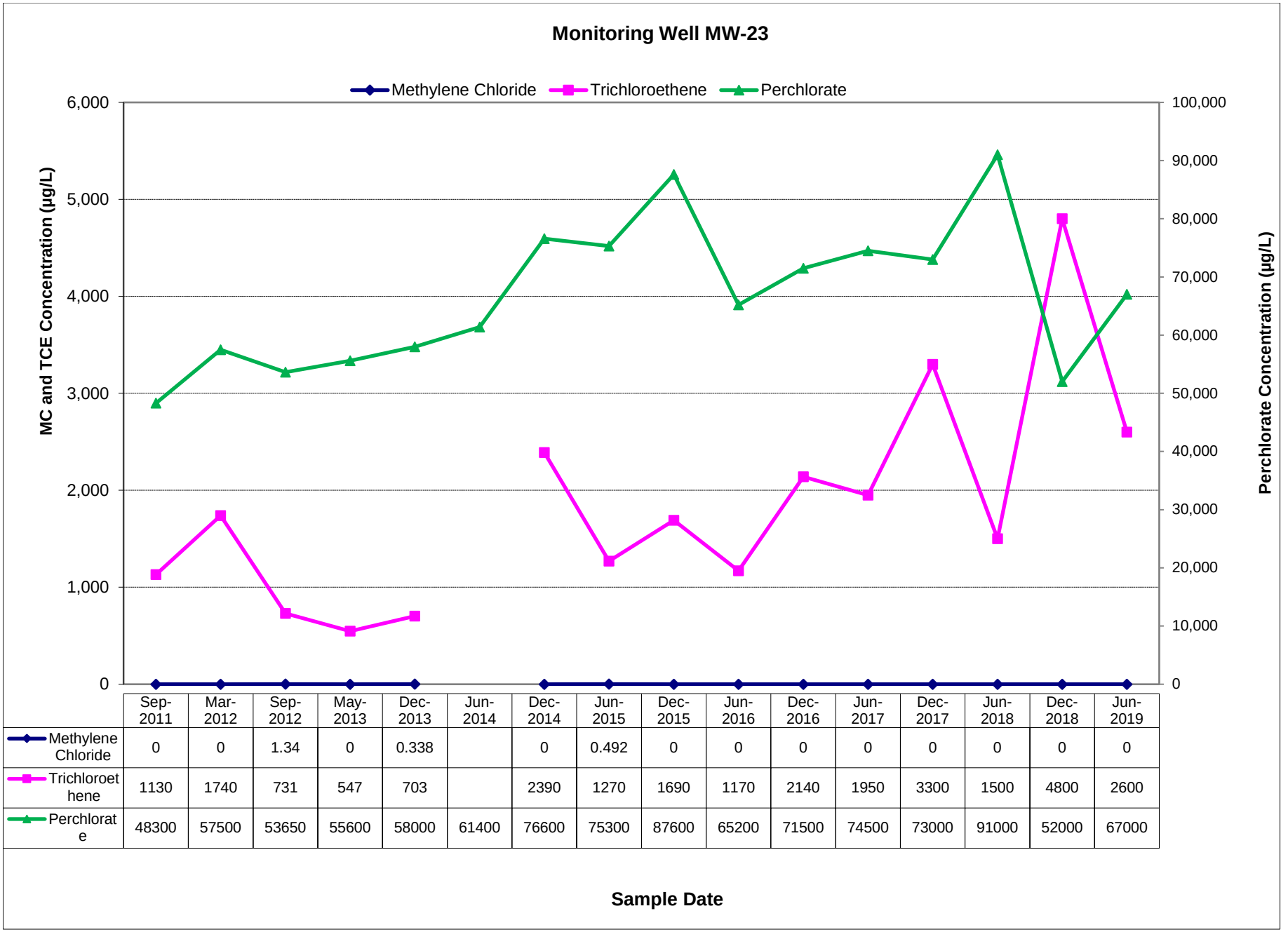
	Sep-2012	Dec-13	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	1.6	0.689	5.65	42.5	312	76.8	0	0	216	11	0	0	0
Trichloroethene	11800	12500	12100	16800	15100	15500	15900	6630	8260	13000	7300	9000	11000
Perchlorate	173000	204000	247000	261000	248000	288000	229000	84200	137000	150000	94000	76000	240000



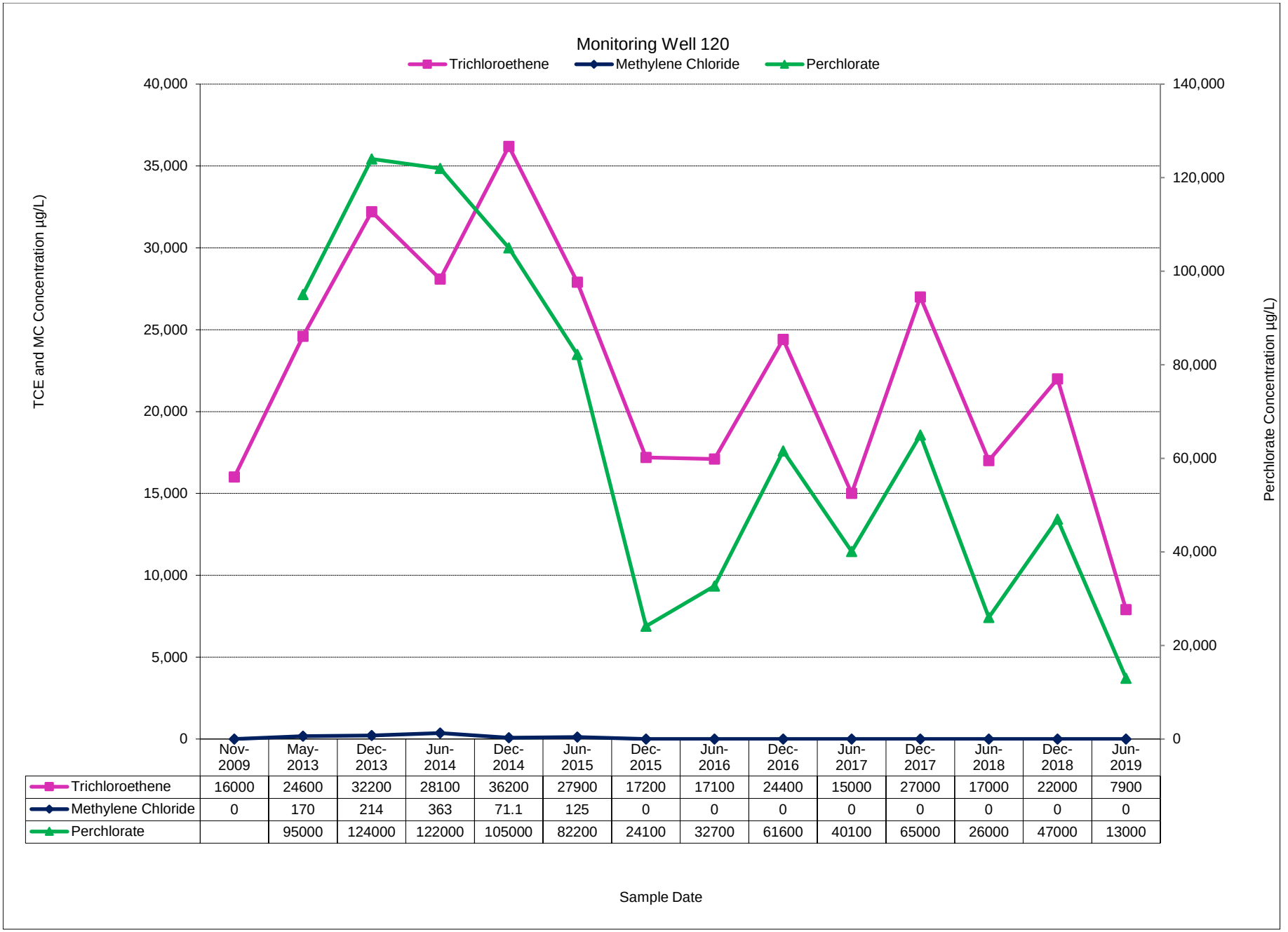
	Sep 2008	Apr 2009	Sep 2009	Mar 2010	Sep 2010	Mar 2011	Sep 2011	Mar 2012	Sep 2012	May-2013	Dec 2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Mar-2017	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Trichloroethene	95100	148000	54500	49400	63800	110000	57800	105000	61500	68400	88400	30100	4240	6760	7450	15500	11800	8720	15300	2600	5000	2300	1400
Methylene Chloride	790000	2E+06	478000	327000	533000	979000	135000	1E+06	1E+06	1E+06	1E+06	484000	167000	130000	189	21300	184000	346000	604000	140000	240000	170000	510000
Perchlorate	5660	14000	4000	3100	5700	11900	13100	8470	6940	4780	7920	2900	16.5	428	0.847	33.3	1290	20404	4830	160	1.3	0	0



	Nov-2009	Sep-2010	Mar-2011	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	12	0	3.04	0	0	0	0.531	0	0	0	0.601	0	0	0	0	0	0	0	0
Trichloroethene	1500	1130	877	779	450	388	0	463	288	719	364	359	488	566	500	550	260	680	230
Perchlorate		6100	4230	3850	2960	2540	1510	1150	824	953	519	671	615	363	214	40	66	84	95

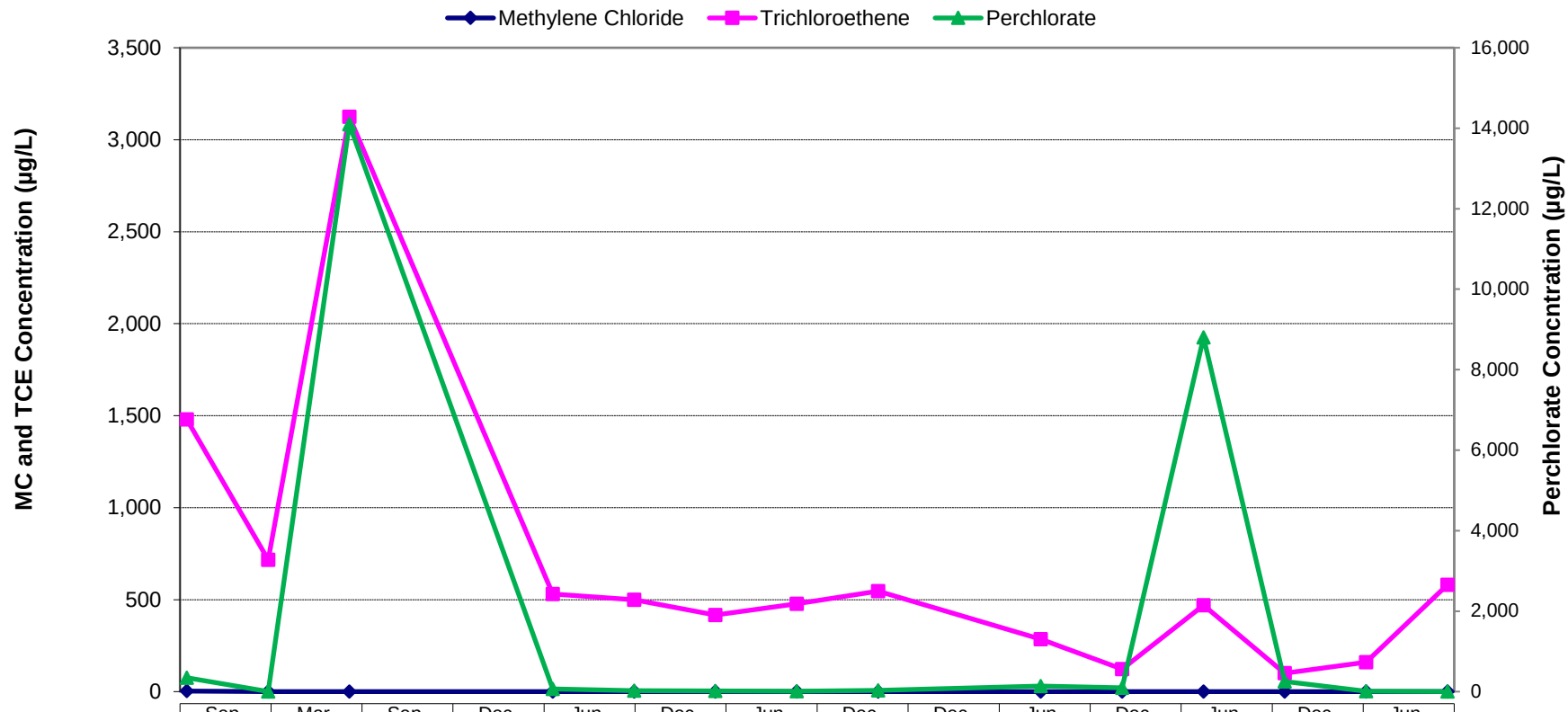


	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	0	1.34	0	0.338		0	0.492	0	0	0	0	0	0	0	0
Trichloroethene	1130	1740	731	547	703		2390	1270	1690	1170	2140	1950	3300	1500	4800	2600
Perchlorate	48300	57500	53650	55600	58000	61400	76600	75300	87600	65200	71500	74500	73000	91000	52000	67000



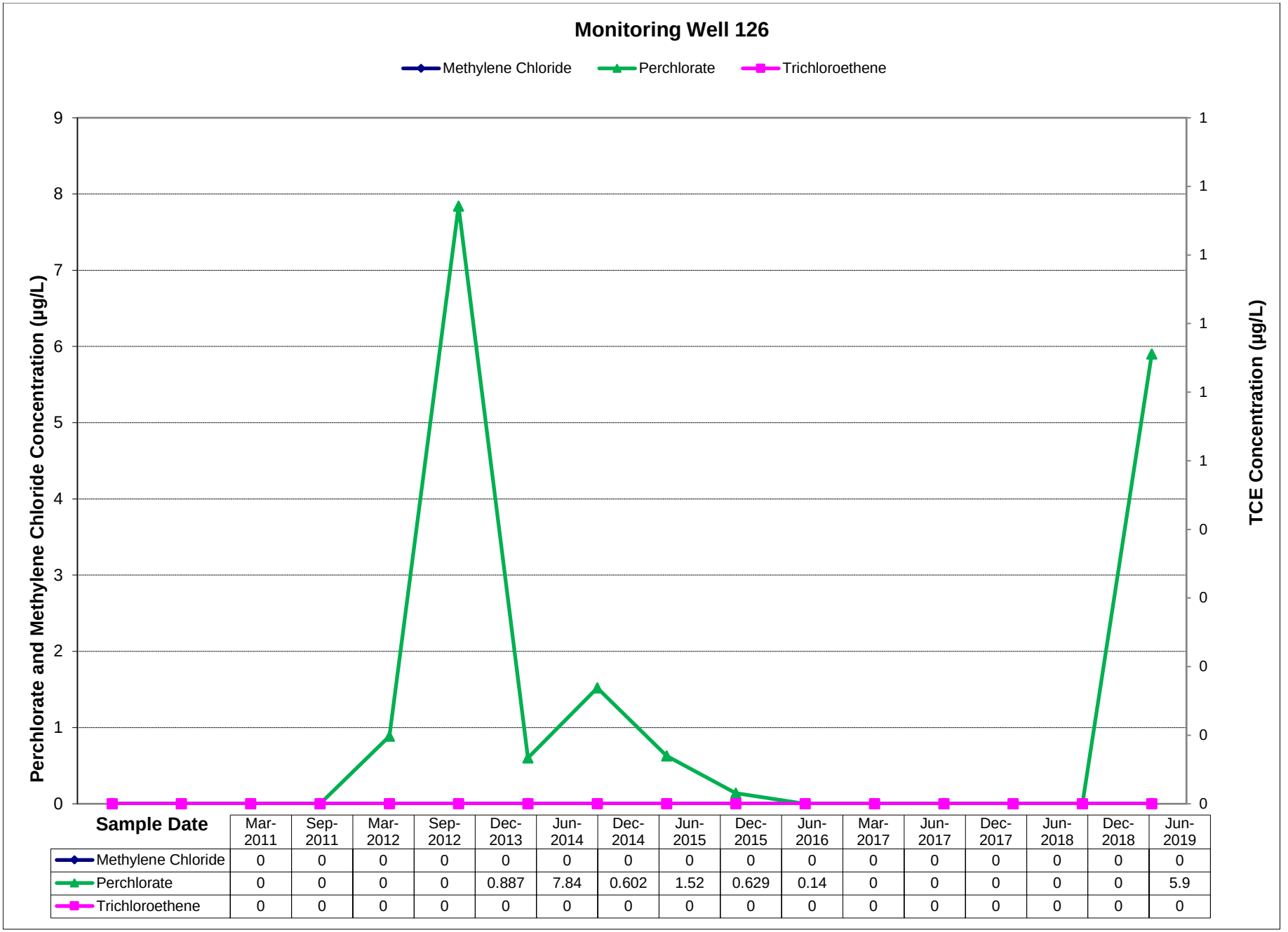
	Nov-2009	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Trichloroethene	16000	24600	32200	28100	36200	27900	17200	17100	24400	15000	27000	17000	22000	7900
Methylene Chloride	0	170	214	363	71.1	125	0	0	0	0	0	0	0	0
Perchlorate		95000	124000	122000	105000	82200	24100	32700	61600	40100	65000	26000	47000	13000

Monitoring Well AWD-3

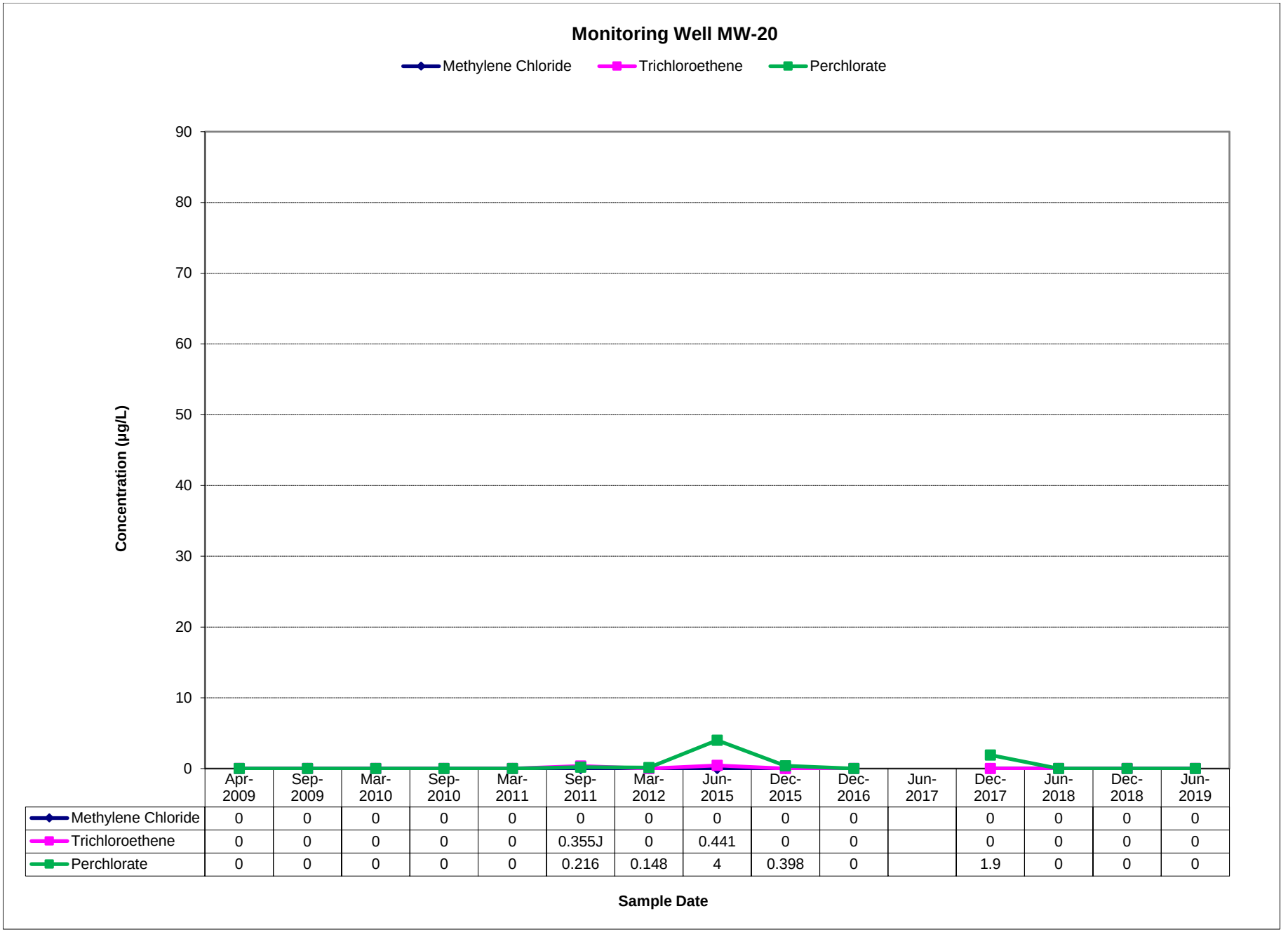


	Sep-2011	Mar-2012	Sep-2012	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	2.92J	0	0	0	0	0	0	0	0	0	0	0	0	0
Trichloroethene	1480	716	3125	530	499	417	477	547	285	122	470	100	160	580
Perchlorate	342	3.88	14100	67.2	25	13.6	8.33	33.8	140	95.4	8800	250	6.9	1.8

Sample Date

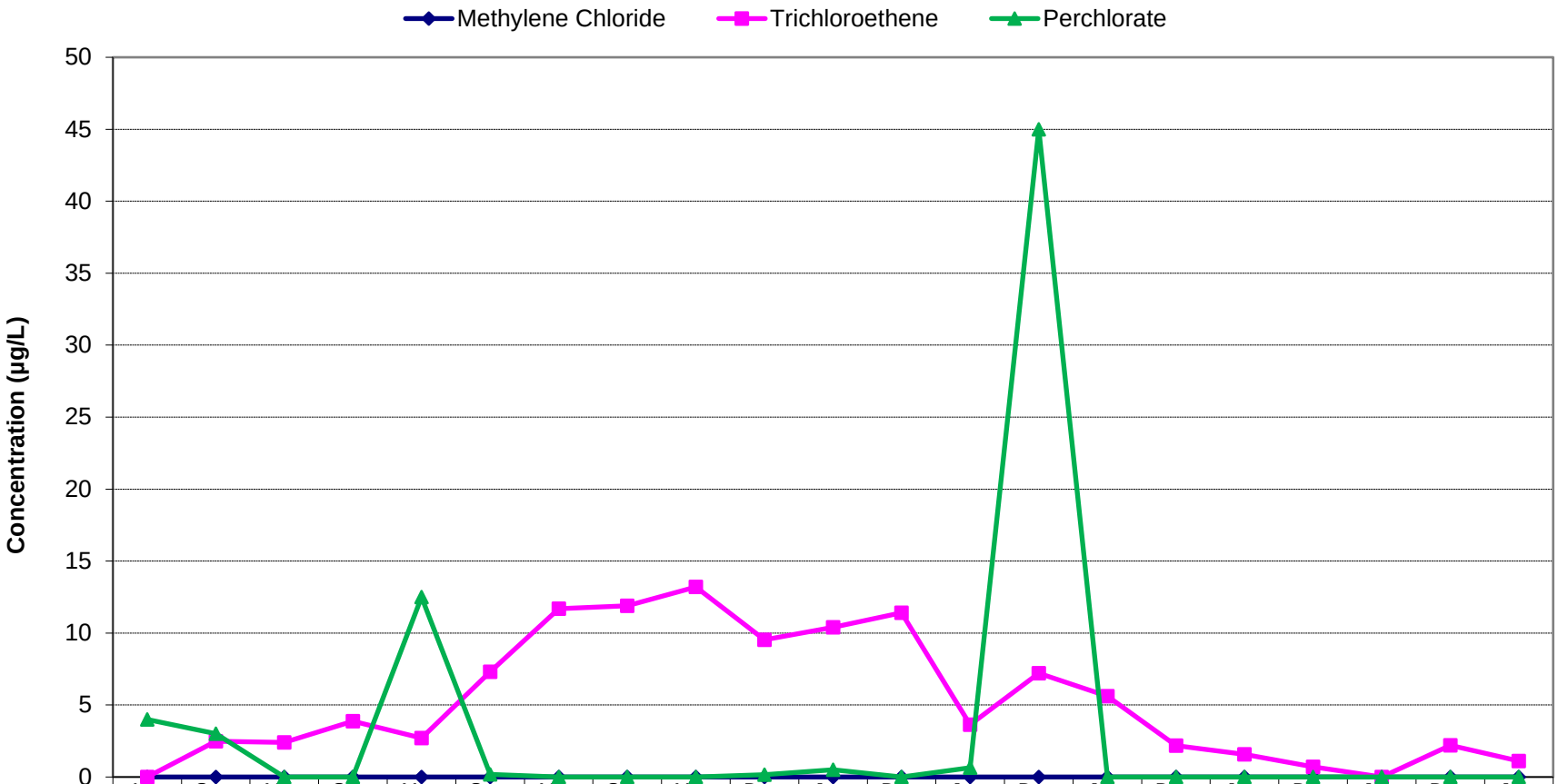


Sample Date	Mar-2011	Sep-2011	Mar-2012	Sep-2012	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Mar-2017	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perchlorate	0	0	0	0	0.887	7.84	0.602	1.52	0.629	0.14	0	0	0	0	0	5.9
Trichloroethene	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0



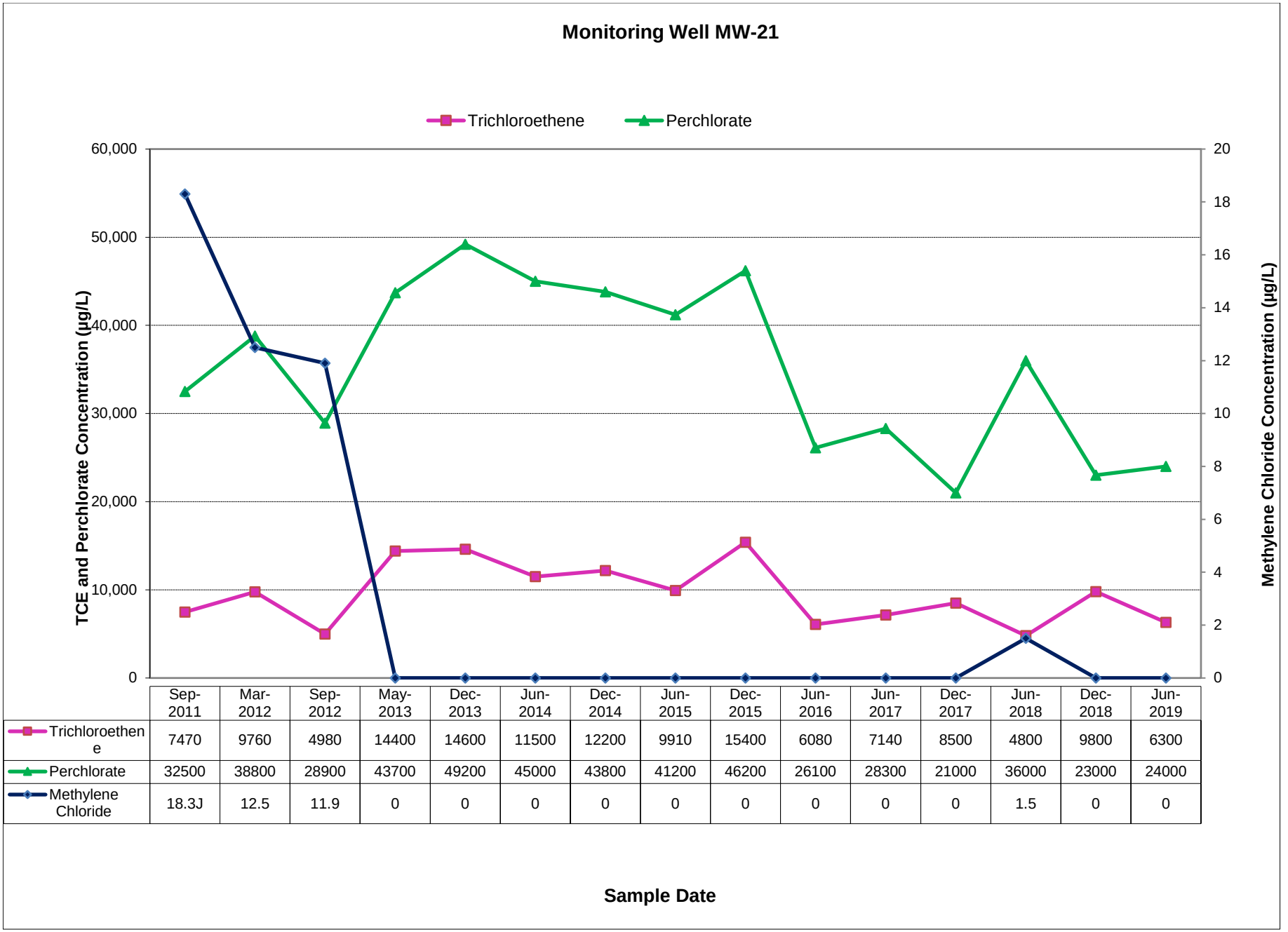
	Apr-2009	Sep-2009	Mar-2010	Sep-2010	Mar-2011	Sep-2011	Mar-2012	Jun-2015	Dec-2015	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	0	0	0	0	0	0	0	0	0		0	0	0	0
Trichloroethene	0	0	0	0	0	0.355J	0	0.441	0	0		0	0	0	0
Perchlorate	0	0	0	0	0	0.216	0.148	4	0.398	0		1.9	0	0	0

Monitoring Well C-08

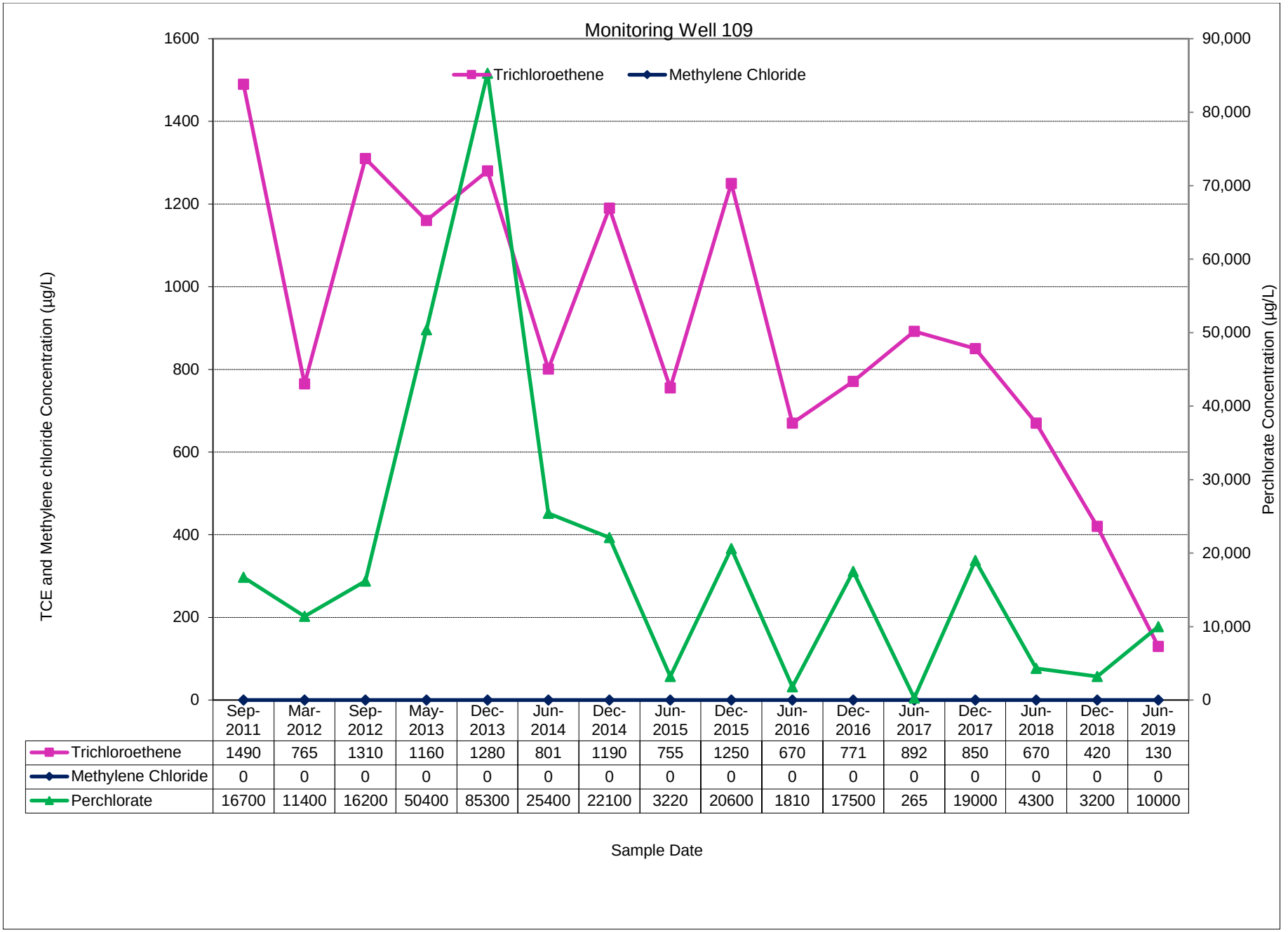


	Apr-2009	Sep-2009	Mar-2010	Sep-2010	Mar-2011	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trichloroethene	0	2.49	2.41	3.87	2.7	7.3	11.7	11.9	13.2	9.54	10.4	11.4	3.64	7.21	5.61	2.18	1.57	0.7	0	2.2	1.1
Perchlorate	4	3	0	0	12.5	0.179J	0	0	0	0.17	0.501	0	0.648	45	0	0	0	0	0	0	0

Sample Date

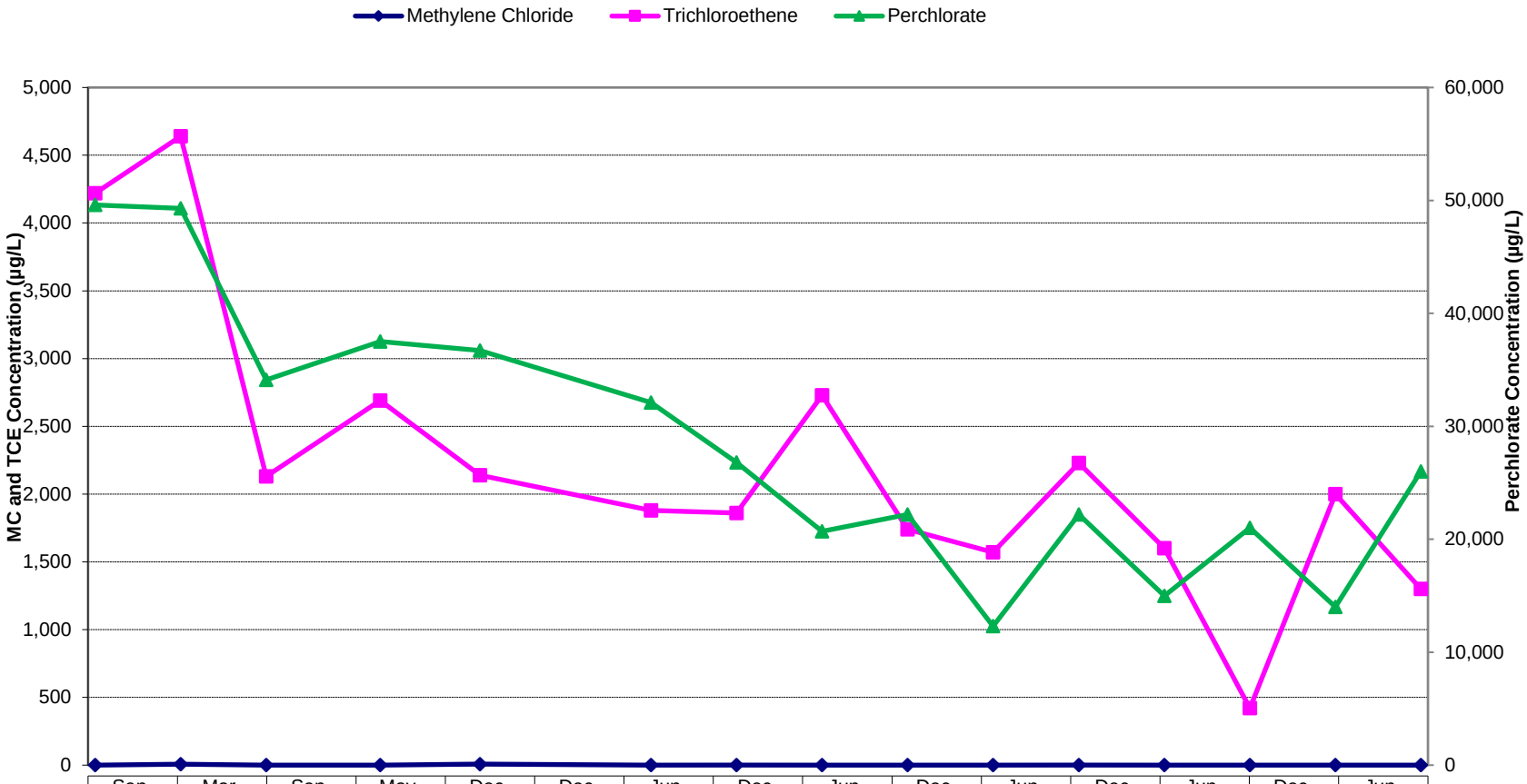


	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Trichloroethene	7470	9760	4980	14400	14600	11500	12200	9910	15400	6080	7140	8500	4800	9800	6300
Perchlorate	32500	38800	28900	43700	49200	45000	43800	41200	46200	26100	28300	21000	36000	23000	24000
Methylene Chloride	18.3J	12.5	11.9	0	0	0	0	0	0	0	0	0	1.5	0	0



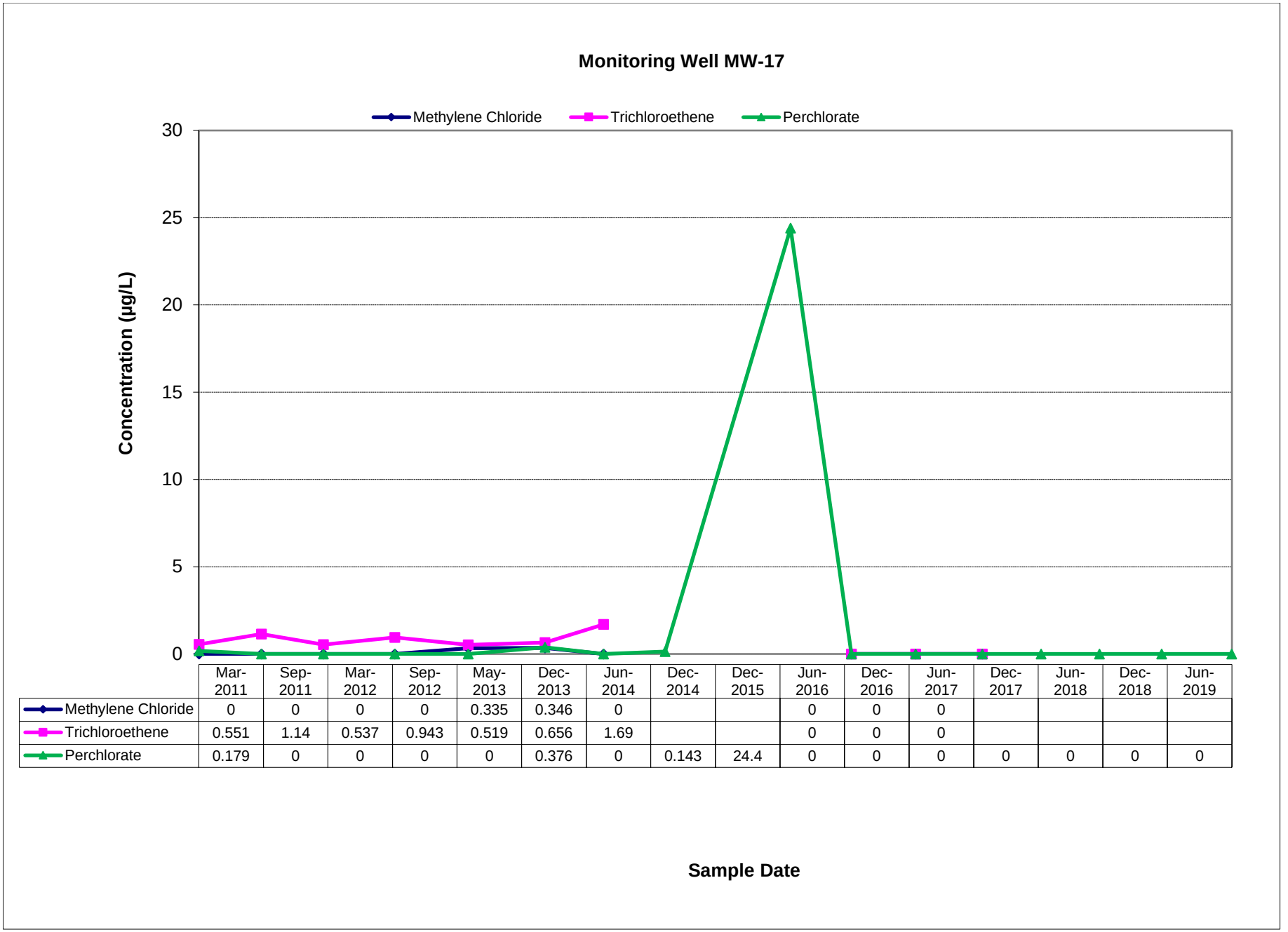
	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Trichloroethene	1490	765	1310	1160	1280	801	1190	755	1250	670	771	892	850	670	420	130
Methylene Chloride	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perchlorate	16700	11400	16200	50400	85300	25400	22100	3220	20600	1810	17500	265	19000	4300	3200	10000

Monitoring Well MW-7

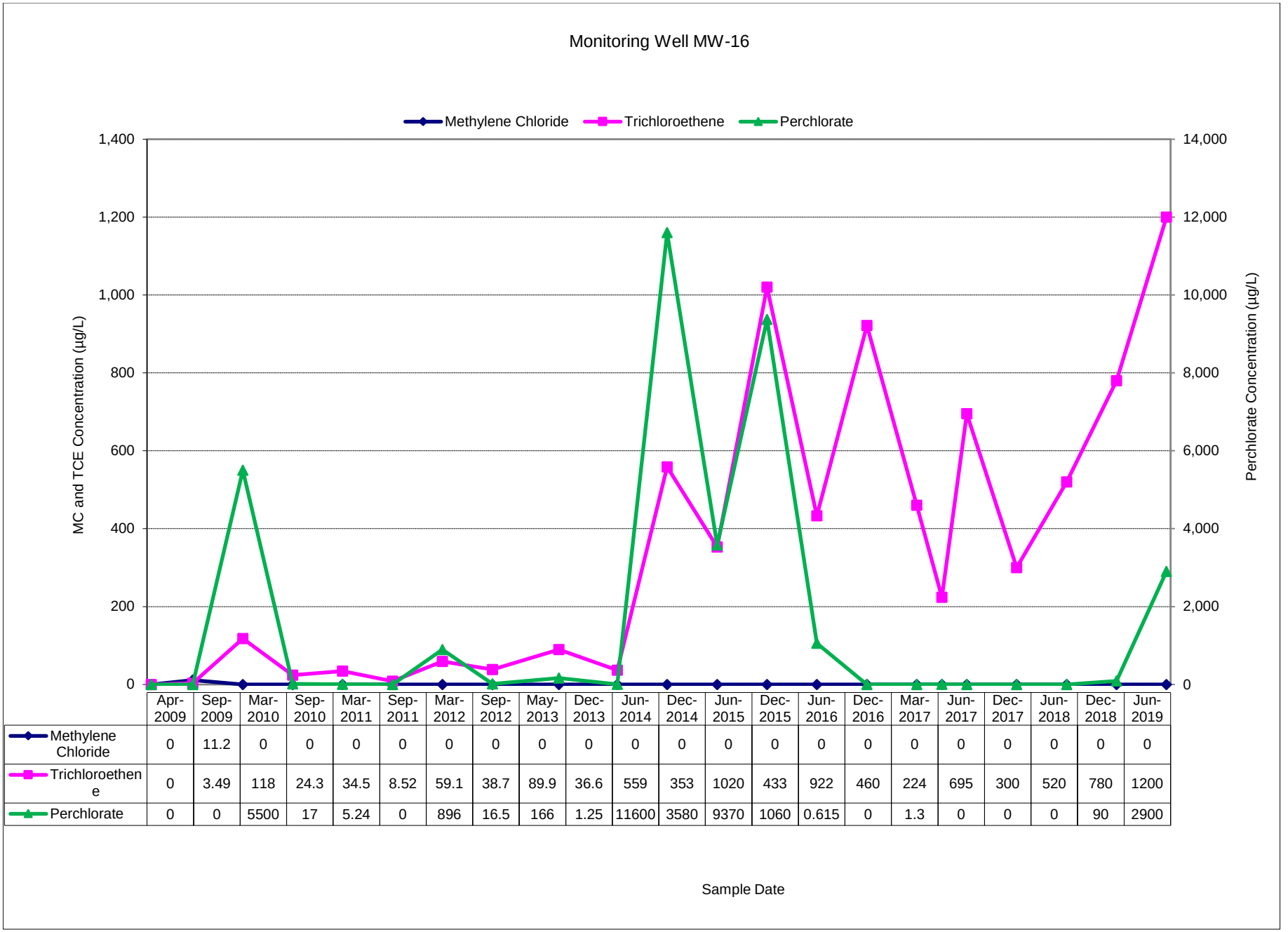


	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	7.75	0	0	7.81	0	0.352	0	0	0	0.314	0	0	0	0
Trichloroethene	4220	4640	2130	2690	2140	1880	1860	2730	1740	1570	2230	1600	420	2000	1300
Perchlorate	49600	49300	34100	37500	36700	32100	26800	20700	22200	12300	22200	15000	21000	14000	26000

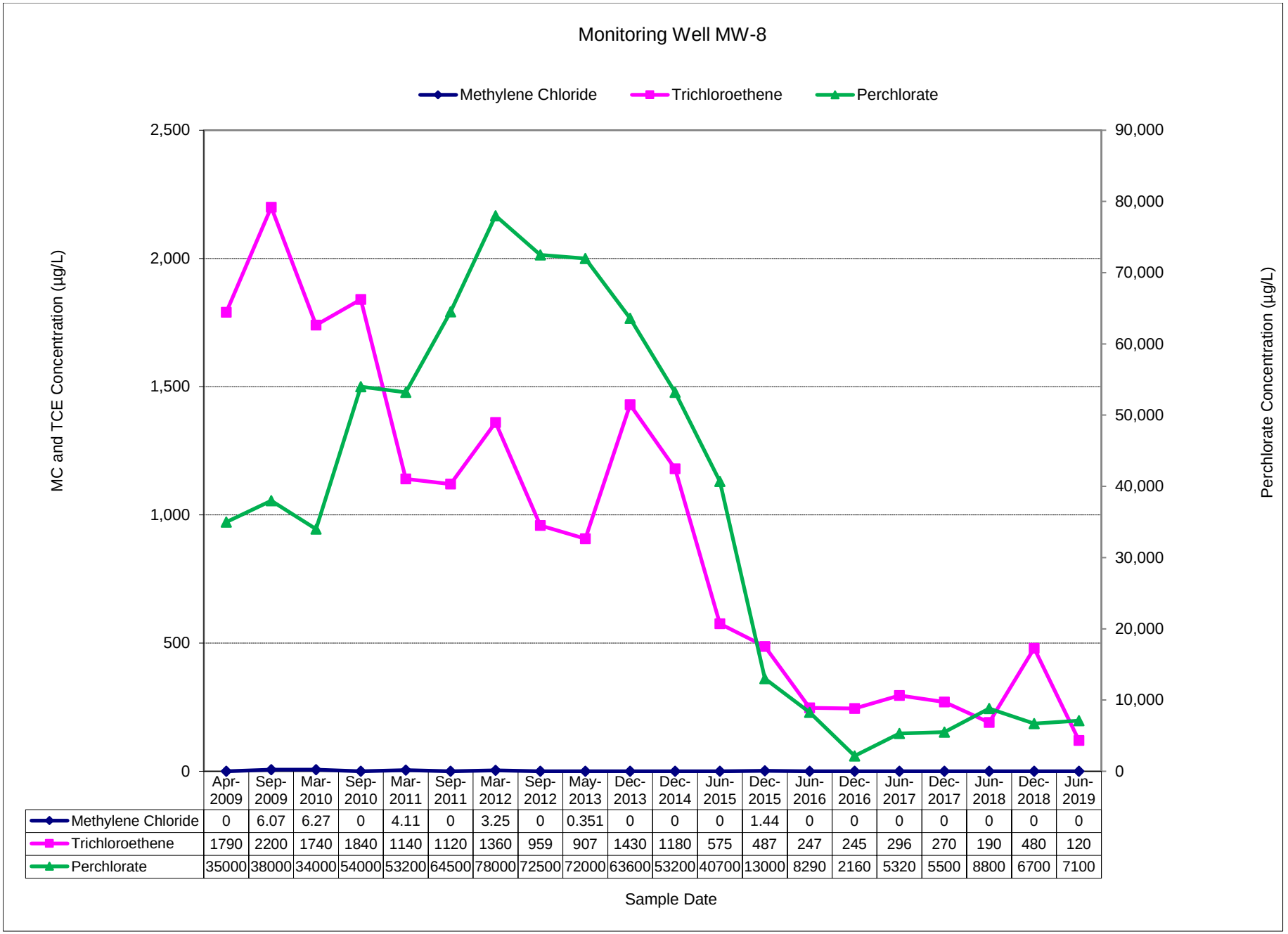
Sample Date



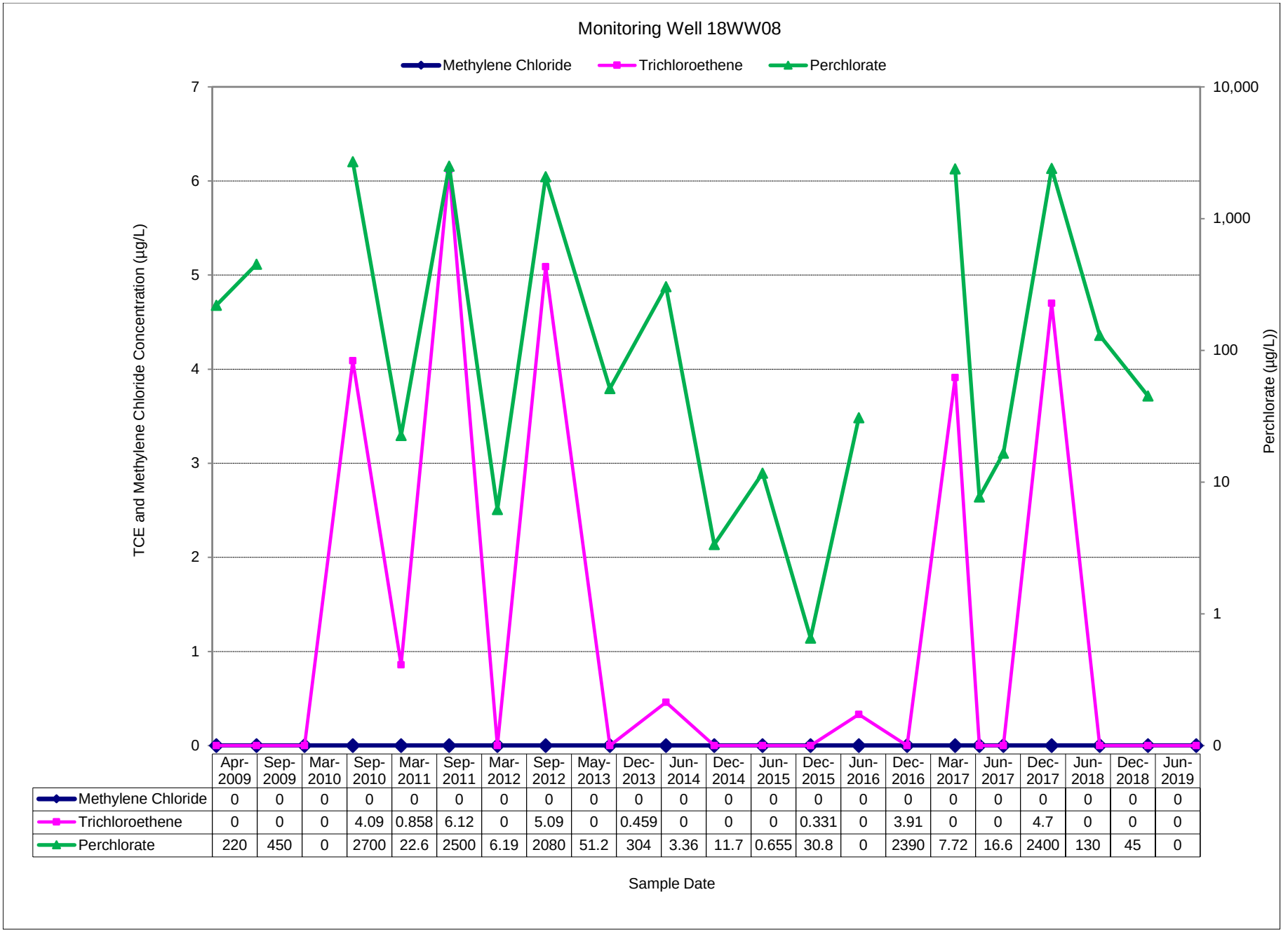
	Mar-2011	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	0	0	0	0.335	0.346	0			0	0	0				
Trichloroethene	0.551	1.14	0.537	0.943	0.519	0.656	1.69			0	0	0				
Perchlorate	0.179	0	0	0	0	0.376	0	0.143	24.4	0	0	0	0	0	0	0



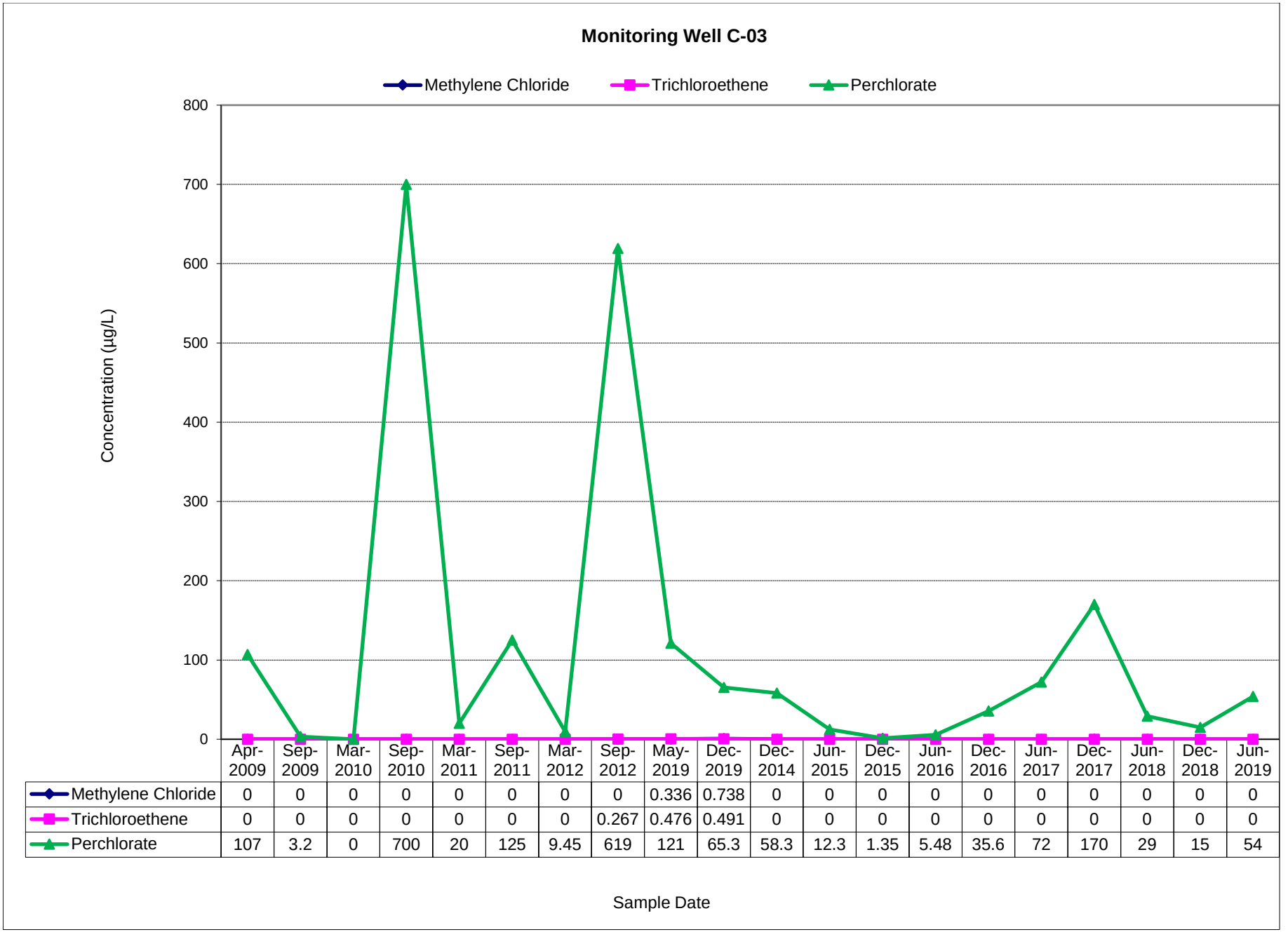
	Apr-2009	Sep-2009	Mar-2010	Sep-2010	Mar-2011	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Mar-2017	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	11.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trichloroethene	0	3.49	118	24.3	34.5	8.52	59.1	38.7	89.9	36.6	559	353	1020	433	922	460	224	695	300	520	780	1200
Perchlorate	0	0	5500	17	5.24	0	896	16.5	166	1.25	11600	3580	9370	1060	0.615	0	1.3	0	0	0	90	2900



	Apr-2009	Sep-2009	Mar-2010	Sep-2010	Mar-2011	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	6.07	6.27	0	4.11	0	3.25	0	0.351	0	0	0	1.44	0	0	0	0	0	0	0
Trichloroethene	1790	2200	1740	1840	1140	1120	1360	959	907	1430	1180	575	487	247	245	296	270	190	480	120
Perchlorate	35000	38000	34000	54000	53200	64500	78000	72500	72000	63600	53200	40700	13000	8290	2160	5320	5500	8800	6700	7100



	Apr-2009	Sep-2009	Mar-2010	Sep-2010	Mar-2011	Sep-2011	Mar-2012	Sep-2012	May-2013	Dec-2013	Jun-2014	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Mar-2017	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Trichloroethene	0	0	0	4.09	0.858	6.12	0	5.09	0	0.459	0	0	0	0.331	0	3.91	0	0	4.7	0	0	0
Perchlorate	220	450	0	2700	22.6	2500	6.19	2080	51.2	304	3.36	11.7	0.655	30.8	0	2390	7.72	16.6	2400	130	45	0



	Apr-2009	Sep-2009	Mar-2010	Sep-2010	Mar-2011	Sep-2011	Mar-2012	Sep-2012	May-2019	Dec-2019	Dec-2014	Jun-2015	Dec-2015	Jun-2016	Dec-2016	Jun-2017	Dec-2017	Jun-2018	Dec-2018	Jun-2019
Methylene Chloride	0	0	0	0	0	0	0	0	0.336	0.738	0	0	0	0	0	0	0	0	0	0
Trichloroethene	0	0	0	0	0	0	0	0.267	0.476	0.491	0	0	0	0	0	0	0	0	0	0
Perchlorate	107	3.2	0	700	20	125	9.45	619	121	65.3	58.3	12.3	1.35	5.48	35.6	72	170	29	15	54

APPENDIX F
GWTP WATER SAMPLING LABORATORY ANALYTICAL RESULTS
(PROVIDED ON CD ONLY)

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July 10, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19060835**

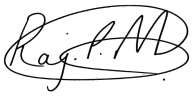
Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 5 sample(s) on Jun 14, 2019 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

10450 Stancliff Rd. Suite 210
Houston, TX 77099
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July 10, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19060929**

Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 8 sample(s) on Jun 18, 2019 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,

Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19060929

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060929-01	MW7_061719	Groundwater		17-Jun-2019 08:20	18-Jun-2019 08:51	☐
HS19060929-02	18CPTMW12DW_061719	Groundwater		17-Jun-2019 09:15	18-Jun-2019 08:51	☐
HS19060929-03	18CPTMW12SW_061719	Groundwater		17-Jun-2019 10:10	18-Jun-2019 08:51	☐
HS19060929-04	18CPTMW12SW_061719_a	Groundwater		17-Jun-2019 10:10	18-Jun-2019 08:51	☐
HS19060929-05	18CPTMW23SW_061719	Groundwater		17-Jun-2019 11:15	18-Jun-2019 08:51	☐
HS19060929-06	18CPTMW23_061719	Groundwater		17-Jun-2019 12:05	18-Jun-2019 08:51	☐
HS19060929-07	18WW14_061719	Groundwater		17-Jun-2019 13:05	18-Jun-2019 08:51	☐
HS19060929-08	Trip Blank	Water		17-Jun-2019 00:00	18-Jun-2019 08:51	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19060929

Work Order Comments

• Revised to correct the reporting limit for Mercury

Work Order Comments

• The analyses for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final Report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142169

Sample ID: MW7_061719 (HS19060929-01)

• The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: 18cptMW23_061719 (HS19060929-06)

• The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: LCSD-142169

• LCS/LCSD RPD recovered above the RPD limit. The individual recoveries met acceptance criteria (Surrogate 4-Terphenyl-d14)

GCMS Volatiles by Method SW8260

Batch ID: R341453

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 142427

Sample ID: HS19060986-04MS

• MS and MSD are for an unrelated sample

Metals by Method SW7470

Batch ID: 142269

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW7_061719
Collection Date: 17-Jun-2019 08:20

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,1,1-Trichloroethane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,1,2,2-Tetrachloroethane	2.5	U	2.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,1,2-Trichloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,1-Dichloroethane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,1-Dichloroethene	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,1-Dichloropropene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2,3-Trichlorobenzene	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2,3-Trichloropropane	2.5	U	2.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2,4-Trichlorobenzene	2.5	U	2.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2,4-Trimethylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2-Dibromo-3-chloropropane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2-Dibromoethane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2-Dichlorobenzene	2.5	U	2.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,2-Dichloroethane	**26**		**1.0**	**2.5**	**5.0**	**UG/L**	5	27-Jun-2019 13:59
1,2-Dichloropropane	2.5	U	2.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,3,5-Trimethylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,3-Dichlorobenzene	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,3-Dichloropropane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
1,4-Dichlorobenzene	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
2,2-Dichloropropane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
2-Butanone	5.0	U	2.5	5.0	10	UG/L	5	27-Jun-2019 13:59
2-Chlorotoluene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
2-Hexanone	5.0	U	5.0	5.0	10	UG/L	5	27-Jun-2019 13:59
4-Chlorotoluene	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
4-Isopropyltoluene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
4-Methyl-2-pentanone	5.0	U	3.5	5.0	10	UG/L	5	27-Jun-2019 13:59
Acetone	5.0	U	2.0	5.0	10	UG/L	5	27-Jun-2019 13:59
Benzene	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Bromobenzene	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Bromochloromethane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Bromodichloromethane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Bromoform	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Bromomethane	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Carbon disulfide	5.0	U	3.0	5.0	10	UG/L	5	27-Jun-2019 13:59
Carbon tetrachloride	2.5	U	2.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Chlorobenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Chloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Chloroform	**3.4**	J	**1.0**	**2.5**	**5.0**	**UG/L**	5	27-Jun-2019 13:59

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW7_061719
Collection Date: 17-Jun-2019 08:20

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
cis-1,2-Dichloroethene	**10**		**1.0**	**2.5**	**5.0**	**UG/L**	5	27-Jun-2019 13:59
cis-1,3-Dichloropropene	2.5	U	0.50	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Dibromochloromethane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Dibromomethane	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Dichlorodifluoromethane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Ethylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Hexachlorobutadiene	5.0	U	5.0	5.0	5.0	UG/L	5	27-Jun-2019 13:59
Isopropylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
m,p-Xylene	5.0	U	2.5	5.0	10	UG/L	5	27-Jun-2019 13:59
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	27-Jun-2019 13:59
n-Butylbenzene	2.5	U	2.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
n-Propylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Naphthalene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
o-Xylene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
sec-Butylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Styrene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
tert-Butylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Tetrachloroethene	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Toluene	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
trans-1,2-Dichloroethene	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
trans-1,3-Dichloropropene	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Trichloroethene	**1,300**		**5.0**	**12**	**25**	**UG/L**	25	27-Jun-2019 15:34
Trichlorofluoromethane	2.5	U	1.5	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Vinyl chloride	2.5	U	1.0	2.5	5.0	UG/L	5	27-Jun-2019 13:59
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*25*	*27-Jun-2019 15:34*
Surr: 1,2-Dichloroethane-d4	*107*			**0**	*81-118*	*%REC*	*5*	*27-Jun-2019 13:59*
Surr: 4-Bromofluorobenzene	*99.1*			**0**	*85-114*	*%REC*	*5*	*27-Jun-2019 13:59*
Surr: 4-Bromofluorobenzene	*98.0*			**0**	*85-114*	*%REC*	*25*	*27-Jun-2019 15:34*
Surr: Dibromofluoromethane	*98.8*			**0**	*80-119*	*%REC*	*5*	*27-Jun-2019 13:59*
Surr: Dibromofluoromethane	*99.4*			**0**	*80-119*	*%REC*	*25*	*27-Jun-2019 15:34*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*5*	*27-Jun-2019 13:59*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*25*	*27-Jun-2019 15:34*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**9.7**		**1.0**	**1.0**	**1.0**	**ug/L**	100	27-Jun-2019 18:24
Surr: 2-Fluorobiphenyl	*0*	*S*		0	*40-140*	*%REC*	*100*	*27-Jun-2019 18:24*
Surr: 4-Terphenyl-d14	*0*	*S*		0	*40-140*	*%REC*	*100*	*27-Jun-2019 18:24*
Surr: Nitrobenzene-d5	*0*	*S*		0	*40-140*	*%REC*	*100*	*27-Jun-2019 18:24*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW7_061719
Collection Date: 17-Jun-2019 08:20

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW12DW_061719
Collection Date: 17-Jun-2019 09:15

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 16:46
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 16:46
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 16:46
Acetone	**3.2**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 16:46
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 16:46
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19060929
Sample ID: 18CPTMW12DW_061719 Lab ID:HS19060929-02
Collection Date: 17-Jun-2019 09:15 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 16:46
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 16:46
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 16:46
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:46
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:46
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 16:46*
Surr: 4-Bromofluorobenzene	*94.5*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 16:46*
Surr: Dibromofluoromethane	*94.5*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 16:46*
Surr: Toluene-d8	*97.6*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 16:46*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.11**		**0.010**	**0.010**	**0.010**	**ug/L**	1	27-Jun-2019 14:16
Surr: 2-Fluorobiphenyl	*73.4*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:16*
Surr: 4-Terphenyl-d14	*102*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:16*
Surr: Nitrobenzene-d5	*117*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:16*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW12DW_061719
Collection Date: 17-Jun-2019 09:15

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0201**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:43
Antimony	**0.000406**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Arsenic	**0.00401**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Barium	**0.133**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:36
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:43
Calcium	**9.65**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:43
Chromium	**0.0136**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Cobalt	**0.000115**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 17:43
Iron	**1.14**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:43
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 17:43
Magnesium	**4.67**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:43
Manganese	**0.0329**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Nickel	**0.000995**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Potassium	**108**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:43
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:43
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:43
Sodium	**184**		**0.0280**	**0.100**	**0.400**	**mg/L**	2	28-Jun-2019 15:38
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:43
Vanadium	**0.00169**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
Zinc	**0.0198**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:43
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 20-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	20-Jun-2019 17:17
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW12SW_061719
Collection Date: 17-Jun-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 17:10
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 17:10
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 17:10
Acetone	**2.9**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 17:10
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 17:10
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW12SW_061719
Collection Date: 17-Jun-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 17:10
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 17:10
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 17:10
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:10
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Trichloroethene	**0.65**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 17:10
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:10
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 17:10*
Surr: 4-Bromofluorobenzene	*93.5*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 17:10*
Surr: Dibromofluoromethane	*95.1*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 17:10*
Surr: Toluene-d8	*97.8*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 17:10*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.073**		**0.010**	**0.010**	**0.010**	**ug/L**	1	27-Jun-2019 14:37
Surr: 2-Fluorobiphenyl	*93.3*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:37*
Surr: 4-Terphenyl-d14	*109*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:37*
Surr: Nitrobenzene-d5	*106*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:37*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW12SW_061719
Collection Date: 17-Jun-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0204**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:45
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:45
Arsenic	**0.000866**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
Barium	**0.803**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:45
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:45
Calcium	**58.5**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:45
Chromium	**0.0159**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
Cobalt	**0.00248**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 17:45
Iron	**0.540**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:45
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 17:45
Magnesium	**38.8**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:45
Manganese	**0.181**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
Nickel	**0.00382**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
Potassium	**75.5**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:45
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:45
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:45
Sodium	**234**		**0.140**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:40
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:45
Vanadium	**0.00102**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
Zinc	**0.0181**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:45
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 20-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	20-Jun-2019 17:23
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW12SW_061719_a
Collection Date: 17-Jun-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 17:34
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 17:34
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 17:34
Acetone	**3.0**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 17:34
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 17:34
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19060929
Sample ID: 18CPTMW12SW_061719_a
Lab ID:HS19060929-04
Collection Date: 17-Jun-2019 10:10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 17:34
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 17:34
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 17:34
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:34
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Trichloroethene	**0.60**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 17:34
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:34
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 17:34*
Surr: 4-Bromofluorobenzene	*95.8*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 17:34*
Surr: Dibromofluoromethane	*95.5*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 17:34*
Surr: Toluene-d8	*99.1*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 17:34*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.18**		**0.010**	**0.010**	**0.010**	**ug/L**	1	27-Jun-2019 14:57
Surr: 2-Fluorobiphenyl	*93.3*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:57*
Surr: 4-Terphenyl-d14	*106*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:57*
Surr: Nitrobenzene-d5	*126*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 14:57*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW12SW_061719_a
Collection Date: 17-Jun-2019 10:10

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0248**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:47
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:47
Arsenic	**0.00106**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
Barium	**0.825**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:41
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:47
Calcium	**58.7**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:47
Chromium	**0.0160**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
Cobalt	**0.00304**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 17:47
Iron	**0.669**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:47
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 17:47
Magnesium	**39.2**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:47
Manganese	**0.232**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
Nickel	**0.00361**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
Potassium	**75.0**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:47
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:47
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:47
Sodium	**229**		**0.0280**	**0.100**	**0.400**	**mg/L**	2	28-Jun-2019 15:43
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:47
Vanadium	**0.00150**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
Zinc	**0.0159**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:47
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 20-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	20-Jun-2019 17:24
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW23SW_061719
Collection Date: 17-Jun-2019 11:15

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 17:58
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 17:58
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 17:58
Acetone	**2.7**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 17:58
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 17:58
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW23SW_061719
Collection Date: 17-Jun-2019 11:15

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 17:58
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 17:58
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 17:58
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 17:58
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 17:58
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 17:58*
Surr: 4-Bromofluorobenzene	*93.8*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 17:58*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 17:58*
Surr: Toluene-d8	*96.3*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 17:58*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	27-Jun-2019 15:18
Surr: 2-Fluorobiphenyl	*107*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 15:18*
Surr: 4-Terphenyl-d14	*88.9*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 15:18*
Surr: Nitrobenzene-d5	*100*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 15:18*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW23_061719
Collection Date: 17-Jun-2019 12:05

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,1-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,2-Dichloroethane	**150**		**2.0**	**5.0**	**10**	**UG/L**	10	27-Jun-2019 14:23
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
2-Butanone	10	U	5.0	10	20	UG/L	10	27-Jun-2019 14:23
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
2-Hexanone	10	U	10	10	20	UG/L	10	27-Jun-2019 14:23
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	27-Jun-2019 14:23
Acetone	10	U	4.0	10	20	UG/L	10	27-Jun-2019 14:23
Benzene	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Bromochloromethane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Carbon disulfide	10	U	6.0	10	20	UG/L	10	27-Jun-2019 14:23
Carbon tetrachloride	5.0	U	5.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Chloroform	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19060929
Sample ID: 18CPTMW23_061719 Lab ID:HS19060929-06
Collection Date: 17-Jun-2019 12:05 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
cis-1,2-Dichloroethene	**150**		**2.0**	**5.0**	**10**	**UG/L**	10	27-Jun-2019 14:23
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Hexachlorobutadiene	10	U	10	10	10	UG/L	10	27-Jun-2019 14:23
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
m,p-Xylene	10	U	5.0	10	20	UG/L	10	27-Jun-2019 14:23
Methylene chloride	10	U	4.0	10	20	UG/L	10	27-Jun-2019 14:23
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	27-Jun-2019 14:23
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Styrene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Tetrachloroethene	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Toluene	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
trans-1,2-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Trichloroethene	**2,900**		**20**	**50**	**100**	**UG/L**	100	27-Jun-2019 15:58
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Vinyl chloride	5.0	U	2.0	5.0	10	UG/L	10	27-Jun-2019 14:23
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*10*	*27-Jun-2019 14:23*
Surr: 1,2-Dichloroethane-d4	*99.8*			**0**	*81-118*	*%REC*	*100*	*27-Jun-2019 15:58*
Surr: 4-Bromofluorobenzene	*96.9*			**0**	*85-114*	*%REC*	*10*	*27-Jun-2019 14:23*
Surr: 4-Bromofluorobenzene	*94.3*			**0**	*85-114*	*%REC*	*100*	*27-Jun-2019 15:58*
Surr: Dibromofluoromethane	*95.4*			**0**	*80-119*	*%REC*	*10*	*27-Jun-2019 14:23*
Surr: Dibromofluoromethane	*93.2*			**0**	*80-119*	*%REC*	*100*	*27-Jun-2019 15:58*
Surr: Toluene-d8	*99.8*			**0**	*89-112*	*%REC*	*10*	*27-Jun-2019 14:23*
Surr: Toluene-d8	*97.8*			**0**	*89-112*	*%REC*	*100*	*27-Jun-2019 15:58*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**8.1**		**0.50**	**0.50**	**0.50**	**ug/L**	50	27-Jun-2019 18:45
Surr: 2-Fluorobiphenyl	*0*	*S*		0	*40-140*	*%REC*	*50*	*27-Jun-2019 18:45*
Surr: 4-Terphenyl-d14	*0*	*S*		0	*40-140*	*%REC*	*50*	*27-Jun-2019 18:45*
Surr: Nitrobenzene-d5	*0*	*S*		0	*40-140*	*%REC*	*50*	*27-Jun-2019 18:45*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW23_061719
Collection Date: 17-Jun-2019 12:05

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW14_061719
Collection Date: 17-Jun-2019 13:05

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.138**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:50
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:50
Arsenic	**0.000663**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Barium	**1.19**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:50
Cadmium	**0.000783**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 17:50
Calcium	**50.8**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:50
Chromium	**0.409**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Cobalt	**0.0132**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Copper	**0.0119**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Iron	**1.90**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:50
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 17:50
Magnesium	**40.4**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:50
Manganese	**0.876**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Nickel	**0.306**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Potassium	**4.38**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:50
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:50
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:50
Sodium	**137**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:50
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:50
Vanadium	**0.00422**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
Zinc	**0.0390**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:50
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 20-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	20-Jun-2019 17:26
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 17-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19060929
Lab ID:HS19060929-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 16:22
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 16:22
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 16:22
Acetone	**17**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 16:22
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 16:22
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19060929
Sample ID: Trip Blank
Lab ID:HS19060929-08
Collection Date: 17-Jun-2019 00:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 16:22
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 16:22
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 16:22
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 16:22
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 16:22
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 16:22*
Surr: 4-Bromofluorobenzene	*96.1*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 16:22*
Surr: Dibromofluoromethane	*98.0*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 16:22*
Surr: Toluene-d8	*99.8*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 16:22*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

Batch ID: 142169 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060929-01	1	1000	1 (mL)	0.001
HS19060929-02	1	1000	1 (mL)	0.001
HS19060929-03	1	1000	1 (mL)	0.001
HS19060929-04	1	1000	1 (mL)	0.001
HS19060929-05	1	1000	1 (mL)	0.001
HS19060929-06	1	1000	1 (mL)	0.001

Batch ID: 142269 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060929-02	1	10 (mL)	10 (mL)	1
HS19060929-03	1	10 (mL)	10 (mL)	1
HS19060929-04	1	10 (mL)	10 (mL)	1
HS19060929-07	1	10 (mL)	10 (mL)	1

Batch ID: 142427 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060929-02	1	10	10 (mL)	1
HS19060929-03	1	10	10 (mL)	1
HS19060929-04	1	10	10 (mL)	1
HS19060929-07	1	10	10 (mL)	1

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142169 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Groundwater	
HS19060929-01	MW7_061719	17 Jun 2019 08:20		19 Jun 2019 09:21	27 Jun 2019 18:24	100
HS19060929-02	18CPTMW12DW_061719	17 Jun 2019 09:15		19 Jun 2019 09:21	27 Jun 2019 14:16	1
HS19060929-03	18CPTMW12SW_061719	17 Jun 2019 10:10		19 Jun 2019 09:21	27 Jun 2019 14:37	1
HS19060929-04	18CPTMW12SW_061719_a	17 Jun 2019 10:10		19 Jun 2019 09:21	27 Jun 2019 14:57	1
HS19060929-05	18CPTMW23SW_061719	17 Jun 2019 11:15		19 Jun 2019 09:21	27 Jun 2019 15:18	1
HS19060929-06	18CPTMW23_061719	17 Jun 2019 12:05		19 Jun 2019 09:21	27 Jun 2019 18:45	50
Batch ID: 142269 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19060929-02	18CPTMW12DW_061719	17 Jun 2019 09:15		20 Jun 2019 12:00	20 Jun 2019 17:17	1
HS19060929-03	18CPTMW12SW_061719	17 Jun 2019 10:10		20 Jun 2019 12:00	20 Jun 2019 17:23	1
HS19060929-04	18CPTMW12SW_061719_a	17 Jun 2019 10:10		20 Jun 2019 12:00	20 Jun 2019 17:24	1
HS19060929-07	18WW14_061719	17 Jun 2019 13:05		20 Jun 2019 12:00	20 Jun 2019 17:26	1
Batch ID: 142427 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19060929-02	18CPTMW12DW_061719	17 Jun 2019 09:15		25 Jun 2019 11:30	28 Jun 2019 15:38	2
HS19060929-02	18CPTMW12DW_061719	17 Jun 2019 09:15		25 Jun 2019 11:30	28 Jun 2019 15:36	1
HS19060929-02	18CPTMW12DW_061719	17 Jun 2019 09:15		25 Jun 2019 11:30	27 Jun 2019 17:43	1
HS19060929-03	18CPTMW12SW_061719	17 Jun 2019 10:10		25 Jun 2019 11:30	28 Jun 2019 15:40	10
HS19060929-03	18CPTMW12SW_061719	17 Jun 2019 10:10		25 Jun 2019 11:30	27 Jun 2019 17:45	1
HS19060929-04	18CPTMW12SW_061719_a	17 Jun 2019 10:10		25 Jun 2019 11:30	28 Jun 2019 15:43	2
HS19060929-04	18CPTMW12SW_061719_a	17 Jun 2019 10:10		25 Jun 2019 11:30	28 Jun 2019 15:41	1
HS19060929-04	18CPTMW12SW_061719_a	17 Jun 2019 10:10		25 Jun 2019 11:30	27 Jun 2019 17:47	1
HS19060929-07	18WW14_061719	17 Jun 2019 13:05		25 Jun 2019 11:30	27 Jun 2019 17:50	1
Batch ID: R341453 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19060929-08	Trip Blank	17 Jun 2019 00:00			27 Jun 2019 16:22	1
Batch ID: R341453 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19060929-01	MW7_061719	17 Jun 2019 08:20			27 Jun 2019 15:34	25
HS19060929-01	MW7_061719	17 Jun 2019 08:20			27 Jun 2019 13:59	5
HS19060929-02	18CPTMW12DW_061719	17 Jun 2019 09:15			27 Jun 2019 16:46	1
HS19060929-03	18CPTMW12SW_061719	17 Jun 2019 10:10			27 Jun 2019 17:10	1
HS19060929-04	18CPTMW12SW_061719_a	17 Jun 2019 10:10			27 Jun 2019 17:34	1
HS19060929-05	18CPTMW23SW_061719	17 Jun 2019 11:15			27 Jun 2019 17:58	1
HS19060929-06	18CPTMW23_061719	17 Jun 2019 12:05			27 Jun 2019 15:58	100
HS19060929-06	18CPTMW23_061719	17 Jun 2019 12:05			27 Jun 2019 14:23	10

Revision: 1

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ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R341759 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19060929-01	MW7_061719	17 Jun 2019 08:20			03 Jul 2019 09:32	1
HS19060929-02	18CPTMW12DW_061719	17 Jun 2019 09:15			03 Jul 2019 09:32	1
HS19060929-03	18CPTMW12SW_061719	17 Jun 2019 10:10			03 Jul 2019 09:32	1
HS19060929-04	18CPTMW12SW_061719_a	17 Jun 2019 10:10			03 Jul 2019 09:32	1
HS19060929-05	18CPTMW23SW_061719	17 Jun 2019 11:15			03 Jul 2019 09:32	1
HS19060929-06	18CPTMW23_061719	17 Jun 2019 12:05			03 Jul 2019 09:32	1
HS19060929-07	18WW14_061719	17 Jun 2019 13:05			03 Jul 2019 09:32	1

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142269 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142269** Units: **mg/L** Analysis Date: **20-Jun-2019 17:14**
Client ID: Run ID: **HG03_340940** SeqNo: **5133203** PrepDate: **20-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142269** Units: **mg/L** Analysis Date: **20-Jun-2019 17:16**
Client ID: Run ID: **HG03_340940** SeqNo: **5133204** PrepDate: **20-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00510	0.000200	0.005	0	102	80 - 120				

MS Sample ID: **HS19060929-02MS** Units: **mg/L** Analysis Date: **20-Jun-2019 17:19**
Client ID: **18CPTMW12DW_061719** Run ID: **HG03_340940** SeqNo: **5133206** PrepDate: **20-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000500	0.000000200	5e-006	0.0000000310	99.4	75 - 125				

MSD Sample ID: **HS19060929-02MSD** Units: **mg/L** Analysis Date: **20-Jun-2019 17:21**
Client ID: **18CPTMW12DW_061719** Run ID: **HG03_340940** SeqNo: **5133207** PrepDate: **20-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000501	0.000000200	5e-006	0.0000000310	99.6	75 - 125	0.000005000	0.2	20	

The following samples were analyzed in this batch: HS19060929-02 HS19060929-03 HS19060929-04 HS19060929-07

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 17:22**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145221** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002457	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.001932	0.00500								J
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.02437	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.001051	0.00500								J
Zinc	0.00200	0.00500								U

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 16:58**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145214** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1091	0.0100	0.1	0	109	84 - 117				
Antimony	0.0559	0.00500	0.05	0	112	85 - 117				
Arsenic	0.05618	0.00500	0.05	0	112	84 - 116				
Barium	0.05364	0.00500	0.05	0	107	86 - 114				
Beryllium	0.05694	0.00200	0.05	0	114	83 - 121				
Cadmium	0.05632	0.00200	0.05	0	113	87 - 115				
Calcium	5.323	0.500	5	0	106	87 - 118				
Chromium	0.05591	0.00500	0.05	0	112	85 - 116				
Cobalt	0.05561	0.00500	0.05	0	111	86 - 115				
Copper	0.05732	0.00500	0.05	0	115	85 - 118				
Iron	5.504	0.200	5	0	110	87 - 118				
Lead	0.05401	0.00500	0.05	0	108	88 - 115				
Magnesium	5.42	0.200	5	0	108	83 - 118				
Manganese	0.05651	0.00500	0.05	0	113	87 - 115				
Nickel	0.05699	0.00500	0.05	0	114	85 - 117				
Potassium	5.366	0.200	5	0	107	87 - 115				
Selenium	0.05781	0.00500	0.05	0	116	80 - 120				
Silver	0.05393	0.00500	0.05	0	108	85 - 116				
Sodium	5.418	0.200	5	0	108	85 - 117				
Thallium	0.05098	0.00200	0.05	0	102	82 - 116				
Vanadium	0.05441	0.00500	0.05	0	109	86 - 115				
Zinc	0.05821	0.00500	0.05	0	116	83 - 119				

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19060986-04MS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:03**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145217** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.116	0.0100	0.1	0.01515	101	84 - 117				
Antimony	0.05308	0.00500	0.05	0.000258	106	85 - 117				
Arsenic	0.05627	0.00500	0.05	0.002036	108	84 - 116				
Barium	0.8428	0.00500	0.05	0.8565	-27.4	86 - 114				SO
Beryllium	0.05294	0.00200	0.05	0.000048	106	83 - 121				
Cadmium	0.05116	0.00200	0.05	0.000205	102	87 - 115				
Calcium	35.9	0.500	5	33.03	57.3	87 - 118				SO
Chromium	0.3735	0.00500	0.05	0.2809	185	85 - 116				SO
Cobalt	0.0563	0.00500	0.05	0.005607	101	86 - 115				
Copper	0.058	0.00500	0.05	0.005199	106	85 - 118				
Iron	7.669	0.200	5	2.556	102	87 - 118				
Lead	0.05089	0.00500	0.05	0.000094	102	88 - 115				
Magnesium	31.26	0.200	5	27.76	69.9	83 - 118				SO
Manganese	0.2154	0.00500	0.05	0.164	103	87 - 115				
Nickel	0.2401	0.00500	0.05	0.2011	78.0	85 - 117				SO
Potassium	7.654	0.200	5	2.639	100	87 - 115				
Selenium	0.05384	0.00500	0.05	0.000343	107	80 - 120				
Silver	0.04654	0.00500	0.05	0.000013	93.1	85 - 116				
Sodium	233.3	0.200	5	245	-233	85 - 117				SEO
Thallium	0.04975	0.00200	0.05	0.000043	99.4	82 - 116				
Vanadium	0.0572	0.00500	0.05	0.003781	107	86 - 115				
Zinc	0.07874	0.00500	0.05	0.03582	85.8	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:05**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145218** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1062	0.0100	0.1	0.01515	91.1	84 - 117	0.116	8.82	20	
Antimony	0.04965	0.00500	0.05	0.000258	98.8	85 - 117	0.05308	6.66	20	
Arsenic	0.05281	0.00500	0.05	0.002036	102	84 - 116	0.05627	6.34	20	
Barium	0.8139	0.00500	0.05	0.8565	-85.2	86 - 114	0.8428	3.49	20	SO
Beryllium	0.05024	0.00200	0.05	0.000048	100	83 - 121	0.05294	5.24	20	
Cadmium	0.04833	0.00200	0.05	0.000205	96.2	87 - 115	0.05116	5.7	20	
Calcium	33.36	0.500	5	33.03	6.56	87 - 118	35.9	7.33	20	SO
Cobalt	0.0531	0.00500	0.05	0.005607	95.0	86 - 115	0.0563	5.85	20	
Copper	0.05342	0.00500	0.05	0.005199	96.4	85 - 118	0.058	8.23	20	
Iron	7.023	0.200	5	2.556	89.3	87 - 118	7.669	8.8	20	
Lead	0.04808	0.00500	0.05	0.000094	96.0	88 - 115	0.05089	5.67	20	
Magnesium	28.94	0.200	5	27.76	23.5	83 - 118	31.26	7.71	20	SO
Manganese	0.1904	0.00500	0.05	0.164	52.8	87 - 115	0.2154	12.4	20	S
Nickel	0.2255	0.00500	0.05	0.2011	48.7	85 - 117	0.2401	6.29	20	SO
Potassium	7.309	0.200	5	2.639	93.4	87 - 115	7.654	4.62	20	
Selenium	0.05051	0.00500	0.05	0.000343	100	80 - 120	0.05384	6.37	20	
Silver	0.04575	0.00500	0.05	0.000013	91.5	85 - 116	0.04654	1.71	20	
Sodium	224.6	0.200	5	245	-407	85 - 117	233.3	3.8	20	SEO
Thallium	0.04905	0.00200	0.05	0.000043	98.0	82 - 116	0.04975	1.42	20	
Vanadium	0.05284	0.00500	0.05	0.003781	98.1	86 - 115	0.0572	7.93	20	
Zinc	0.08005	0.00500	0.05	0.03582	88.5	83 - 119	0.07874	1.66	20	

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:07**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145651** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium	0.343	0.00500	0.05	0.2809	124	85 - 116	0.3735	8.51	20	SO

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:07**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145219** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1008	0.0100	0.1	0.01515	85.7	80 - 120				
Antimony	0.08752	0.00500	0.1	0.000258	87.3	80 - 120				
Arsenic	0.09313	0.00500	0.1	0.002036	91.1	80 - 120				
Beryllium	0.09784	0.00200	0.1	0.000048	97.8	80 - 120				
Cadmium	0.09096	0.00200	0.1	0.000205	90.8	80 - 120				
Cobalt	0.09093	0.00500	0.1	0.005607	85.3	80 - 120				
Copper	0.09101	0.00500	0.1	0.005199	85.8	80 - 120				
Iron	10.93	0.200	10	2.556	83.8	80 - 120				
Lead	0.09017	0.00500	0.1	0.000094	90.1	80 - 120				
Potassium	11.36	0.200	10	2.639	87.2	80 - 120				
Selenium	0.09025	0.00500	0.1	0.000343	89.9	80 - 120				
Silver	0.08464	0.00500	0.1	0.000013	84.6	80 - 120				
Thallium	0.08892	0.00200	0.1	0.000043	88.9	80 - 120				
Vanadium	0.09309	0.00500	0.1	0.003781	89.3	80 - 120				
Zinc	0.1183	0.00500	0.1	0.03582	82.5	80 - 120				

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **28-Jun-2019 15:14**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145655** PrepDate: **25-Jun-2019** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	1.703	0.0500	1	0.7	100	80 - 120				
Calcium	129.7	5.00	100	26.89	103	80 - 120				
Chromium	1.283	0.0500	1	0.2283	105	80 - 120				
Iron	107.4	2.00	100	2.151	105	80 - 120				
Magnesium	125.2	2.00	100	22.92	102	80 - 120				
Manganese	1.175	0.0500	1	0.1367	104	80 - 120				
Nickel	1.217	0.0500	1	0.1678	105	80 - 120				
Potassium	106.9	2.00	100	2.16	105	80 - 120				
Sodium	299.8	2.00	100	202.9	96.9	80 - 120				

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:02**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145216** PrepDate: **25-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.01988	0.0500					0.01515	0	10	J
Antimony	0.00250	0.0250					0.000258	0	10	U
Arsenic	0.002183	0.0250					0.002036	0	10	J
Beryllium	0.00250	0.0100					0.000048	0	10	U
Cadmium	0.00250	0.0100					0.000205	0	10	U
Cobalt	0.004619	0.0250					0.005607	0	10	J
Copper	0.00500	0.0250					0.005199	0	10	U
Lead	0.00500	0.0250					0.000094	0	10	U
Selenium	0.0125	0.0250					0.000343	0	10	U
Silver	0.00250	0.0250					0.000013	0	10	U
Thallium	0.00250	0.0100					0.000043	0	10	U
Vanadium	0.01164	0.0250					0.003781	0	10	J
Zinc	0.038	0.0250					0.03582	6.07	10	

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145654** PrepDate: **25-Jun-2019** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.6998	0.250					0.7	0.0306	10	
Calcium	27.1	25.0					26.89	0.761	10	
Chromium	0.234	0.250					0.2283	0	10	J
Iron	2.19	10.0					2.151	0	10	J
Magnesium	22.74	10.0					22.92	0.776	10	
Manganese	0.1567	0.250					0.1367	0	10	J
Nickel	0.1736	0.250					0.1678	0	10	J
Potassium	2.068	10.0					2.16	0	10	J
Sodium	207.1	10.0					202.9	2.06	10	

The following samples were analyzed in this batch: HS19060929-02 HS19060929-03 HS19060929-04 HS19060929-07

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: 142169 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 11:30**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145167** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.07589*	*0*	*0.08*	*0*	*94.9*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.09153*	*0*	*0.08*	*0*	*114*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.09043*	*0*	*0.08*	*0*	*113*	*40 - 140*				

LCS Sample ID: **LCS-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 11:51**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145168** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07581	0.010	0.08	0	94.8	40 - 140				
Surr: 2-Fluorobiphenyl	*0.0738*	*0*	*0.08*	*0*	*92.2*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.07856*	*0*	*0.08*	*0*	*98.2*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08245*	*0*	*0.08*	*0*	*103*	*40 - 140*				

LCSD Sample ID: **LCSD-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 12:11**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145169** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07894	0.010	0.08	0	98.7	40 - 140	0.07581	4.05	20	
Surr: 2-Fluorobiphenyl	*0.07855*	*0*	*0.08*	*0*	*98.2*	*40 - 140*	*0.0738*	*6.23*	*20*	
Surr: 4-Terphenyl-d14	*0.1075*	*0*	*0.08*	*0*	*134*	*40 - 140*	*0.07856*	*31.1*	*20*	R
Surr: Nitrobenzene-d5	*0.08954*	*0*	*0.08*	*0*	*112*	*40 - 140*	*0.08245*	*8.25*	*20*	

The following samples were analyzed in this batch: HS19060929-01 HS19060929-02 HS19060929-03 HS19060929-04 HS19060929-05 HS19060929-06

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 11:11**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144199** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 11:11**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144199** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*49.36*	*1.0*	*50*	*0*	*98.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.49*	*1.0*	*50*	*0*	*95.0*	*85 - 114*				
Surr: Dibromofluoromethane	*46.28*	*1.0*	*50*	*0*	*92.6*	*80 - 119*				
Surr: Toluene-d8	*49.04*	*1.0*	*50*	*0*	*98.1*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 10:23**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144198** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.77	1.0	20	0	93.8	78 - 124				
1,1,1-Trichloroethane	19.61	1.0	20	0	98.1	74 - 131				
1,1,2,2-Tetrachloroethane	20.69	1.0	20	0	103	71 - 121				
1,1,2-Trichloroethane	20.36	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.43	1.0	20	0	97.1	77 - 125				
1,1-Dichloroethene	19.6	1.0	20	0	98.0	71 - 131				
1,1-Dichloropropene	19.74	1.0	20	0	98.7	78 - 125				
1,2,3-Trichlorobenzene	23.06	1.0	20	0	115	69 - 129				
1,2,3-Trichloropropane	21.25	1.0	20	0	106	73 - 122				
1,2,4-Trichlorobenzene	20.84	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	18.56	1.0	20	0	92.8	76 - 124				
1,2-Dibromo-3-chloropropane	21.57	1.0	20	0	108	62 - 128				
1,2-Dibromoethane	19.54	1.0	20	0	97.7	77 - 121				
1,2-Dichlorobenzene	18.49	1.0	20	0	92.4	80 - 119				
1,2-Dichloroethane	18.7	1.0	20	0	93.5	73 - 128				
1,2-Dichloropropane	19.06	1.0	20	0	95.3	78 - 122				
1,3,5-Trimethylbenzene	18.18	1.0	20	0	90.9	75 - 124				
1,3-Dichlorobenzene	18.01	1.0	20	0	90.1	80 - 119				
1,3-Dichloropropane	19.83	1.0	20	0	99.1	80 - 119				
1,4-Dichlorobenzene	19.42	1.0	20	0	97.1	79 - 118				
2,2-Dichloropropane	20.55	1.0	20	0	103	60 - 139				
2-Butanone	45.99	2.0	40	0	115	56 - 143				
2-Chlorotoluene	19.68	1.0	20	0	98.4	79 - 122				
2-Hexanone	39.89	2.0	40	0	99.7	57 - 139				
4-Chlorotoluene	19.71	1.0	20	0	98.5	78 - 122				
4-Isopropyltoluene	18.53	1.0	20	0	92.6	77 - 127				
4-Methyl-2-pentanone	39.77	2.0	40	0	99.4	67 - 130				
Acetone	49.5	2.0	40	0	124	39 - 160				
Benzene	19.65	1.0	20	0	98.2	79 - 120				
Bromobenzene	17.92	1.0	20	0	89.6	80 - 120				
Bromochloromethane	18.73	1.0	20	0	93.7	78 - 123				
Bromodichloromethane	19.3	1.0	20	0	96.5	79 - 125				
Bromoform	19.68	1.0	20	0	98.4	66 - 130				
Bromomethane	21.59	1.0	20	0	108	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 10:23**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144198** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.73	2.0	40	0	89.3	64 - 133				
Carbon tetrachloride	19.41	1.0	20	0	97.0	72 - 136				
Chlorobenzene	18.46	1.0	20	0	92.3	82 - 118				
Chloroethane	20.98	1.0	20	0	105	60 - 138				
Chloroform	19.78	1.0	20	0	98.9	79 - 124				
Chloromethane	18.51	1.0	20	0	92.5	50 - 139				
cis-1,2-Dichloroethene	19.31	1.0	20	0	96.6	78 - 123				
cis-1,3-Dichloropropene	19.08	1.0	20	0	95.4	75 - 124				
Dibromochloromethane	18.87	1.0	20	0	94.4	74 - 126				
Dibromomethane	19.13	1.0	20	0	95.6	79 - 123				
Dichlorodifluoromethane	19.8	1.0	20	0	99.0	32 - 152				
Ethylbenzene	18.41	1.0	20	0	92.0	79 - 121				
Hexachlorobutadiene	23.02	1.0	20	0	115	66 - 134				
Isopropylbenzene	18.47	1.0	20	0	92.4	72 - 131				
m,p-Xylene	37.16	2.0	40	0	92.9	80 - 121				
Methylene chloride	18.91	2.0	20	0	94.5	74 - 124				
Naphthalene	21.45	1.0	20	0	107	61 - 128				
n-Butylbenzene	18.85	1.0	20	0	94.2	75 - 128				
n-Propylbenzene	19.66	1.0	20	0	98.3	76 - 126				
o-Xylene	18.48	1.0	20	0	92.4	78 - 122				
sec-Butylbenzene	19.8	1.0	20	0	99.0	77 - 126				
Styrene	19.29	1.0	20	0	96.4	78 - 123				
tert-Butylbenzene	19.57	1.0	20	0	97.8	78 - 124				
Tetrachloroethene	18.01	1.0	20	0	90.1	74 - 129				
Toluene	18.39	1.0	20	0	91.9	80 - 121				
trans-1,2-Dichloroethene	19.44	1.0	20	0	97.2	75 - 124				
trans-1,3-Dichloropropene	19.45	1.0	20	0	97.3	73 - 127				
Trichloroethene	18.29	1.0	20	0	91.4	79 - 123				
Trichlorofluoromethane	20.3	1.0	20	0	102	65 - 141				
Vinyl chloride	19.44	1.0	20	0	97.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.25*	*1.0*	*50*	*0*	*106*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.3*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*51.63*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*49.81*	*1.0*	*50*	*0*	*99.6*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19060986-04MS** Units: **UG/L** Analysis Date: **27-Jun-2019 14:47**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144208** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.6	1.0	20	0	88.0	78 - 124				
1,1,1-Trichloroethane	19.37	1.0	20	0	96.9	74 - 131				
1,1,2,2-Tetrachloroethane	19.88	1.0	20	0	99.4	71 - 121				
1,1,2-Trichloroethane	18.84	1.0	20	0	94.2	80 - 119				
1,1-Dichloroethane	20.52	1.0	20	0	103	77 - 125				
1,1-Dichloroethene	20.92	1.0	20	0	105	71 - 131				
1,1-Dichloropropene	19.44	1.0	20	0	97.2	78 - 125				
1,2,3-Trichlorobenzene	21.07	1.0	20	0	105	69 - 129				
1,2,3-Trichloropropane	20.06	1.0	20	0	100	73 - 122				
1,2,4-Trichlorobenzene	20.07	1.0	20	0	100	69 - 130				
1,2,4-Trimethylbenzene	18.7	1.0	20	0	93.5	76 - 124				
1,2-Dibromo-3-chloropropane	20.57	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	17.91	1.0	20	0	89.6	77 - 121				
1,2-Dichlorobenzene	18.15	1.0	20	0	90.7	80 - 119				
1,2-Dichloroethane	17.56	1.0	20	0	87.8	73 - 128				
1,2-Dichloropropane	18.1	1.0	20	0	90.5	78 - 122				
1,3,5-Trimethylbenzene	18.75	1.0	20	0	93.7	75 - 124				
1,3-Dichlorobenzene	18.62	1.0	20	0.619	90.0	80 - 119				
1,3-Dichloropropane	18.78	1.0	20	0	93.9	80 - 119				
1,4-Dichlorobenzene	18.97	1.0	20	0	94.9	79 - 118				
2,2-Dichloropropane	19.07	1.0	20	0	95.3	60 - 139				
2-Butanone	40.06	2.0	40	0	100	56 - 143				
2-Chlorotoluene	19.58	1.0	20	0	97.9	79 - 122				
2-Hexanone	35.98	2.0	40	0	90.0	57 - 139				
4-Chlorotoluene	19.71	1.0	20	0	98.5	78 - 122				
4-Isopropyltoluene	19.52	1.0	20	0	97.6	77 - 127				
4-Methyl-2-pentanone	36.25	2.0	40	0	90.6	67 - 130				
Acetone	42.2	2.0	40	0	105	39 - 160				
Benzene	18.94	1.0	20	0	94.7	79 - 120				
Bromobenzene	17	1.0	20	0	85.0	80 - 120				
Bromochloromethane	16.86	1.0	20	0	84.3	78 - 123				
Bromodichloromethane	18.36	1.0	20	0	91.8	79 - 125				
Bromoform	17.93	1.0	20	0	89.6	66 - 130				
Bromomethane	20.38	1.0	20	0	102	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19060986-04MS** Units: **UG/L** Analysis Date: **27-Jun-2019 14:47**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144208** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.55	2.0	40	0	88.9	64 - 133				
Carbon tetrachloride	19.35	1.0	20	0	96.8	72 - 136				
Chlorobenzene	17.87	1.0	20	0	89.3	82 - 118				
Chloroethane	19.94	1.0	20	0	99.7	60 - 138				
Chloroform	18.71	1.0	20	0	93.6	79 - 124				
Chloromethane	19.86	1.0	20	0	99.3	50 - 139				
cis-1,2-Dichloroethene	24.44	1.0	20	4.696	98.7	78 - 123				
cis-1,3-Dichloropropene	17.14	1.0	20	0	85.7	75 - 124				
Dibromochloromethane	17.35	1.0	20	0	86.8	74 - 126				
Dibromomethane	17.39	1.0	20	0	86.9	79 - 123				
Dichlorodifluoromethane	18.96	1.0	20	0	94.8	32 - 152				
Ethylbenzene	18.23	1.0	20	0	91.2	79 - 121				
Hexachlorobutadiene	22.45	1.0	20	0	112	66 - 134				
Isopropylbenzene	19.04	1.0	20	0	95.2	72 - 131				
m,p-Xylene	37.06	2.0	40	0	92.7	80 - 121				
Methylene chloride	17.62	2.0	20	0	88.1	74 - 124				
Naphthalene	20.33	1.0	20	0	102	61 - 128				
n-Butylbenzene	19.95	1.0	20	0	99.7	75 - 128				
n-Propylbenzene	20.39	1.0	20	0	102	76 - 126				
o-Xylene	17.97	1.0	20	0	89.9	78 - 122				
sec-Butylbenzene	20.69	1.0	20	0	103	77 - 126				
Styrene	18.28	1.0	20	0	91.4	78 - 123				
tert-Butylbenzene	20.4	1.0	20	0	102	78 - 124				
Tetrachloroethene	18.26	1.0	20	0	91.3	74 - 129				
Toluene	18.16	1.0	20	0	90.8	80 - 121				
trans-1,2-Dichloroethene	19.19	1.0	20	0	96.0	75 - 124				
trans-1,3-Dichloropropene	17.78	1.0	20	0	88.9	73 - 127				
Trichloroethene	32.63	1.0	20	13.8	94.2	79 - 123				
Trichlorofluoromethane	20.12	1.0	20	0	101	65 - 141				
Vinyl chloride	20.24	1.0	20	0	101	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.63*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.94*	*1.0*	*50*	*0*	*99.9*	*85 - 114*				
Surr: Dibromofluoromethane	*49.14*	*1.0*	*50*	*0*	*98.3*	*80 - 119*				
Surr: Toluene-d8	*48.68*	*1.0*	*50*	*0*	*97.4*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19060986-04MSD** Units: **UG/L** Analysis Date: **27-Jun-2019 15:10**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144209** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.76	1.0	20	0	88.8	78 - 124	17.6	0.896	20	
1,1,1-Trichloroethane	19.21	1.0	20	0	96.0	74 - 131	19.37	0.855	20	
1,1,2,2-Tetrachloroethane	20.67	1.0	20	0	103	71 - 121	19.88	3.87	20	
1,1,2-Trichloroethane	19.42	1.0	20	0	97.1	80 - 119	18.84	3.01	20	
1,1-Dichloroethane	20.68	1.0	20	0	103	77 - 125	20.52	0.772	20	
1,1-Dichloroethene	20.95	1.0	20	0	105	71 - 131	20.92	0.151	20	
1,1-Dichloropropene	19.47	1.0	20	0	97.4	78 - 125	19.44	0.197	20	
1,2,3-Trichlorobenzene	22.82	1.0	20	0	114	69 - 129	21.07	7.97	20	
1,2,3-Trichloropropane	20.8	1.0	20	0	104	73 - 122	20.06	3.63	20	
1,2,4-Trichlorobenzene	21.1	1.0	20	0	105	69 - 130	20.07	4.98	20	
1,2,4-Trimethylbenzene	19.03	1.0	20	0	95.2	76 - 124	18.7	1.75	20	
1,2-Dibromo-3-chloropropane	21.34	1.0	20	0	107	62 - 128	20.57	3.7	20	
1,2-Dibromoethane	18.27	1.0	20	0	91.4	77 - 121	17.91	1.99	20	
1,2-Dichlorobenzene	18.58	1.0	20	0	92.9	80 - 119	18.15	2.37	20	
1,2-Dichloroethane	17.68	1.0	20	0	88.4	73 - 128	17.56	0.689	20	
1,2-Dichloropropane	18.34	1.0	20	0	91.7	78 - 122	18.1	1.29	20	
1,3,5-Trimethylbenzene	18.93	1.0	20	0	94.7	75 - 124	18.75	0.991	20	
1,3-Dichlorobenzene	18.6	1.0	20	0.619	89.9	80 - 119	18.62	0.134	20	
1,3-Dichloropropane	18.98	1.0	20	0	94.9	80 - 119	18.78	1.08	20	
1,4-Dichlorobenzene	19.29	1.0	20	0	96.5	79 - 118	18.97	1.68	20	
2,2-Dichloropropane	18.72	1.0	20	0	93.6	60 - 139	19.07	1.86	20	
2-Butanone	41.72	2.0	40	0	104	56 - 143	40.06	4.07	20	
2-Chlorotoluene	19.83	1.0	20	0	99.2	79 - 122	19.58	1.26	20	
2-Hexanone	37.6	2.0	40	0	94.0	57 - 139	35.98	4.41	20	
4-Chlorotoluene	19.88	1.0	20	0	99.4	78 - 122	19.71	0.902	20	
4-Isopropyltoluene	19.73	1.0	20	0	98.7	77 - 127	19.52	1.07	20	
4-Methyl-2-pentanone	37.65	2.0	40	0	94.1	67 - 130	36.25	3.77	20	
Acetone	43.42	2.0	40	0	109	39 - 160	42.2	2.86	20	
Benzene	18.88	1.0	20	0	94.4	79 - 120	18.94	0.299	20	
Bromobenzene	17.22	1.0	20	0	86.1	80 - 120	17	1.29	20	
Bromochloromethane	17.4	1.0	20	0	87.0	78 - 123	16.86	3.17	20	
Bromodichloromethane	18.44	1.0	20	0	92.2	79 - 125	18.36	0.421	20	
Bromoform	18.53	1.0	20	0	92.6	66 - 130	17.93	3.28	20	
Bromomethane	19.72	1.0	20	0	98.6	53 - 141	20.38	3.28	20	

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19060986-04MSD** Units: **UG/L** Analysis Date: **27-Jun-2019 15:10**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144209** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.97	2.0	40	0	87.4	64 - 133	35.55	1.65	20	
Carbon tetrachloride	19.12	1.0	20	0	95.6	72 - 136	19.35	1.2	20	
Chlorobenzene	17.91	1.0	20	0	89.5	82 - 118	17.87	0.216	20	
Chloroethane	21.79	1.0	20	0	109	60 - 138	19.94	8.88	20	
Chloroform	18.72	1.0	20	0	93.6	79 - 124	18.71	0.043	20	
Chloromethane	18.15	1.0	20	0	90.8	50 - 139	19.86	8.97	20	
cis-1,2-Dichloroethene	24.78	1.0	20	4.696	100	78 - 123	24.44	1.39	20	
cis-1,3-Dichloropropene	17.28	1.0	20	0	86.4	75 - 124	17.14	0.79	20	
Dibromochloromethane	17.72	1.0	20	0	88.6	74 - 126	17.35	2.1	20	
Dibromomethane	18.15	1.0	20	0	90.8	79 - 123	17.39	4.3	20	
Dichlorodifluoromethane	18.36	1.0	20	0	91.8	32 - 152	18.96	3.24	20	
Ethylbenzene	18.31	1.0	20	0	91.6	79 - 121	18.23	0.456	20	
Hexachlorobutadiene	23.53	1.0	20	0	118	66 - 134	22.45	4.71	20	
Isopropylbenzene	18.92	1.0	20	0	94.6	72 - 131	19.04	0.611	20	
m,p-Xylene	37.08	2.0	40	0	92.7	80 - 121	37.06	0.0437	20	
Methylene chloride	17.83	2.0	20	0	89.2	74 - 124	17.62	1.2	20	
Naphthalene	21.72	1.0	20	0	109	61 - 128	20.33	6.62	20	
n-Butylbenzene	20.3	1.0	20	0	102	75 - 128	19.95	1.76	20	
n-Propylbenzene	20.51	1.0	20	0	103	76 - 126	20.39	0.609	20	
o-Xylene	17.89	1.0	20	0	89.5	78 - 122	17.97	0.445	20	
sec-Butylbenzene	21.03	1.0	20	0	105	77 - 126	20.69	1.6	20	
Styrene	18.48	1.0	20	0	92.4	78 - 123	18.28	1.12	20	
tert-Butylbenzene	20.44	1.0	20	0	102	78 - 124	20.4	0.178	20	
Tetrachloroethene	18.1	1.0	20	0	90.5	74 - 129	18.26	0.894	20	
Toluene	18.1	1.0	20	0	90.5	80 - 121	18.16	0.31	20	
trans-1,2-Dichloroethene	18.55	1.0	20	0	92.8	75 - 124	19.19	3.4	20	
trans-1,3-Dichloropropene	17.86	1.0	20	0	89.3	73 - 127	17.78	0.461	20	
Trichloroethene	32.01	1.0	20	13.8	91.0	79 - 123	32.63	1.94	20	
Trichlorofluoromethane	20.09	1.0	20	0	100	65 - 141	20.12	0.15	20	
Vinyl chloride	19.45	1.0	20	0	97.3	58 - 137	20.24	3.94	20	
Surr: 1,2-Dichloroethane-d4	*51.82*	*1.0*	*50*	*0*	*104*	*81 - 118*	*50.63*	*2.31*	*20*	
Surr: 4-Bromofluorobenzene	*49.79*	*1.0*	*50*	*0*	*99.6*	*85 - 114*	*49.94*	*0.285*	*20*	
Surr: Dibromofluoromethane	*49.79*	*1.0*	*50*	*0*	*99.6*	*80 - 119*	*49.14*	*1.3*	*20*	
Surr: Toluene-d8	*48.19*	*1.0*	*50*	*0*	*96.4*	*89 - 112*	*48.68*	*0.999*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060929

QC BATCH REPORT

Batch ID: R341453 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS19060929-01	HS19060929-02	HS19060929-03	HS19060929-04
HS19060929-05	HS19060929-06	HS19060929-08	

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19060929**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

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ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19060929

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19060929-01	MW7_061719	Login	18/06/2019 11:36:37	RPG	Sub
HS19060929-01	MW7_061719	Login	18/06/2019 11:36:37	RPG	EXT177
HS19060929-01	MW7_061719	Login	18/06/2019 11:36:37	RPG	VOA192
HS19060929-02	18CPTMW12DW_061719	Login	18/06/2019 11:36:37	RPG	MET023
HS19060929-02	18CPTMW12DW_061719	Login	18/06/2019 11:36:37	RPG	Sub
HS19060929-02	18CPTMW12DW_061719	Login	18/06/2019 11:36:37	RPG	EXT177
HS19060929-02	18CPTMW12DW_061719	Login	18/06/2019 11:36:37	RPG	VOA192

Revision:1

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ALS Houston, US Date: 10-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060929
Date/Time Received: **18-Jun-2019 08:51**
Received by: **RPG**

Checklist completed by: *Raegen Giga* eSignature 18-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature 18-Jun-2019 Date

Matrices: **GW**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.2c uc/c	IR 25
Cooler(s)/Kit(s):	44978	
Date/Time sample(s) sent to storage:	06/18/2019 12:10	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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bhate
ENVIRONMENTAL ASSOCIATES, INC.
1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
MW7_061719		17 JUN 2019	0820	-	N		WG	5	X	X		X				
18CPTMW12DW_061719		17 JUN 2019	0915	-	N		WG	6	X	X	X	X				
18CPTMW12SW_061719		17 JUN 2019	1010	-	N		WG	6	X	X	X	X				
18CPTMW12SW_061719_DUP		17 JUN 2019	1010		FD		WG	6	X	X	X	X				
18CPTMW23SW_061719		17 JUN 2019	1115		N		WG	5	X	X		X				
18CPTMW23_061719		17 JUN 2019	1205	-	N		WG	5	X	X		X				
18WW14_061719		17 JUN 2019	1305	-	N		WG	2		X	X					
TRIPBLANK		17 JUN 2019		-	TB		W	2	X							
				-												
				-												
				-												

Sample Analysis Requested (5) | Quality Assurance Samples (6)

HS19060929
Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS:

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	6/17/19	1430	1. R Cuse	6/18/19	0851
2.			2. Cooler # 449178		
3.			3. TEMP: 1.2c 1225 CFO		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: FedEx Shipped No.:

Method of Shipment: ____

Fed Ex Airbill Number: 4809 7834 3207

Analytical Lab: ALS 10450 Stanciff Rd, Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time: 6/18/19 0851

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

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ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44978

CUSTODY SEAL

Date: 6/17/19 Time: 1430
Name: Scott Beesinger
Company: BHATE

Seal Broken By: SM
Date: 06/18/19

44978

Must Deliver Next Business Day
Time and Tempature Sensitive!

44978

ORIGIN ID:SGRA (903) 930-8193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 24MAY19
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5868
REF: LHAAP/18/24 & SURFACE WATER - RJ
RMA:

FedEx Express

FedEx
4809 7834 3207

TUE - 18 JUN 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA

FIC LG2705 17JUN19 GGGA 5631/M21B/3E8A

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1917488, 1917489, 1917672

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2264 (242398)

General Set Information: There were thirteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 660892) was less than 1/2 the CRDL. The recovery for the LCS (660893) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on sample 1917488001 (Client ID: LH18/24-SP650_061219_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5.µg/L. The MS/MSD percent recoveries were within the performance limits. The MS/MSD failed QC acceptance criteria for relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 660890) is reported from the analysis of the Laboratory Control Sample (LCS – 660893) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 27JUND03/12/20.

Thomas Bosch July 1, 2019
Analyst Date

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ANALYTICAL REPORT

Report Date: July 01, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1917672**
Project ID: HS19060929
Purchase Order: HS19060929
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
MW7_061719	1917672001	06/17/19	06/19/19	
18CPTMW12DW_061719	1917672002	06/17/19	06/19/19	
18CPTMW12SW_061719	1917672003	06/17/19	06/19/19	
18CPTMW12SW_061719_a	1917672004	06/17/19	06/19/19	
18CPTMW23SW_061719	1917672005	06/17/19	06/19/19	
18CPTMW23_061719	1917672006	06/17/19	06/19/19	
18W14_061719W_061719	1917672007	06/17/19	06/19/19	

ANALYTICAL REPORT

Workorder: 34-1917672
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **MW7_061719** | Sampling Site: NA | Collected: 06/17/2019
Lab ID: 1917672001 | Media: 125 mL Nalgene | Received: 06/19/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 11:33 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**26000**	1000	2000	4000	1000	

Sample ID: **18CPTMW12DW_061719** | Sampling Site: NA | Collected: 06/17/2019
Lab ID: 1917672002 | Media: 125 mL Nalgene | Received: 06/19/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 11:47 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1.2	1.0	2.0	4.0	1	J

Sample ID: **18CPTMW12SW_061719** | Sampling Site: NA | Collected: 06/17/2019
Lab ID: 1917672003 | Media: 125 mL Nalgene | Received: 06/19/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 12:15 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18CPTMW12SW_061719_a** | Sampling Site: NA | Collected: 06/17/2019
Lab ID: 1917672004 | Media: 125 mL Nalgene | Received: 06/19/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 12:29 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

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ANALYTICAL REPORT

Workorder: 34-1917672
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW23SW_061719** | Sampling Site: NA | Collected: 06/17/2019
Lab ID: 1917672005 | Media: 125 mL Nalgene | Received: 06/19/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 12:43 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18CPTMW23_061719** | Sampling Site: NA | Collected: 06/17/2019
Lab ID: 1917672006 | Media: 125 mL Nalgene | Received: 06/19/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 12:57 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**2500**	100	200	400	100	

Sample ID: **18W14_061719W_061719** | Sampling Site: NA | Collected: 06/17/2019
Lab ID: 1917672007 | Media: 125 mL Nalgene | Received: 06/19/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 13:11 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 242398)**

Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/01/2019 10:47	/S/ Stephen Brose 07/01/2019 13:43

ANALYTICAL REPORT

Workorder: 34-1917672
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

ANALYTICAL REPORT

Workorder: 34-1917672
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1917672

Limits:	Client SOW/Contract Specified	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	ELMS/2264 (HBN: 242398)
Preparation:	NA	**Analyzed By:**	Thomas Bosch
Batch:	NA		
Prepared By:	NA		

Blank

LMB: 660892
Analyzed: 06/27/2019 09:28
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 660893
Analyzed: 06/27/2019 09:00
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.27	4.00	107	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1917488001	**MS:**	660894
Analyzed:	06/27/2019 09:42	**Analyzed:**	06/27/2019 09:56
Dilution:	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L

MSD:	660895
Analyzed:	06/27/2019 10:10
Dilution:	1
Units:	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec		RPD	QC Limits	
Perchlorate	ND	5.13	5	103	78.8	123.8	4.06	81.2	#	23.3	0.0	20.0

Comments

Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/01/2019 10:55	07/01/2019 13:43

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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10450 Stancliff Rd, Ste 210
Houston, TX 77099
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www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11616**

1917672

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123 **Phone:** +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19060929
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060929-01**	**MW7_061719**	**Groundwater**	**17 Jun 2019 08:20**
	SUB_Perch-6850			02 Jul 2019
2.	**HS19060929-02**	**18cptMW12DW_061719**	**Groundwater**	**17 Jun 2019 09:15**
	SUB_Perch-6850			02 Jul 2019
3.	**HS19060929-03**	**18cptMW12SW_061719**	**Groundwater**	**17 Jun 2019 10:10**
	SUB_Perch-6850			02 Jul 2019
4.	**HS19060929-04**	**18cptMW12SW_061719_a**	**Groundwater**	**17 Jun 2019 10:10**
	SUB_Perch-6850			02 Jul 2019
5.	**HS19060929-05**	**18cptMW23SW_061719**	**Groundwater**	**17 Jun 2019 11:15**
	SUB_Perch-6850			02 Jul 2019
6.	**HS19060929-06**	**18cptMW23_061719**	**Groundwater**	**17 Jun 2019 12:05**
	SUB_Perch-6850			02 Jul 2019
7.	**HS19060929-07**	**18W14_061719W_061719**	**Groundwater**	**17 Jun 2019 13:05**
	SUB_Perch-6850			02 Jul 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

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Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11616**

QC Level: DOD IV (DoD Data Package)

Relinquished By:		Date/Time:	6/18/19 1800.
Received By:		Date/Time:	6/19/19 10:05
Cooler ID(s):		Temperature(s):	

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19060929	*Split:*	**Workorder ID:** 1917672	Level: ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	Type: 125Poly
Comments:			Preservatives: COOL

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	06/17/2019 08:20	MW7_061719	1917672001		Water	A	1	A
2	06/17/2019 09:15	18CPTMW12DW_061719	1917672002		Water	A	1	A
3	06/17/2019 10:10	18CPTMW12SW_061719	1917672003		Water	A	1	A
4	06/17/2019 10:10	18CPTMW12SW_061719_a	1917672004		Water	A	1	A
5	06/17/2019 11:15	18CPTMW23SW_061719	1917672005		Water	A	1	A
6	06/17/2019 12:05	18CPTMW23_061719	1917672006		Water	A	1	A
7	06/17/2019 13:05	18W14_061719W_061719	1917672007		Water	A	1	A
8								
9								
10								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	06/19/2019 10:05	ALS Sample Receiving	Sample Login
[signature] R33.1	6/19/2019 0840	4C	Storage
	6/26/19/0820	T. Bush	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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00940198

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 1917672

Date/Time of Receipt: 6/19/19 10:05

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA		
	Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C199711	3 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [signature] (Signature) Jaylynn Johnson (Printed Name) 6/19/19 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018

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Batch Worklist

Batch: ELMS/ 2264 **Created:** 6/27/2019 07:47 **Instrument:** HBN: 242398

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1917488 [ENV_LVL4]
Workorder: 1917489 [ENV_LVL4]
Workorder: 1917672 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	660889	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	
2	660890	RLVS for HBN 242398 [ELMS/2264				RLVS	3		E685041C3Q	5311		7/1/2019	
3	660891	ICS for HBN 242398 [ELMS/2264]				ICS	3		E6850..D3Q	5311		7/1/2019	
4	660892	LMB for HBN 242398 [ELMS/2264]				LMB	3		E6850Q413Q	5311		7/1/2019	
5	660893	LCS for HBN 242398 [ELMS/2264]				LCS	3		E6850Q413Q	5311		7/1/2019	
6	1917488001	LH18/24-SP650_061219_BIX				SAMPLE	3	1917488001-A	E6850Q41.3	5480	7/10/2019	7/1/2019	
7	660894	LH18/24-SP650...(1917488001MS)				MS	3		E6850Q413Q	5311		7/1/2019	
8	660895	LH18/24-SP65...(1917488001MSD)				MSD	3		E6850Q413Q	5311		7/1/2019	
9	1917489001	18CPTMW22SW_061319				SAMPLE	3	1917489001-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
10	1917489002	18CPTMW22DW_061319				SAMPLE	3	1917489002-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
11	1917489003	18CPTMW22R_061319				SAMPLE	3	1917489003-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
12	1917489004	MW20_061319				SAMPLE	3	1917489004-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
13	1917489005	18CPTMW26SW_061319				SAMPLE	3	1917489005-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
14	1917672001	MW7_061719				SAMPLE	3	1917672001-A	E6850Q41.3	5480	7/15/2019	7/3/2019	
15	1917672002	18CPTMW12DW_061719				SAMPLE	3	1917672002-A	E6850Q41.3	5480	7/15/2019	7/3/2019	
16	660896	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	
17	1917672003	18CPTMW12SW_061719				SAMPLE	3	1917672003-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
18	1917672004	18CPTMW12SW_061719_a				SAMPLE	3	1917672004-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
19	1917672005	18CPTMW23SW_061719				SAMPLE	3	1917672005-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
20	1917672006	18CPTMW23_061719				SAMPLE	3	1917672006-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
21	1917672007	18W14_061719W_061719				SAMPLE	3	1917672007-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
22	660897	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	

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00940200

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1917488 (001), 1917489 (001-05), 1917672 (001-07)
ELMS Batch/HBN ID: 2264 (242398)
Prep Date: 06/26/2019 Analysis Date: 06/27/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\27JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 660893; Target = 4.0µg/L. ASTM type II water was used for LMB 660892.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1917488001 (Client ID: LH18/24-SP650_061219_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:
1) Results reported in µg/L. Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD – 660894/95 failed QC acceptance criteria for relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\242398-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 660890) is reported from the analysis of the Laboratory Control Sample (LCS – 660893) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 27JUND03/12/20.

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2264 HBN: 242398 Sample Set IDs if Applicable: 1917488/1917489/1917672	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	/
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#_____	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK - Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
			1000 ug/mL
1	14797-73-0	Perchlorate	

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT	Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description - 6850 QC WKG STD 100ug/L

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK		**Description - 6850 QC Stock STD 1,000ug/mL**
Standard: 36748	Created By: Thomas Bosch	Amount: 100 mL
MFG: Ultra Scientific	Create Date: 05/11/2017 01:05PM	Expires: 03/31/2020
MFG Lot: CP-0860		Usable: Yes
Part ID: ICC-013		Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ANAB ACCREDITED

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

AccuStandard®

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

Page 1 of 1

For use in routine laboratory analysis.

AccuStandard

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015
08-ORG/INO-001
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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Report: C:\HPCHEM\1\DATA\27JUN19D\27JUN19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	660889 CCV@25	Vial 71	1	Control	1	1.82515e6	8.439	25.67350
*	660893 QC@4.0	Vial 72	1	Control	2	3.38083e5	8.214	4.26890
*	660891 ICS@4.0	Vial 73	1	Control	3	2.57330e5	7.965	3.92512
*	660892 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917488001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	660894 174881S	Vial 76	1	Sample	6	2.62640e5	7.903	5.12768
*	660895 174881D	Vial 77	1	Sample	7	2.64844e5	7.941	4.05844
*	1917489001 100	Vial 78	1	Sample	8	4.17326e5	8.686	591.94538
*	1917489002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1917489003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1917489004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1917489005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1917672001 1K	Vial 83	1	Sample	13	1.57532e6	8.712	2.61220e4
*	1917672002	Vial 84	1	Sample	14	6.54028e4	7.973	1.24787
*	660896 CCV@25	Vial 71	1	Control	15	1.48921e6	8.624	25.51318
*	1917672003	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1917672004	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1917672005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917672006 100	Vial 88	1	Sample	19	1.71986e6	8.736	2534.96449
*	1917672007	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	660897 CCV@25	Vial 71	1	Control	21	1.42516e6	8.651	24.42440

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	660889 CCV@25	Vial 71	1	Control	1	5.48361e5	8.454	25.97496
*	660893 QC@4.0	Vial 72	1	Control	2	1.12796e5	8.202	4.63897
*	660891 ICS@4.0	Vial 73	1	Control	3	8.93833e4	7.980	4.42426
*	660892 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917488001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	660894 174881S	Vial 76	1	Sample	6	8.68330e4	7.935	5.55768
*	660895 174881D	Vial 77	1	Sample	7	8.75585e4	7.960	4.36181
*	1917489001 100	Vial 78	1	Sample	8	1.40501e5	8.696	655.91363
*	1917489002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1917489003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1917489004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1917489005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1917672001 1K	Vial 83	1	Sample	13	4.80693e5	8.744	2.68224e4
*	1917672002	Vial 84	1	Sample	14	2.29889e4	7.974	1.29323
*	660896 CCV@25	Vial 71	1	Control	15	4.52707e5	8.622	26.10046
*	1917672003	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1917672004	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1917672005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917672006 100	Vial 88	1	Sample	19	5.21595e5	8.762	2587.43586
*	1917672007	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	660897 CCV@25	Vial 71	1	Control	21	4.30118e5	8.688	24.80913

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	660889 CCV@25	Vial 71	1	Control	1	2.15939e5	8.466	5.00000
*	660893 QC@4.0	Vial 72	1	Control	2	2.60134e5	8.243	5.00000
*	660891 ICS@4.0	Vial 73	1	Control	3	2.16232e5	7.969	5.00000
*	660892 LMB	Vial 74	1	Control	4	2.72547e5	8.630	5.00000
*	1917488001	Vial 75	1	Sample	5	2.27402e5	7.920	5.00000
*	660894 174881S	Vial 76	1	Sample	6	1.66848e5	7.932	5.00000
*	660895 174881D	Vial 77	1	Sample	7	2.14876e5	7.954	5.00000
*	1917489001 100	Vial 78	1	Sample	8	2.28283e5	8.729	500.00000
*	1917489002	Vial 79	1	Sample	9	2.07849e5	7.985	5.00000
*	1917489003	Vial 80	1	Sample	10	2.26487e5	8.403	5.00000

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Batch Report: C:\HPCHEM\1\DATA\27JUN19D\27JUN19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	1917489004	Vial 81	1	Sample	11	1.93008e5	7.993	5.00000
*	1917489005	Vial 82	1	Sample	12	1.81500e5	7.840	5.00000
*	1917672001 1K	Vial 83	1	Sample	13	1.82987e5	8.737	5000.00000
*	1917672002	Vial 84	1	Sample	14	1.91018e5	8.001	5.00000
*	660896 CCV@25	Vial 71	1	Control	15	1.77368e5	8.624	5.00000
*	1917672003	Vial 85	1	Sample	16	1.65261e5	7.950	5.00000
*	1917672004	Vial 86	1	Sample	17	1.47928e5	7.939	5.00000
*	1917672005	Vial 87	1	Sample	18	1.93450e5	8.278	5.00000
*	1917672006 100	Vial 88	1	Sample	19	2.06241e5	8.740	500.00000
*	1917672007	Vial 89	1	Sample	20	1.87344e5	7.970	5.00000
*	660897 CCV@25	Vial 71	1	Control	21	1.77769e5	8.693	5.00000

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	660889 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	660893 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	660891 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	660892 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1917488001	CLO4-AQN	1	Sample		
6	Vial 76	660894 174881S	CLO4-AQN	1	Sample		
7	Vial 77	660895 174881D	CLO4-AQN	1	Sample		
8	Vial 78	1917489001 100	CLO4-AQN	1	Sample		
9	Vial 79	1917489002	CLO4-AQN	1	Sample		
10	Vial 80	1917489003	CLO4-AQN	1	Sample		
11	Vial 81	1917489004	CLO4-AQN	1	Sample		
12	Vial 82	1917489005	CLO4-AQN	1	Sample		
13	Vial 83	1917672001 1K	CLO4-AQN	1	Sample		
14	Vial 84	1917672002	CLO4-AQN	1	Sample		
15	Vial 71	660896 CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1917672003	CLO4-AQN	1	Sample		
17	Vial 86	1917672004	CLO4-AQN	1	Sample		
18	Vial 87	1917672005	CLO4-AQN	1	Sample		
19	Vial 88	1917672006 100	CLO4-AQN	1	Sample		
20	Vial 89	1917672007	CLO4-AQN	1	Sample		
21	Vial 71	660897 CCV@25	CLO4-AQN	1	Ctrl Samp		

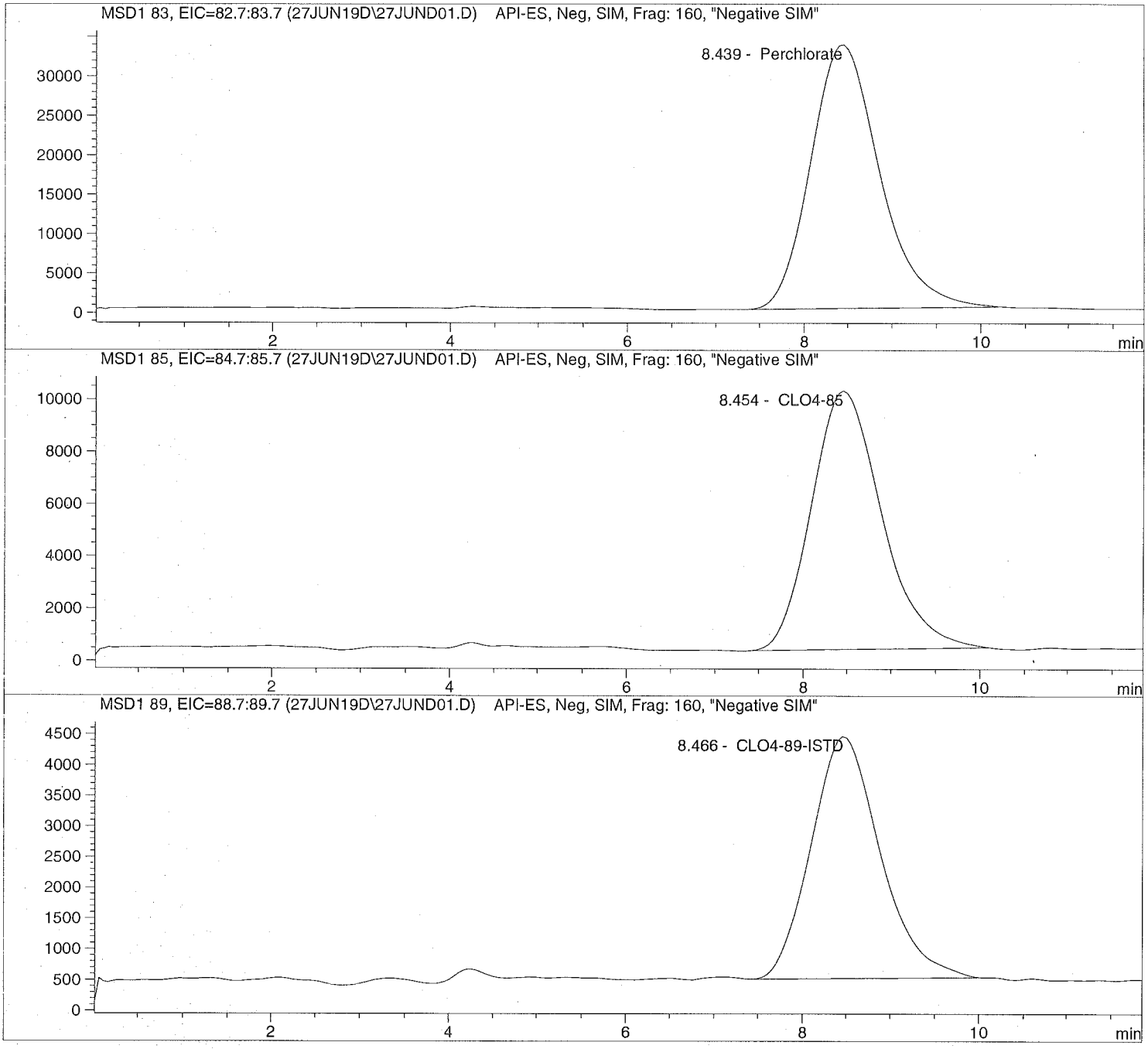
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND01.D Sample Name: 660889 CCV@25

Injection Date:	6/27/2019 08:45:38	Seq Line:	1
Sample Name:	660889 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND01.D Sample Name: 660889 CCV@25

Injection Date:	6/27/2019 08:45:38	Seq Line:	1
Sample Name:	660889 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.439	PBA	1825148.0	25.6735	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.454	PBA	548361.0	25.9750	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.466	PBA	215939.1	5.0000	CLO4-89-ISTD

*** End of Report ***

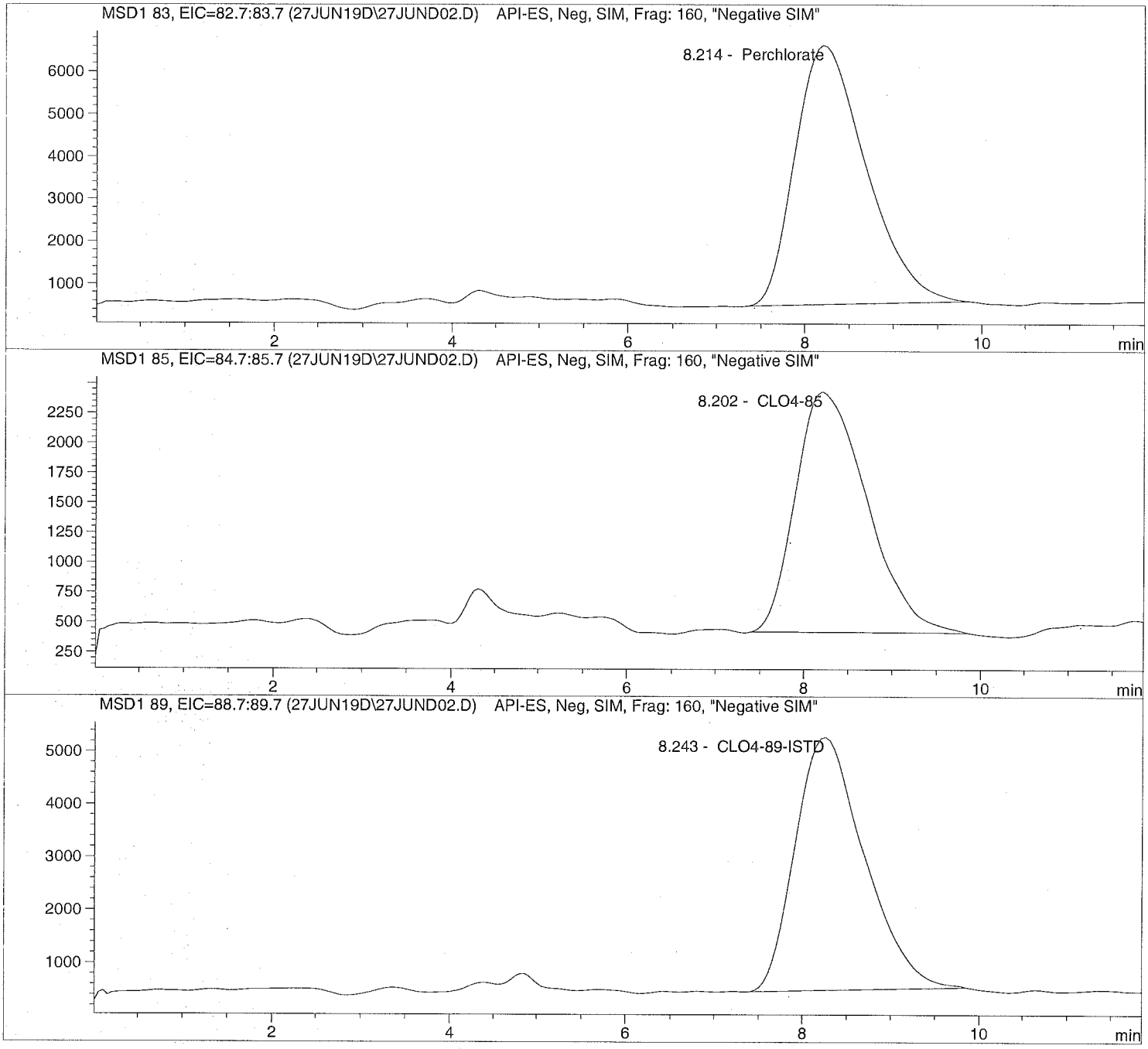
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND02.D Sample Name: 660893 QC@4.0

Injection Date:	6/27/2019 09:00:21	Seq Line:	2
Sample Name:	660893 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND02.D Sample Name: 660893 QC@4.0

Injection Date:	6/27/2019 09:00:21	Seq Line:	2
Sample Name:	660893 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.214	PBA	338083.1	4.2689	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.202	PBA	112796.3	4.6390	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.243	PBA	260134.2	5.0000	CLO4-89-ISTD

*** End of Report ***

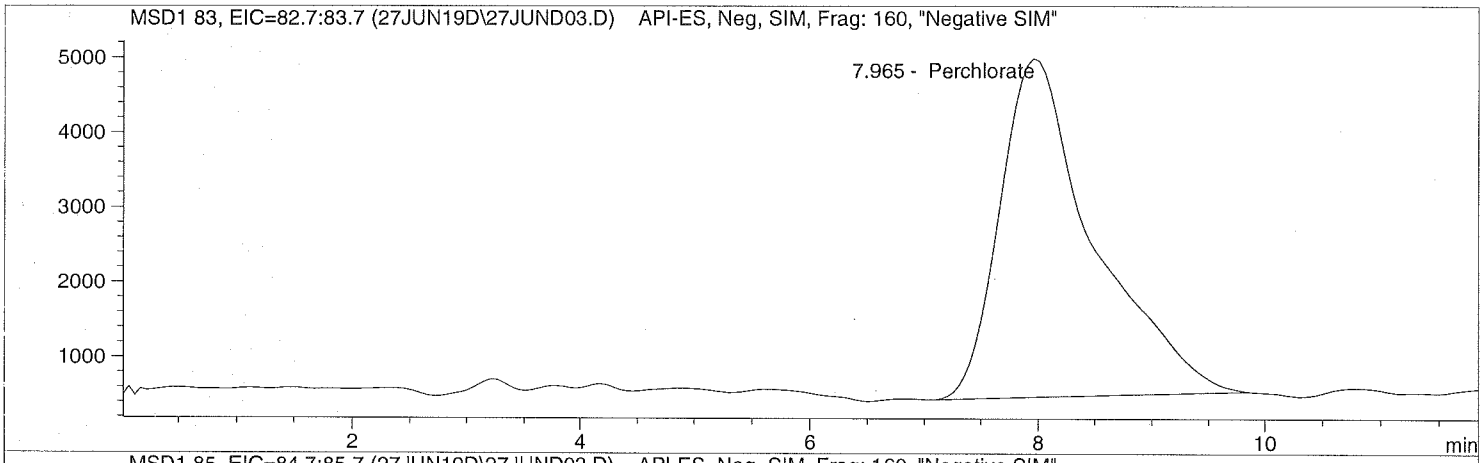
RIGHT SOLUTIONS | RIGHT PARTNER

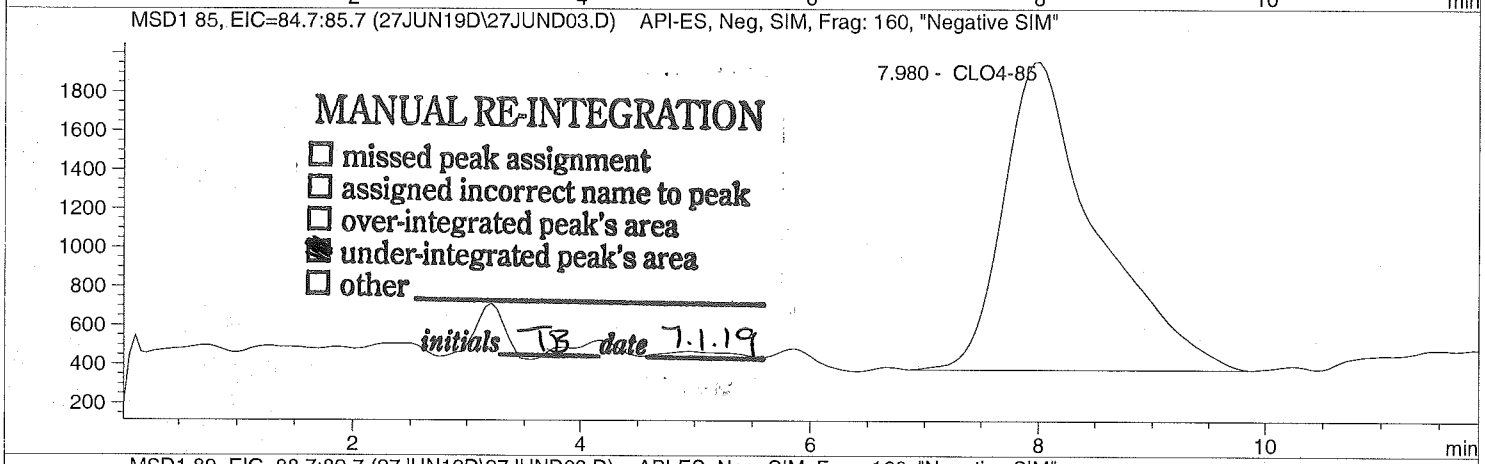
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

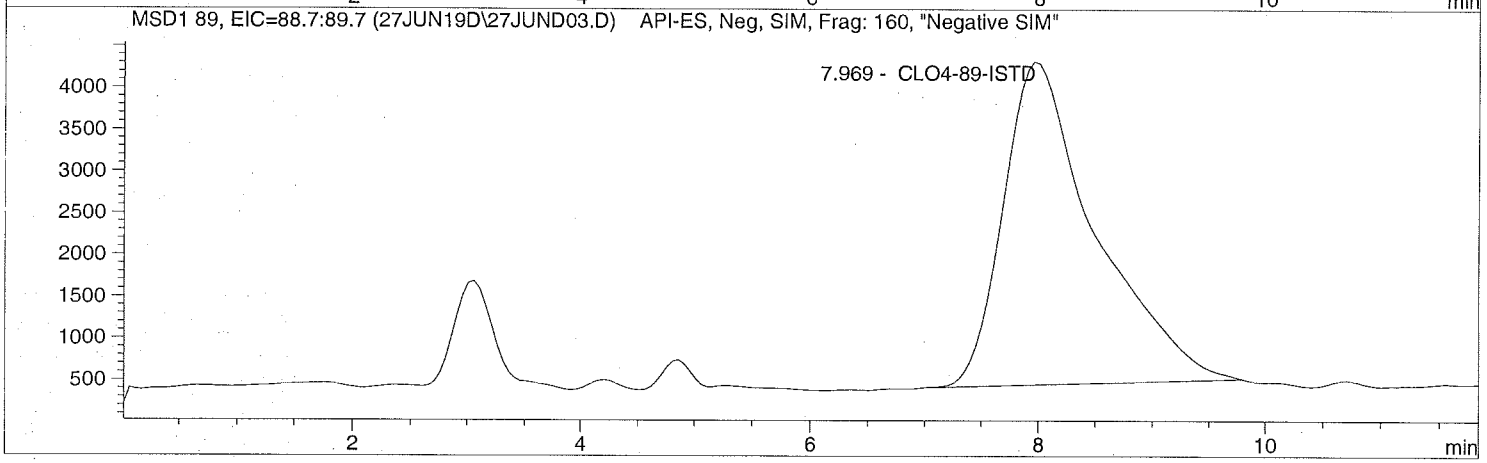
Perchlorate analysis





MANUAL RE-INTEGRATION
- ☐ missed peak assignment
- ☐ assigned incorrect name to peak
- ☐ over-integrated peak's area
- ☒ under-integrated peak's area
- ☐ other _____

initials TB date 7.1.19



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.965	PBA	257330.2	3.9251	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.980	MM	89383.3	4.4243	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.969	BBA	216232.2	5.0000	CLO4-89-ISTD

*** End of Report ***

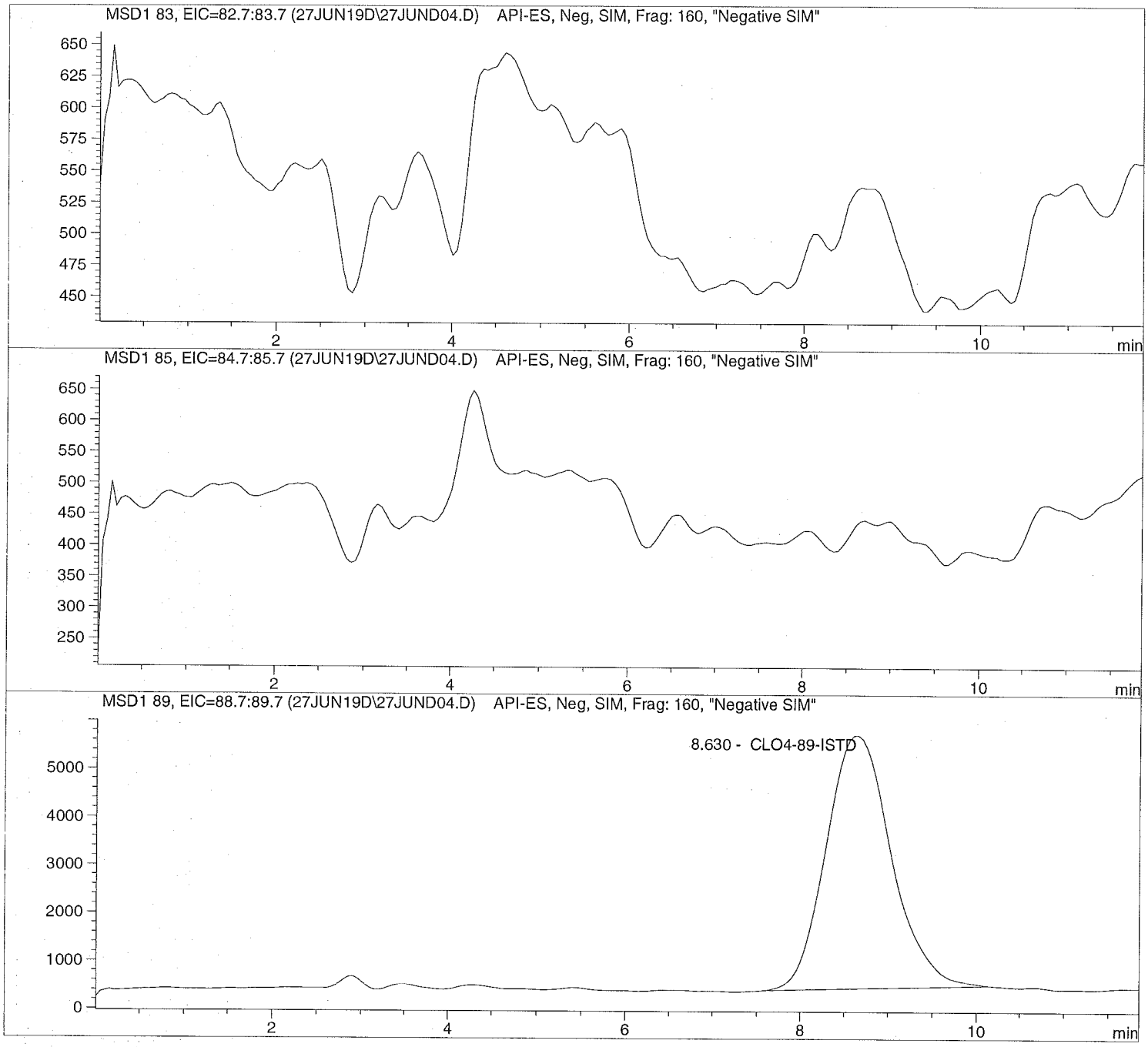
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND04.D Sample Name: 660892 LMB

Injection Date:	6/27/2019 09:28:13	Seq Line:	4
Sample Name:	660892 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND04.D Sample Name: 660892 LMB

Injection Date:	6/27/2019 09:28:13	Seq Line:	4
Sample Name:	660892 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.630	PBA	272546.7	5.0000	CLO4-89-ISTD

*** End of Report ***

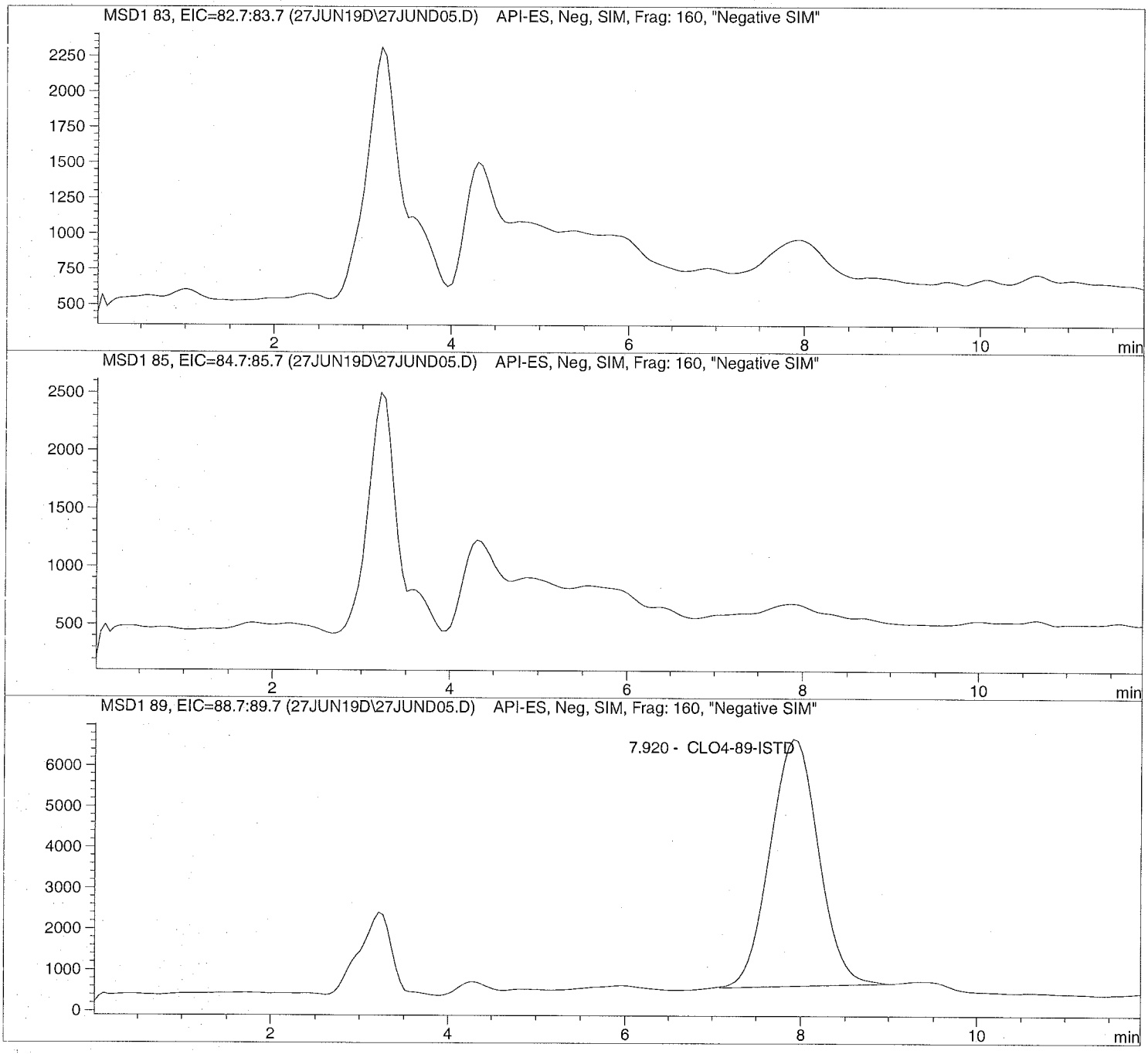
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND05.D Sample Name: 1917488001

Injection Date:	6/27/2019 09:42:40	Seq Line:	5
Sample Name:	1917488001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND05.D Sample Name: 1917488001

Injection Date:	6/27/2019 09:42:40	Seq Line:	5
Sample Name:	1917488001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.920	PBA	227402.2	5.0000	CLO4-89-ISTD

*** End of Report ***

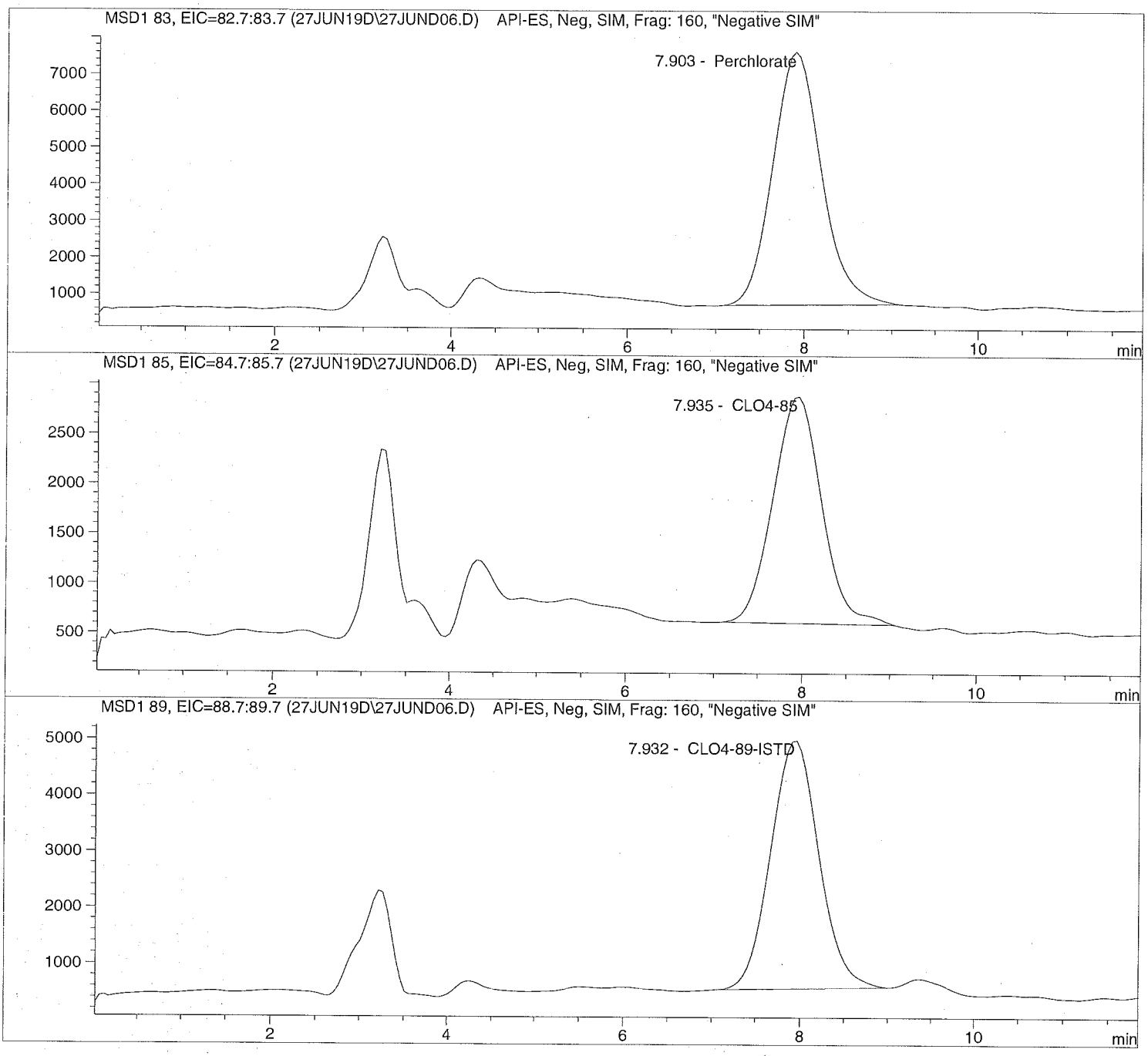
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND06.D Sample Name: 660894 174881S

Injection Date:	6/27/2019 09:56:36	Seq Line:	6
Sample Name:	660894 174881S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND06.D Sample Name: 660894 174881S

Injection Date:	6/27/2019 09:56:36	Seq Line:	6
Sample Name:	660894 174881S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.903	PBA	262639.7	5.1277	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.935	BBA	86833.0	5.5577	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.932	PBA	166848.2	5.0000	CLO4-89-ISTD

*** End of Report ***

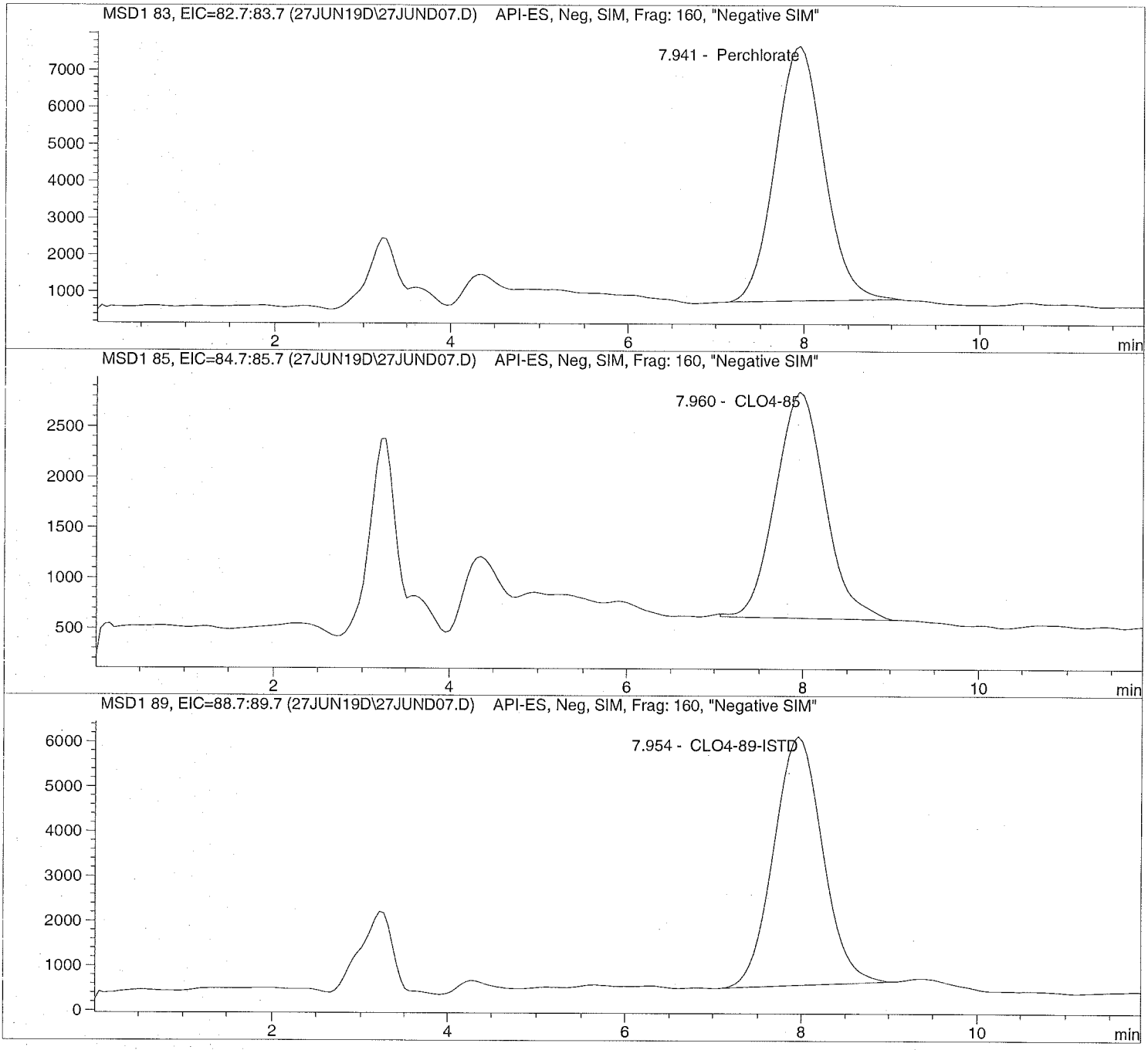
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND07.D Sample Name: 660895 174881D

Injection Date:	6/27/2019 10:10:32	Seq Line:	7
Sample Name:	660895 174881D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND07.D Sample Name: 660895 174881D

Injection Date:	6/27/2019 10:10:32	Seq Line:	7
Sample Name:	660895 174881D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.941	PBA	264844.2	4.0584	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.960	BBA	87558.5	4.3618	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.954	PBA	214876.4	5.0000	CLO4-89-ISTD

*** End of Report ***

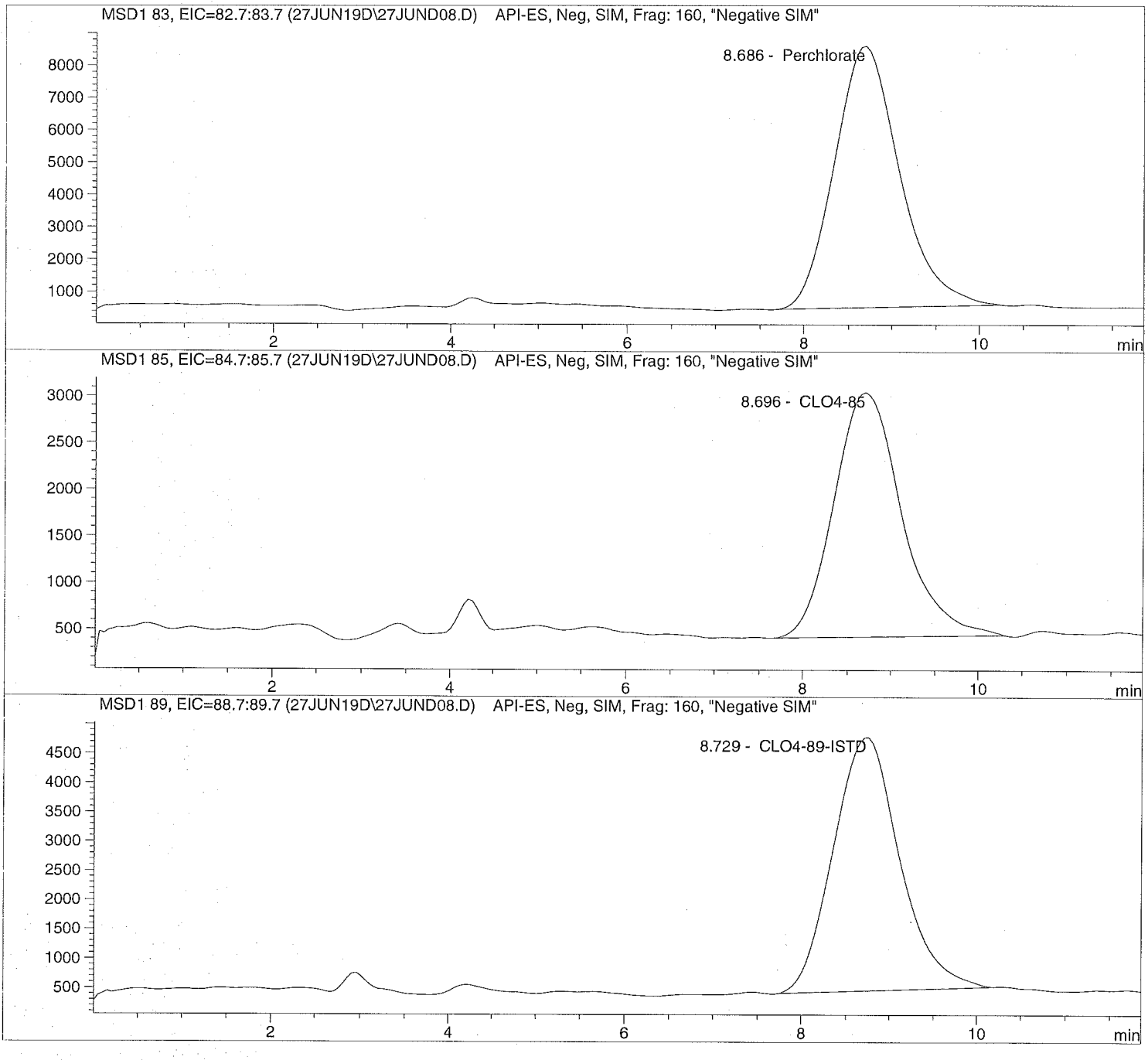
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND08.D Sample Name: 1917489001 100

Injection Date:	6/27/2019 10:24:27	Seq Line:	8
Sample Name:	1917489001 100	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND08.D Sample Name: 1917489001 100

Injection Date:	6/27/2019 10:24:27	Seq Line:	8
Sample Name:	1917489001 100	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.686	PBA	417326.3	591.9454	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.696	PBA	140501.0	655.9136	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.729	PBA	228282.9	500.0000	CLO4-89-ISTD

*** End of Report ***

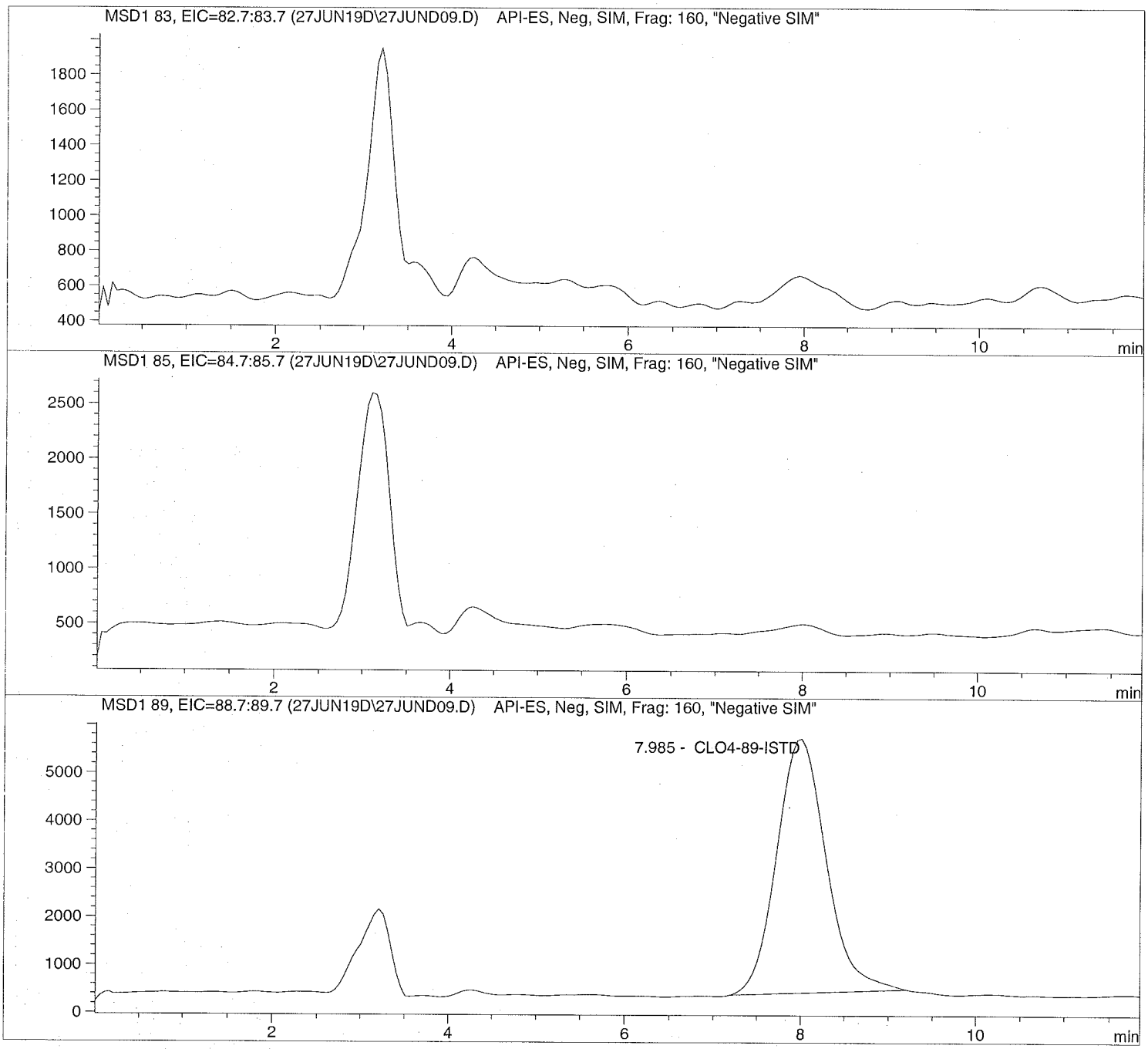
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND09.D Sample Name: 1917489002

Injection Date:	6/27/2019 10:38:23	Seq Line:	9
Sample Name:	1917489002	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND09.D Sample Name: 1917489002

Injection Date:	6/27/2019 10:38:23	Seq Line:	9
Sample Name:	1917489002	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.985	BBA	207849.5	5.0000	CLO4-89-ISTD

*** End of Report ***

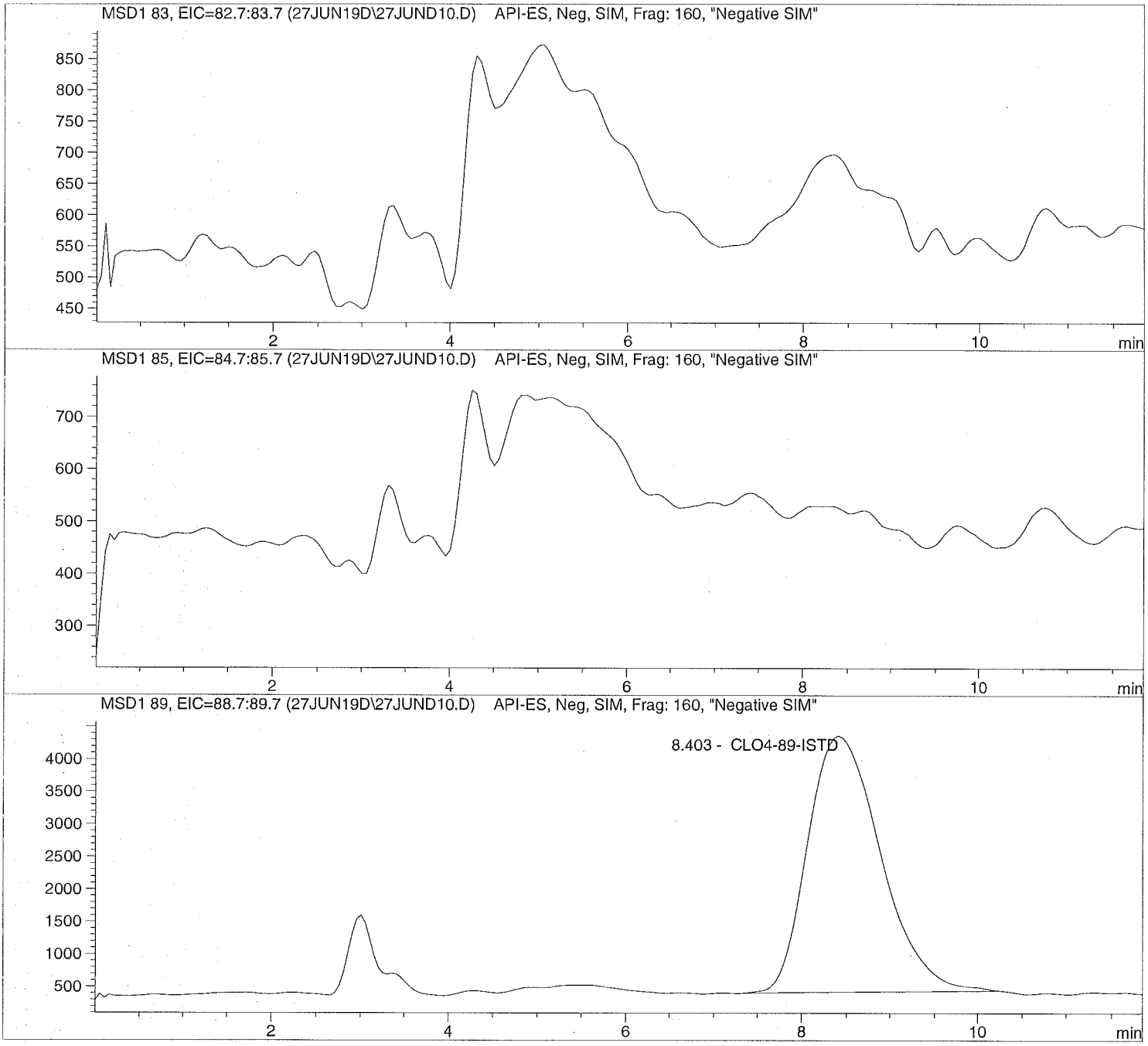
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND10.D Sample Name: 1917489003

Injection Date:	6/27/2019 10:52:17	Seq Line:	10
Sample Name:	1917489003	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND10.D Sample Name: 1917489003

Injection Date:	6/27/2019 10:52:17	Seq Line:	10
Sample Name:	1917489003	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.403	PBA	226487.0	5.0000	CLO4-89-ISTD

*** End of Report ***

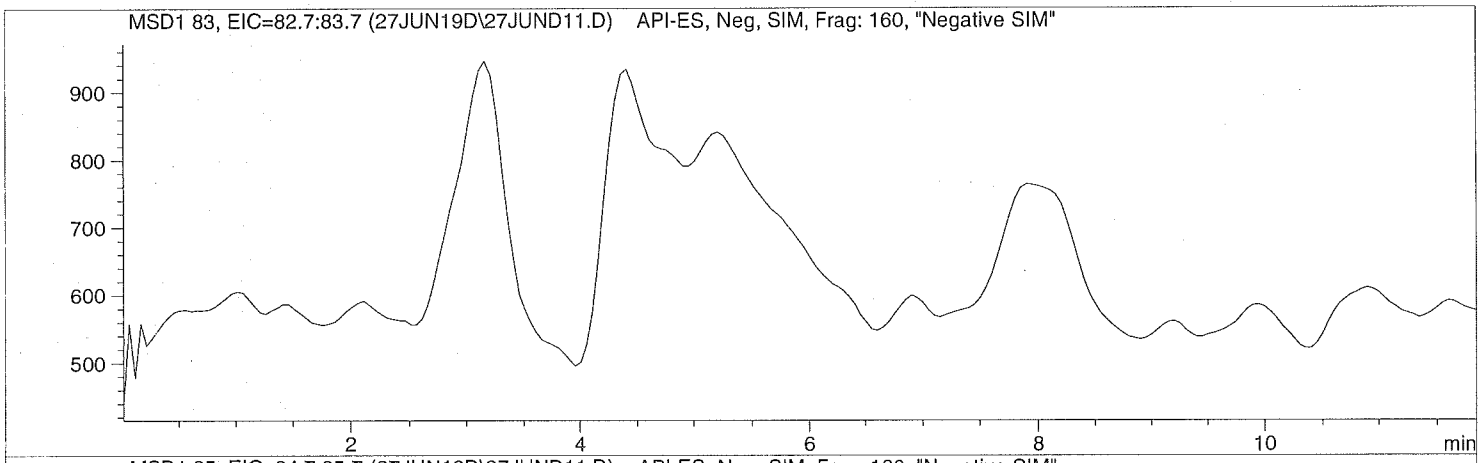
RIGHT SOLUTIONS | RIGHT PARTNER

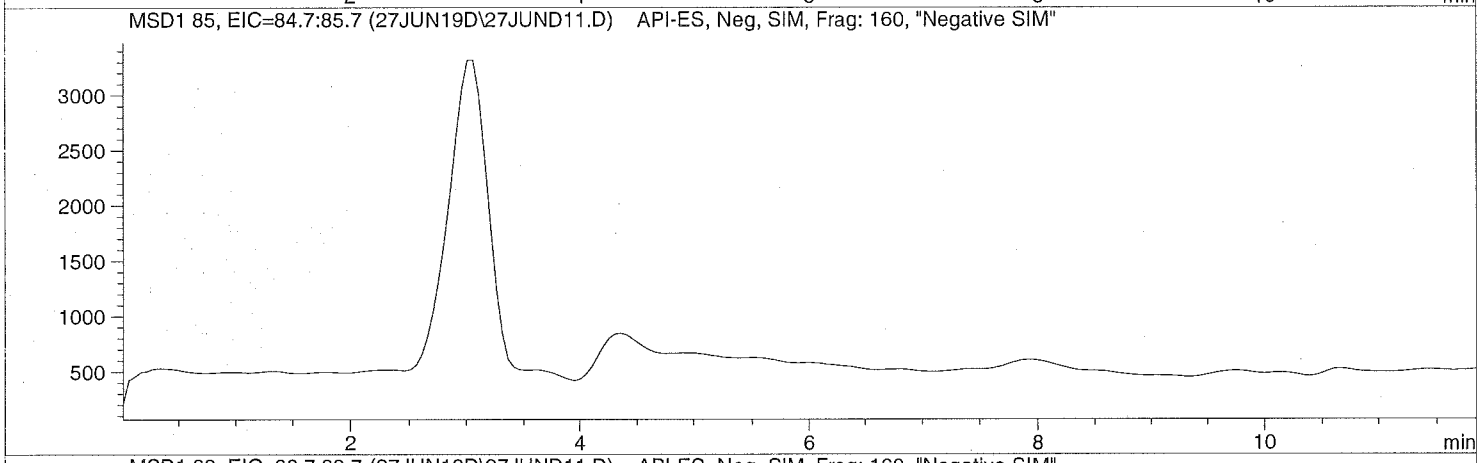
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND11.D Sample Name: 1917489004

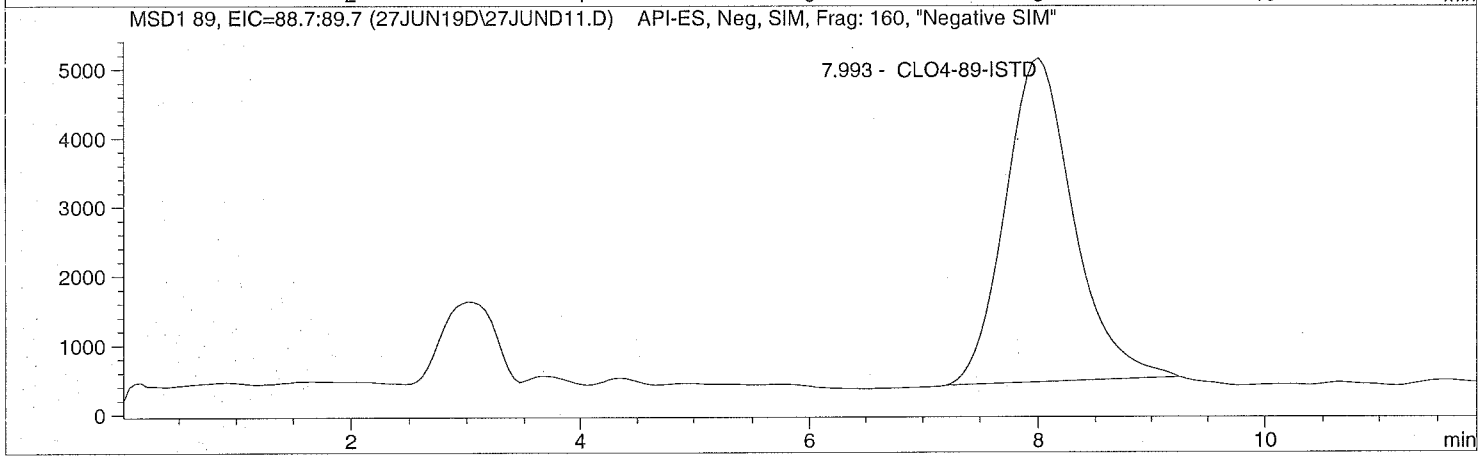
Injection Date:	6/27/2019 11:06:11	Seq Line:	11
Sample Name:	1917489004	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND11.D Sample Name: 1917489004

Injection Date:	6/27/2019 11:06:11	Seq Line:	11
Sample Name:	1917489004	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.993	BBA	193007.7	5.0000	CLO4-89-ISTD

*** End of Report ***

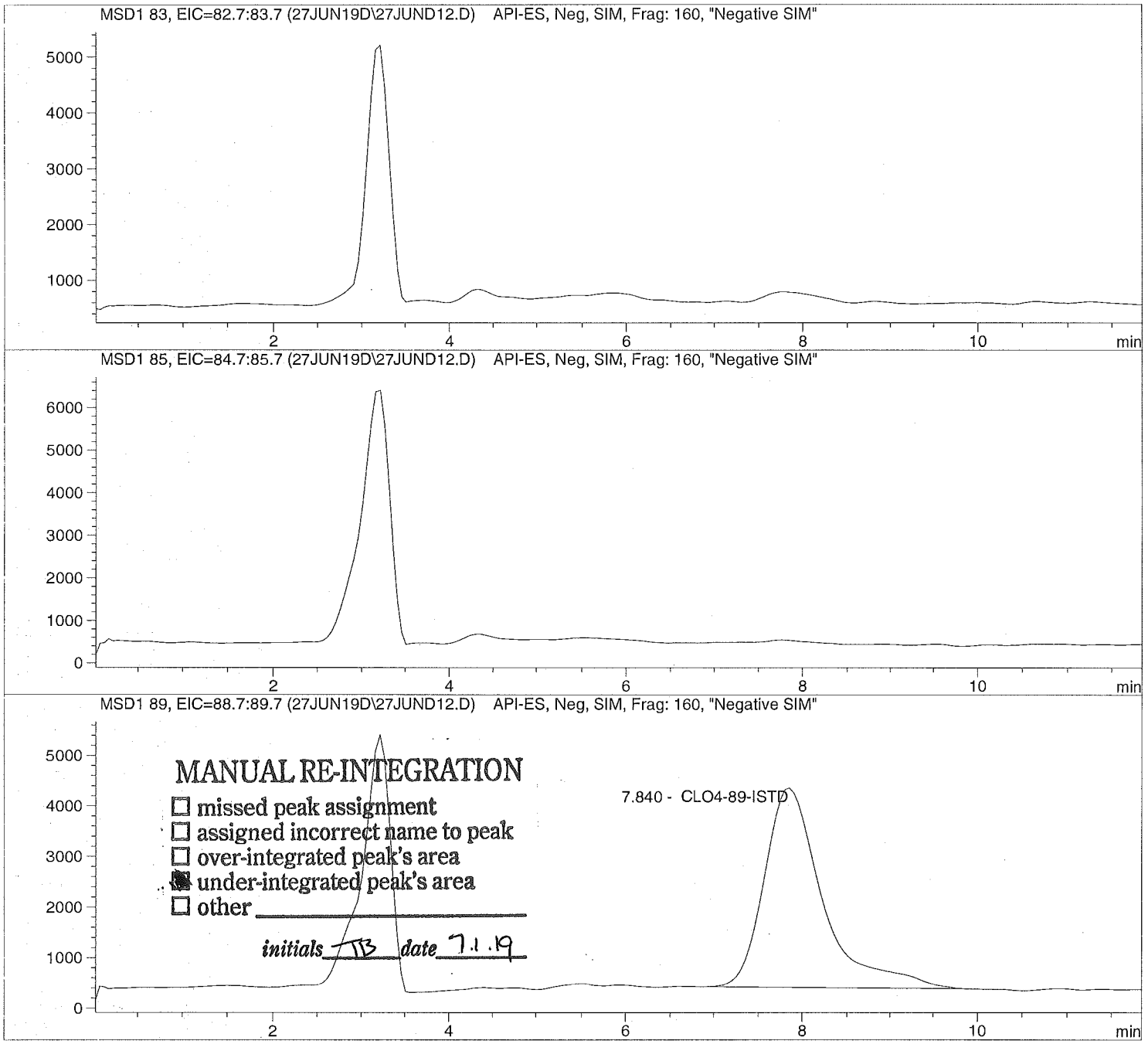
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.840	MM	181499.8	5.0000	CLO4-89-ISTD

*** End of Report ***

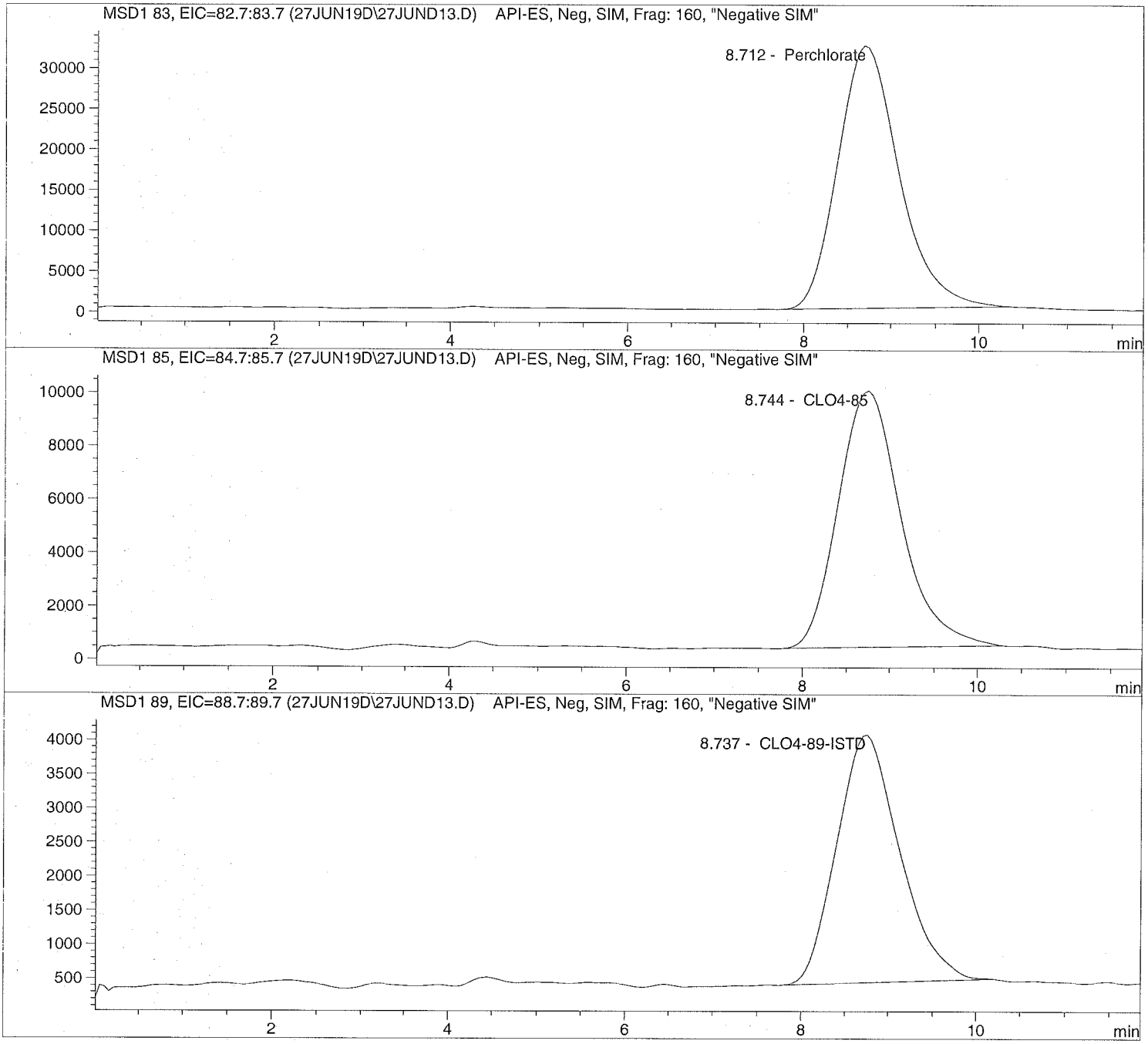
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND13.D Sample Name: 1917672001 1K

Injection Date:	6/27/2019 11:33:53	Seq Line:	13
Sample Name:	1917672001 1K	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND13.D Sample Name: 1917672001 1K

Injection Date:	6/27/2019 11:33:53	Seq Line:	13
Sample Name:	1917672001 1K	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.712	PBA	1575319.3	26121.9614	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	PBA	480692.7	26822.4361	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.737	PBA	182986.5	5000.0000	CLO4-89-ISTD

*** End of Report ***

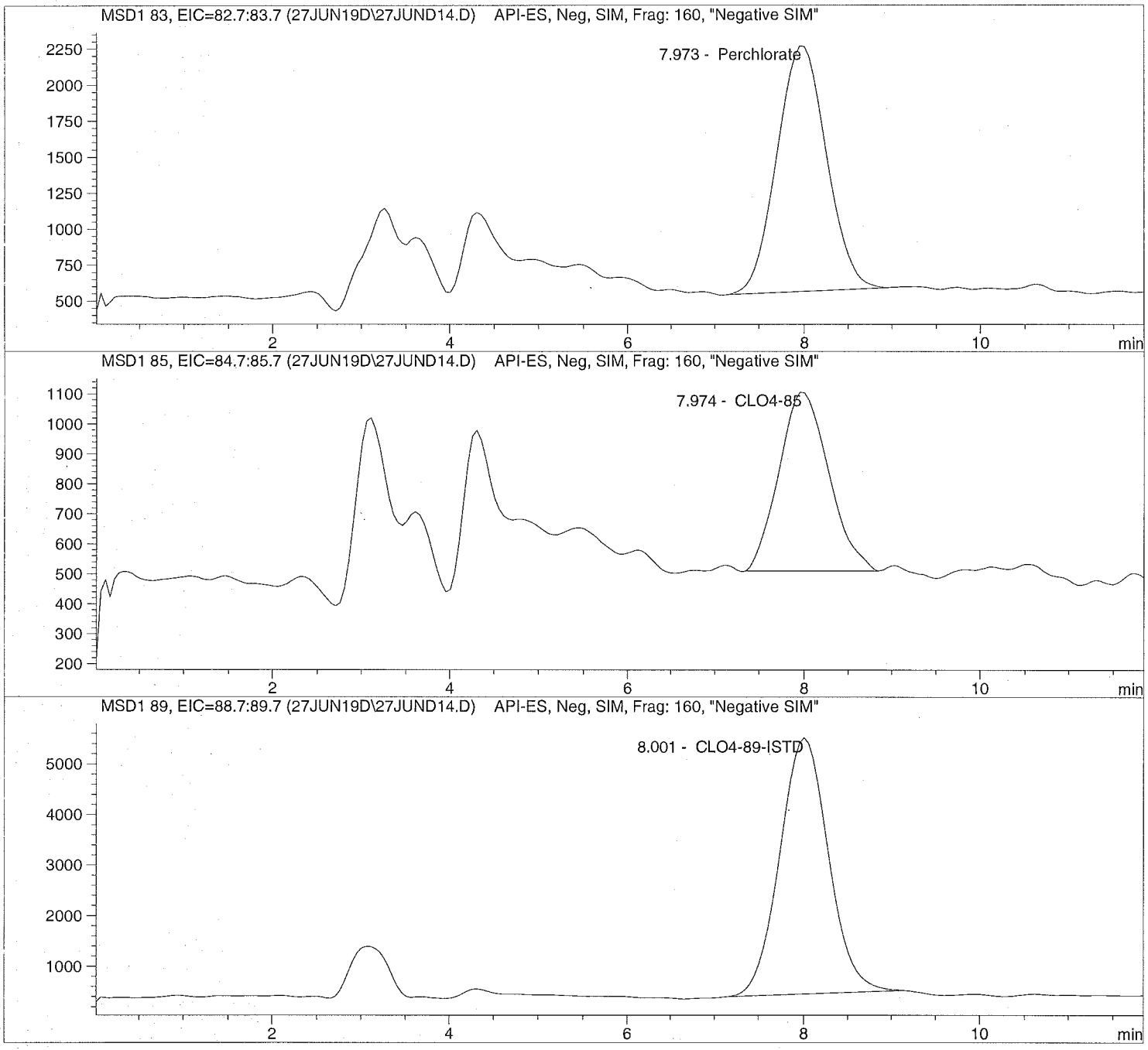
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND14.D Sample Name: 1917672002

Injection Date:	6/27/2019 11:47:53	Seq Line:	14
Sample Name:	1917672002	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND14.D Sample Name: 1917672002

Injection Date:	6/27/2019 11:47:53	Seq Line:	14
Sample Name:	1917672002	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.973	PBA	65402.8	1.2479	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.974	PBA	22988.9	1.2932	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.001	PBA	191017.5	5.0000	CLO4-89-ISTD

*** End of Report ***

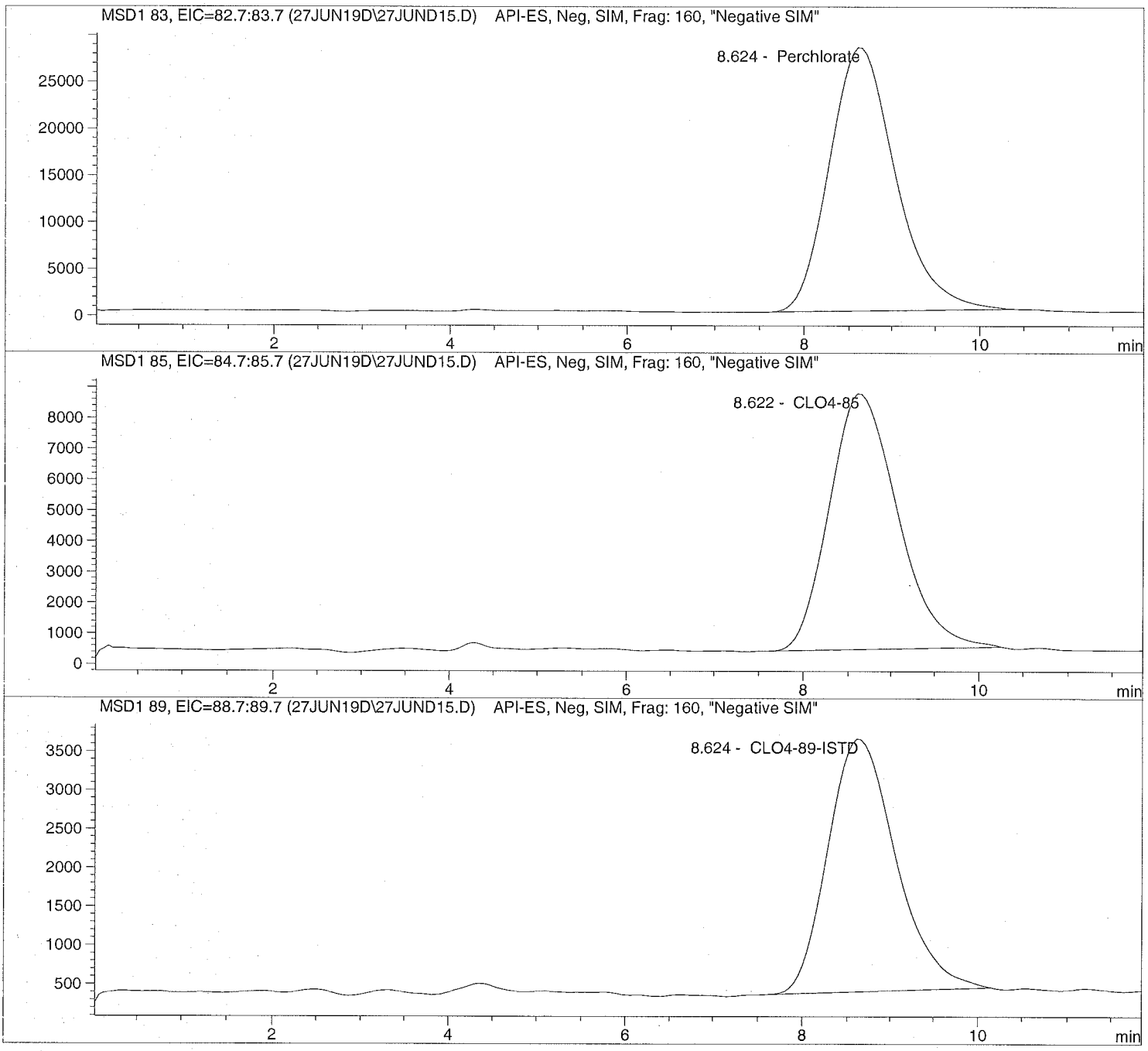
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND15.D Sample Name: 660896 CCV@25

Injection Date:	6/27/2019 12:01:48	Seq Line:	15
Sample Name:	660896 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND15.D Sample Name: 660896 CCV@25

Injection Date:	6/27/2019 12:01:48	Seq Line:	15
Sample Name:	660896 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.624	PBA	1489207.3	25.5132	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.622	PBA	452707.0	26.1005	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.624	PBA	177367.7	5.0000	CLO4-89-ISTD

*** End of Report ***

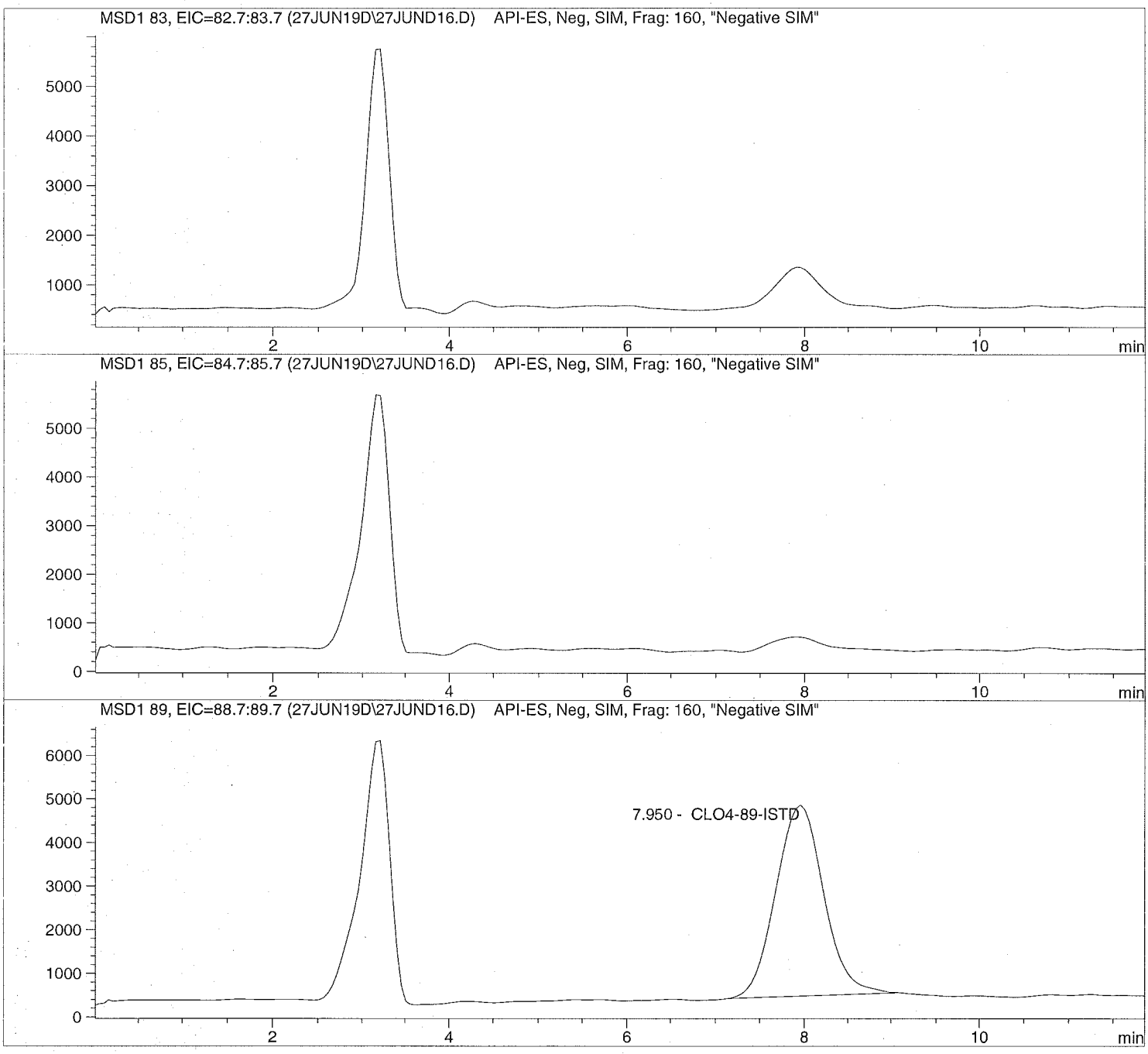
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND16.D Sample Name: 1917672003

Injection Date:	6/27/2019 12:15:39	Seq Line:	16
Sample Name:	1917672003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND16.D Sample Name: 1917672003

Injection Date:	6/27/2019 12:15:39	Seq Line:	16
Sample Name:	1917672003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.950	PBA	165260.9	5.0000	CLO4-89-ISTD

*** End of Report ***

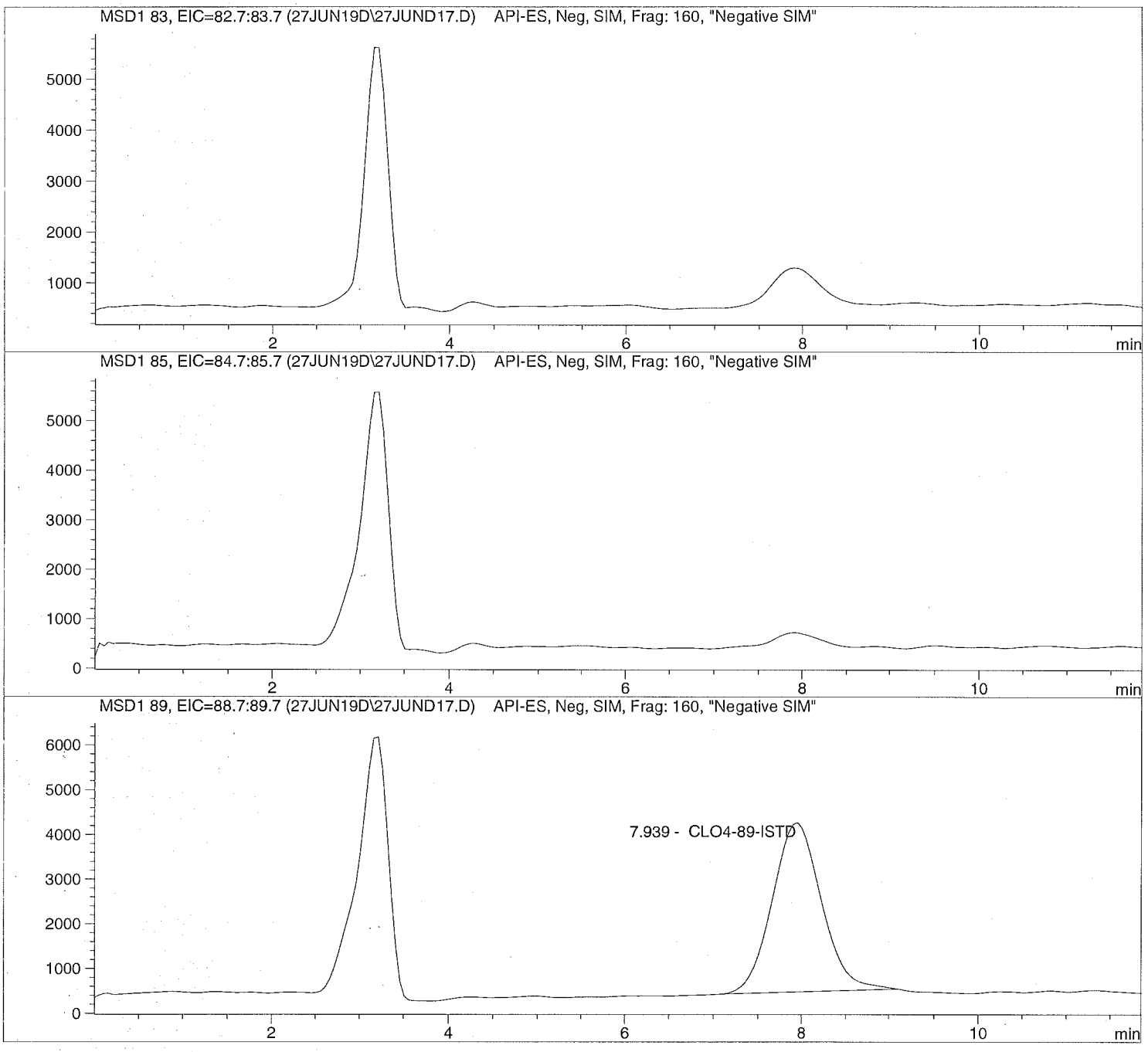
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND17.D Sample Name: 1917672004

Injection Date:	6/27/2019 12:29:33	Seq Line:	17
Sample Name:	1917672004	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND17.D Sample Name: 1917672004

Injection Date:	6/27/2019 12:29:33	Seq Line:	17
Sample Name:	1917672004	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.939	BBA	147927.7	5.0000	CLO4-89-ISTD

*** End of Report ***

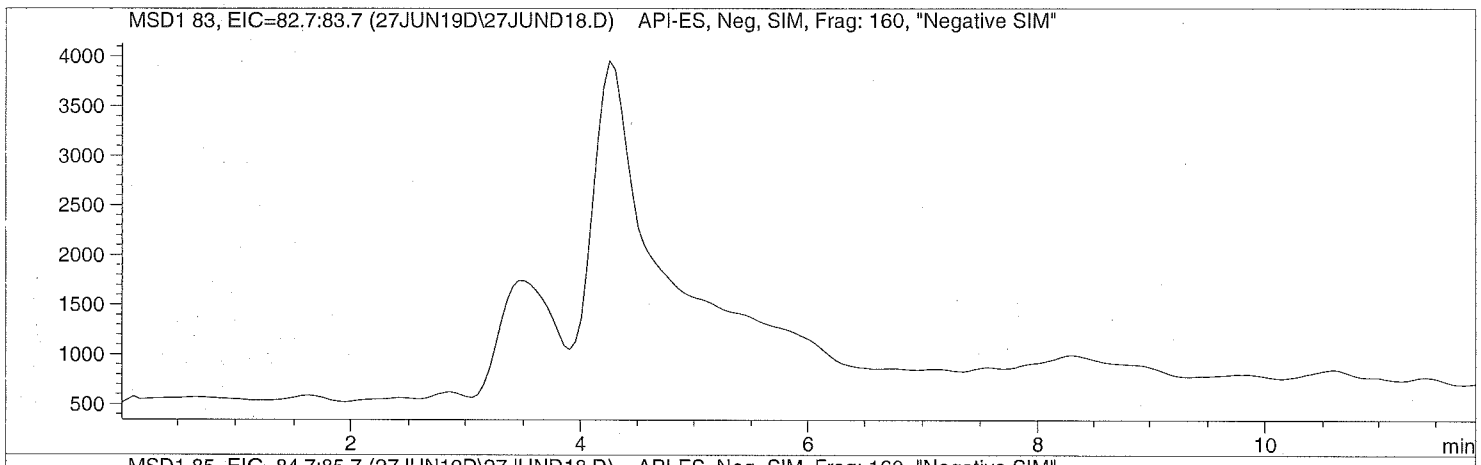
RIGHT SOLUTIONS | RIGHT PARTNER

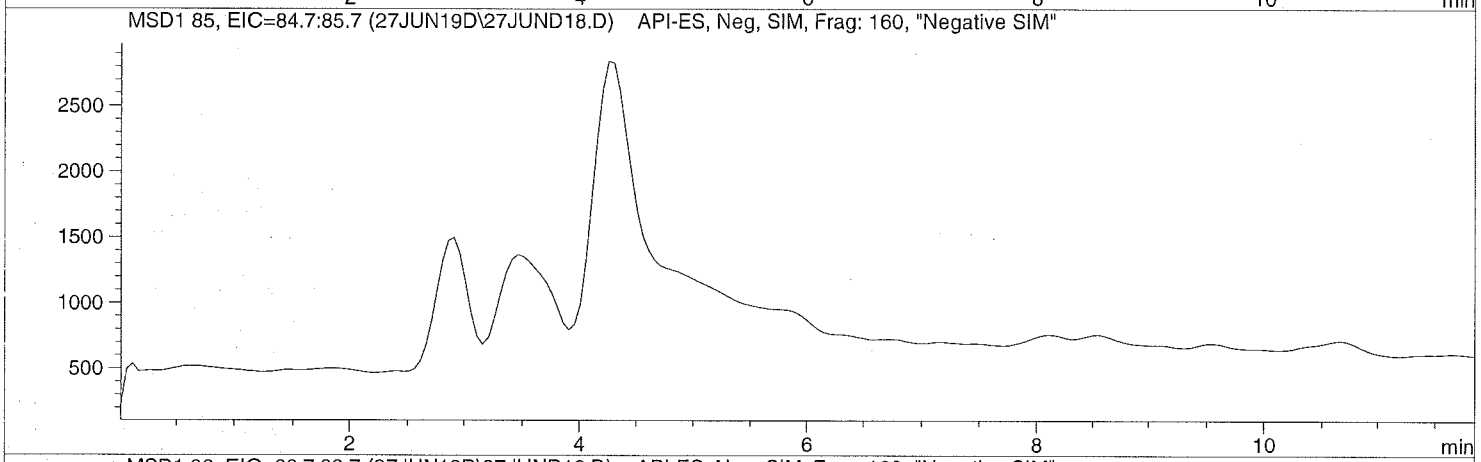
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND18.D Sample Name: 1917672005

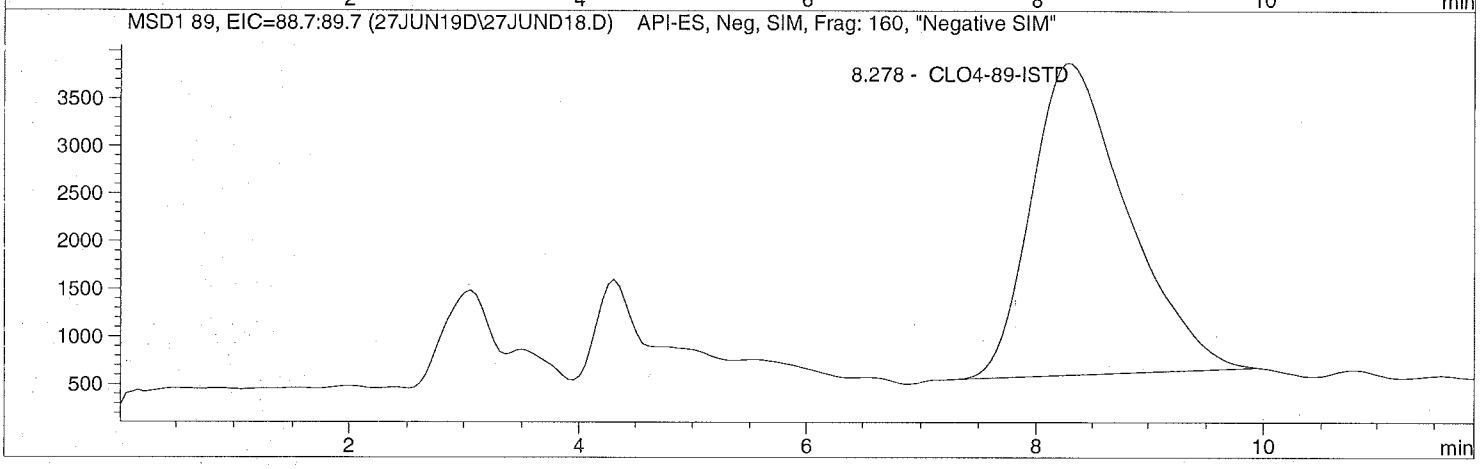
Injection Date:	6/27/2019 12:43:25	Seq Line:	18
Sample Name:	1917672005	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND18.D Sample Name: 1917672005

Injection Date:	6/27/2019 12:43:25	Seq Line:	18
Sample Name:	1917672005	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.278	PBA	193450.5	5.0000	CLO4-89-ISTD

*** End of Report ***

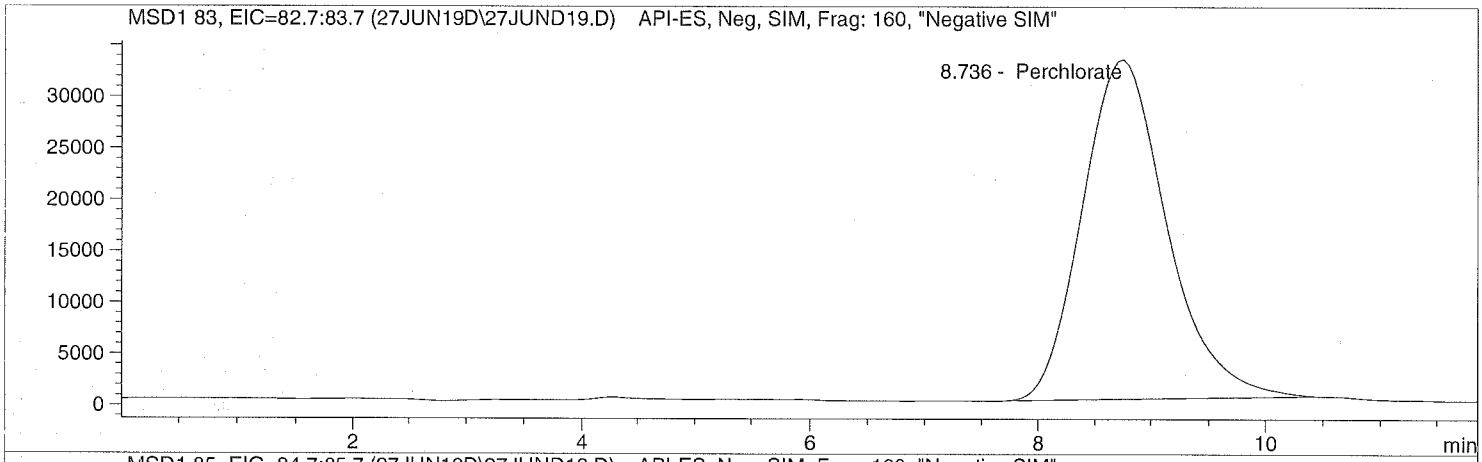
RIGHT SOLUTIONS | RIGHT PARTNER

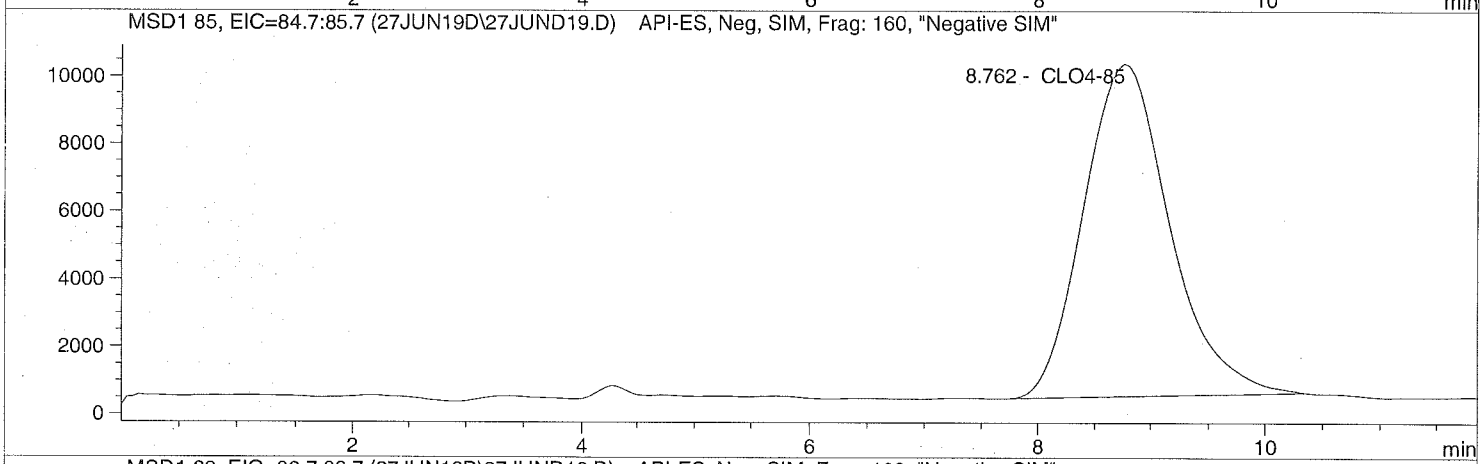
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND19.D Sample Name: 1917672006 100

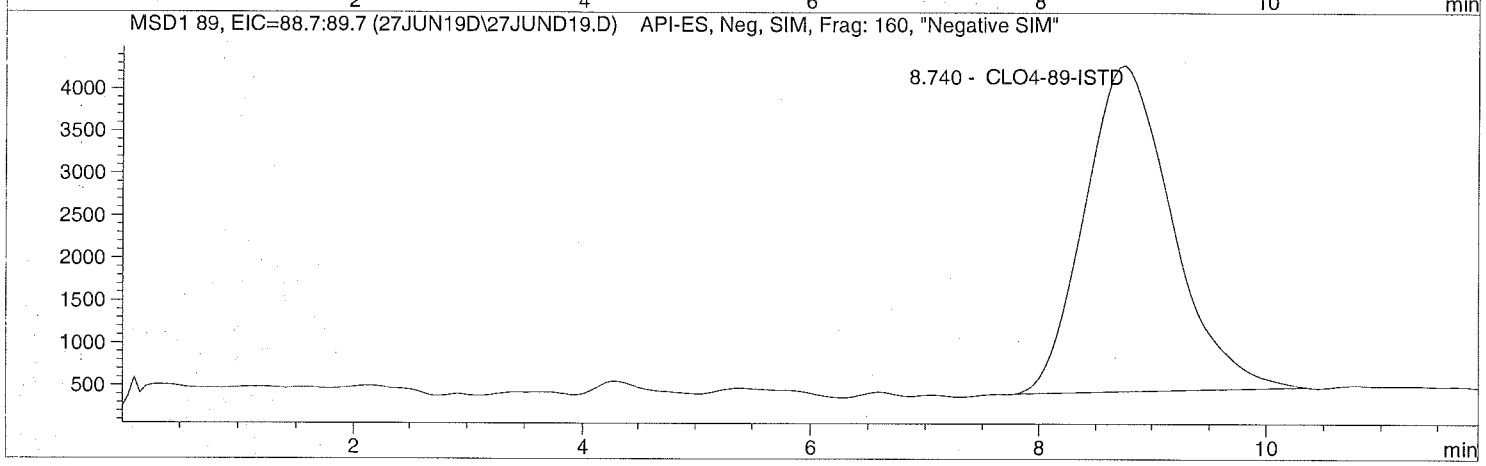
Injection Date:	6/27/2019 12:57:19	Seq Line:	19
Sample Name:	1917672006 100	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND19.D Sample Name: 1917672006 100

Injection Date:	6/27/2019 12:57:19	Seq Line:	19
Sample Name:	1917672006 100	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.736	PBA	1719861.8	2534.9645	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.762	PBA	521595.0	2587.4359	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.740	BBA	206241.0	500.0000	CLO4-89-ISTD

*** End of Report ***

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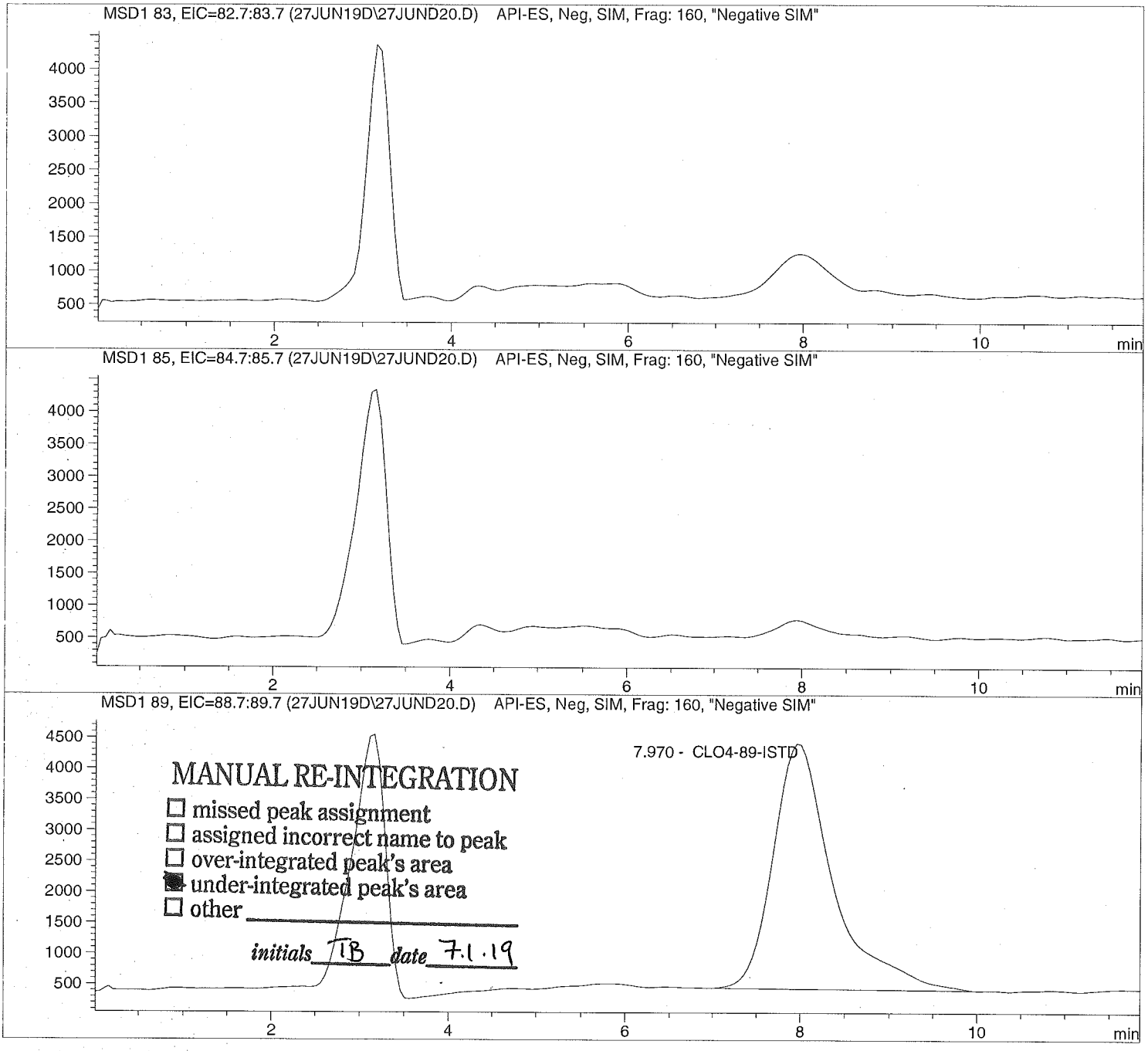
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.970	MM	187343.8	5.0000	CLO4-89-ISTD

*** End of Report ***

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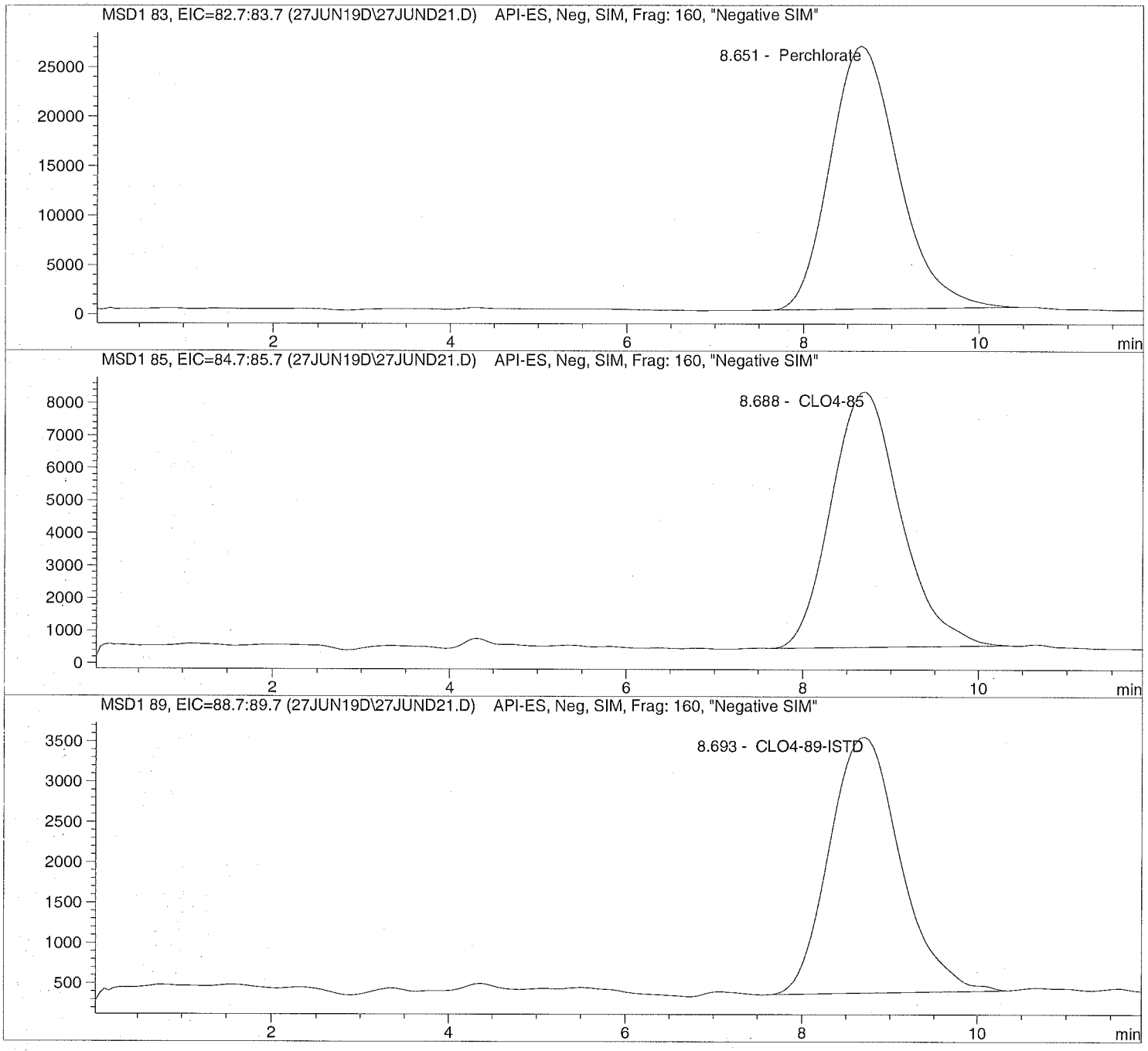
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND21.D Sample Name: 660897 CCV@25

Injection Date:	6/27/2019 13:28:58	Seq Line:	21
Sample Name:	660897 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND21.D Sample Name: 660897 CCV@25

Injection Date:	6/27/2019 13:28:58	Seq Line:	21
Sample Name:	660897 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.651	PBA	1425160.6	24.4244	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.688	PBA	430117.7	24.8091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.693	PBA	177769.0	5.0000	CLO4-89-ISTD

*** End of Report ***

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

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Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

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RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

Peak Sum Table

No Entries in table

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Calibration Curves

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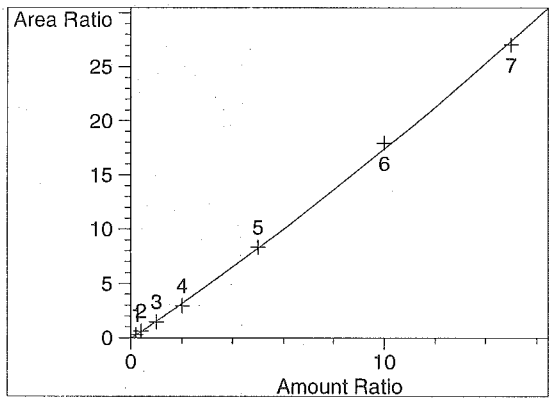
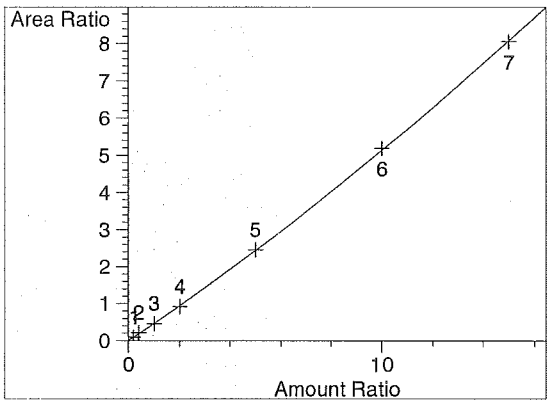
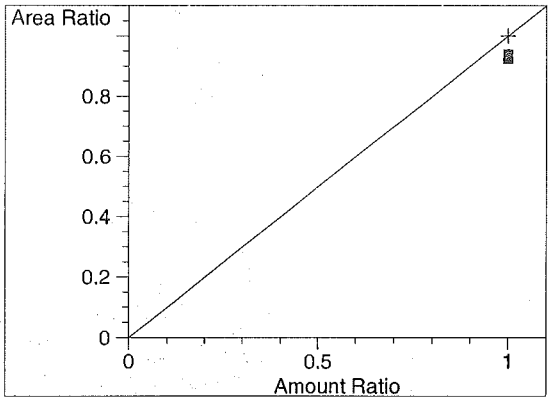


Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

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Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

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Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

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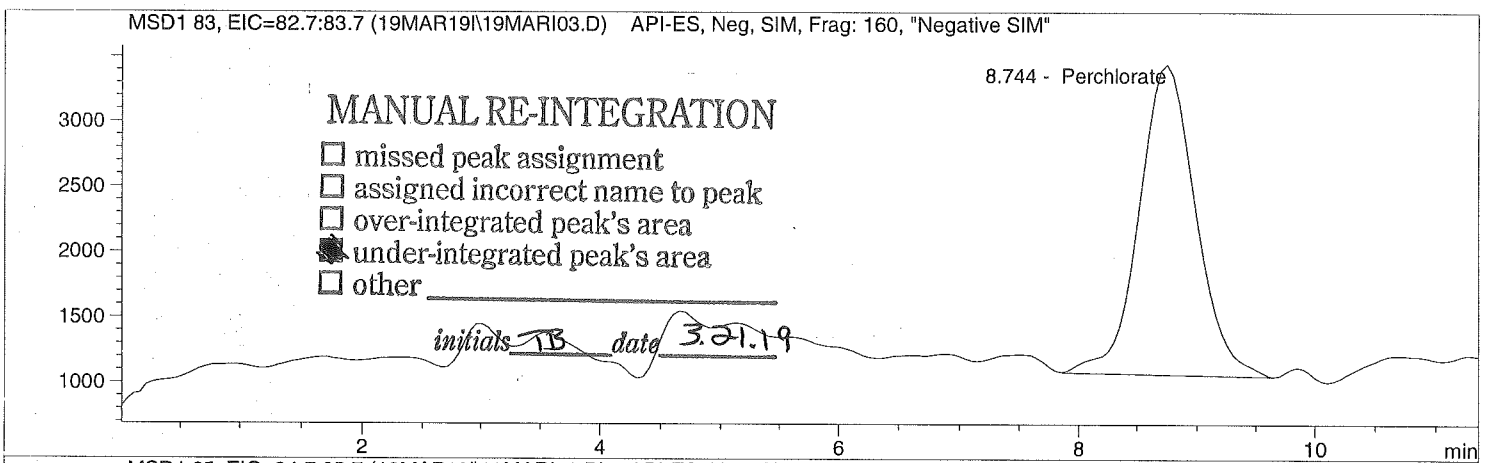
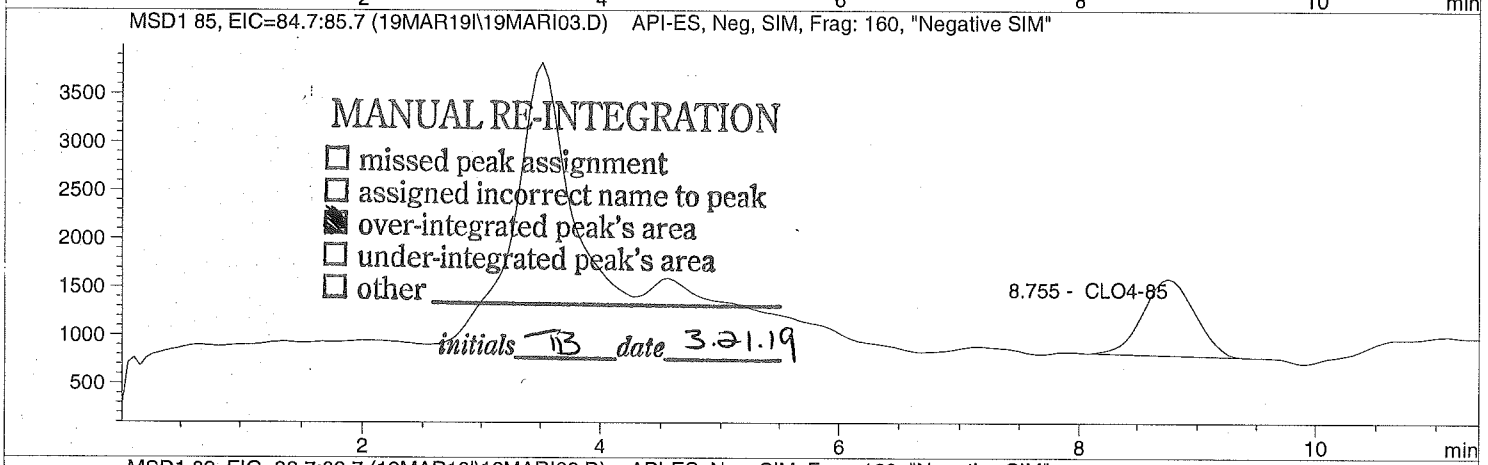
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

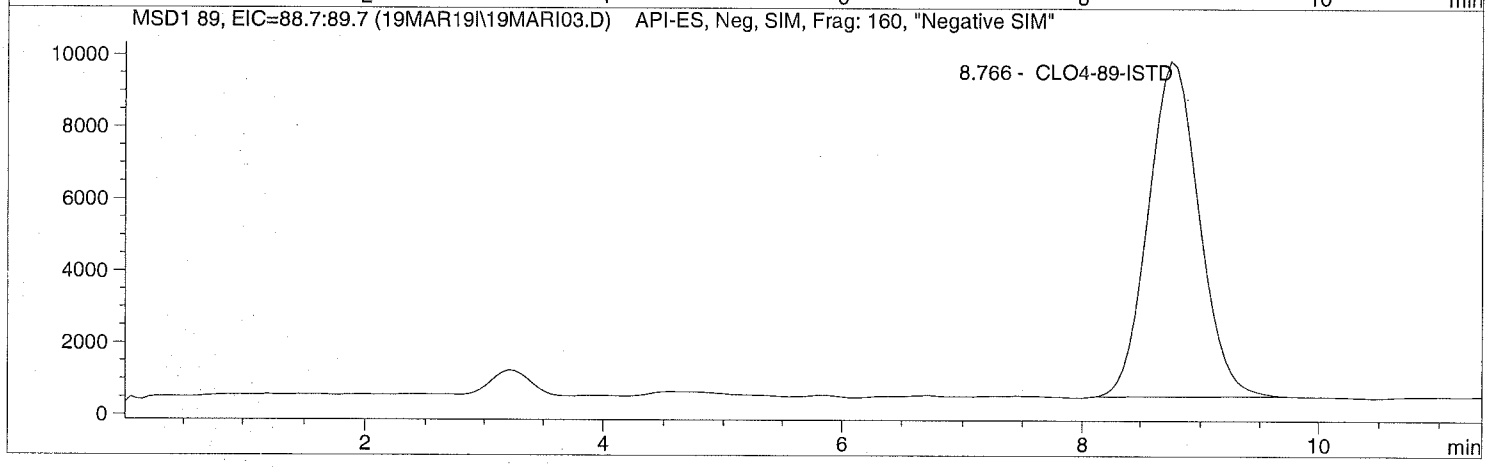
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

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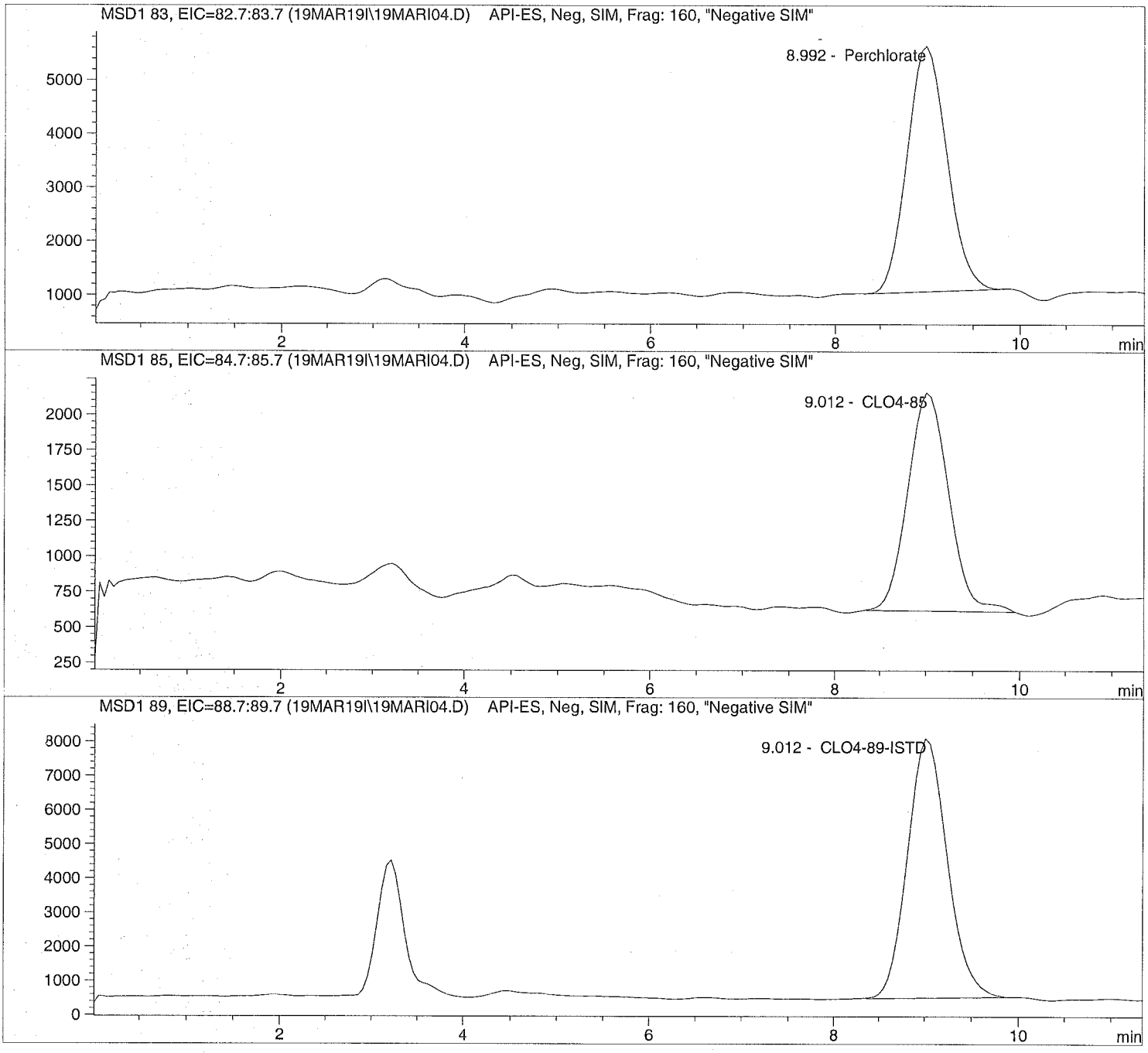
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

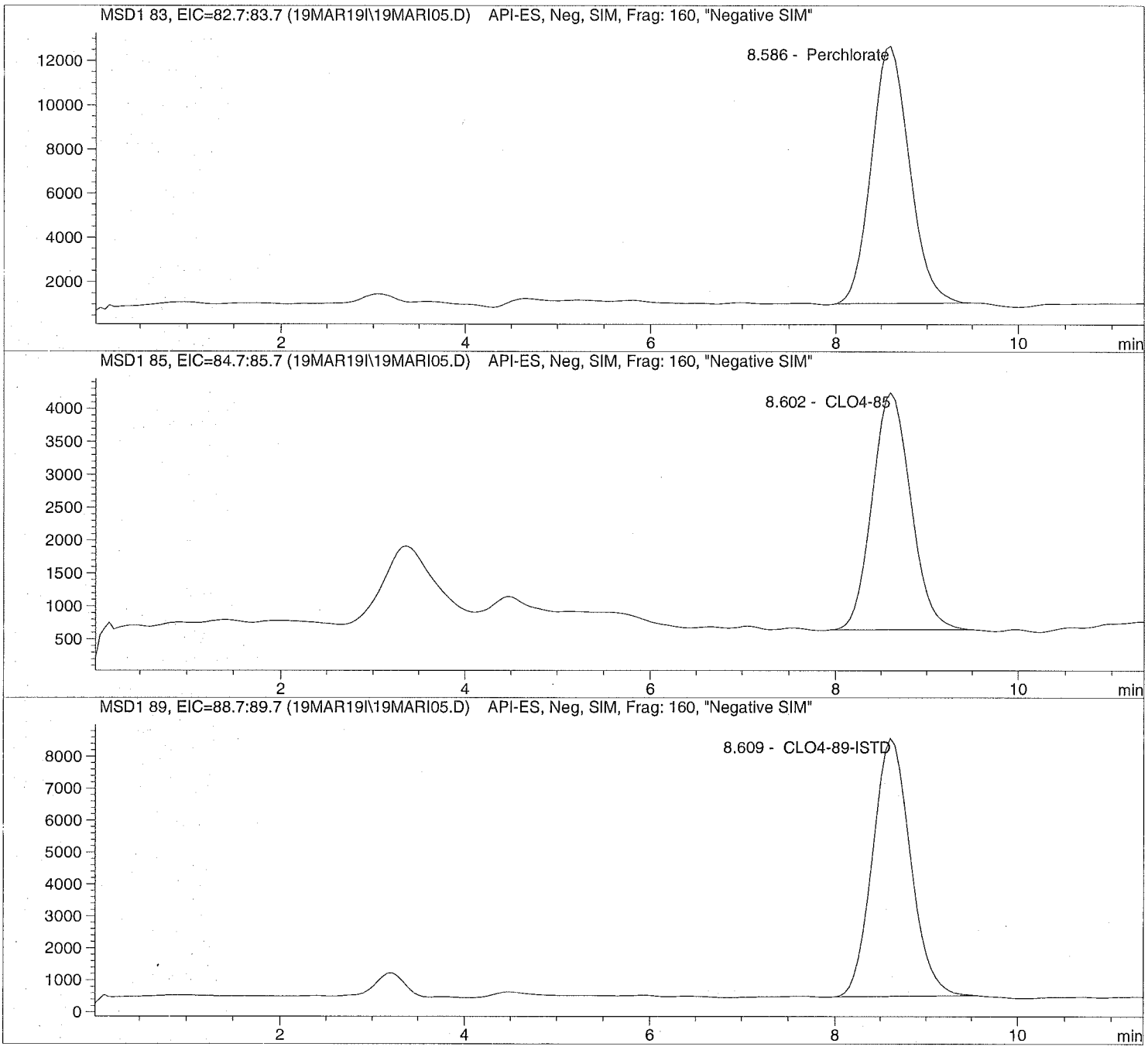
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

*** End of Report ***

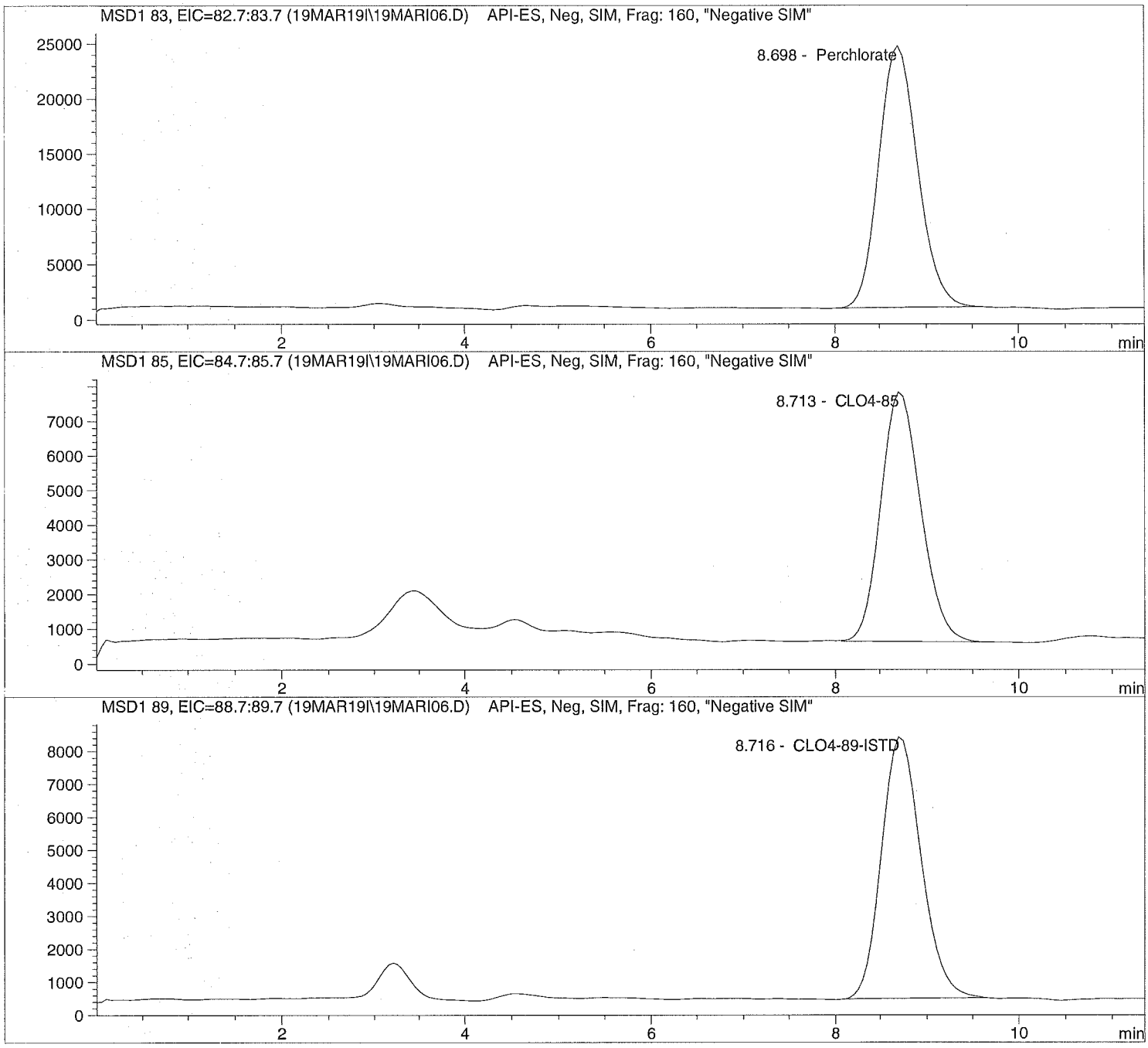
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

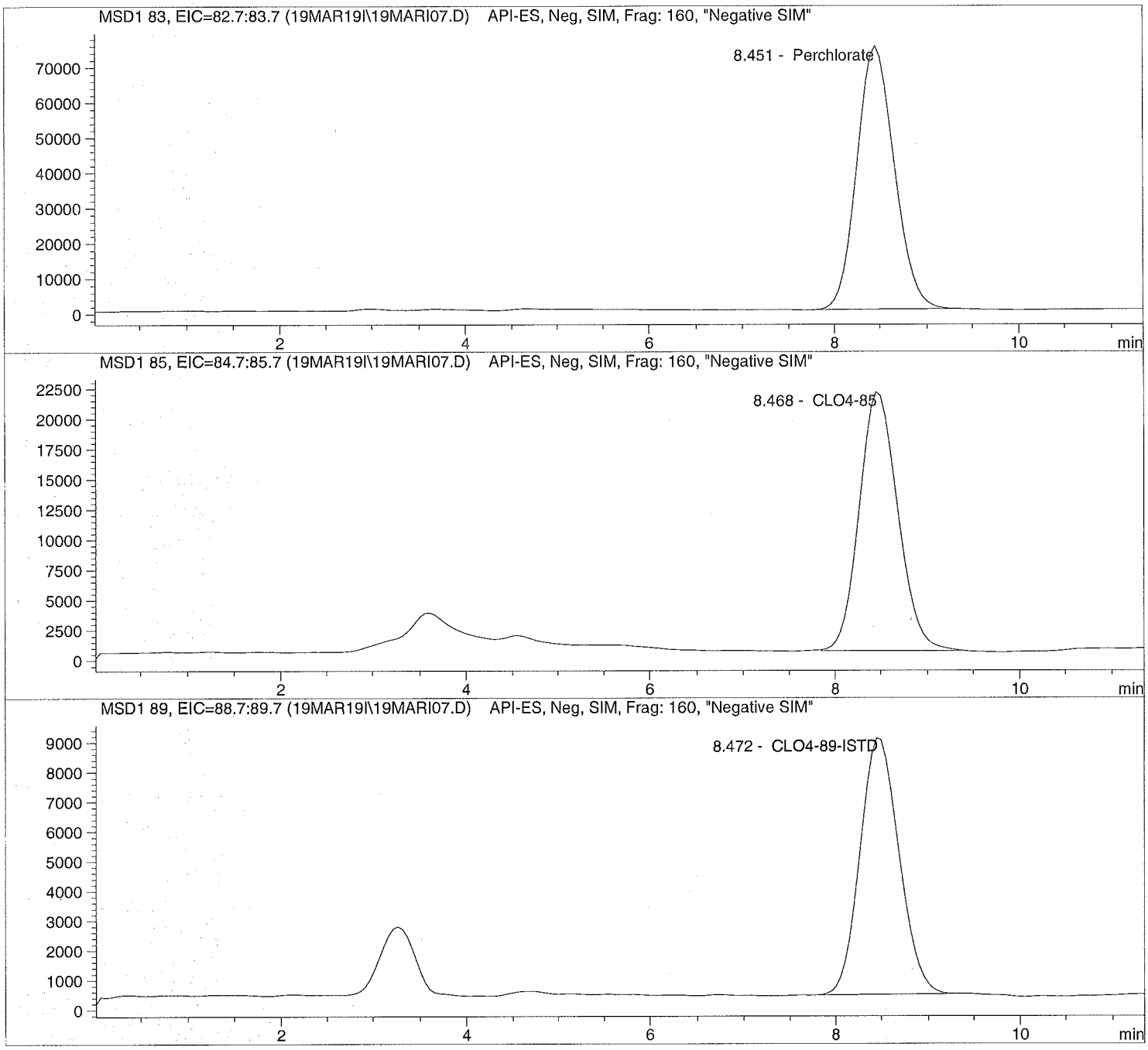
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

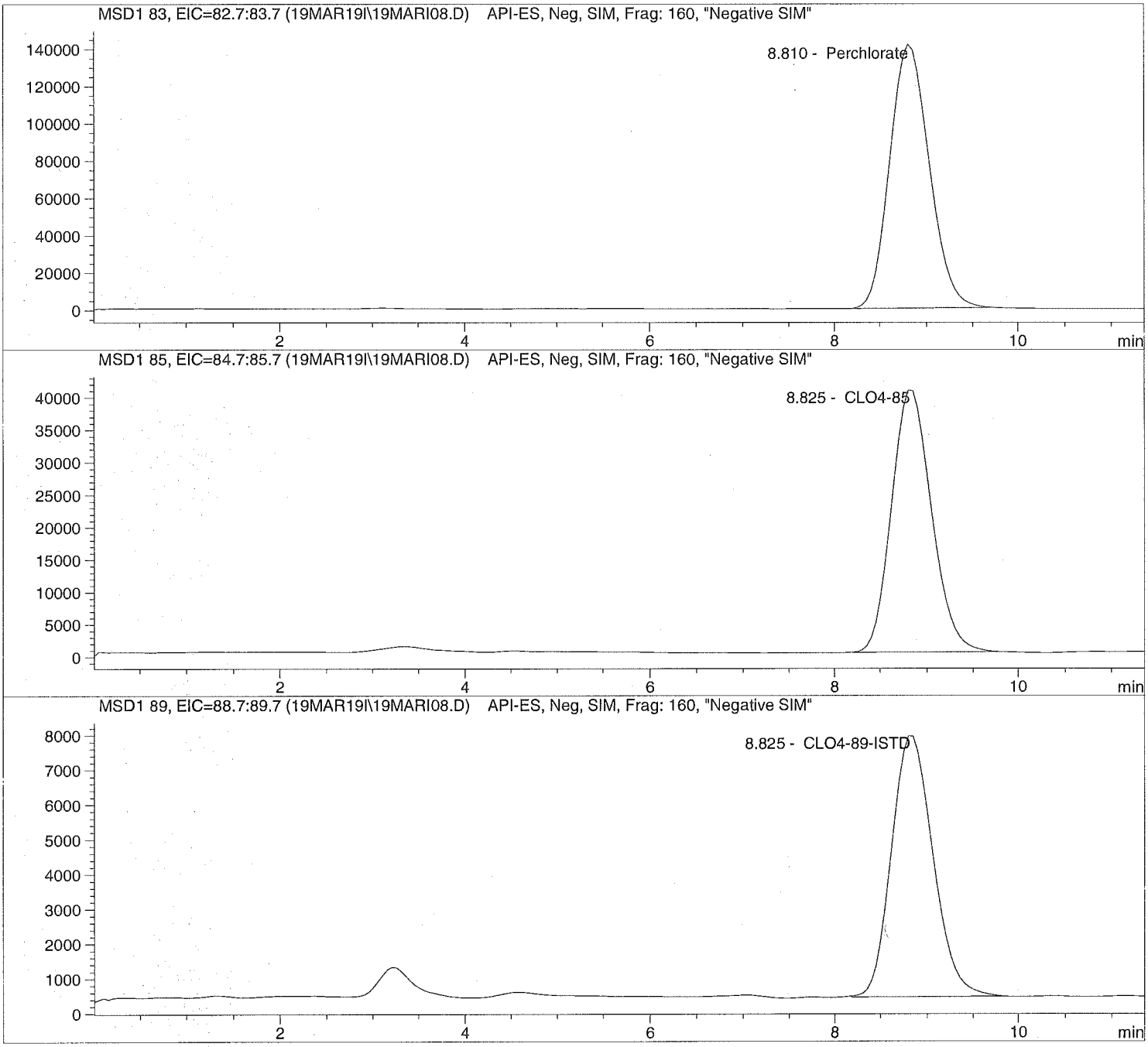
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

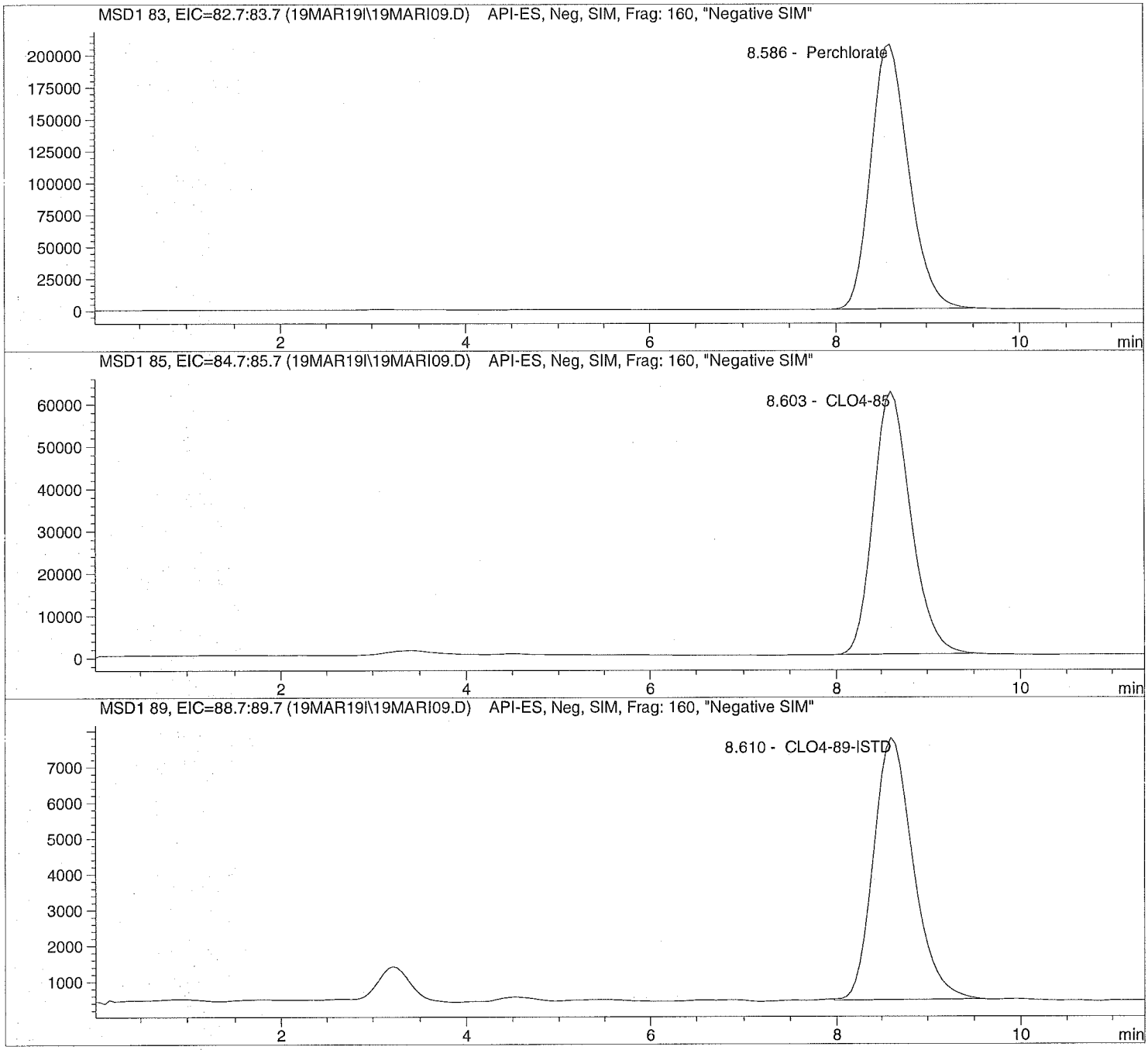
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

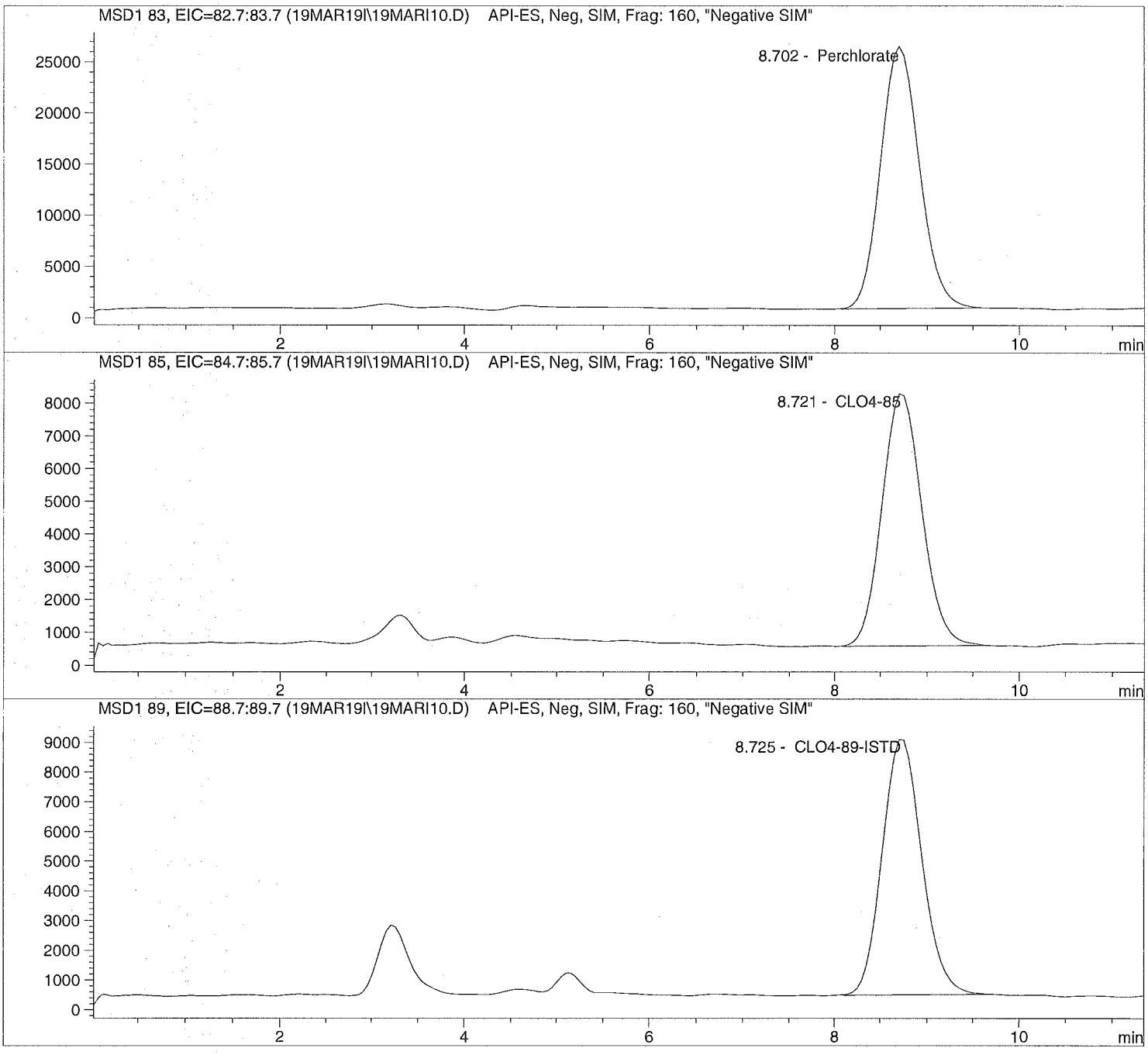
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

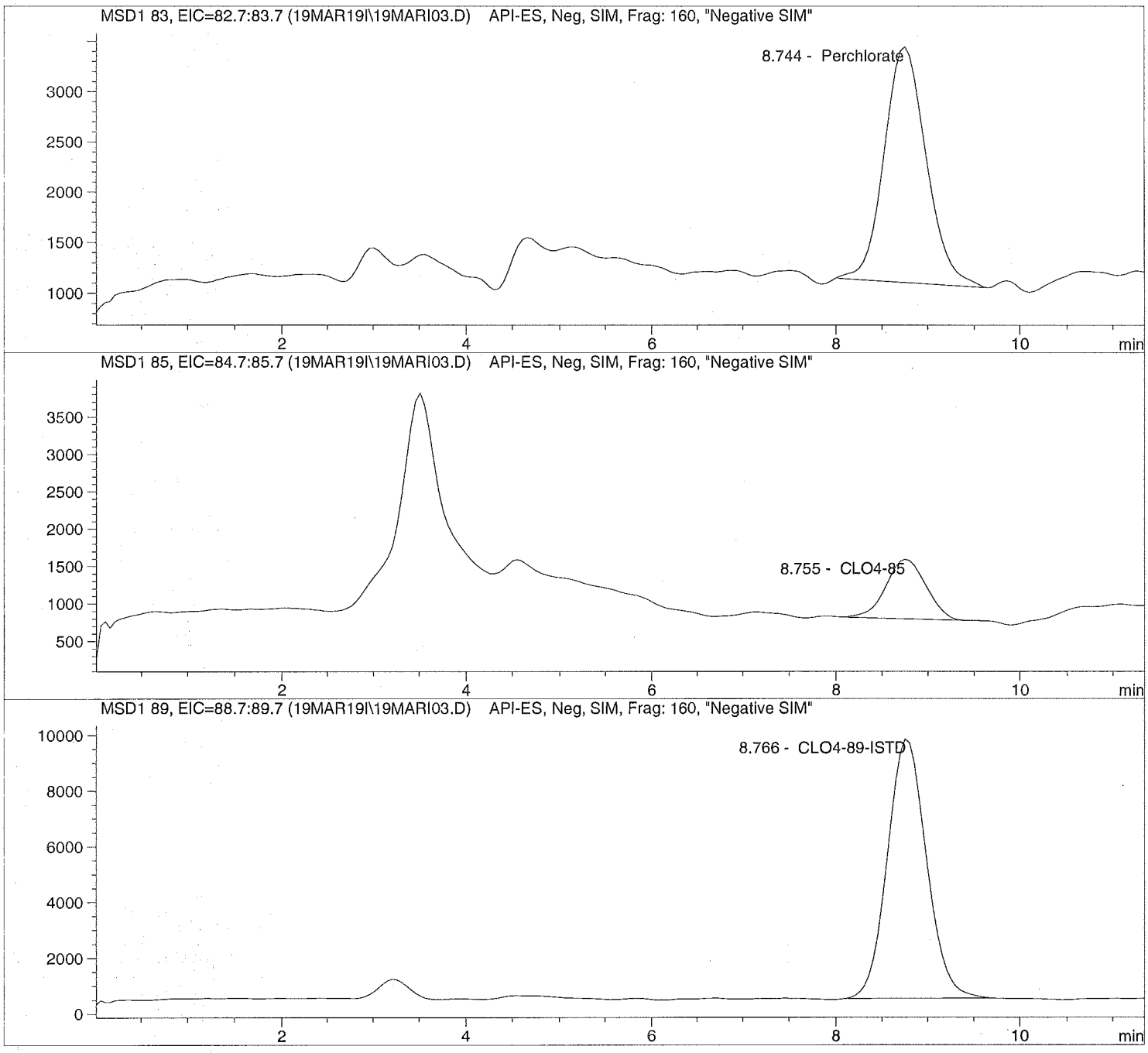
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

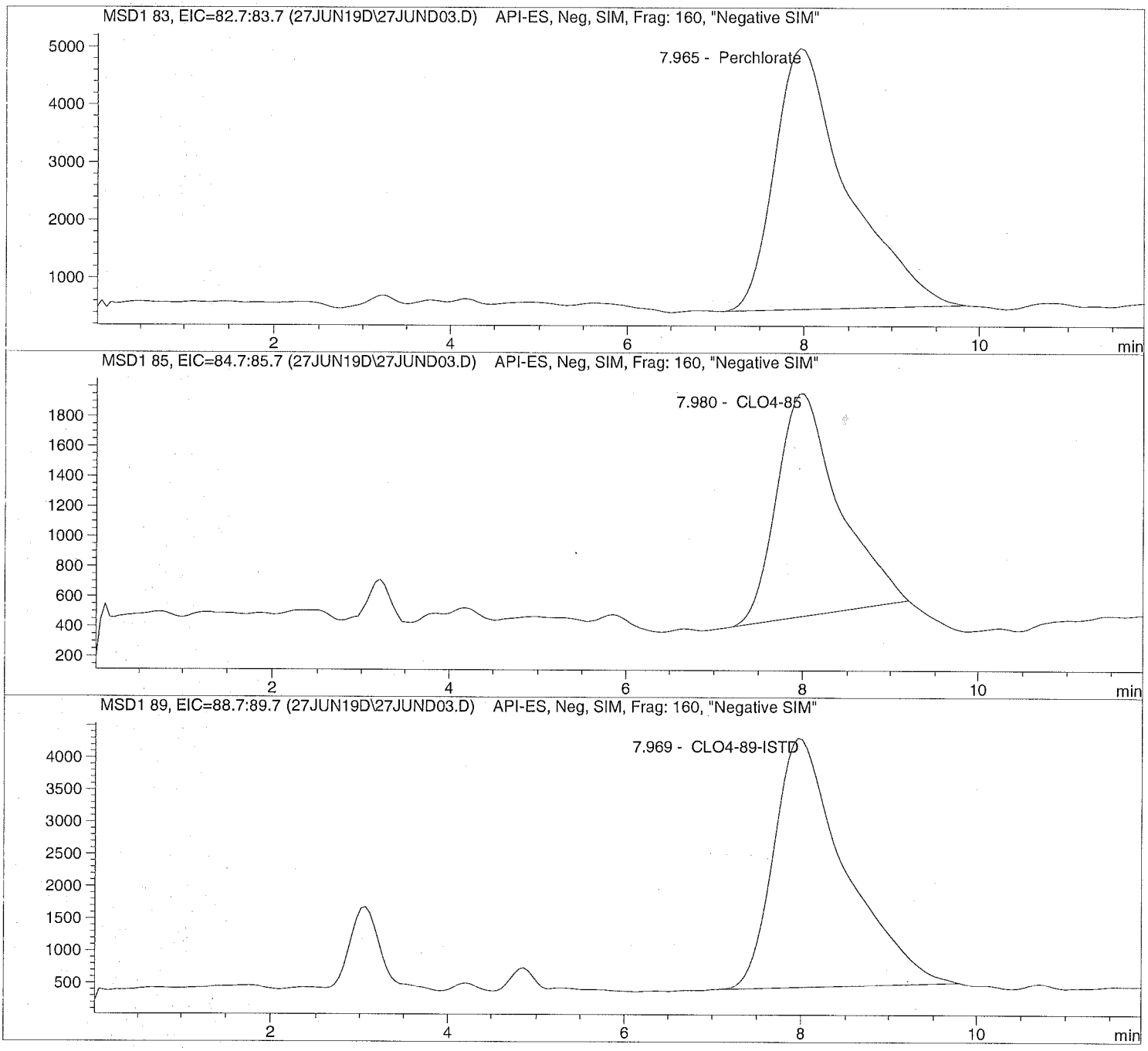
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.965	PBA	257330.2	3.9251	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.980	PBA	71973.3	3.5682	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.969	BBA	216232.2	5.0000	CLO4-89-ISTD

*** End of Report ***

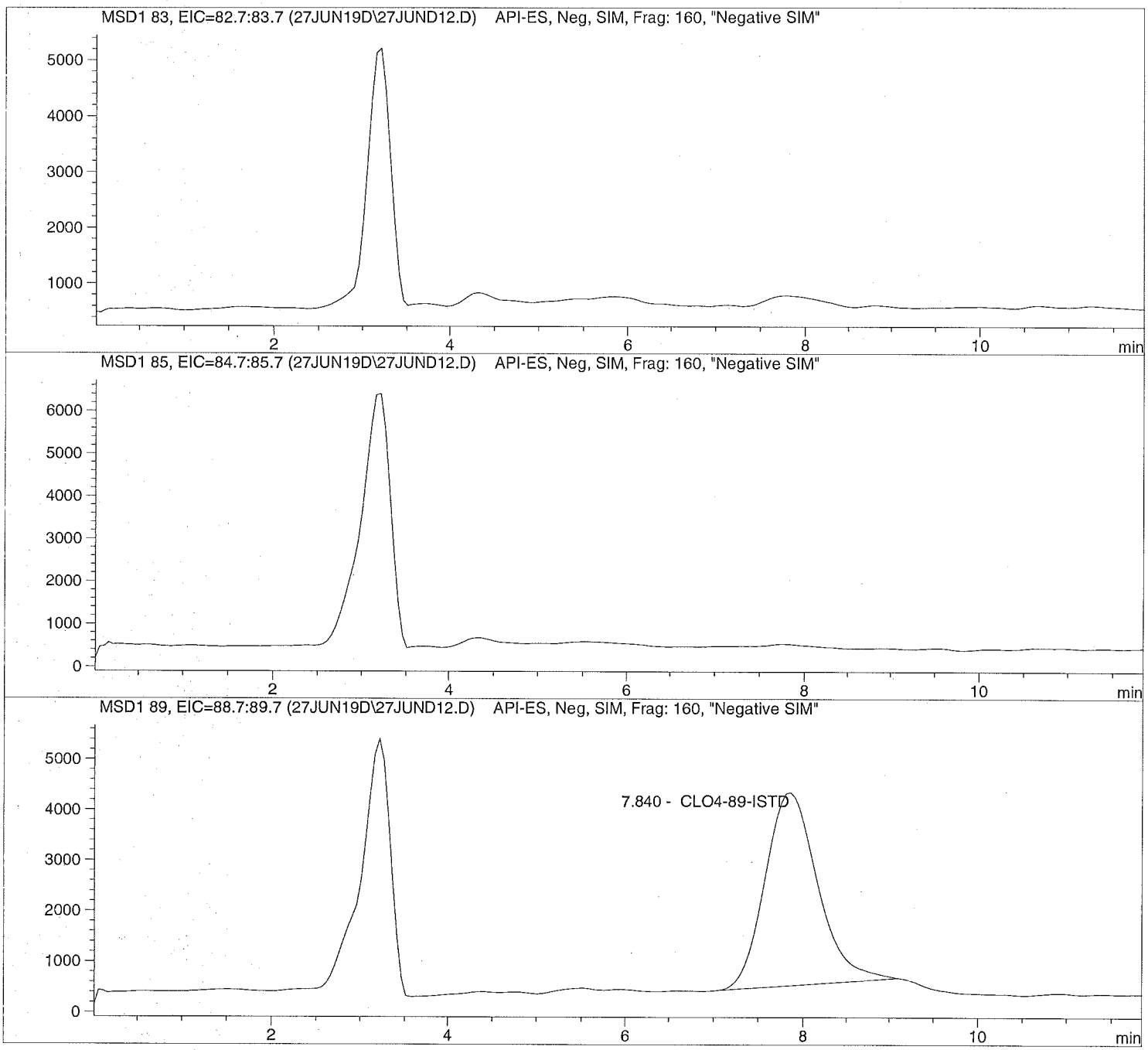
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.840	PBA	156379.6	5.0000	CLO4-89-ISTD

*** End of Report ***

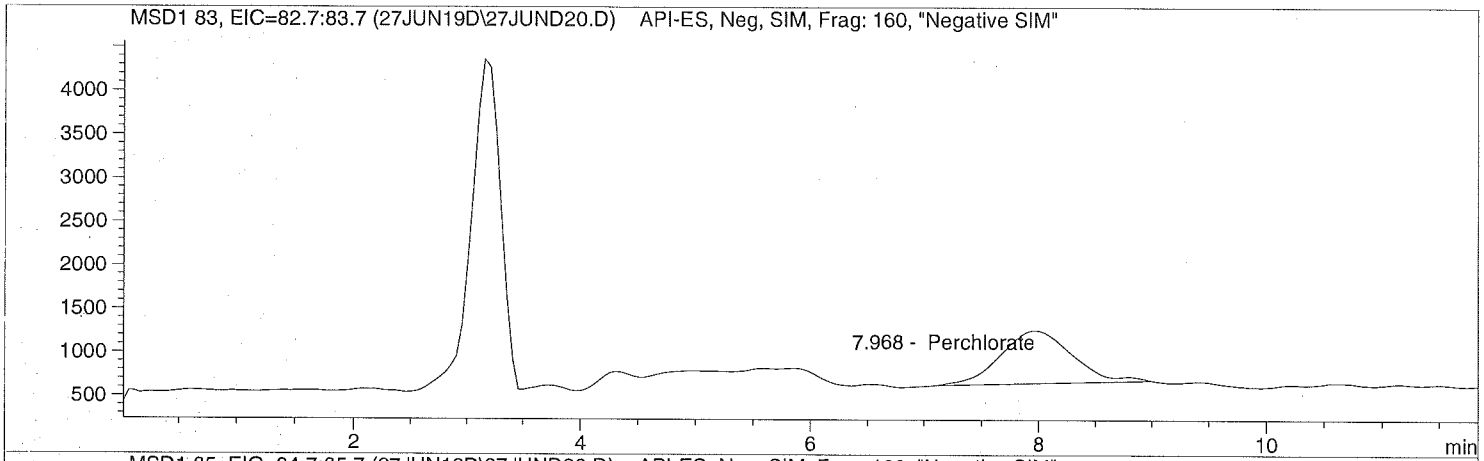
RIGHT SOLUTIONS | RIGHT PARTNER

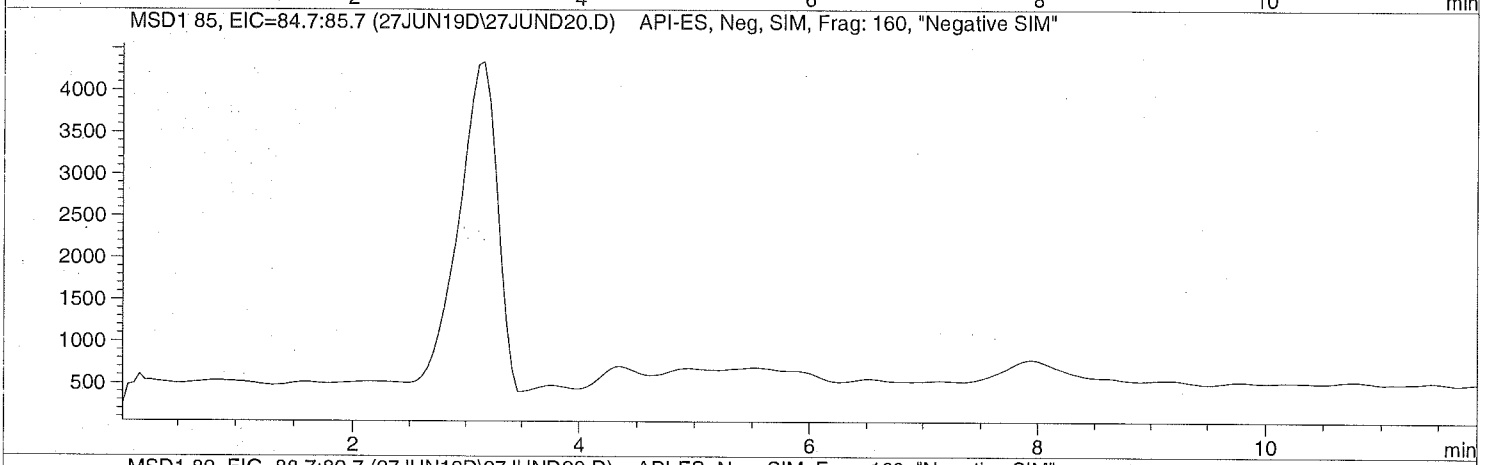
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

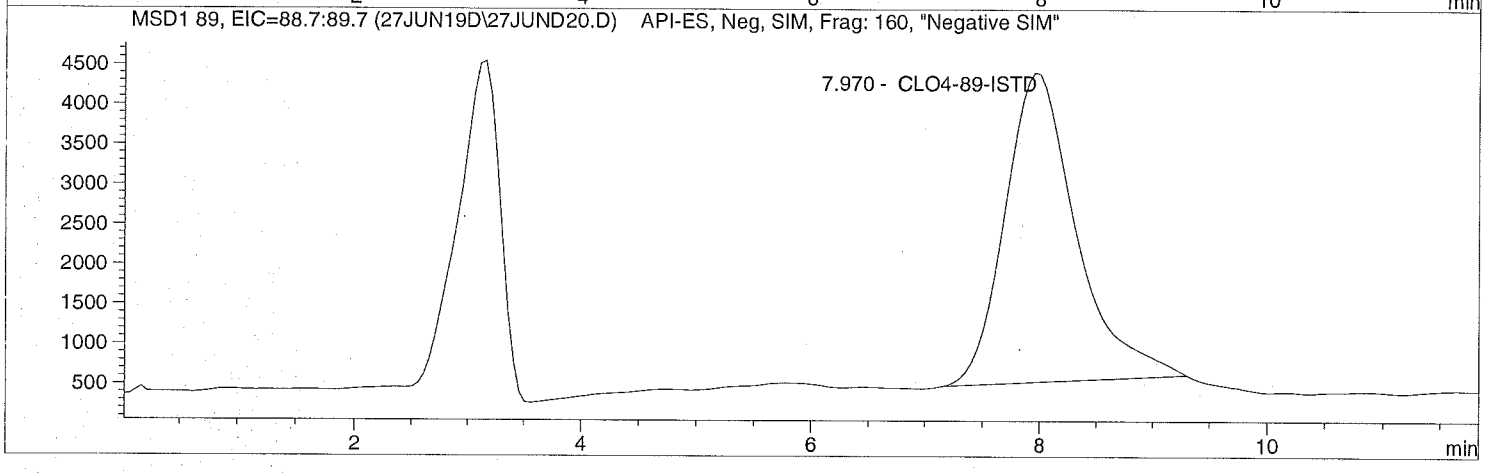
Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.968	PBA	26504.7	0.6583	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.970	PBA	168729.9	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19060835

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060835-01	18CPTMW22SW_061319	Groundwater		13-Jun-2019 10:30	14-Jun-2019 08:45	☐
HS19060835-02	18CPTMW22DW_061319	Groundwater		13-Jun-2019 11:20	14-Jun-2019 08:45	☐
HS19060835-03	18CPTMW22R_061319	Groundwater		13-Jun-2019 12:10	14-Jun-2019 08:45	☐
HS19060835-04	MW20_061319	Groundwater		13-Jun-2019 12:55	14-Jun-2019 08:45	☐
HS19060835-05	18CPTMW26SW_061319	Groundwater		13-Jun-2019 13:45	14-Jun-2019 08:45	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19060835

Work Order Comments

• Revised to correct the reporting limit for Mercury

Work Order Comments

• The analyses for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final Report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142169

Sample ID: LCSD-142169

• LCS/LCSD RPD recovered above the RPD limit. The individual recoveries met acceptance criteria (Surrogate 4-Terphenyl-d14)

GCMS Volatiles by Method SW8260

Batch ID: R341453

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 142427

Sample ID: HS19060986-04MS

• MS and MSD are for an unrelated sample

Metals by Method SW7470

Batch ID: 142083

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22SW_061319
Collection Date: 13-Jun-2019 10:30

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 11:35
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 11:35
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 11:35
Acetone	**3.4**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 11:35
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 11:35
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22SW_061319
Collection Date: 13-Jun-2019 10:30

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 11:35
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 11:35
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 11:35
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:35
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:35
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 11:35*
Surr: 4-Bromofluorobenzene	*96.9*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 11:35*
Surr: Dibromofluoromethane	*95.2*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 11:35*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 11:35*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.95**		**0.050**	**0.050**	**0.050**	**ug/L**	5	27-Jun-2019 18:04
Surr: 2-Fluorobiphenyl	*55.3*			**0**	*40-140*	*%REC*	*5*	*27-Jun-2019 18:04*
Surr: 4-Terphenyl-d14	*63.1*			**0**	*40-140*	*%REC*	*5*	*27-Jun-2019 18:04*
Surr: Nitrobenzene-d5	*55.7*			**0**	*40-140*	*%REC*	*5*	*27-Jun-2019 18:04*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22SW_061319
Collection Date: 13-Jun-2019 10:30

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.284**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:30
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:30
Arsenic	**0.00358**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:30
Barium	**0.0799**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:30
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:29
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:30
Calcium	**24.5**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:30
Chromium	**0.0486**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:30
Cobalt	0.000500	U	0.000100	0.000500	0.00500	mg/L	1	27-Jun-2019 17:30
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 17:30
Iron	**0.0723**	J	**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:30
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 17:30
Magnesium	**2.20**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:30
Manganese	**0.0223**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:30
Nickel	**0.00100**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:30
Potassium	**379**		**0.180**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:20
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:30
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:30
Sodium	**313**		**0.140**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:20
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:30
Vanadium	**0.00200**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:30
Zinc	**0.0294**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:30
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 17-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	17-Jun-2019 15:18
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22DW_061319
Collection Date: 13-Jun-2019 11:20

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 11:59
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 11:59
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 11:59
Acetone	**2.8**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 11:59
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 11:59
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19060835
Sample ID: 18CPTMW22DW_061319 Lab ID:HS19060835-02
Collection Date: 13-Jun-2019 11:20 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 11:59
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 11:59
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 11:59
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 11:59
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 11:59
Surr: 1,2-Dichloroethane-d4	*99.9*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 11:59*
Surr: 4-Bromofluorobenzene	*95.4*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 11:59*
Surr: Dibromofluoromethane	*93.7*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 11:59*
Surr: Toluene-d8	*99.1*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 11:59*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.15**		**0.010**	**0.010**	**0.010**	**ug/L**	1	27-Jun-2019 12:53
Surr: 2-Fluorobiphenyl	*78.9*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 12:53*
Surr: 4-Terphenyl-d14	*90.0*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 12:53*
Surr: Nitrobenzene-d5	*110*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 12:53*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22DW_061319
Collection Date: 13-Jun-2019 11:20

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.133**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:32
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:32
Arsenic	**0.00316**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
Barium	**0.0930**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:32
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:32
Calcium	**12.4**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:32
Chromium	**0.000531**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
Cobalt	**0.000402**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 17:32
Iron	**0.832**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:32
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 17:32
Magnesium	**6.18**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:32
Manganese	**0.0603**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
Nickel	**0.000918**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
Potassium	**2.85**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:32
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:32
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:32
Sodium	**234**		**0.140**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:31
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:32
Vanadium	**0.00216**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
Zinc	**0.0220**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:32
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 17-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	17-Jun-2019 18:42
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22R_061319
Collection Date: 13-Jun-2019 12:10

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 12:23
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 12:23
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 12:23
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 12:23
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 12:23
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19060835
Sample ID: 18CPTMW22R_061319 Lab ID:HS19060835-03
Collection Date: 13-Jun-2019 12:10 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 12:23
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 12:23
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 12:23
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:23
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:23
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 12:23*
Surr: 4-Bromofluorobenzene	*95.6*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 12:23*
Surr: Dibromofluoromethane	*95.4*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 12:23*
Surr: Toluene-d8	*98.0*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 12:23*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	27-Jun-2019 13:13
Surr: 2-Fluorobiphenyl	*81.2*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 13:13*
Surr: 4-Terphenyl-d14	*115*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 13:13*
Surr: Nitrobenzene-d5	*108*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 13:13*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW22R_061319
Collection Date: 13-Jun-2019 12:10

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**1.54**		**0.0180**	**0.0500**	**0.100**	**mg/L**	10	28-Jun-2019 15:33
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:34
Arsenic	**0.00317**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Barium	**0.0493**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Beryllium	**0.000337**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 17:34
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:34
Calcium	**0.683**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:34
Chromium	**0.00400**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Cobalt	**0.00659**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Copper	**0.00172**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Iron	**2.90**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:34
Lead	**0.000894**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Magnesium	**0.800**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:34
Manganese	**0.0807**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Nickel	**0.00370**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Potassium	**0.542**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:34
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:34
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:34
Sodium	**20.8**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:34
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:34
Vanadium	**0.00954**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
Zinc	**0.0183**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:34
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 17-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	17-Jun-2019 18:44
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW20_061319
Collection Date: 13-Jun-2019 12:55

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 12:47
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 12:47
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 12:47
Acetone	**2.1**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 12:47
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 12:47
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW20_061319
Collection Date: 13-Jun-2019 12:55

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 12:47
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 12:47
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 12:47
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 12:47
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 12:47
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 12:47*
Surr: 4-Bromofluorobenzene	*96.9*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 12:47*
Surr: Dibromofluoromethane	*97.9*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 12:47*
Surr: Toluene-d8	*99.3*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 12:47*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW20_061319
Collection Date: 13-Jun-2019 12:55

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**1.12**		**0.0180**	**0.0500**	**0.100**	**mg/L**	10	28-Jun-2019 15:34
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:35
Arsenic	**0.00104**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Barium	**0.479**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:35
Cadmium	**0.000359**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 17:35
Calcium	**44.7**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 17:35
Chromium	**0.0188**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Cobalt	**0.0154**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Copper	**0.00576**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Iron	**3.14**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:35
Lead	**0.00155**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Magnesium	**12.5**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:35
Manganese	**0.274**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Nickel	**0.540**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Potassium	**0.862**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:35
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:35
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:35
Sodium	**48.6**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:35
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:35
Vanadium	**0.00507**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
Zinc	**0.102**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:35
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 17-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	17-Jun-2019 18:45
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW26SW_061319
Collection Date: 13-Jun-2019 13:45

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 13:11
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 13:11
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 13:11
Acetone	**4.2**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 13:11
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 13:11
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW26SW_061319
Collection Date: 13-Jun-2019 13:45

ANALYTICAL REPORT
WorkOrder:HS19060835
Lab ID:HS19060835-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 13:11
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 13:11
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 13:11
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:11
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:11
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 13:11*
Surr: 4-Bromofluorobenzene	*96.8*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 13:11*
Surr: Dibromofluoromethane	*97.1*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 13:11*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 13:11*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.024**		**0.010**	**0.010**	**0.010**	**ug/L**	1	27-Jun-2019 13:34
Surr: 2-Fluorobiphenyl	*83.1*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 13:34*
Surr: 4-Terphenyl-d14	*103*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 13:34*
Surr: Nitrobenzene-d5	*102*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 13:34*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	03-Jul-2019 09:32

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

Batch ID: 142083 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060835-01	1	10 (mL)	10 (mL)	1
HS19060835-02	1	10 (mL)	10 (mL)	1
HS19060835-03	1	10 (mL)	10 (mL)	1
HS19060835-04	1	10 (mL)	10 (mL)	1

Batch ID: 142169 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060835-01	1	1000	1 (mL)	0.001
HS19060835-02	1	1000	1 (mL)	0.001
HS19060835-03	1	1000	1 (mL)	0.001
HS19060835-05	1	1000	1 (mL)	0.001

Batch ID: 142427 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060835-01	1	10	10 (mL)	1
HS19060835-02	1	10	10 (mL)	1
HS19060835-03	1	10	10 (mL)	1
HS19060835-04	1	10	10 (mL)	1

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142083 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19060835-01	18CPTMW22SW_061319	13 Jun 2019 10:30		17 Jun 2019 11:00	17 Jun 2019 15:18	1
HS19060835-02	18CPTMW22DW_061319	13 Jun 2019 11:20		17 Jun 2019 11:00	17 Jun 2019 18:42	1
HS19060835-03	18CPTMW22R_061319	13 Jun 2019 12:10		17 Jun 2019 11:00	17 Jun 2019 18:44	1
HS19060835-04	MW20_061319	13 Jun 2019 12:55		17 Jun 2019 11:00	17 Jun 2019 18:45	1
Batch ID: 142169 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Groundwater	
HS19060835-01	18CPTMW22SW_061319	13 Jun 2019 10:30		19 Jun 2019 09:21	27 Jun 2019 18:04	5
HS19060835-02	18CPTMW22DW_061319	13 Jun 2019 11:20		19 Jun 2019 09:21	27 Jun 2019 12:53	1
HS19060835-03	18CPTMW22R_061319	13 Jun 2019 12:10		19 Jun 2019 09:21	27 Jun 2019 13:13	1
HS19060835-05	18CPTMW26SW_061319	13 Jun 2019 13:45		19 Jun 2019 09:21	27 Jun 2019 13:34	1
Batch ID: 142427 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19060835-01	18CPTMW22SW_061319	13 Jun 2019 10:30		25 Jun 2019 11:30	28 Jun 2019 15:29	1
HS19060835-01	18CPTMW22SW_061319	13 Jun 2019 10:30		25 Jun 2019 11:30	28 Jun 2019 15:20	10
HS19060835-01	18CPTMW22SW_061319	13 Jun 2019 10:30		25 Jun 2019 11:30	27 Jun 2019 17:30	1
HS19060835-02	18CPTMW22DW_061319	13 Jun 2019 11:20		25 Jun 2019 11:30	28 Jun 2019 15:31	10
HS19060835-02	18CPTMW22DW_061319	13 Jun 2019 11:20		25 Jun 2019 11:30	27 Jun 2019 17:32	1
HS19060835-03	18CPTMW22R_061319	13 Jun 2019 12:10		25 Jun 2019 11:30	28 Jun 2019 15:33	10
HS19060835-03	18CPTMW22R_061319	13 Jun 2019 12:10		25 Jun 2019 11:30	27 Jun 2019 17:34	1
HS19060835-04	MW20_061319	13 Jun 2019 12:55		25 Jun 2019 11:30	28 Jun 2019 15:34	10
HS19060835-04	MW20_061319	13 Jun 2019 12:55		25 Jun 2019 11:30	27 Jun 2019 17:35	1
Batch ID: R341453 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19060835-01	18CPTMW22SW_061319	13 Jun 2019 10:30			27 Jun 2019 11:35	1
HS19060835-02	18CPTMW22DW_061319	13 Jun 2019 11:20			27 Jun 2019 11:59	1
HS19060835-03	18CPTMW22R_061319	13 Jun 2019 12:10			27 Jun 2019 12:23	1
HS19060835-04	MW20_061319	13 Jun 2019 12:55			27 Jun 2019 12:47	1
HS19060835-05	18CPTMW26SW_061319	13 Jun 2019 13:45			27 Jun 2019 13:11	1
Batch ID: R341759 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19060835-01	18CPTMW22SW_061319	13 Jun 2019 10:30			03 Jul 2019 09:32	1
HS19060835-02	18CPTMW22DW_061319	13 Jun 2019 11:20			03 Jul 2019 09:32	1
HS19060835-03	18CPTMW22R_061319	13 Jun 2019 12:10			03 Jul 2019 09:32	1
HS19060835-04	MW20_061319	13 Jun 2019 12:55			03 Jul 2019 09:32	1
HS19060835-05	18CPTMW26SW_061319	13 Jun 2019 13:45			03 Jul 2019 09:32	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142083 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142083** Units: **mg/L** Analysis Date: **17-Jun-2019 15:15**
Client ID: Run ID: **HG03_340651** SeqNo: **5125721** PrepDate: **17-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142083** Units: **mg/L** Analysis Date: **17-Jun-2019 15:16**
Client ID: Run ID: **HG03_340651** SeqNo: **5125722** PrepDate: **17-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00486	0.000200	0.005	0	97.2	80 - 120				

MS Sample ID: **HS19060835-01MS** Units: **mg/L** Analysis Date: **17-Jun-2019 15:21**
Client ID: **18CPTMW22SW_061319** Run ID: **HG03_340651** SeqNo: **5125724** PrepDate: **17-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000512	0.000000200	5e-006	0.0000000360	102	75 - 125				

MSD Sample ID: **HS19060835-01MSD** Units: **mg/L** Analysis Date: **17-Jun-2019 15:23**
Client ID: **18CPTMW22SW_061319** Run ID: **HG03_340651** SeqNo: **5125725** PrepDate: **17-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000539	0.000000200	5e-006	0.0000000360	107	75 - 125	0.000005120	5.14	20	

The following samples were analyzed in this batch: HS19060835-01 HS19060835-02 HS19060835-03 HS19060835-04

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 17:22**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145221** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002457	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.001932	0.00500								J
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.02437	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.001051	0.00500								J
Zinc	0.00200	0.00500								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 16:58**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145214** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1091	0.0100	0.1	0	109	84 - 117				
Antimony	0.0559	0.00500	0.05	0	112	85 - 117				
Arsenic	0.05618	0.00500	0.05	0	112	84 - 116				
Barium	0.05364	0.00500	0.05	0	107	86 - 114				
Beryllium	0.05694	0.00200	0.05	0	114	83 - 121				
Cadmium	0.05632	0.00200	0.05	0	113	87 - 115				
Calcium	5.323	0.500	5	0	106	87 - 118				
Chromium	0.05591	0.00500	0.05	0	112	85 - 116				
Cobalt	0.05561	0.00500	0.05	0	111	86 - 115				
Copper	0.05732	0.00500	0.05	0	115	85 - 118				
Iron	5.504	0.200	5	0	110	87 - 118				
Lead	0.05401	0.00500	0.05	0	108	88 - 115				
Magnesium	5.42	0.200	5	0	108	83 - 118				
Manganese	0.05651	0.00500	0.05	0	113	87 - 115				
Nickel	0.05699	0.00500	0.05	0	114	85 - 117				
Potassium	5.366	0.200	5	0	107	87 - 115				
Selenium	0.05781	0.00500	0.05	0	116	80 - 120				
Silver	0.05393	0.00500	0.05	0	108	85 - 116				
Sodium	5.418	0.200	5	0	108	85 - 117				
Thallium	0.05098	0.00200	0.05	0	102	82 - 116				
Vanadium	0.05441	0.00500	0.05	0	109	86 - 115				
Zinc	0.05821	0.00500	0.05	0	116	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19060986-04MS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:03**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145217** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.116	0.0100	0.1	0.01515	101	84 - 117				
Antimony	0.05308	0.00500	0.05	0.000258	106	85 - 117				
Arsenic	0.05627	0.00500	0.05	0.002036	108	84 - 116				
Barium	0.8428	0.00500	0.05	0.8565	-27.4	86 - 114				SO
Beryllium	0.05294	0.00200	0.05	0.000048	106	83 - 121				
Cadmium	0.05116	0.00200	0.05	0.000205	102	87 - 115				
Calcium	35.9	0.500	5	33.03	57.3	87 - 118				SO
Chromium	0.3735	0.00500	0.05	0.2809	185	85 - 116				SO
Cobalt	0.0563	0.00500	0.05	0.005607	101	86 - 115				
Copper	0.058	0.00500	0.05	0.005199	106	85 - 118				
Iron	7.669	0.200	5	2.556	102	87 - 118				
Lead	0.05089	0.00500	0.05	0.000094	102	88 - 115				
Magnesium	31.26	0.200	5	27.76	69.9	83 - 118				SO
Manganese	0.2154	0.00500	0.05	0.164	103	87 - 115				
Nickel	0.2401	0.00500	0.05	0.2011	78.0	85 - 117				SO
Potassium	7.654	0.200	5	2.639	100	87 - 115				
Selenium	0.05384	0.00500	0.05	0.000343	107	80 - 120				
Silver	0.04654	0.00500	0.05	0.000013	93.1	85 - 116				
Sodium	233.3	0.200	5	245	-233	85 - 117				SEO
Thallium	0.04975	0.00200	0.05	0.000043	99.4	82 - 116				
Vanadium	0.0572	0.00500	0.05	0.003781	107	86 - 115				
Zinc	0.07874	0.00500	0.05	0.03582	85.8	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:05**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145218** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1062	0.0100	0.1	0.01515	91.1	84 - 117	0.116	8.82	20	
Antimony	0.04965	0.00500	0.05	0.000258	98.8	85 - 117	0.05308	6.66	20	
Arsenic	0.05281	0.00500	0.05	0.002036	102	84 - 116	0.05627	6.34	20	
Barium	0.8139	0.00500	0.05	0.8565	-85.2	86 - 114	0.8428	3.49	20	SO
Beryllium	0.05024	0.00200	0.05	0.000048	100	83 - 121	0.05294	5.24	20	
Cadmium	0.04833	0.00200	0.05	0.000205	96.2	87 - 115	0.05116	5.7	20	
Calcium	33.36	0.500	5	33.03	6.56	87 - 118	35.9	7.33	20	SO
Cobalt	0.0531	0.00500	0.05	0.005607	95.0	86 - 115	0.0563	5.85	20	
Copper	0.05342	0.00500	0.05	0.005199	96.4	85 - 118	0.058	8.23	20	
Iron	7.023	0.200	5	2.556	89.3	87 - 118	7.669	8.8	20	
Lead	0.04808	0.00500	0.05	0.000094	96.0	88 - 115	0.05089	5.67	20	
Magnesium	28.94	0.200	5	27.76	23.5	83 - 118	31.26	7.71	20	SO
Manganese	0.1904	0.00500	0.05	0.164	52.8	87 - 115	0.2154	12.4	20	S
Nickel	0.2255	0.00500	0.05	0.2011	48.7	85 - 117	0.2401	6.29	20	SO
Potassium	7.309	0.200	5	2.639	93.4	87 - 115	7.654	4.62	20	
Selenium	0.05051	0.00500	0.05	0.000343	100	80 - 120	0.05384	6.37	20	
Silver	0.04575	0.00500	0.05	0.000013	91.5	85 - 116	0.04654	1.71	20	
Sodium	224.6	0.200	5	245	-407	85 - 117	233.3	3.8	20	SEO
Thallium	0.04905	0.00200	0.05	0.000043	98.0	82 - 116	0.04975	1.42	20	
Vanadium	0.05284	0.00500	0.05	0.003781	98.1	86 - 115	0.0572	7.93	20	
Zinc	0.08005	0.00500	0.05	0.03582	88.5	83 - 119	0.07874	1.66	20	

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:07**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145651** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium	0.343	0.00500	0.05	0.2809	124	85 - 116	0.3735	8.51	20	SO

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:07**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145219** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1008	0.0100	0.1	0.01515	85.7	80 - 120				
Antimony	0.08752	0.00500	0.1	0.000258	87.3	80 - 120				
Arsenic	0.09313	0.00500	0.1	0.002036	91.1	80 - 120				
Beryllium	0.09784	0.00200	0.1	0.000048	97.8	80 - 120				
Cadmium	0.09096	0.00200	0.1	0.000205	90.8	80 - 120				
Cobalt	0.09093	0.00500	0.1	0.005607	85.3	80 - 120				
Copper	0.09101	0.00500	0.1	0.005199	85.8	80 - 120				
Iron	10.93	0.200	10	2.556	83.8	80 - 120				
Lead	0.09017	0.00500	0.1	0.000094	90.1	80 - 120				
Potassium	11.36	0.200	10	2.639	87.2	80 - 120				
Selenium	0.09025	0.00500	0.1	0.000343	89.9	80 - 120				
Silver	0.08464	0.00500	0.1	0.000013	84.6	80 - 120				
Thallium	0.08892	0.00200	0.1	0.000043	88.9	80 - 120				
Vanadium	0.09309	0.00500	0.1	0.003781	89.3	80 - 120				
Zinc	0.1183	0.00500	0.1	0.03582	82.5	80 - 120				

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **28-Jun-2019 15:14**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145655** PrepDate: **25-Jun-2019** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	1.703	0.0500	1	0.7	100	80 - 120				
Calcium	129.7	5.00	100	26.89	103	80 - 120				
Chromium	1.283	0.0500	1	0.2283	105	80 - 120				
Iron	107.4	2.00	100	2.151	105	80 - 120				
Magnesium	125.2	2.00	100	22.92	102	80 - 120				
Manganese	1.175	0.0500	1	0.1367	104	80 - 120				
Nickel	1.217	0.0500	1	0.1678	105	80 - 120				
Potassium	106.9	2.00	100	2.16	105	80 - 120				
Sodium	299.8	2.00	100	202.9	96.9	80 - 120				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:02**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145216** PrepDate: **25-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.01988	0.0500					0.01515	0	10	J
Antimony	0.00250	0.0250					0.000258	0	10	U
Arsenic	0.002183	0.0250					0.002036	0	10	J
Beryllium	0.00250	0.0100					0.000048	0	10	U
Cadmium	0.00250	0.0100					0.000205	0	10	U
Cobalt	0.004619	0.0250					0.005607	0	10	J
Copper	0.00500	0.0250					0.005199	0	10	U
Lead	0.00500	0.0250					0.000094	0	10	U
Selenium	0.0125	0.0250					0.000343	0	10	U
Silver	0.00250	0.0250					0.000013	0	10	U
Thallium	0.00250	0.0100					0.000043	0	10	U
Vanadium	0.01164	0.0250					0.003781	0	10	J
Zinc	0.038	0.0250					0.03582	6.07	10	

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145654** PrepDate: **25-Jun-2019** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.6998	0.250					0.7	0.0306	10	
Calcium	27.1	25.0					26.89	0.761	10	
Chromium	0.234	0.250					0.2283	0	10	J
Iron	2.19	10.0					2.151	0	10	J
Magnesium	22.74	10.0					22.92	0.776	10	
Manganese	0.1567	0.250					0.1367	0	10	J
Nickel	0.1736	0.250					0.1678	0	10	J
Potassium	2.068	10.0					2.16	0	10	J
Sodium	207.1	10.0					202.9	2.06	10	

The following samples were analyzed in this batch: HS19060835-01 HS19060835-02 HS19060835-03 HS19060835-04

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: 142169 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 11:30**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145167** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.07589*	*0*	*0.08*	*0*	*94.9*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.09153*	*0*	*0.08*	*0*	*114*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.09043*	*0*	*0.08*	*0*	*113*	*40 - 140*				

LCS Sample ID: **LCS-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 11:51**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145168** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07581	0.010	0.08	0	94.8	40 - 140				
Surr: 2-Fluorobiphenyl	*0.0738*	*0*	*0.08*	*0*	*92.2*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.07856*	*0*	*0.08*	*0*	*98.2*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08245*	*0*	*0.08*	*0*	*103*	*40 - 140*				

LCSD Sample ID: **LCSD-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 12:11**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145169** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07894	0.010	0.08	0	98.7	40 - 140	0.07581	4.05	20	
Surr: 2-Fluorobiphenyl	*0.07855*	*0*	*0.08*	*0*	*98.2*	*40 - 140*	*0.0738*	*6.23*	*20*	
Surr: 4-Terphenyl-d14	*0.1075*	*0*	*0.08*	*0*	*134*	*40 - 140*	*0.07856*	*31.1*	*20*	R
Surr: Nitrobenzene-d5	*0.08954*	*0*	*0.08*	*0*	*112*	*40 - 140*	*0.08245*	*8.25*	*20*	

The following samples were analyzed in this batch: HS19060835-01 HS19060835-02 HS19060835-03 HS19060835-05

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 11:11**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144199** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 11:11**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144199** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*49.36*	*1.0*	*50*	*0*	*98.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.49*	*1.0*	*50*	*0*	*95.0*	*85 - 114*				
Surr: Dibromofluoromethane	*46.28*	*1.0*	*50*	*0*	*92.6*	*80 - 119*				
Surr: Toluene-d8	*49.04*	*1.0*	*50*	*0*	*98.1*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 10:23**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144198** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.77	1.0	20	0	93.8	78 - 124				
1,1,1-Trichloroethane	19.61	1.0	20	0	98.1	74 - 131				
1,1,2,2-Tetrachloroethane	20.69	1.0	20	0	103	71 - 121				
1,1,2-Trichloroethane	20.36	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.43	1.0	20	0	97.1	77 - 125				
1,1-Dichloroethene	19.6	1.0	20	0	98.0	71 - 131				
1,1-Dichloropropene	19.74	1.0	20	0	98.7	78 - 125				
1,2,3-Trichlorobenzene	23.06	1.0	20	0	115	69 - 129				
1,2,3-Trichloropropane	21.25	1.0	20	0	106	73 - 122				
1,2,4-Trichlorobenzene	20.84	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	18.56	1.0	20	0	92.8	76 - 124				
1,2-Dibromo-3-chloropropane	21.57	1.0	20	0	108	62 - 128				
1,2-Dibromoethane	19.54	1.0	20	0	97.7	77 - 121				
1,2-Dichlorobenzene	18.49	1.0	20	0	92.4	80 - 119				
1,2-Dichloroethane	18.7	1.0	20	0	93.5	73 - 128				
1,2-Dichloropropane	19.06	1.0	20	0	95.3	78 - 122				
1,3,5-Trimethylbenzene	18.18	1.0	20	0	90.9	75 - 124				
1,3-Dichlorobenzene	18.01	1.0	20	0	90.1	80 - 119				
1,3-Dichloropropane	19.83	1.0	20	0	99.1	80 - 119				
1,4-Dichlorobenzene	19.42	1.0	20	0	97.1	79 - 118				
2,2-Dichloropropane	20.55	1.0	20	0	103	60 - 139				
2-Butanone	45.99	2.0	40	0	115	56 - 143				
2-Chlorotoluene	19.68	1.0	20	0	98.4	79 - 122				
2-Hexanone	39.89	2.0	40	0	99.7	57 - 139				
4-Chlorotoluene	19.71	1.0	20	0	98.5	78 - 122				
4-Isopropyltoluene	18.53	1.0	20	0	92.6	77 - 127				
4-Methyl-2-pentanone	39.77	2.0	40	0	99.4	67 - 130				
Acetone	49.5	2.0	40	0	124	39 - 160				
Benzene	19.65	1.0	20	0	98.2	79 - 120				
Bromobenzene	17.92	1.0	20	0	89.6	80 - 120				
Bromochloromethane	18.73	1.0	20	0	93.7	78 - 123				
Bromodichloromethane	19.3	1.0	20	0	96.5	79 - 125				
Bromoform	19.68	1.0	20	0	98.4	66 - 130				
Bromomethane	21.59	1.0	20	0	108	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 10:23**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144198** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.73	2.0	40	0	89.3	64 - 133				
Carbon tetrachloride	19.41	1.0	20	0	97.0	72 - 136				
Chlorobenzene	18.46	1.0	20	0	92.3	82 - 118				
Chloroethane	20.98	1.0	20	0	105	60 - 138				
Chloroform	19.78	1.0	20	0	98.9	79 - 124				
Chloromethane	18.51	1.0	20	0	92.5	50 - 139				
cis-1,2-Dichloroethene	19.31	1.0	20	0	96.6	78 - 123				
cis-1,3-Dichloropropene	19.08	1.0	20	0	95.4	75 - 124				
Dibromochloromethane	18.87	1.0	20	0	94.4	74 - 126				
Dibromomethane	19.13	1.0	20	0	95.6	79 - 123				
Dichlorodifluoromethane	19.8	1.0	20	0	99.0	32 - 152				
Ethylbenzene	18.41	1.0	20	0	92.0	79 - 121				
Hexachlorobutadiene	23.02	1.0	20	0	115	66 - 134				
Isopropylbenzene	18.47	1.0	20	0	92.4	72 - 131				
m,p-Xylene	37.16	2.0	40	0	92.9	80 - 121				
Methylene chloride	18.91	2.0	20	0	94.5	74 - 124				
Naphthalene	21.45	1.0	20	0	107	61 - 128				
n-Butylbenzene	18.85	1.0	20	0	94.2	75 - 128				
n-Propylbenzene	19.66	1.0	20	0	98.3	76 - 126				
o-Xylene	18.48	1.0	20	0	92.4	78 - 122				
sec-Butylbenzene	19.8	1.0	20	0	99.0	77 - 126				
Styrene	19.29	1.0	20	0	96.4	78 - 123				
tert-Butylbenzene	19.57	1.0	20	0	97.8	78 - 124				
Tetrachloroethene	18.01	1.0	20	0	90.1	74 - 129				
Toluene	18.39	1.0	20	0	91.9	80 - 121				
trans-1,2-Dichloroethene	19.44	1.0	20	0	97.2	75 - 124				
trans-1,3-Dichloropropene	19.45	1.0	20	0	97.3	73 - 127				
Trichloroethene	18.29	1.0	20	0	91.4	79 - 123				
Trichlorofluoromethane	20.3	1.0	20	0	102	65 - 141				
Vinyl chloride	19.44	1.0	20	0	97.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.25*	*1.0*	*50*	*0*	*106*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.3*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*51.63*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*49.81*	*1.0*	*50*	*0*	*99.6*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19060986-04MS** Units: **UG/L** Analysis Date: **27-Jun-2019 14:47**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144208** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.6	1.0	20	0	88.0	78 - 124				
1,1,1-Trichloroethane	19.37	1.0	20	0	96.9	74 - 131				
1,1,2,2-Tetrachloroethane	19.88	1.0	20	0	99.4	71 - 121				
1,1,2-Trichloroethane	18.84	1.0	20	0	94.2	80 - 119				
1,1-Dichloroethane	20.52	1.0	20	0	103	77 - 125				
1,1-Dichloroethene	20.92	1.0	20	0	105	71 - 131				
1,1-Dichloropropene	19.44	1.0	20	0	97.2	78 - 125				
1,2,3-Trichlorobenzene	21.07	1.0	20	0	105	69 - 129				
1,2,3-Trichloropropane	20.06	1.0	20	0	100	73 - 122				
1,2,4-Trichlorobenzene	20.07	1.0	20	0	100	69 - 130				
1,2,4-Trimethylbenzene	18.7	1.0	20	0	93.5	76 - 124				
1,2-Dibromo-3-chloropropane	20.57	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	17.91	1.0	20	0	89.6	77 - 121				
1,2-Dichlorobenzene	18.15	1.0	20	0	90.7	80 - 119				
1,2-Dichloroethane	17.56	1.0	20	0	87.8	73 - 128				
1,2-Dichloropropane	18.1	1.0	20	0	90.5	78 - 122				
1,3,5-Trimethylbenzene	18.75	1.0	20	0	93.7	75 - 124				
1,3-Dichlorobenzene	18.62	1.0	20	0.619	90.0	80 - 119				
1,3-Dichloropropane	18.78	1.0	20	0	93.9	80 - 119				
1,4-Dichlorobenzene	18.97	1.0	20	0	94.9	79 - 118				
2,2-Dichloropropane	19.07	1.0	20	0	95.3	60 - 139				
2-Butanone	40.06	2.0	40	0	100	56 - 143				
2-Chlorotoluene	19.58	1.0	20	0	97.9	79 - 122				
2-Hexanone	35.98	2.0	40	0	90.0	57 - 139				
4-Chlorotoluene	19.71	1.0	20	0	98.5	78 - 122				
4-Isopropyltoluene	19.52	1.0	20	0	97.6	77 - 127				
4-Methyl-2-pentanone	36.25	2.0	40	0	90.6	67 - 130				
Acetone	42.2	2.0	40	0	105	39 - 160				
Benzene	18.94	1.0	20	0	94.7	79 - 120				
Bromobenzene	17	1.0	20	0	85.0	80 - 120				
Bromochloromethane	16.86	1.0	20	0	84.3	78 - 123				
Bromodichloromethane	18.36	1.0	20	0	91.8	79 - 125				
Bromoform	17.93	1.0	20	0	89.6	66 - 130				
Bromomethane	20.38	1.0	20	0	102	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19060986-04MS** Units: **UG/L** Analysis Date: **27-Jun-2019 14:47**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144208** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.55	2.0	40	0	88.9	64 - 133				
Carbon tetrachloride	19.35	1.0	20	0	96.8	72 - 136				
Chlorobenzene	17.87	1.0	20	0	89.3	82 - 118				
Chloroethane	19.94	1.0	20	0	99.7	60 - 138				
Chloroform	18.71	1.0	20	0	93.6	79 - 124				
Chloromethane	19.86	1.0	20	0	99.3	50 - 139				
cis-1,2-Dichloroethene	24.44	1.0	20	4.696	98.7	78 - 123				
cis-1,3-Dichloropropene	17.14	1.0	20	0	85.7	75 - 124				
Dibromochloromethane	17.35	1.0	20	0	86.8	74 - 126				
Dibromomethane	17.39	1.0	20	0	86.9	79 - 123				
Dichlorodifluoromethane	18.96	1.0	20	0	94.8	32 - 152				
Ethylbenzene	18.23	1.0	20	0	91.2	79 - 121				
Hexachlorobutadiene	22.45	1.0	20	0	112	66 - 134				
Isopropylbenzene	19.04	1.0	20	0	95.2	72 - 131				
m,p-Xylene	37.06	2.0	40	0	92.7	80 - 121				
Methylene chloride	17.62	2.0	20	0	88.1	74 - 124				
Naphthalene	20.33	1.0	20	0	102	61 - 128				
n-Butylbenzene	19.95	1.0	20	0	99.7	75 - 128				
n-Propylbenzene	20.39	1.0	20	0	102	76 - 126				
o-Xylene	17.97	1.0	20	0	89.9	78 - 122				
sec-Butylbenzene	20.69	1.0	20	0	103	77 - 126				
Styrene	18.28	1.0	20	0	91.4	78 - 123				
tert-Butylbenzene	20.4	1.0	20	0	102	78 - 124				
Tetrachloroethene	18.26	1.0	20	0	91.3	74 - 129				
Toluene	18.16	1.0	20	0	90.8	80 - 121				
trans-1,2-Dichloroethene	19.19	1.0	20	0	96.0	75 - 124				
trans-1,3-Dichloropropene	17.78	1.0	20	0	88.9	73 - 127				
Trichloroethene	32.63	1.0	20	13.8	94.2	79 - 123				
Trichlorofluoromethane	20.12	1.0	20	0	101	65 - 141				
Vinyl chloride	20.24	1.0	20	0	101	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.63*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.94*	*1.0*	*50*	*0*	*99.9*	*85 - 114*				
Surr: Dibromofluoromethane	*49.14*	*1.0*	*50*	*0*	*98.3*	*80 - 119*				
Surr: Toluene-d8	*48.68*	*1.0*	*50*	*0*	*97.4*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19060986-04MSD** Units: **UG/L** Analysis Date: **27-Jun-2019 15:10**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144209** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.76	1.0	20	0	88.8	78 - 124	17.6	0.896	20	
1,1,1-Trichloroethane	19.21	1.0	20	0	96.0	74 - 131	19.37	0.855	20	
1,1,2,2-Tetrachloroethane	20.67	1.0	20	0	103	71 - 121	19.88	3.87	20	
1,1,2-Trichloroethane	19.42	1.0	20	0	97.1	80 - 119	18.84	3.01	20	
1,1-Dichloroethane	20.68	1.0	20	0	103	77 - 125	20.52	0.772	20	
1,1-Dichloroethene	20.95	1.0	20	0	105	71 - 131	20.92	0.151	20	
1,1-Dichloropropene	19.47	1.0	20	0	97.4	78 - 125	19.44	0.197	20	
1,2,3-Trichlorobenzene	22.82	1.0	20	0	114	69 - 129	21.07	7.97	20	
1,2,3-Trichloropropane	20.8	1.0	20	0	104	73 - 122	20.06	3.63	20	
1,2,4-Trichlorobenzene	21.1	1.0	20	0	105	69 - 130	20.07	4.98	20	
1,2,4-Trimethylbenzene	19.03	1.0	20	0	95.2	76 - 124	18.7	1.75	20	
1,2-Dibromo-3-chloropropane	21.34	1.0	20	0	107	62 - 128	20.57	3.7	20	
1,2-Dibromoethane	18.27	1.0	20	0	91.4	77 - 121	17.91	1.99	20	
1,2-Dichlorobenzene	18.58	1.0	20	0	92.9	80 - 119	18.15	2.37	20	
1,2-Dichloroethane	17.68	1.0	20	0	88.4	73 - 128	17.56	0.689	20	
1,2-Dichloropropane	18.34	1.0	20	0	91.7	78 - 122	18.1	1.29	20	
1,3,5-Trimethylbenzene	18.93	1.0	20	0	94.7	75 - 124	18.75	0.991	20	
1,3-Dichlorobenzene	18.6	1.0	20	0.619	89.9	80 - 119	18.62	0.134	20	
1,3-Dichloropropane	18.98	1.0	20	0	94.9	80 - 119	18.78	1.08	20	
1,4-Dichlorobenzene	19.29	1.0	20	0	96.5	79 - 118	18.97	1.68	20	
2,2-Dichloropropane	18.72	1.0	20	0	93.6	60 - 139	19.07	1.86	20	
2-Butanone	41.72	2.0	40	0	104	56 - 143	40.06	4.07	20	
2-Chlorotoluene	19.83	1.0	20	0	99.2	79 - 122	19.58	1.26	20	
2-Hexanone	37.6	2.0	40	0	94.0	57 - 139	35.98	4.41	20	
4-Chlorotoluene	19.88	1.0	20	0	99.4	78 - 122	19.71	0.902	20	
4-Isopropyltoluene	19.73	1.0	20	0	98.7	77 - 127	19.52	1.07	20	
4-Methyl-2-pentanone	37.65	2.0	40	0	94.1	67 - 130	36.25	3.77	20	
Acetone	43.42	2.0	40	0	109	39 - 160	42.2	2.86	20	
Benzene	18.88	1.0	20	0	94.4	79 - 120	18.94	0.299	20	
Bromobenzene	17.22	1.0	20	0	86.1	80 - 120	17	1.29	20	
Bromochloromethane	17.4	1.0	20	0	87.0	78 - 123	16.86	3.17	20	
Bromodichloromethane	18.44	1.0	20	0	92.2	79 - 125	18.36	0.421	20	
Bromoform	18.53	1.0	20	0	92.6	66 - 130	17.93	3.28	20	
Bromomethane	19.72	1.0	20	0	98.6	53 - 141	20.38	3.28	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19060986-04MSD** Units: **UG/L** Analysis Date: **27-Jun-2019 15:10**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144209** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.97	2.0	40	0	87.4	64 - 133	35.55	1.65	20	
Carbon tetrachloride	19.12	1.0	20	0	95.6	72 - 136	19.35	1.2	20	
Chlorobenzene	17.91	1.0	20	0	89.5	82 - 118	17.87	0.216	20	
Chloroethane	21.79	1.0	20	0	109	60 - 138	19.94	8.88	20	
Chloroform	18.72	1.0	20	0	93.6	79 - 124	18.71	0.043	20	
Chloromethane	18.15	1.0	20	0	90.8	50 - 139	19.86	8.97	20	
cis-1,2-Dichloroethene	24.78	1.0	20	4.696	100	78 - 123	24.44	1.39	20	
cis-1,3-Dichloropropene	17.28	1.0	20	0	86.4	75 - 124	17.14	0.79	20	
Dibromochloromethane	17.72	1.0	20	0	88.6	74 - 126	17.35	2.1	20	
Dibromomethane	18.15	1.0	20	0	90.8	79 - 123	17.39	4.3	20	
Dichlorodifluoromethane	18.36	1.0	20	0	91.8	32 - 152	18.96	3.24	20	
Ethylbenzene	18.31	1.0	20	0	91.6	79 - 121	18.23	0.456	20	
Hexachlorobutadiene	23.53	1.0	20	0	118	66 - 134	22.45	4.71	20	
Isopropylbenzene	18.92	1.0	20	0	94.6	72 - 131	19.04	0.611	20	
m,p-Xylene	37.08	2.0	40	0	92.7	80 - 121	37.06	0.0437	20	
Methylene chloride	17.83	2.0	20	0	89.2	74 - 124	17.62	1.2	20	
Naphthalene	21.72	1.0	20	0	109	61 - 128	20.33	6.62	20	
n-Butylbenzene	20.3	1.0	20	0	102	75 - 128	19.95	1.76	20	
n-Propylbenzene	20.51	1.0	20	0	103	76 - 126	20.39	0.609	20	
o-Xylene	17.89	1.0	20	0	89.5	78 - 122	17.97	0.445	20	
sec-Butylbenzene	21.03	1.0	20	0	105	77 - 126	20.69	1.6	20	
Styrene	18.48	1.0	20	0	92.4	78 - 123	18.28	1.12	20	
tert-Butylbenzene	20.44	1.0	20	0	102	78 - 124	20.4	0.178	20	
Tetrachloroethene	18.1	1.0	20	0	90.5	74 - 129	18.26	0.894	20	
Toluene	18.1	1.0	20	0	90.5	80 - 121	18.16	0.31	20	
trans-1,2-Dichloroethene	18.55	1.0	20	0	92.8	75 - 124	19.19	3.4	20	
trans-1,3-Dichloropropene	17.86	1.0	20	0	89.3	73 - 127	17.78	0.461	20	
Trichloroethene	32.01	1.0	20	13.8	91.0	79 - 123	32.63	1.94	20	
Trichlorofluoromethane	20.09	1.0	20	0	100	65 - 141	20.12	0.15	20	
Vinyl chloride	19.45	1.0	20	0	97.3	58 - 137	20.24	3.94	20	
Surr: 1,2-Dichloroethane-d4	*51.82*	*1.0*	*50*	*0*	*104*	*81 - 118*	*50.63*	*2.31*	*20*	
Surr: 4-Bromofluorobenzene	*49.79*	*1.0*	*50*	*0*	*99.6*	*85 - 114*	*49.94*	*0.285*	*20*	
Surr: Dibromofluoromethane	*49.79*	*1.0*	*50*	*0*	*99.6*	*80 - 119*	*49.14*	*1.3*	*20*	
Surr: Toluene-d8	*48.19*	*1.0*	*50*	*0*	*96.4*	*89 - 112*	*48.68*	*0.999*	*20*	

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060835

QC BATCH REPORT

Batch ID: R341453 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS19060835-01	HS19060835-02	HS19060835-03	HS19060835-04
HS19060835-05			

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19060835**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

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ALS Houston, US Date: 10-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060835
Date/Time Received: **14-Jun-2019 08:45**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 15-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature 17-Jun-2019 Date

Matrices: **Groundwater**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.3c U/c	IR25
Cooler(s)/Kit(s):	43893	
Date/Time sample(s) sent to storage:	6/14/19 18:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes: Trip Blank not received

Client Contacted: Date Contacted: Person Contacted:
Contacted By: Regarding:

Comments:

Corrective Action:

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bhate

Page: of

Project/Phase No: NW01312.0150

COC Number(1):

LIMS Number:

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
18QPTMW22SW_061319		13 JUN 2019	1030	-	N		WG	6	X	X	X	X				
18QPTMW22DW_061319		13 JUN 2019	1130	-	N		WG	6	X	X	X	X				
18QPTMW22R_061319		13 JUN 2019	1210	-	N		WG	6	X	X	X	X				
MW20_061319		13 JUN 2019	1255	-	N		WG	5	X	X	X					
18QPTMW26SW_061319		13 JUN 2019	1345	-	N		WG	5	X	X		X				
TRIP BLANK		13 JUN 2019		-	TB		W	2	X							
				-												
				-												
				-												
				-												
				-												

Sample Analysis Requested (5)

Quality Assurance Samples (6)

HS19060835

Bhate Environmental Associates, Inc.

LHAAP 18 24

COMMENTS:

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	6/13/19	1430	1. [illegible]	6/14/19	0845
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: Shipped No.:

Method of Shipment:

Fed Ex Airbill Number:

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONJA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

Cooler 43993 1425

Temp 1.3 COC

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00940333

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

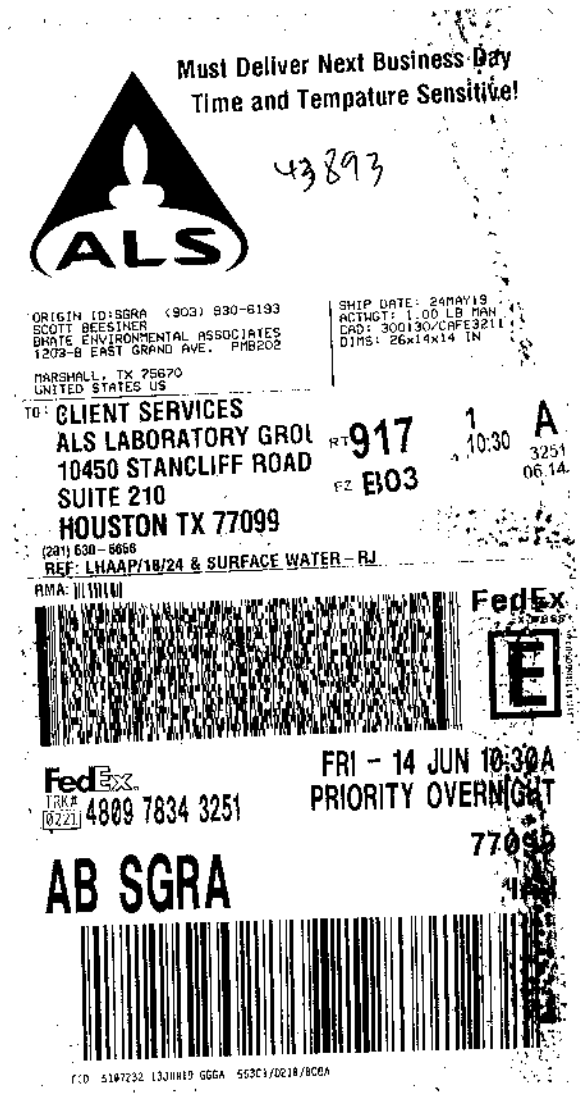
43893

CUSTODY SEAL

Date: 6/13/19 Time: 1430
Name: Scott Beesinger
Company: BHATE

Seal Broken By: SM
Date: 06/14/19

43893 JUN 14 2019



Must Deliver Next Business Day
Time and Tempature Sensitive!

43893

ORIGIN ID:SGRA (903) 930-8193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 24MAY19
ACTWGT: 1.00 LB MAN
CAD: 3001130/CAFE3211
DIMS: 26x14x14 IN

TO: CLIENT SERVICES
ALS LABORATORY GROU
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP/18/24 & SURFACE WATER - RJ

RT 917 1 A
FZ E03 10:30 3251 06.14

RMA:

FedEx
E

FedEx
TRK# 0221 4809 7834 3251

FRI - 14 JUN 10:30A
PRIORITY OVERNIGHT

77099

AB SGRA

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1917488, 1917489, 1917672

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2264 (242398)

General Set Information: There were thirteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 660892) was less than 1/2 the CRDL. The recovery for the LCS (660893) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on sample 1917488001 (Client ID: LH18/24-SP650_061219_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 5.µg/L. The MS/MSD percent recoveries were within the performance limits. The MS/MSD failed QC acceptance criteria for relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 660890) is reported from the analysis of the Laboratory Control Sample (LCS – 660893) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 27JUND03/12/20.

Thomas Bosch July 1, 2019
Analyst Date

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ANALYTICAL REPORT

Report Date: July 01, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1917489**
Project ID: HS19060835
Purchase Order: HS19060835
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
18CPTMW22SW_061319	1917489001	06/13/19	06/18/19	
18CPTMW22DW_061319	1917489002	06/13/19	06/18/19	
18CPTMW22R_061319	1917489003	06/13/19	06/18/19	
MW20_061319	1917489004	06/13/19	06/18/19	
18CPTMW26SW_061319	1917489005	06/13/19	06/18/19	

ANALYTICAL REPORT

Workorder: 34-1917489
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW22SW_061319** | Sampling Site: NA | Collected: 06/13/2019
Lab ID: 1917489001 | Media: 125 mL Nalgene | Received: 06/18/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 10:24 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**590**	100	200	400	100	

Sample ID: **18CPTMW22DW_061319** | Sampling Site: NA | Collected: 06/13/2019
Lab ID: 1917489002 | Media: 125 mL Nalgene | Received: 06/18/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 10:38 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18CPTMW22R_061319** | Sampling Site: NA | Collected: 06/13/2019
Lab ID: 1917489003 | Media: 125 mL Nalgene | Received: 06/18/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 10:52 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **MW20_061319** | Sampling Site: NA | Collected: 06/13/2019
Lab ID: 1917489004 | Media: 125 mL Nalgene | Received: 06/18/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2264 (HBN: 242398) | **Percent Solid:** NA
Analyzed: 06/27/2019 11:06 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

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ANALYTICAL REPORT

Workorder: 34-1917489
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW26SW_061319**	Sampling Site: NA	Collected: 06/13/2019
Lab ID: 1917489005	Media: 125 mL Nalgene	Received: 06/18/2019
Matrix: Water	Sampling Parameter: NA	

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:** LCMS04
	Batch: ELMS/2264 (HBN: 242398)	**Percent Solid:** NA
	Analyzed: 06/27/2019 11:20	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 242398)

Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/01/2019 10:47	/S/ Stephen Brose 07/01/2019 13:43

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1917489
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1917489

Limits:	Client SOW/Contract Specified	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	ELMS/2264 (HBN: 242398)
Preparation:	NA	**Analyzed By:**	Thomas Bosch
Batch:	NA		
Prepared By:	NA		

Blank

LMB: 660892
Analyzed: 06/27/2019 09:28
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 660893
Analyzed: 06/27/2019 09:00
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.27	4.00	107	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1917488001	**MS:** 660894	**MSD:** 660895
Analyzed:	06/27/2019 09:42	**Analyzed:** 06/27/2019 09:56	**Analyzed:** 06/27/2019 10:10
Dilution:	1	**Dilution:** 1	**Dilution:** 1
Units:	ug/L	**Units:** ug/L	**Units:** ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec		RPD	QC Limits	
Perchlorate	ND	5.13	5	103	78.8	123.8	4.06	81.2	#	23.3	0.0	20.0

Comments

Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/01/2019 10:55	07/01/2019 13:43

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18693/2

1917489

# of Custody

SAMPLING STATE: **Texas**

COC ID: **11600**

1917489

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19060835
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060835-01**	**18CPTMW22SW_061319**	**Groundwater**	**13 Jun 2019 10:30**
	SUB_Perch-6850			24 Jun 2019
2.	**HS19060835-02**	**18CPTMW22DW_061319**	**Groundwater**	**13 Jun 2019 11:20**
	SUB_Perch-6850			24 Jun 2019
3.	**HS19060835-03**	**18CPTMW22R_061319**	**Groundwater**	**13 Jun 2019 12:10**
	SUB_Perch-6850			24 Jun 2019
4.	**HS19060835-04**	**MW20_061319**	**Groundwater**	**13 Jun 2019 12:55**
	SUB_Perch-6850			24 Jun 2019
5.	**HS19060835-05**	**18CPTMW26SW_061319**	**Groundwater**	**13 Jun 2019 13:45**
	SUB_Perch-6850			24 Jun 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

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Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **11600**

Relinquished By: _____ Date/Time: 6/17/19 1800

Received By: Laura Van Fossen Date/Time: 06-18-19 9:58

Cooler ID(s): _____ Temperature(s): _____

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19060835	Split:	Workorder ID: 1917489	Level: ENV_LVL4	Requested Analysis
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly	
Comments:			Preservatives	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	COOL	EPA 6850, DoD QSM	Requested Analysis
1	06/13/2019 10:30	18CPTMW22SW_061319	1917489001		Water	A	1		A	
2	06/13/2019 11:20	18CPTMW22DW_061319	1917489002		Water	A	1		A	
3	06/13/2019 11:10	18CPTMW22R_061319	1917489003		Water	A	1		A	
4	06/13/2019 12:55	MW20_061319	1917489004		Water	A	1		A	
5	06/13/2019 13:45	18CPTMW26SW_061319	1917489005		Water	A	1		A	
6										
7										
8										
9										
10										

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	06/18/2019 09:58	ALS Sample Receiving	Sample Login
Julie Warath	6/18/19 1440	4C	Storage
R.Bl	6-26-19/0820	T.Bond	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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00940344

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 197489

Date/Time of Receipt: 06-18-19 9:58

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9706	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Signature T. Vantassell Printed Name 06-18-19 Date

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Printed Name Returned to Sample Receipt by: _____ Signature Date: _____

CRIR.doc Revised 01/01/2018

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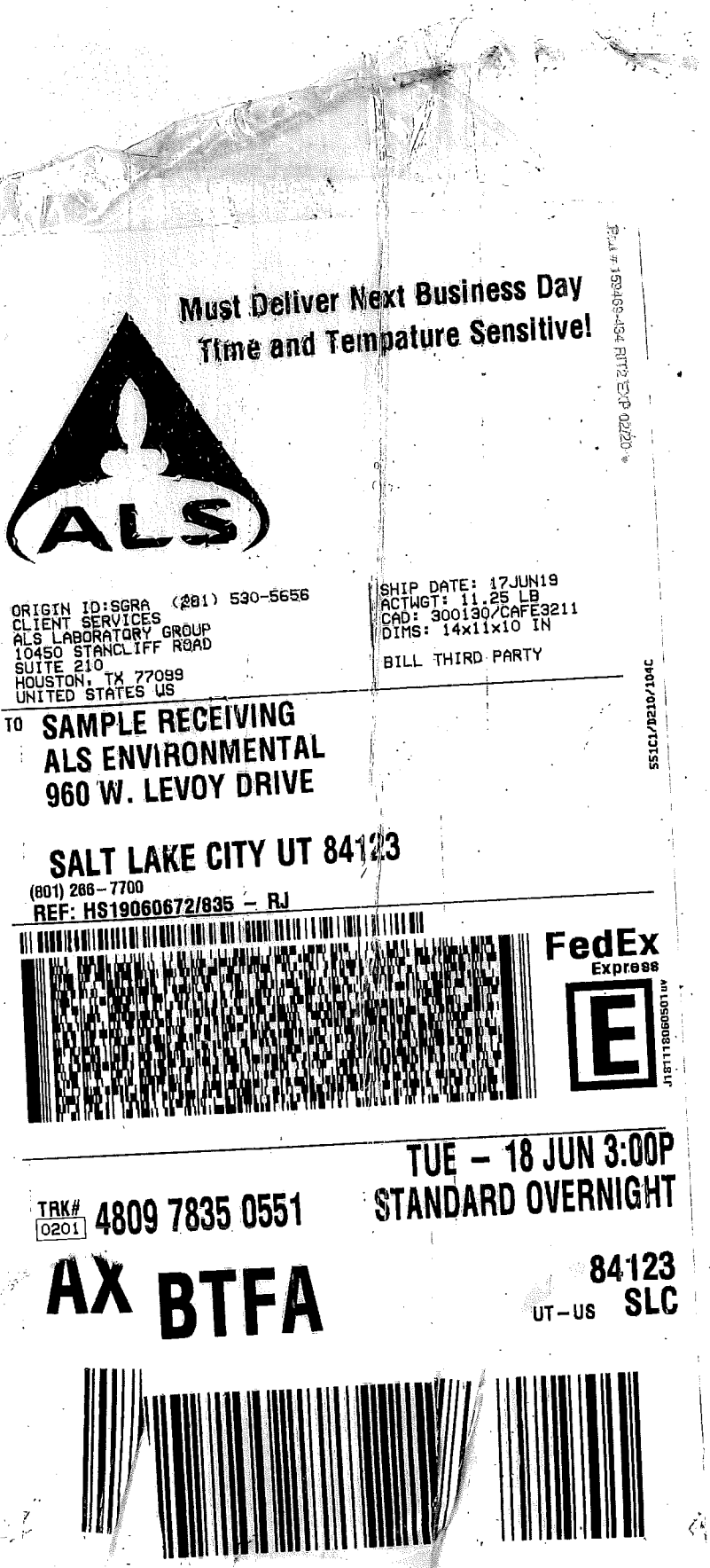

Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159469-494 RITC EXP 02/20 *

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 17JUN19
ACTWGT: 11.25 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

551C1/D210/104C

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19060672/835 - RJ

FedEx Express

J1811100500101aug

TUE - 18 JUN 3:00P
STANDARD OVERNIGHT

TRK# 0201 4809 7835 0551

AX BTFA

84123
UT-US SLC

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Batch Worklist

Batch: ELMS/ 2264 **Created:** 6/27/2019 07:47 **Instrument:** HBN: 242398

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1917488 [ENV_LVL4]
Workorder: 1917489 [ENV_LVL4]
Workorder: 1917672 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	660889	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	
2	660890	RLVS for HBN 242398 [ELMS/2264				RLVS	3		E685041C3Q	5311		7/1/2019	
3	660891	ICS for HBN 242398 [ELMS/2264]				ICS	3		E6850..D3Q	5311		7/1/2019	
4	660892	LMB for HBN 242398 [ELMS/2264]				LMB	3		E6850Q413Q	5311		7/1/2019	
5	660893	LCS for HBN 242398 [ELMS/2264]				LCS	3		E6850Q413Q	5311		7/1/2019	
6	1917488001	LH18/24-SP650_061219_BIX				SAMPLE	3	1917488001-A	E6850Q41.3	5480	7/10/2019	7/1/2019	
	660894	LH18/24-SP650...(1917488001MS)				MS	3		E6850Q413Q	5311		7/1/2019	
	660895	LH18/24-SP65...(1917488001MSD)				MSD	3		E6850Q413Q	5311		7/1/2019	
	1917489001	18CPTMW22SW_061319				SAMPLE	3	1917489001-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
	1917489002	18CPTMW22DW_061319				SAMPLE	3	1917489002-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
11	1917489003	18CPTMW22R_061319				SAMPLE	3	1917489003-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
12	1917489004	MW20_061319				SAMPLE	3	1917489004-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
13	1917489005	18CPTMW26SW_061319				SAMPLE	3	1917489005-A	E6850Q41.3	5480	7/11/2019	7/1/2019	
14	1917672001	MW7_061719				SAMPLE	3	1917672001-A	E6850Q41.3	5480	7/15/2019	7/3/2019	
15	1917672002	18CPTMW12DW_061719				SAMPLE	3	1917672002-A	E6850Q41.3	5480	7/15/2019	7/3/2019	
16	660896	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	
17	1917672003	18CPTMW12SW_061719				SAMPLE	3	1917672003-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
18	1917672004	18CPTMW12SW_061719_a				SAMPLE	3	1917672004-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
19	1917672005	18CPTMW23SW_061719				SAMPLE	3	1917672005-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
20	1917672006	18CPTMW23_061719				SAMPLE	3	1917672006-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
21	1917672007	18W14_061719W_061719				SAMPLE	3	1917672007-A	E6850Q41.3	5480	7/15/2019	7/2/2019	
22	660897	CCV for HBN 242398 [ELMS/2264]				CCV	3		E685041C3Q	5311		7/1/2019	

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00940347

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1917488 (001), 1917489 (001-05), 1917672 (001-07)
ELMS Batch/HBN ID: 2264 (242398)
Prep Date: 06/26/2019 Analysis Date: 06/27/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUN\27JUN19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 660893; Target = 4.0µg/L. ASTM type II water was used for LMB 660892.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1917488001 (Client ID: LH18/24-SP650_061219_BIX). 5.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 5.0µg/L.

COMMENTS:
1) Results reported in µg/L. Field samples 1917489001 and 1917672006 were analyzed and reported from 1:100 dilutions. Field sample 1917672001 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS/MSD – 660894/95 failed QC acceptance criteria for relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUN\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\242398-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 660890) is reported from the analysis of the Laboratory Control Sample (LCS – 660893) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 27JUND03/12/20.

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2264 HBN: 242398 Sample Set IDs if Applicable: 1917488/1917489/1917672	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	/
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#_____	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK - Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
			1000 ug/mL
1	14797-73-0	Perchlorate	

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT	Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description - 6850 QC WKG STD 100ug/L

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ANAB ACCREDITED

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

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125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

QR-ORG/IND-001
Rev. 5/18

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Report: C:\HPCHEM\1\DATA\27JUN19D\27JUN19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	660889 CCV@25	Vial 71	1	Control	1	1.82515e6	8.439	25.67350
*	660893 QC@4.0	Vial 72	1	Control	2	3.38083e5	8.214	4.26890
*	660891 ICS@4.0	Vial 73	1	Control	3	2.57330e5	7.965	3.92512
*	660892 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917488001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	660894 174881S	Vial 76	1	Sample	6	2.62640e5	7.903	5.12768
*	660895 174881D	Vial 77	1	Sample	7	2.64844e5	7.941	4.05844
*	1917489001 100	Vial 78	1	Sample	8	4.17326e5	8.686	591.94538
*	1917489002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1917489003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1917489004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1917489005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1917672001 1K	Vial 83	1	Sample	13	1.57532e6	8.712	2.61220e4
*	1917672002	Vial 84	1	Sample	14	6.54028e4	7.973	1.24787
*	660896 CCV@25	Vial 71	1	Control	15	1.48921e6	8.624	25.51318
*	1917672003	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1917672004	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1917672005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917672006 100	Vial 88	1	Sample	19	1.71986e6	8.736	2534.96449
*	1917672007	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	660897 CCV@25	Vial 71	1	Control	21	1.42516e6	8.651	24.42440

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	660889 CCV@25	Vial 71	1	Control	1	5.48361e5	8.454	25.97496
*	660893 QC@4.0	Vial 72	1	Control	2	1.12796e5	8.202	4.63897
*	660891 ICS@4.0	Vial 73	1	Control	3	8.93833e4	7.980	4.42426
*	660892 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917488001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	660894 174881S	Vial 76	1	Sample	6	8.68330e4	7.935	5.55768
*	660895 174881D	Vial 77	1	Sample	7	8.75585e4	7.960	4.36181
*	1917489001 100	Vial 78	1	Sample	8	1.40501e5	8.696	655.91363
*	1917489002	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1917489003	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	1917489004	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1917489005	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1917672001 1K	Vial 83	1	Sample	13	4.80693e5	8.744	2.68224e4
*	1917672002	Vial 84	1	Sample	14	2.29889e4	7.974	1.29323
*	660896 CCV@25	Vial 71	1	Control	15	4.52707e5	8.622	26.10046
*	1917672003	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1917672004	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1917672005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917672006 100	Vial 88	1	Sample	19	5.21595e5	8.762	2587.43586
*	1917672007	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	660897 CCV@25	Vial 71	1	Control	21	4.30118e5	8.688	24.80913

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	660889 CCV@25	Vial 71	1	Control	1	2.15939e5	8.466	5.00000
*	660893 QC@4.0	Vial 72	1	Control	2	2.60134e5	8.243	5.00000
*	660891 ICS@4.0	Vial 73	1	Control	3	2.16232e5	7.969	5.00000
*	660892 LMB	Vial 74	1	Control	4	2.72547e5	8.630	5.00000
*	1917488001	Vial 75	1	Sample	5	2.27402e5	7.920	5.00000
*	660894 174881S	Vial 76	1	Sample	6	1.66848e5	7.932	5.00000
*	660895 174881D	Vial 77	1	Sample	7	2.14876e5	7.954	5.00000
*	1917489001 100	Vial 78	1	Sample	8	2.28283e5	8.729	500.00000
*	1917489002	Vial 79	1	Sample	9	2.07849e5	7.985	5.00000
*	1917489003	Vial 80	1	Sample	10	2.26487e5	8.403	5.00000

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Batch Report: C:\HPCHEM\1\DATA\27JUN19D\27JUN19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	1917489004	Vial 81	1	Sample	11	1.93008e5	7.993	5.00000
*	1917489005	Vial 82	1	Sample	12	1.81500e5	7.840	5.00000
*	1917672001 1K	Vial 83	1	Sample	13	1.82987e5	8.737	5000.00000
*	1917672002	Vial 84	1	Sample	14	1.91018e5	8.001	5.00000
*	660896 CCV@25	Vial 71	1	Control	15	1.77368e5	8.624	5.00000
*	1917672003	Vial 85	1	Sample	16	1.65261e5	7.950	5.00000
*	1917672004	Vial 86	1	Sample	17	1.47928e5	7.939	5.00000
*	1917672005	Vial 87	1	Sample	18	1.93450e5	8.278	5.00000
*	1917672006 100	Vial 88	1	Sample	19	2.06241e5	8.740	500.00000
*	1917672007	Vial 89	1	Sample	20	1.87344e5	7.970	5.00000
*	660897 CCV@25	Vial 71	1	Control	21	1.77769e5	8.693	5.00000

*** End of Report ***

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Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	660889 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	660893 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	660891 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	660892 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1917488001	CLO4-AQN	1	Sample		
6	Vial 76	660894 174881S	CLO4-AQN	1	Sample		
7	Vial 77	660895 174881D	CLO4-AQN	1	Sample		
8	Vial 78	1917489001 100	CLO4-AQN	1	Sample		
9	Vial 79	1917489002	CLO4-AQN	1	Sample		
10	Vial 80	1917489003	CLO4-AQN	1	Sample		
11	Vial 81	1917489004	CLO4-AQN	1	Sample		
12	Vial 82	1917489005	CLO4-AQN	1	Sample		
13	Vial 83	1917672001 1K	CLO4-AQN	1	Sample		
14	Vial 84	1917672002	CLO4-AQN	1	Sample		
15	Vial 71	660896 CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1917672003	CLO4-AQN	1	Sample		
17	Vial 86	1917672004	CLO4-AQN	1	Sample		
18	Vial 87	1917672005	CLO4-AQN	1	Sample		
19	Vial 88	1917672006 100	CLO4-AQN	1	Sample		
20	Vial 89	1917672007	CLO4-AQN	1	Sample		
21	Vial 71	660897 CCV@25	CLO4-AQN	1	Ctrl Samp		

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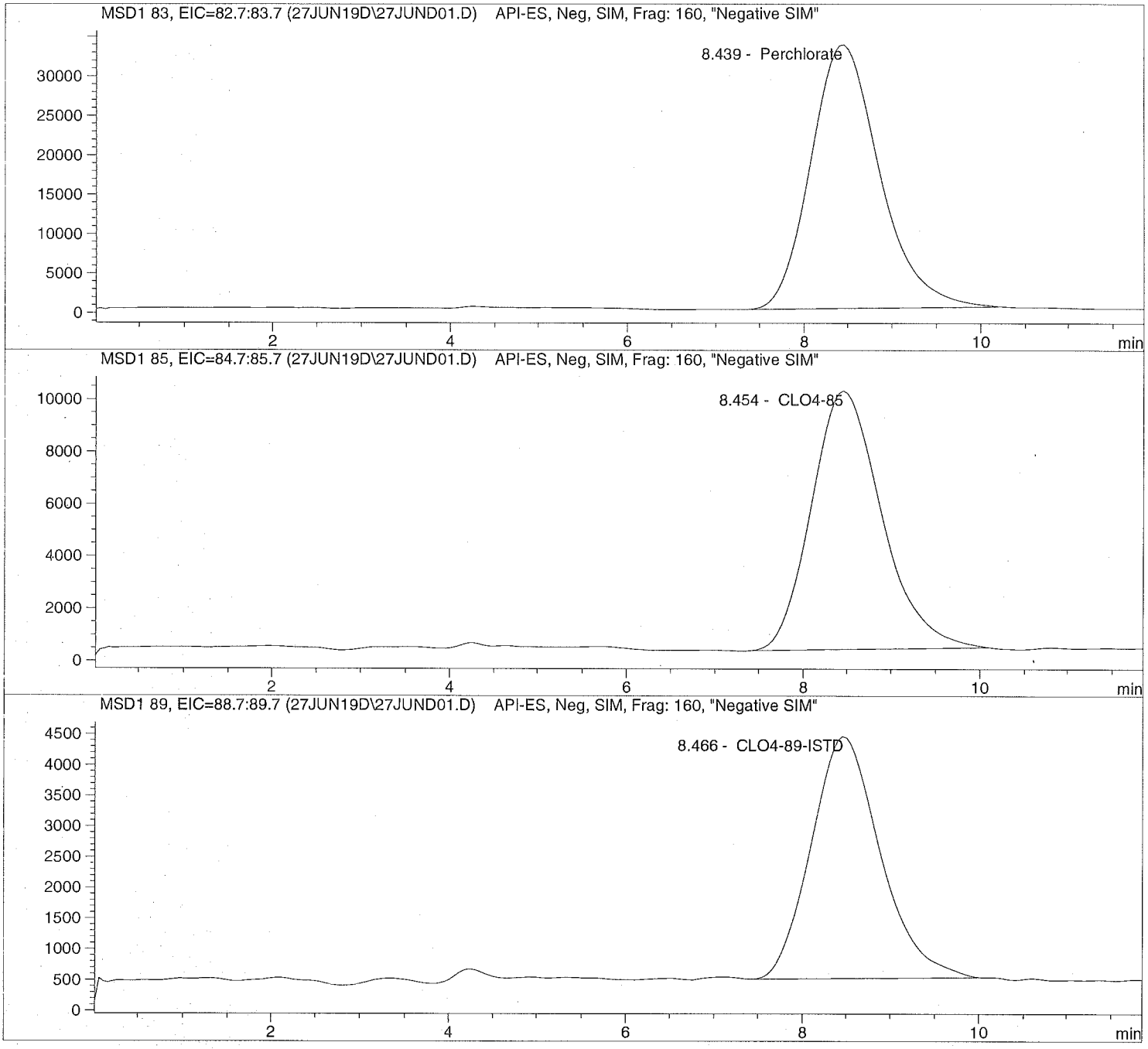
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND01.D Sample Name: 660889 CCV@25

Injection Date:	6/27/2019 08:45:38	Seq Line:	1
Sample Name:	660889 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND01.D Sample Name: 660889 CCV@25

Injection Date:	6/27/2019 08:45:38	Seq Line:	1
Sample Name:	660889 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.439	PBA	1825148.0	25.6735	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.454	PBA	548361.0	25.9750	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.466	PBA	215939.1	5.0000	CLO4-89-ISTD

*** End of Report ***

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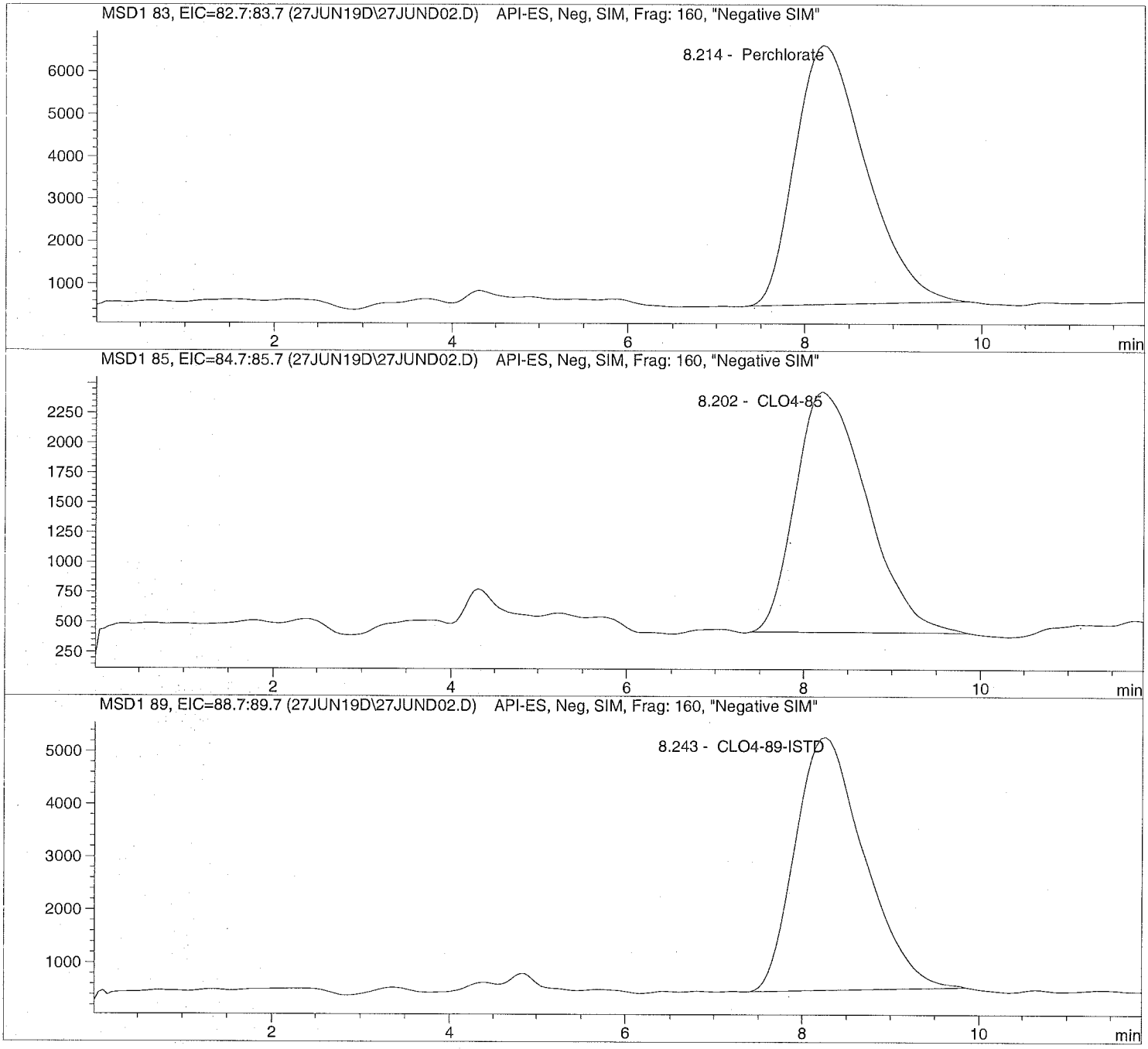
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND02.D Sample Name: 660893 QC@4.0

Injection Date:	6/27/2019 09:00:21	Seq Line:	2
Sample Name:	660893 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND02.D Sample Name: 660893 QC@4.0

Injection Date:	6/27/2019 09:00:21	Seq Line:	2
Sample Name:	660893 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.214	PBA	338083.1	4.2689	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.202	PBA	112796.3	4.6390	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.243	PBA	260134.2	5.0000	CLO4-89-ISTD

*** End of Report ***

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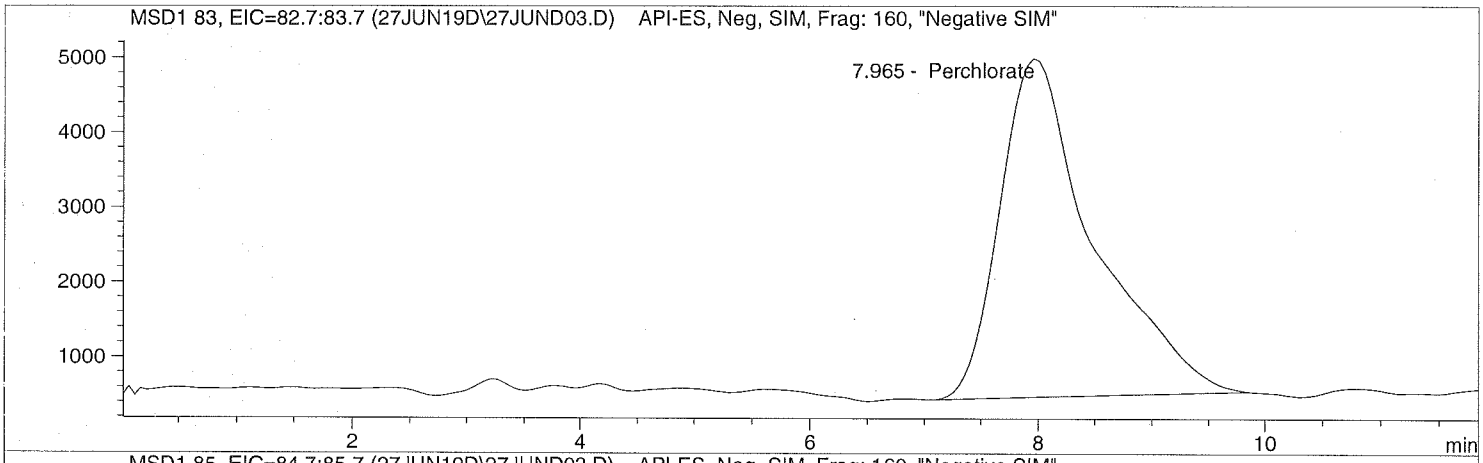
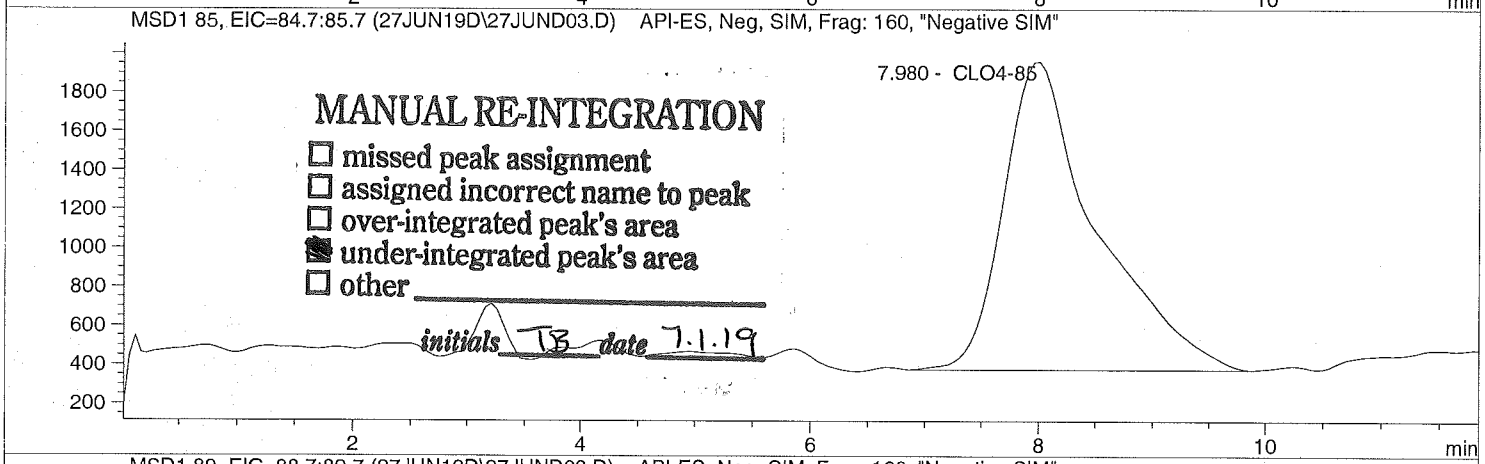
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

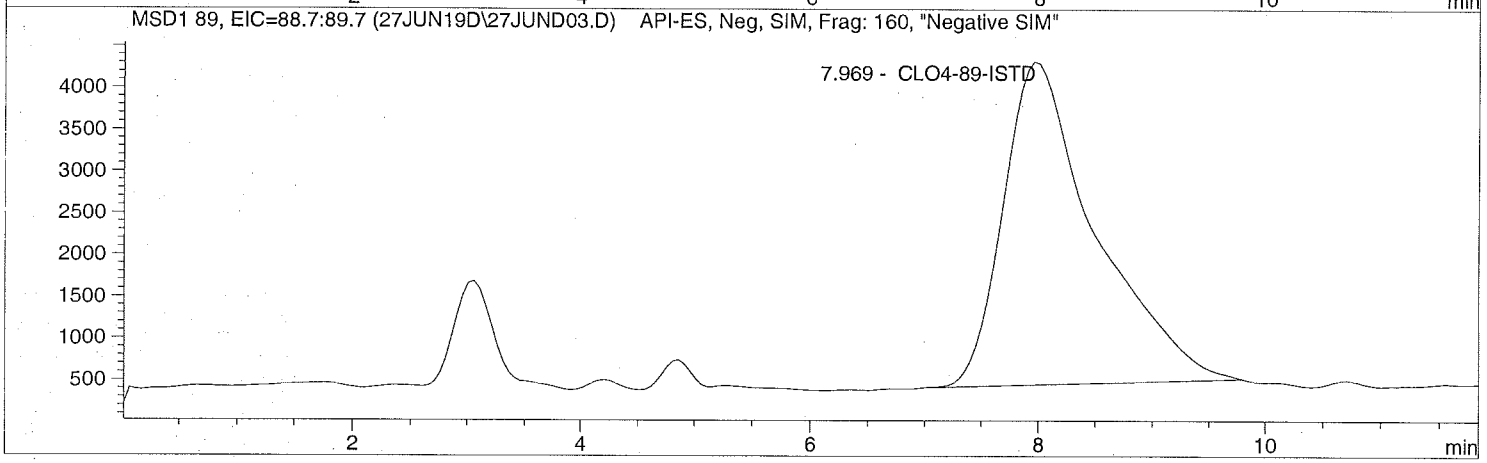
Perchlorate analysis





MANUAL RE-INTEGRATION
- ☐ missed peak assignment
- ☐ assigned incorrect name to peak
- ☐ over-integrated peak's area
- ☒ under-integrated peak's area
- ☐ other _____

initials TB date 7.1.19



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Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.965	PBA	257330.2	3.9251	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.980	MM	89383.3	4.4243	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.969	BBA	216232.2	5.0000	CLO4-89-ISTD

*** End of Report ***

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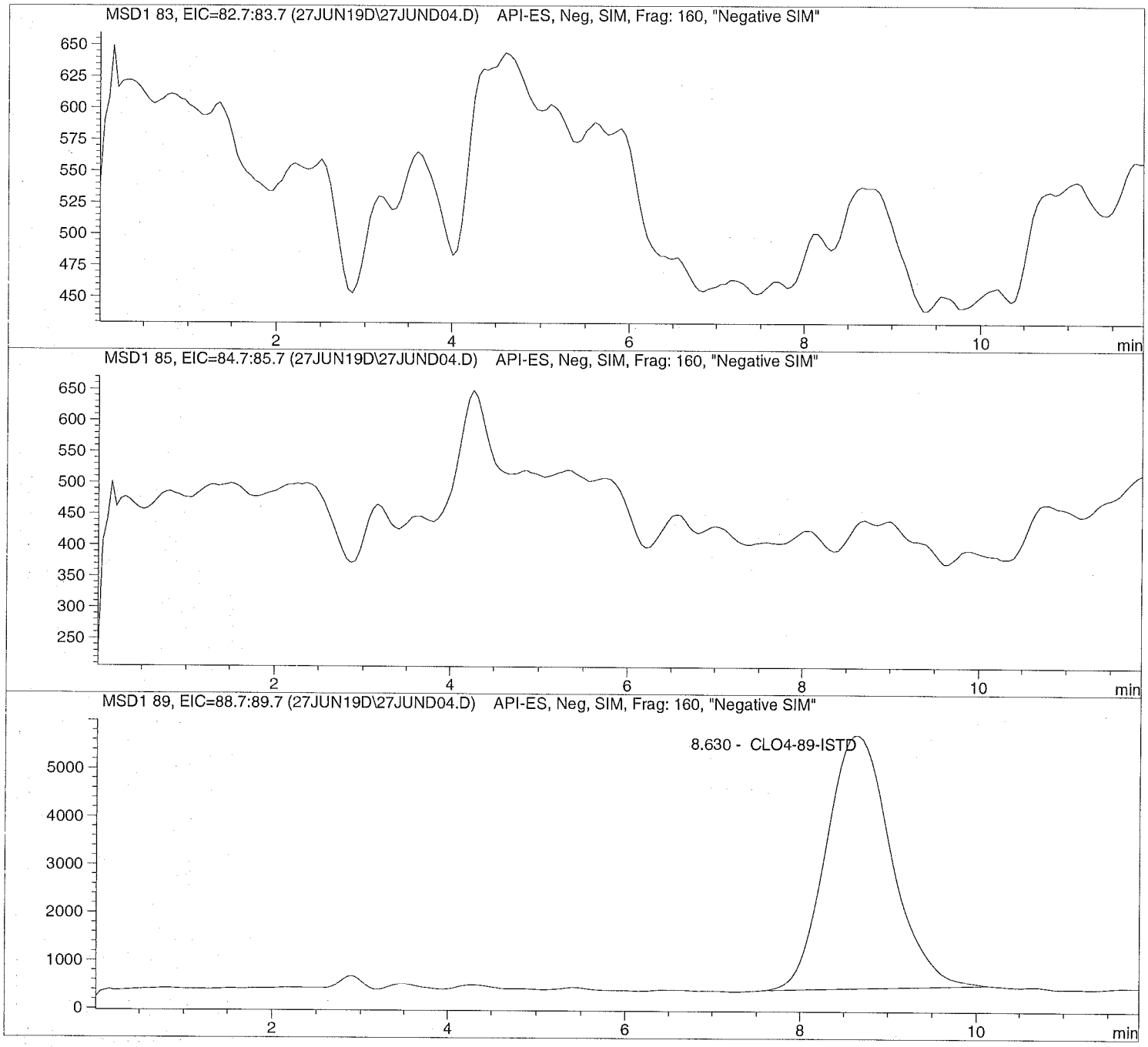
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND04.D Sample Name: 660892 LMB

Injection Date:	6/27/2019 09:28:13	Seq Line:	4
Sample Name:	660892 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND04.D Sample Name: 660892 LMB

Injection Date:	6/27/2019 09:28:13	Seq Line:	4
Sample Name:	660892 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.630	PBA	272546.7	5.0000	CLO4-89-ISTD

*** End of Report ***

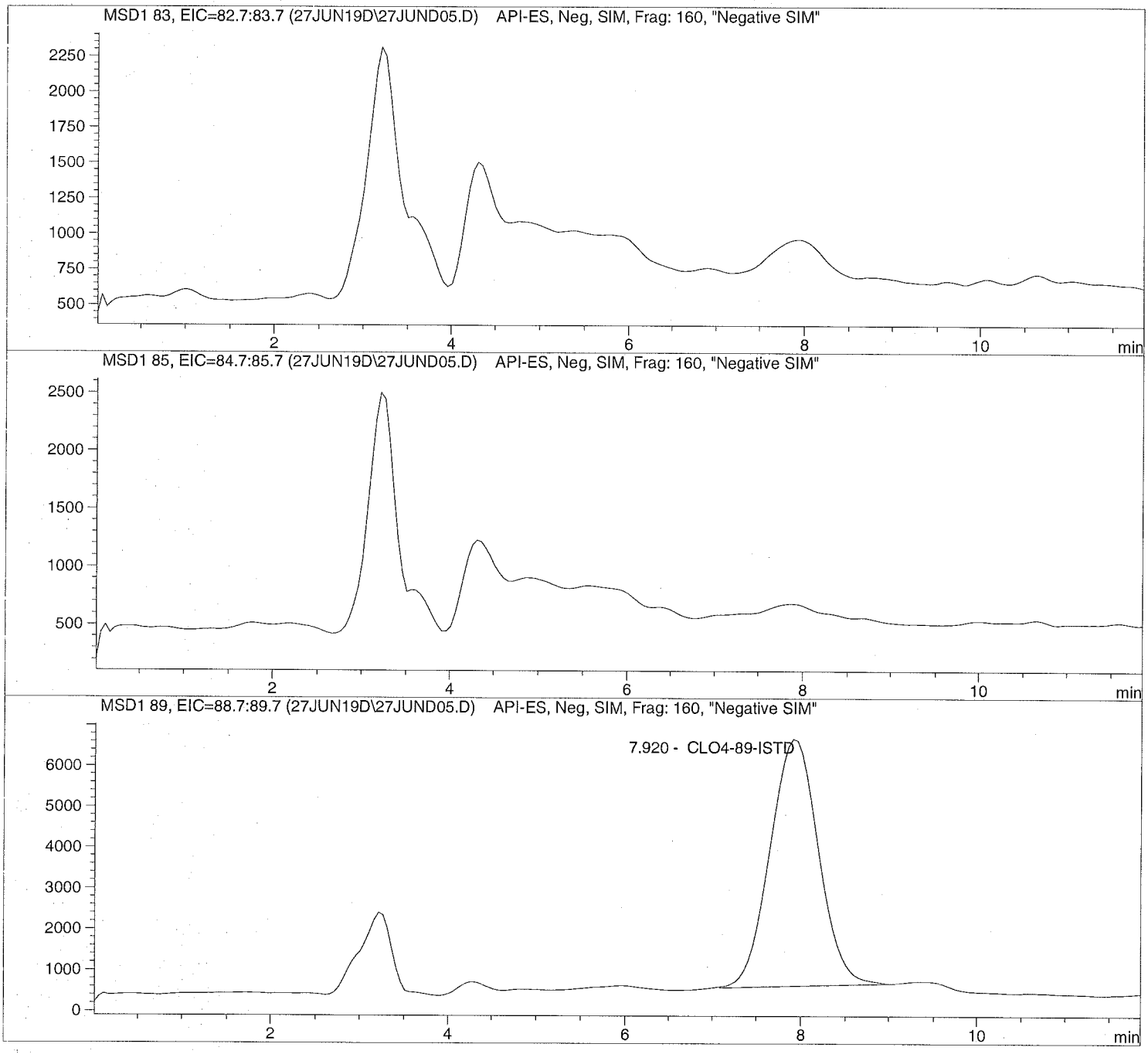
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND05.D Sample Name: 1917488001

Injection Date:	6/27/2019 09:42:40	Seq Line:	5
Sample Name:	1917488001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND05.D Sample Name: 1917488001

Injection Date:	6/27/2019 09:42:40	Seq Line:	5
Sample Name:	1917488001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.920	PBA	227402.2	5.0000	CLO4-89-ISTD

*** End of Report ***

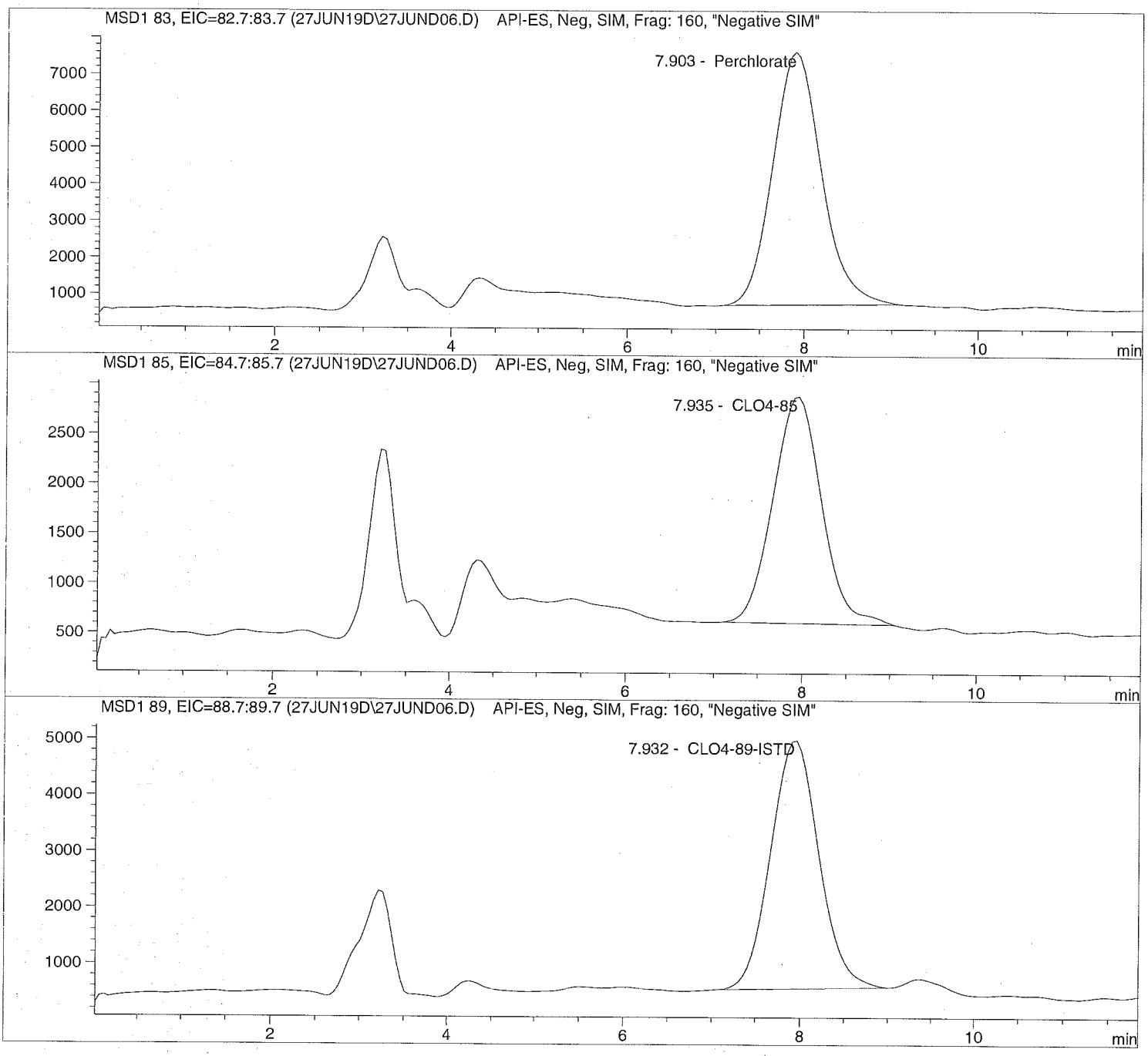
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND06.D Sample Name: 660894 174881S

Injection Date:	6/27/2019 09:56:36	Seq Line:	6
Sample Name:	660894 174881S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND06.D Sample Name: 660894 174881S

Injection Date:	6/27/2019 09:56:36	Seq Line:	6
Sample Name:	660894 174881S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.903	PBA	262639.7	5.1277	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.935	BBA	86833.0	5.5577	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.932	PBA	166848.2	5.0000	CLO4-89-ISTD

*** End of Report ***

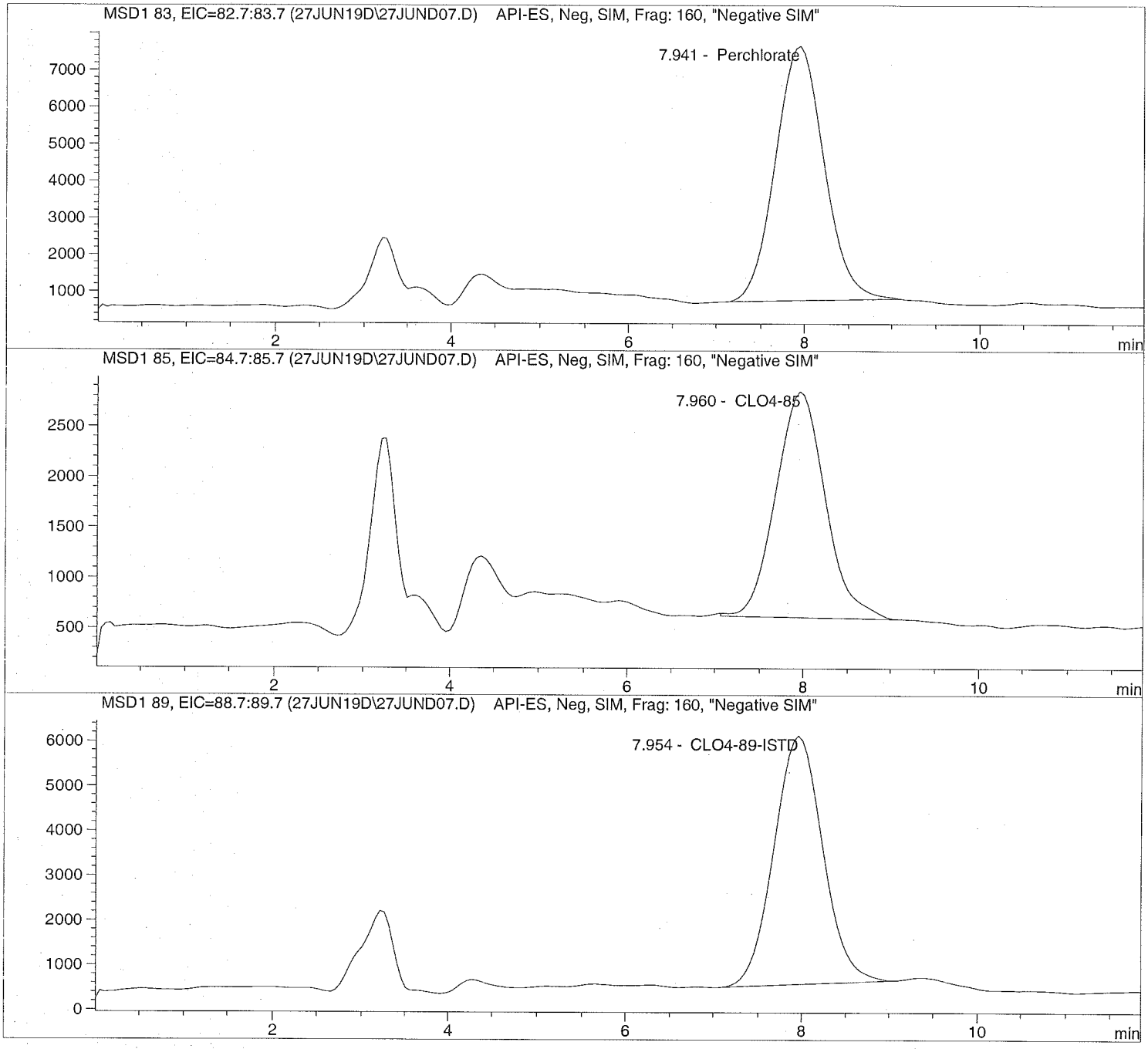
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND07.D Sample Name: 660895 174881D

Injection Date:	6/27/2019 10:10:32	Seq Line:	7
Sample Name:	660895 174881D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND07.D Sample Name: 660895 174881D

Injection Date:	6/27/2019 10:10:32	Seq Line:	7
Sample Name:	660895 174881D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.941	PBA	264844.2	4.0584	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.960	BBA	87558.5	4.3618	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.954	PBA	214876.4	5.0000	CLO4-89-ISTD

*** End of Report ***

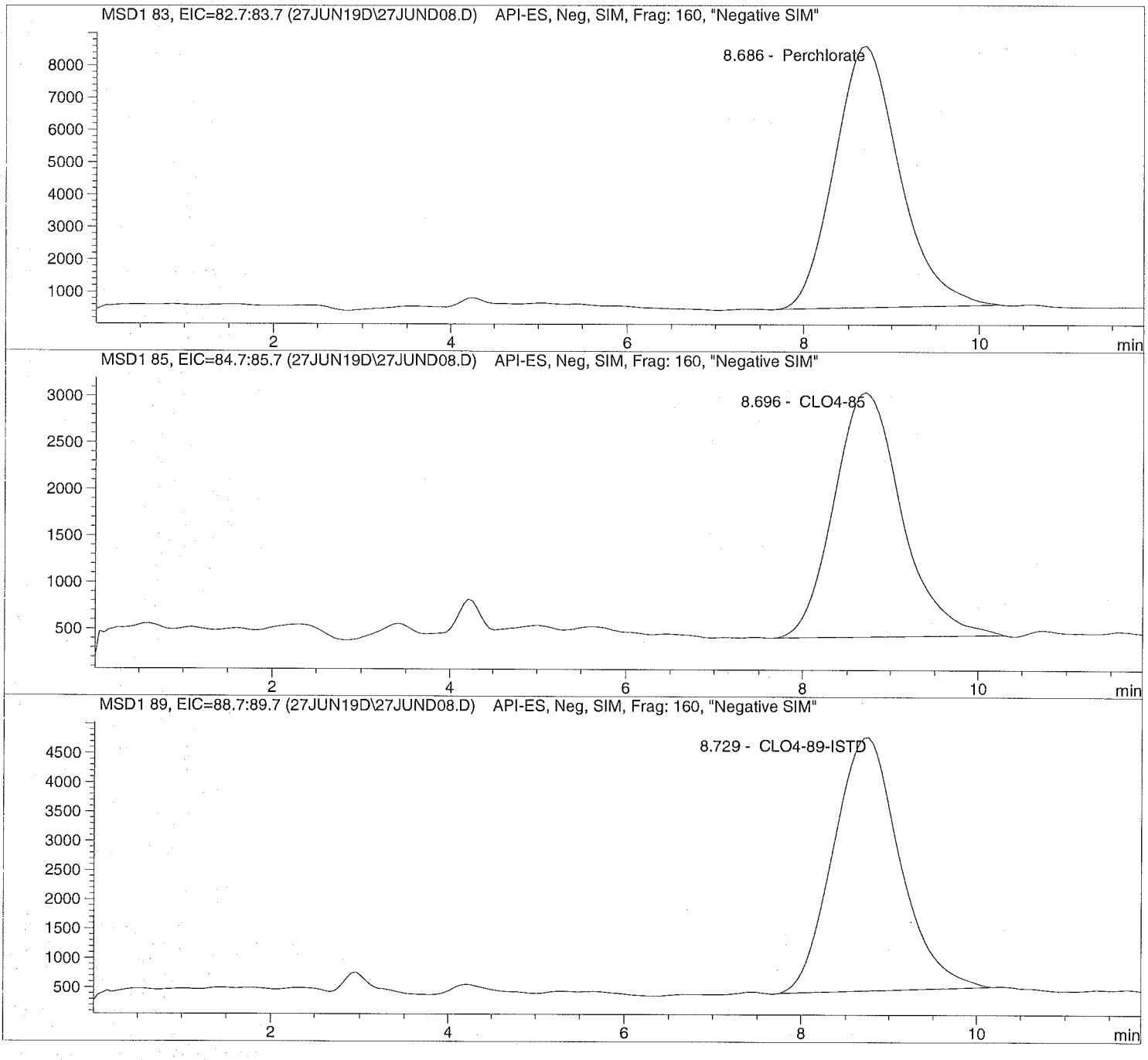
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND08.D Sample Name: 1917489001 100

Injection Date:	6/27/2019 10:24:27	Seq Line:	8
Sample Name:	1917489001 100	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND08.D Sample Name: 1917489001 100

Injection Date:	6/27/2019 10:24:27	Seq Line:	8
Sample Name:	1917489001 100	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.686	PBA	417326.3	591.9454	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.696	PBA	140501.0	655.9136	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.729	PBA	228282.9	500.0000	CLO4-89-ISTD

*** End of Report ***

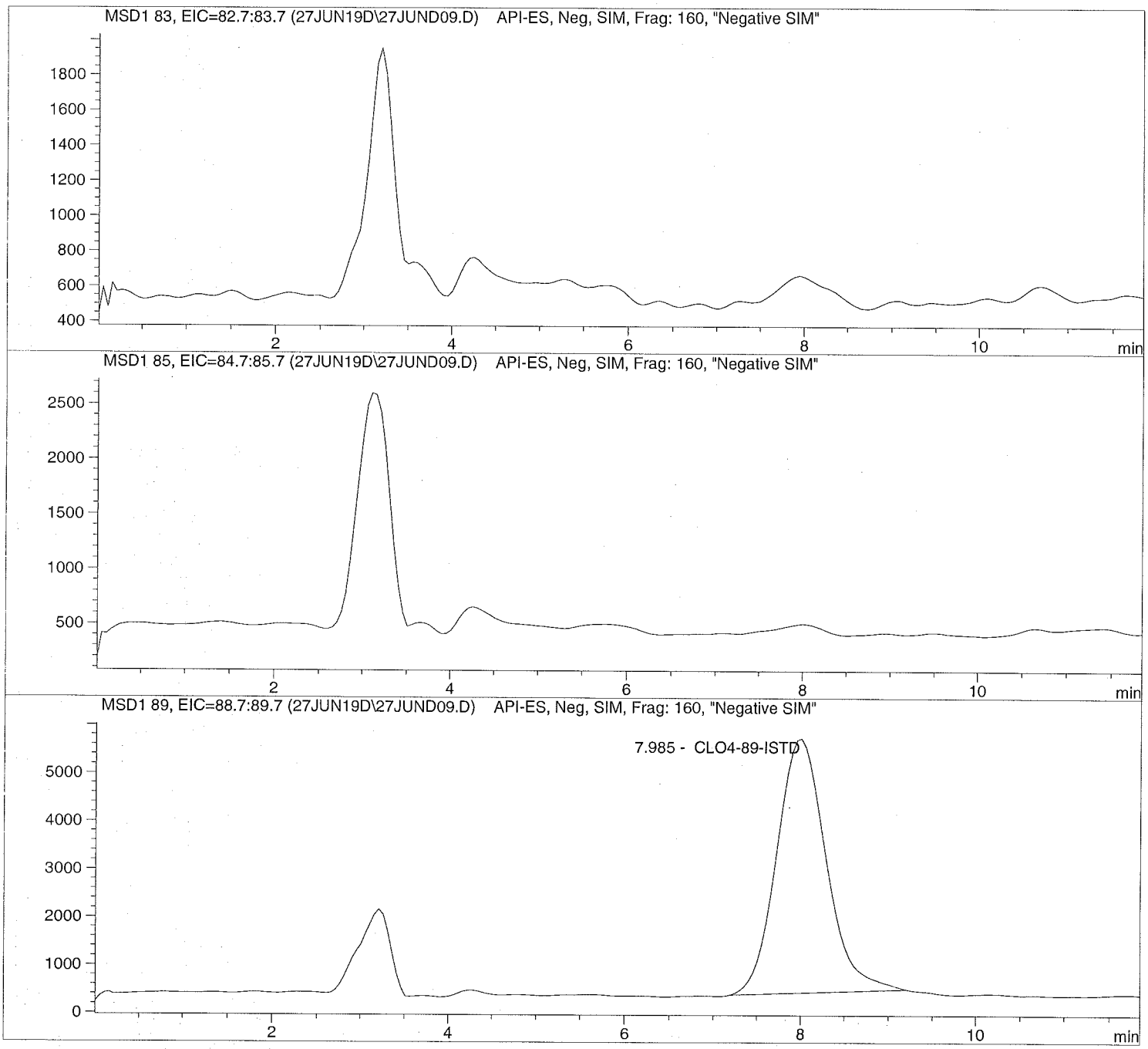
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND09.D Sample Name: 1917489002

Injection Date:	6/27/2019 10:38:23	Seq Line:	9
Sample Name:	1917489002	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND09.D Sample Name: 1917489002

Injection Date:	6/27/2019 10:38:23	Seq Line:	9
Sample Name:	1917489002	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.985	BBA	207849.5	5.0000	CLO4-89-ISTD

*** End of Report ***

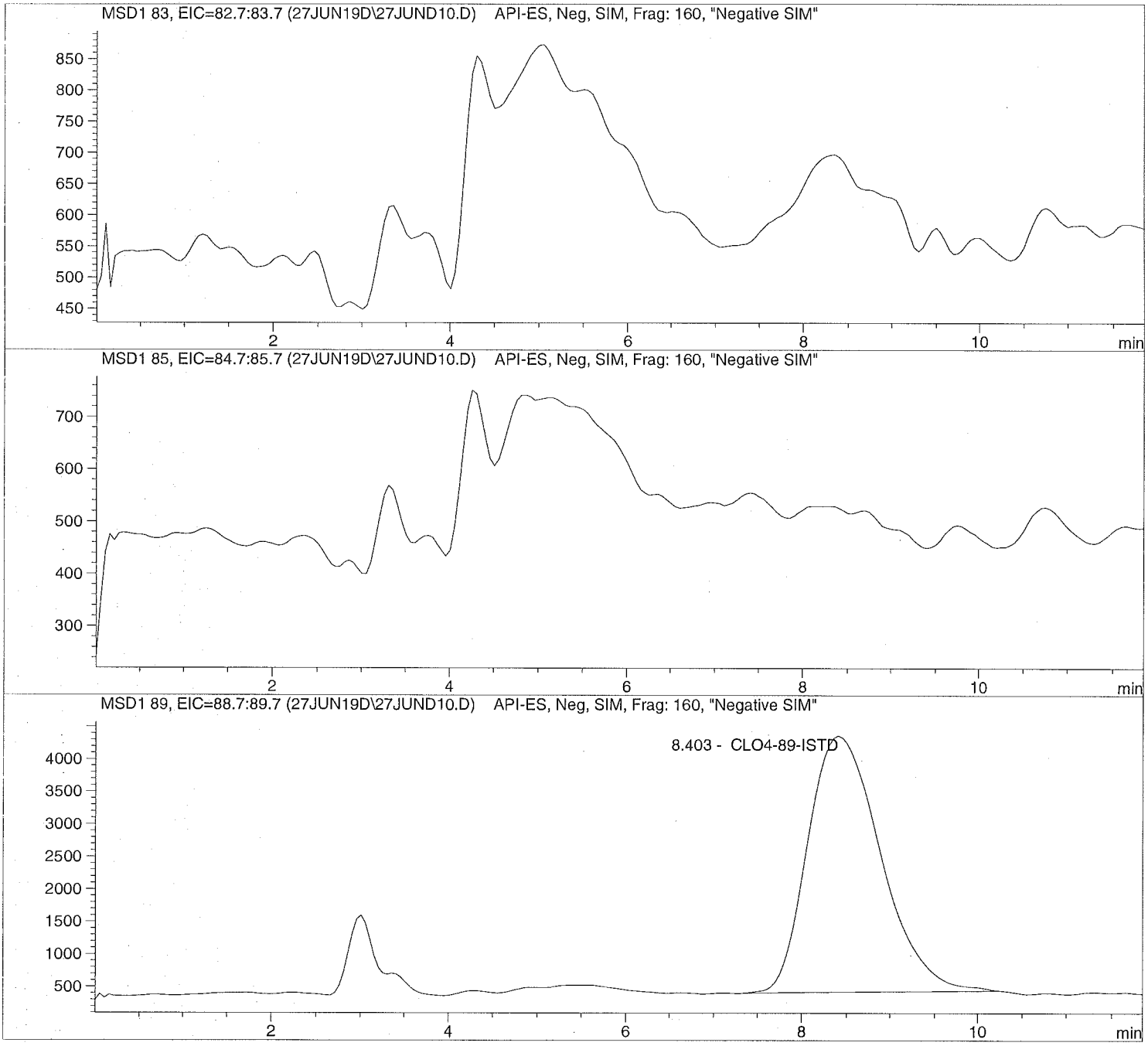
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND10.D Sample Name: 1917489003

Injection Date:	6/27/2019 10:52:17	Seq Line:	10
Sample Name:	1917489003	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND10.D Sample Name: 1917489003

Injection Date:	6/27/2019 10:52:17	Seq Line:	10
Sample Name:	1917489003	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.403	PBA	226487.0	5.0000	CLO4-89-ISTD

*** End of Report ***

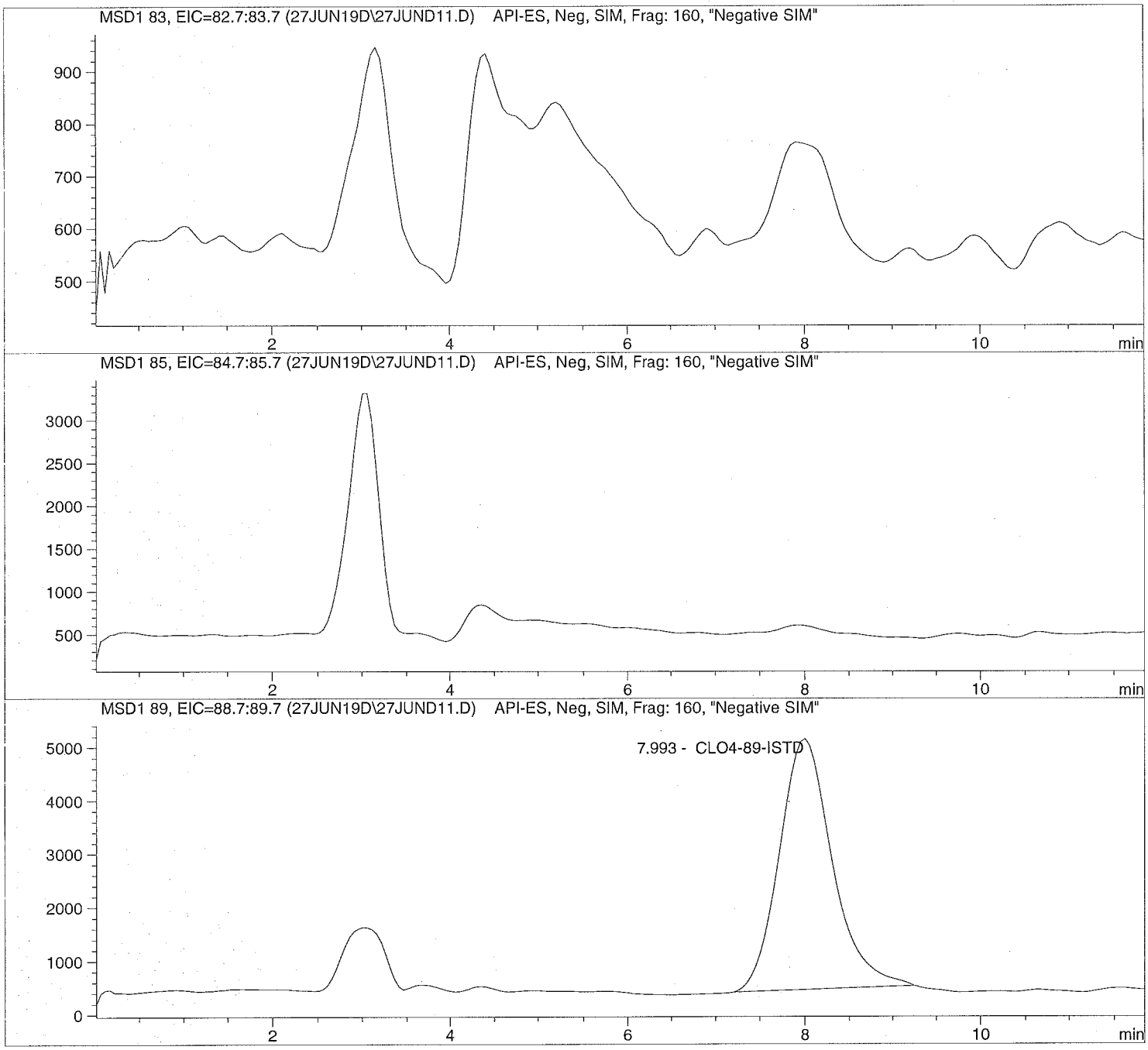
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND11.D Sample Name: 1917489004

Injection Date:	6/27/2019 11:06:11	Seq Line:	11
Sample Name:	1917489004	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND11.D Sample Name: 1917489004

Injection Date:	6/27/2019 11:06:11	Seq Line:	11
Sample Name:	1917489004	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.993	BBA	193007.7	5.0000	CLO4-89-ISTD

*** End of Report ***

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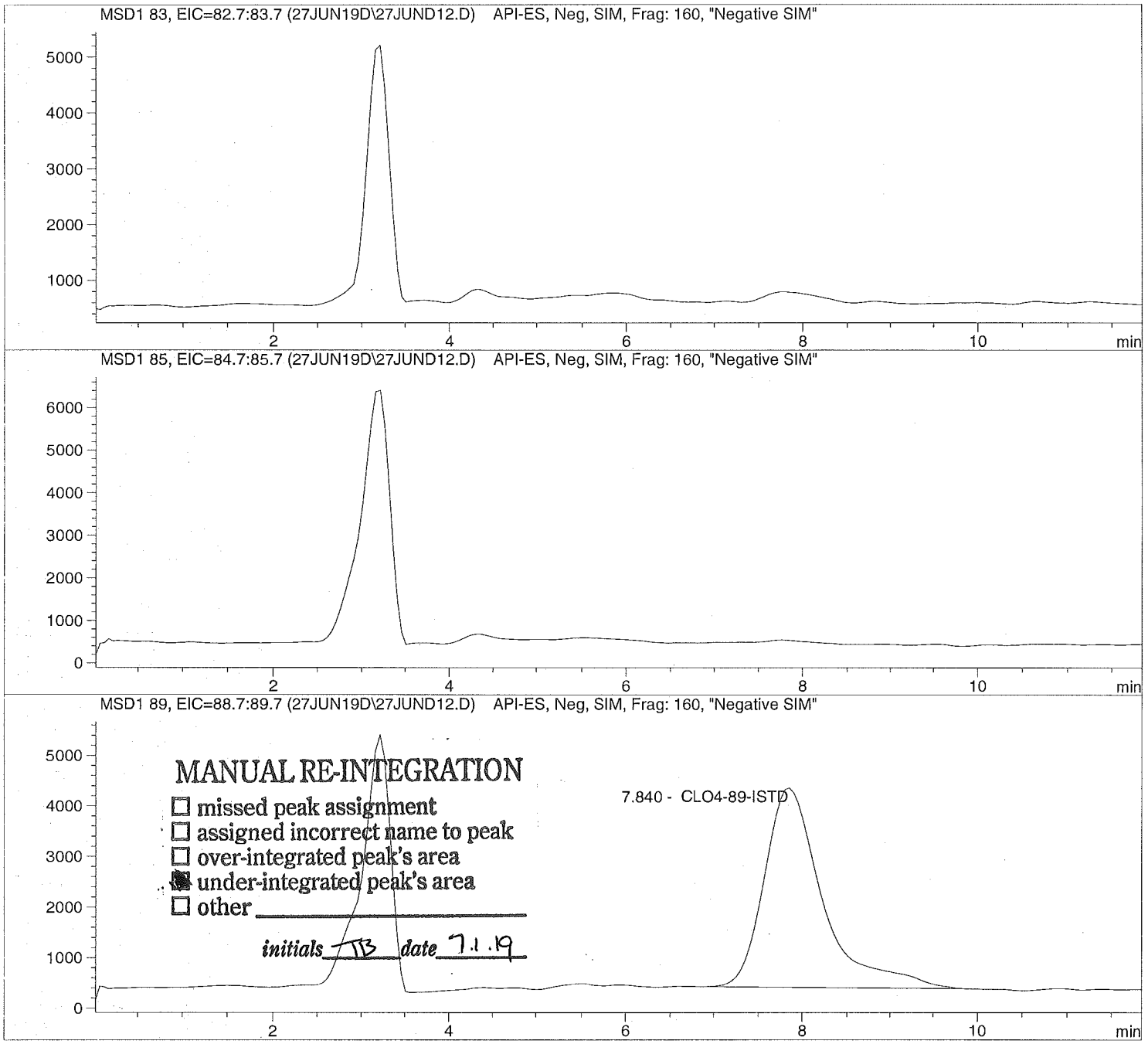
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.840	MM	181499.8	5.0000	CLO4-89-ISTD

*** End of Report ***

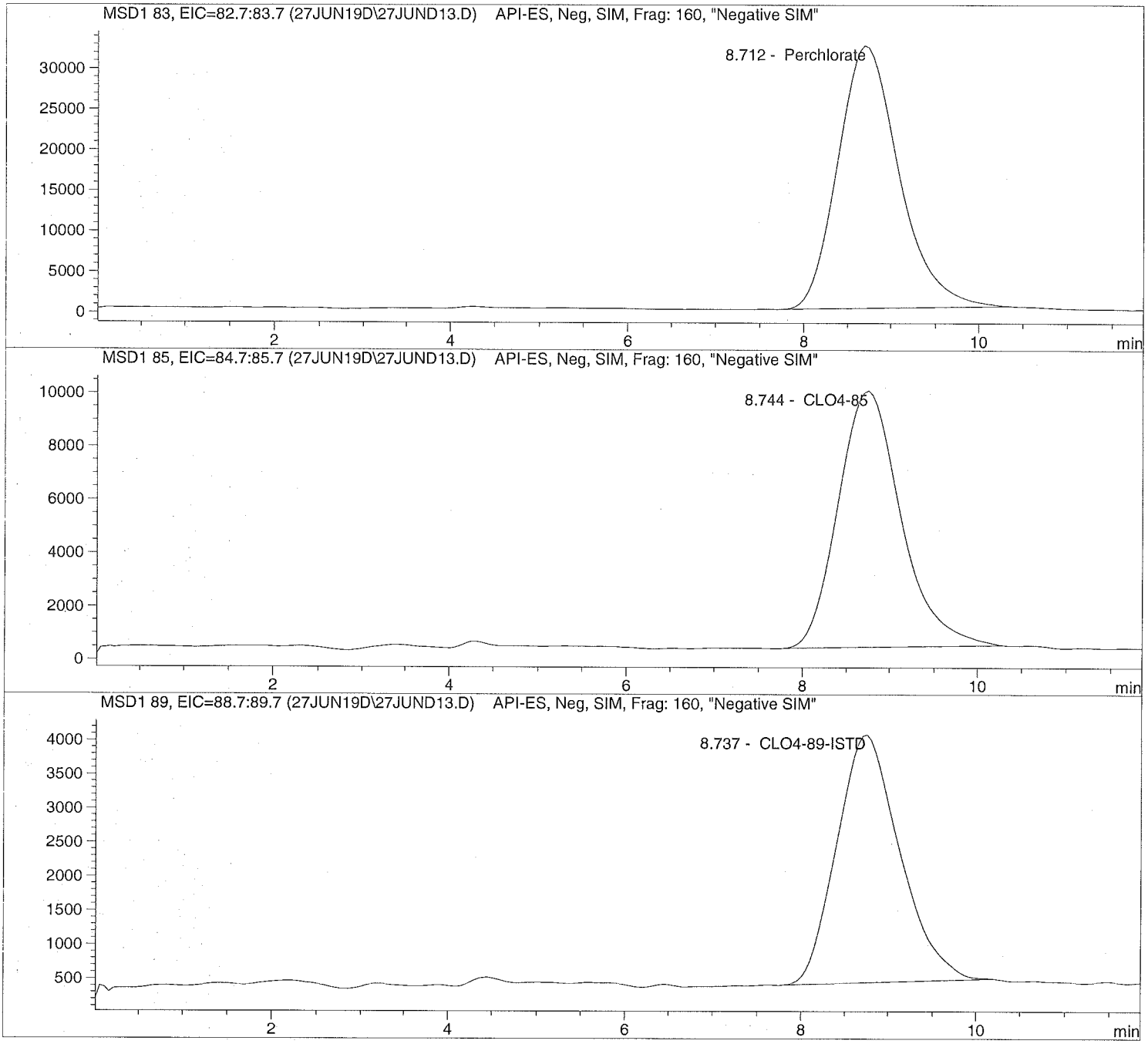
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND13.D Sample Name: 1917672001 1K

Injection Date:	6/27/2019 11:33:53	Seq Line:	13
Sample Name:	1917672001 1K	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND13.D Sample Name: 1917672001 1K

Injection Date:	6/27/2019 11:33:53	Seq Line:	13
Sample Name:	1917672001 1K	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.712	PBA	1575319.3	26121.9614	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	PBA	480692.7	26822.4361	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.737	PBA	182986.5	5000.0000	CLO4-89-ISTD

*** End of Report ***

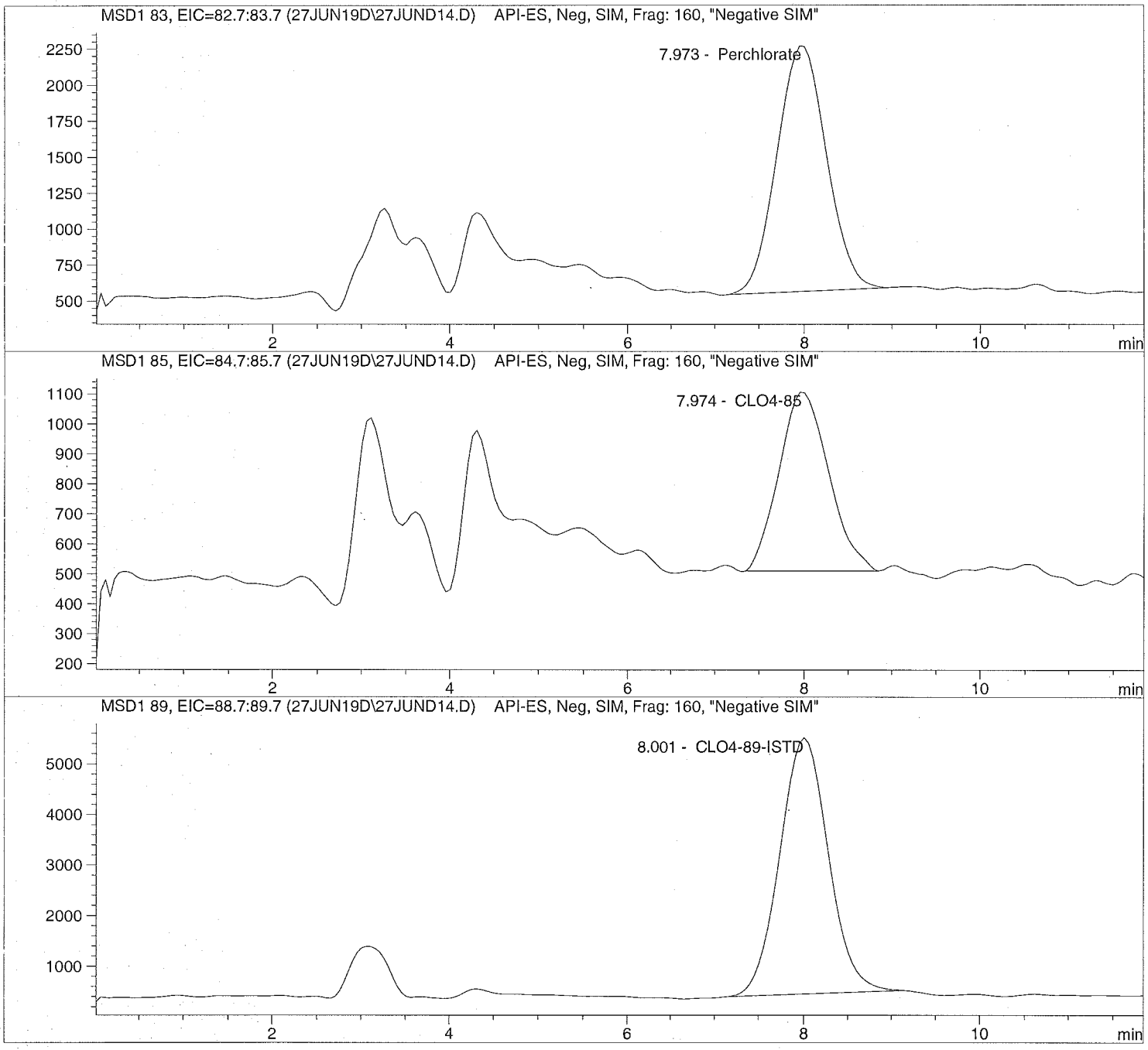
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND14.D Sample Name: 1917672002

Injection Date:	6/27/2019 11:47:53	Seq Line:	14
Sample Name:	1917672002	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND14.D Sample Name: 1917672002

Injection Date:	6/27/2019 11:47:53	Seq Line:	14
Sample Name:	1917672002	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.973	PBA	65402.8	1.2479	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.974	PBA	22988.9	1.2932	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.001	PBA	191017.5	5.0000	CLO4-89-ISTD

*** End of Report ***

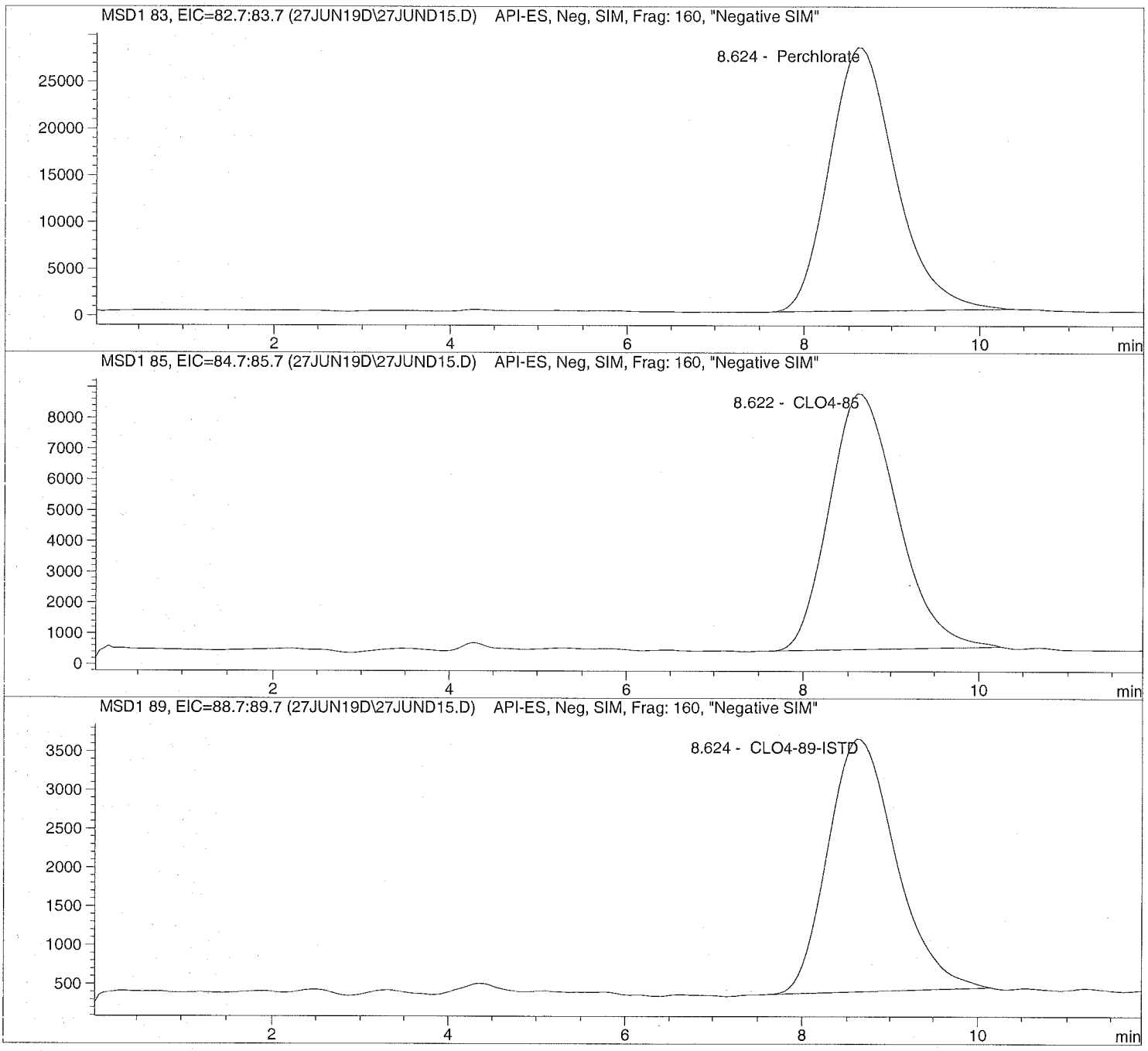
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND15.D Sample Name: 660896 CCV@25

Injection Date:	6/27/2019 12:01:48	Seq Line:	15
Sample Name:	660896 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND15.D Sample Name: 660896 CCV@25

Injection Date:	6/27/2019 12:01:48	Seq Line:	15
Sample Name:	660896 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.624	PBA	1489207.3	25.5132	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.622	PBA	452707.0	26.1005	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.624	PBA	177367.7	5.0000	CLO4-89-ISTD

*** End of Report ***

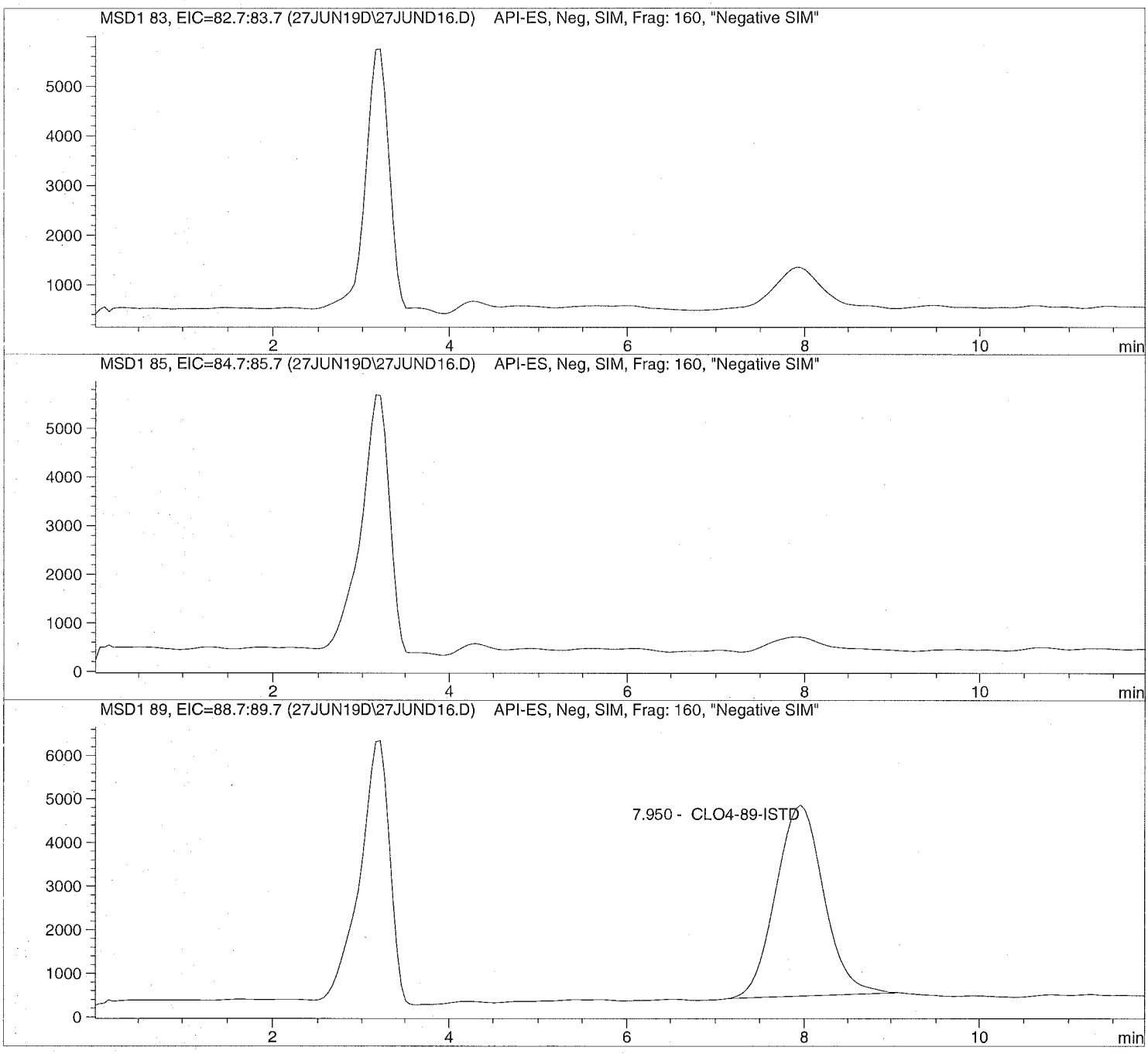
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND16.D Sample Name: 1917672003

Injection Date:	6/27/2019 12:15:39	Seq Line:	16
Sample Name:	1917672003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND16.D Sample Name: 1917672003

Injection Date:	6/27/2019 12:15:39	Seq Line:	16
Sample Name:	1917672003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.950	PBA	165260.9	5.0000	CLO4-89-ISTD

*** End of Report ***

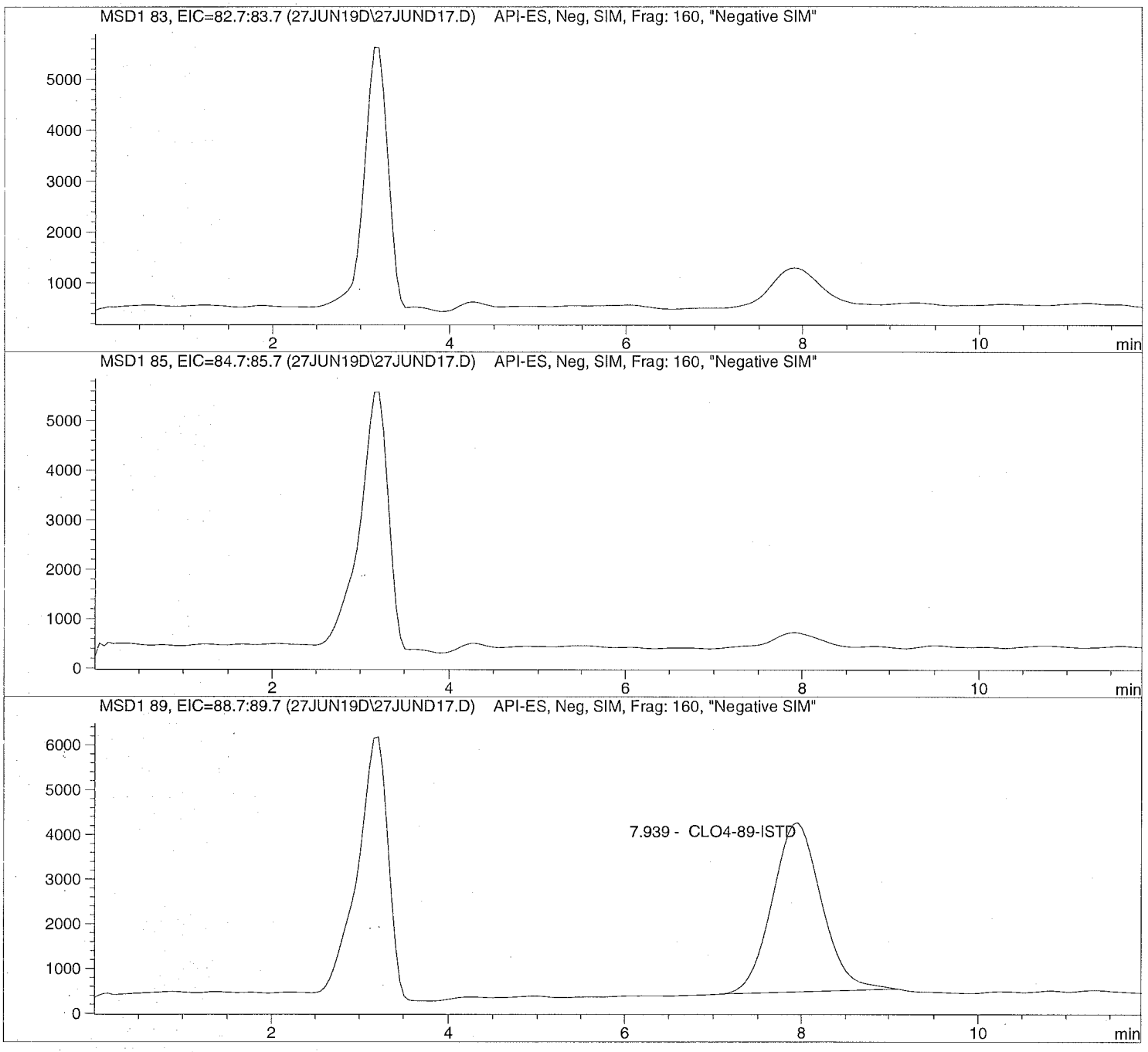
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND17.D Sample Name: 1917672004

Injection Date:	6/27/2019 12:29:33	Seq Line:	17
Sample Name:	1917672004	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND17.D Sample Name: 1917672004

Injection Date:	6/27/2019 12:29:33	Seq Line:	17
Sample Name:	1917672004	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.939	BBA	147927.7	5.0000	CLO4-89-ISTD

*** End of Report ***

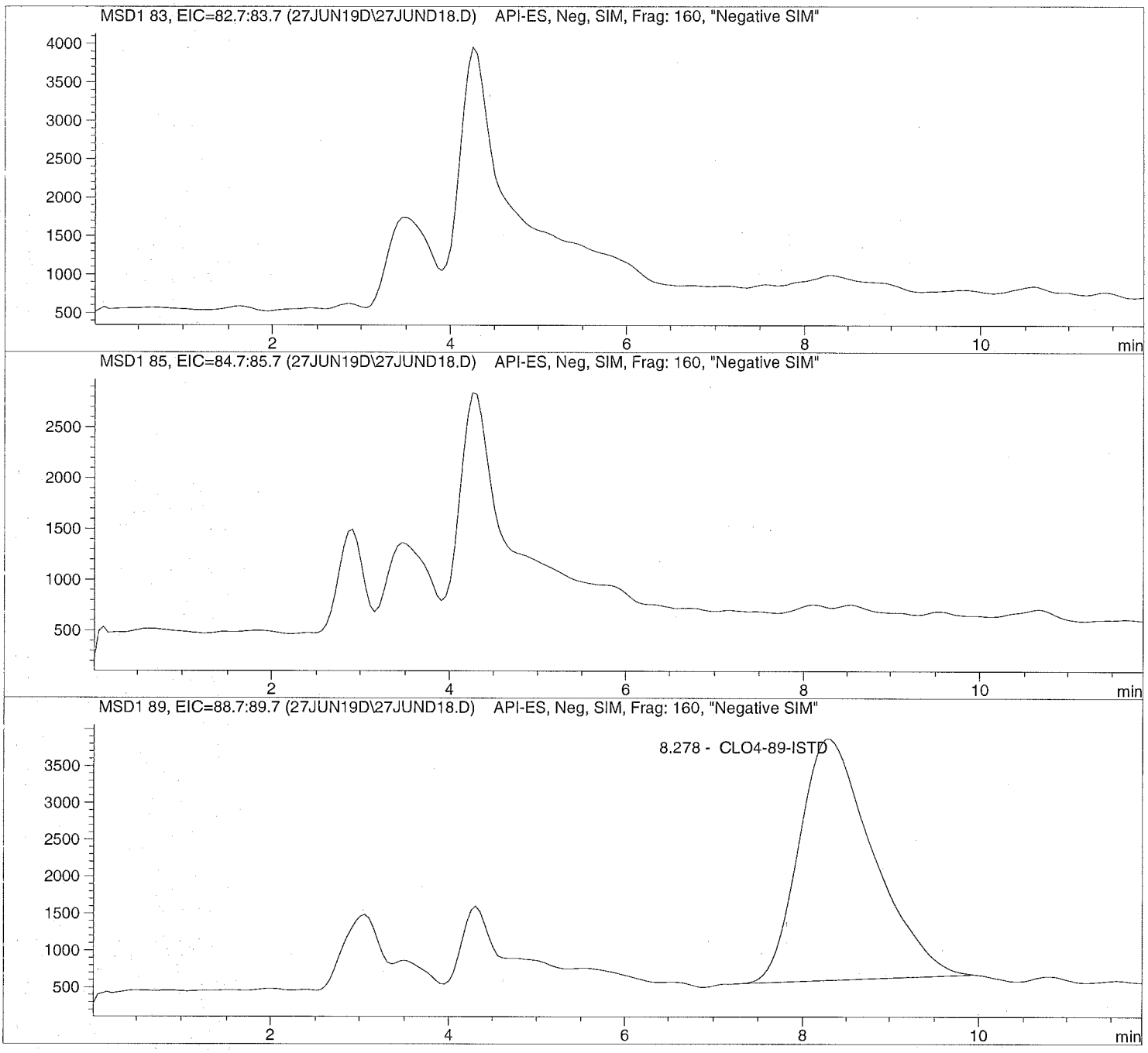
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND18.D Sample Name: 1917672005

Injection Date:	6/27/2019 12:43:25	Seq Line:	18
Sample Name:	1917672005	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND18.D Sample Name: 1917672005

Injection Date:	6/27/2019 12:43:25	Seq Line:	18
Sample Name:	1917672005	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.278	PBA	193450.5	5.0000	CLO4-89-ISTD

*** End of Report ***

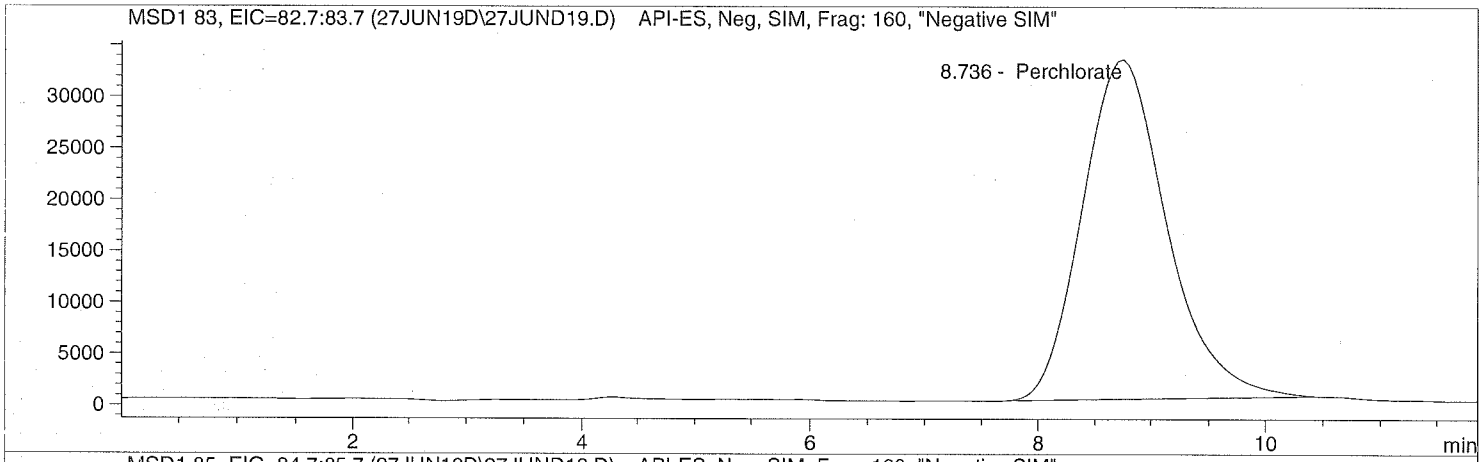
RIGHT SOLUTIONS | RIGHT PARTNER

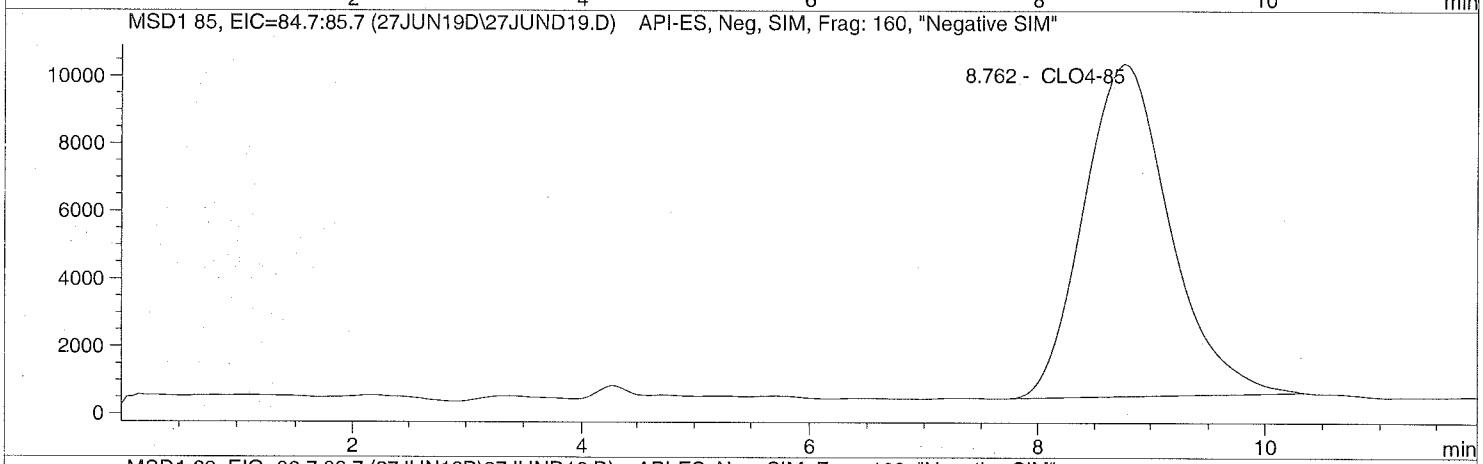
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND19.D Sample Name: 1917672006 100

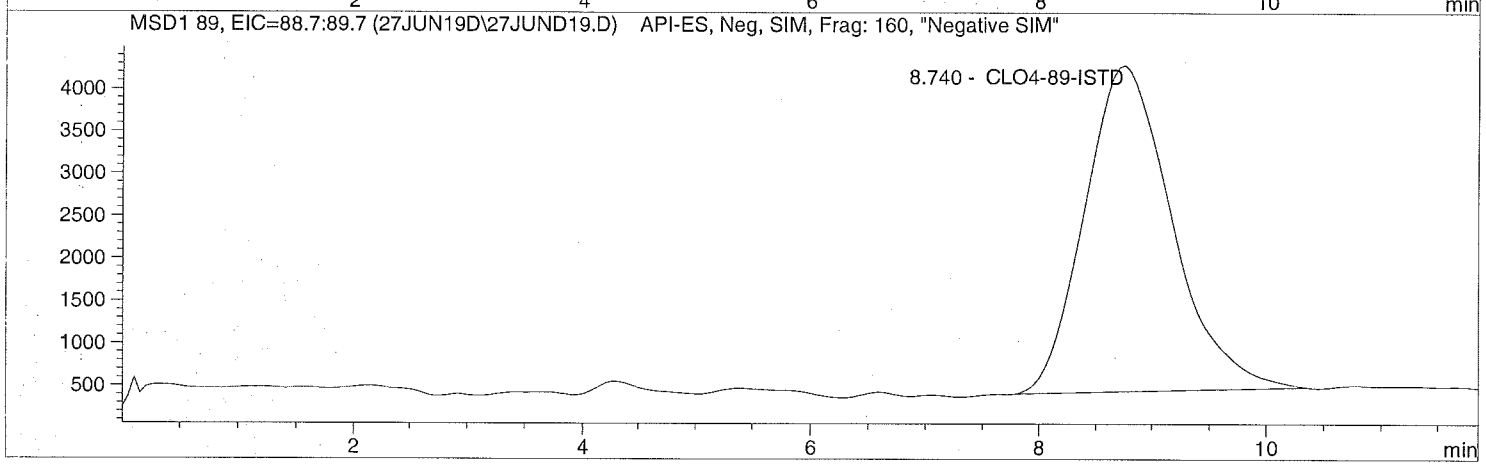
Injection Date:	6/27/2019 12:57:19	Seq Line:	19
Sample Name:	1917672006 100	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND19.D Sample Name: 1917672006 100

Injection Date:	6/27/2019 12:57:19	Seq Line:	19
Sample Name:	1917672006 100	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.736	PBA	1719861.8	2534.9645	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.762	PBA	521595.0	2587.4359	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.740	BBA	206241.0	500.0000	CLO4-89-ISTD

*** End of Report ***

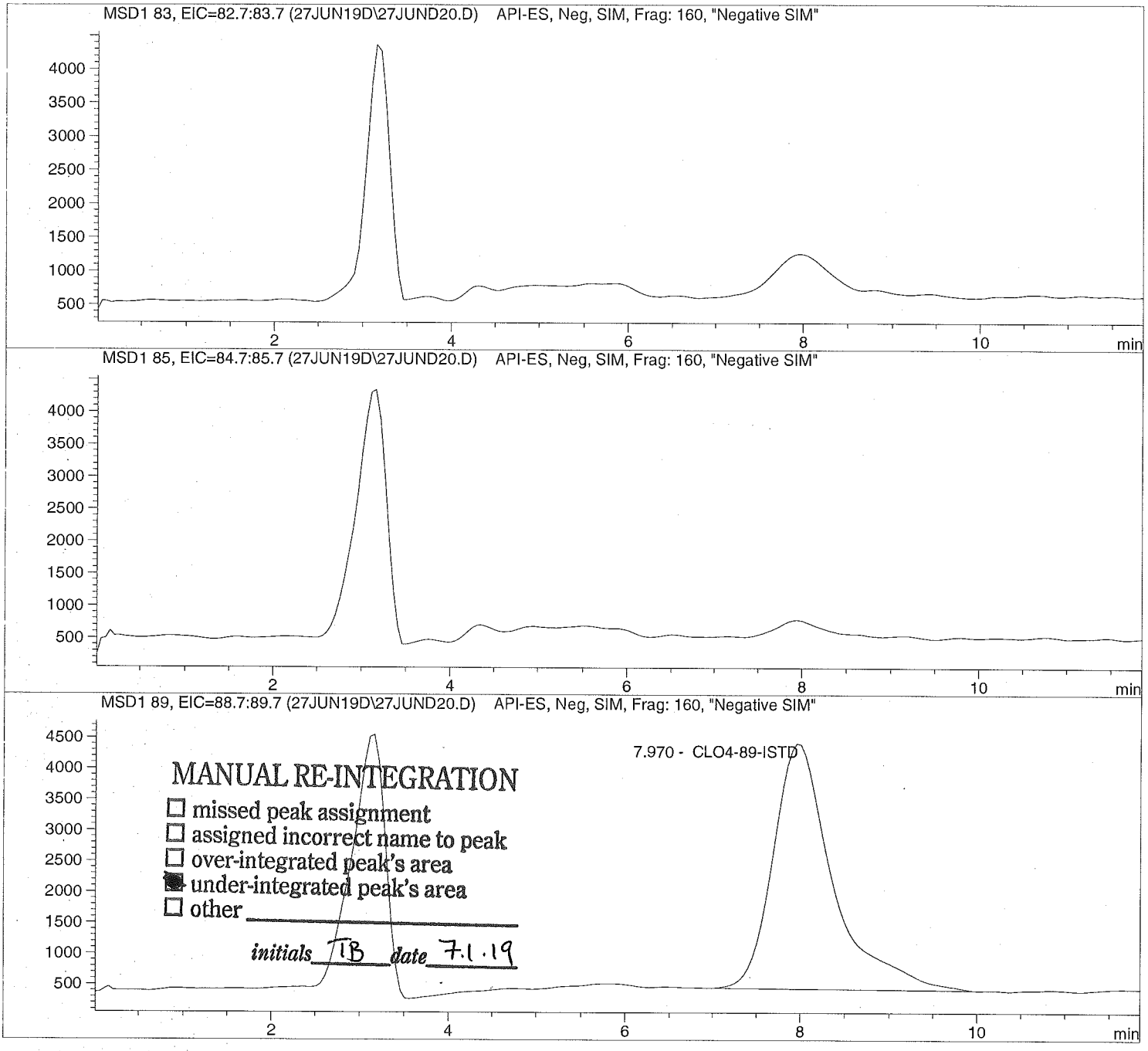
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.970	MM	187343.8	5.0000	CLO4-89-ISTD

*** End of Report ***

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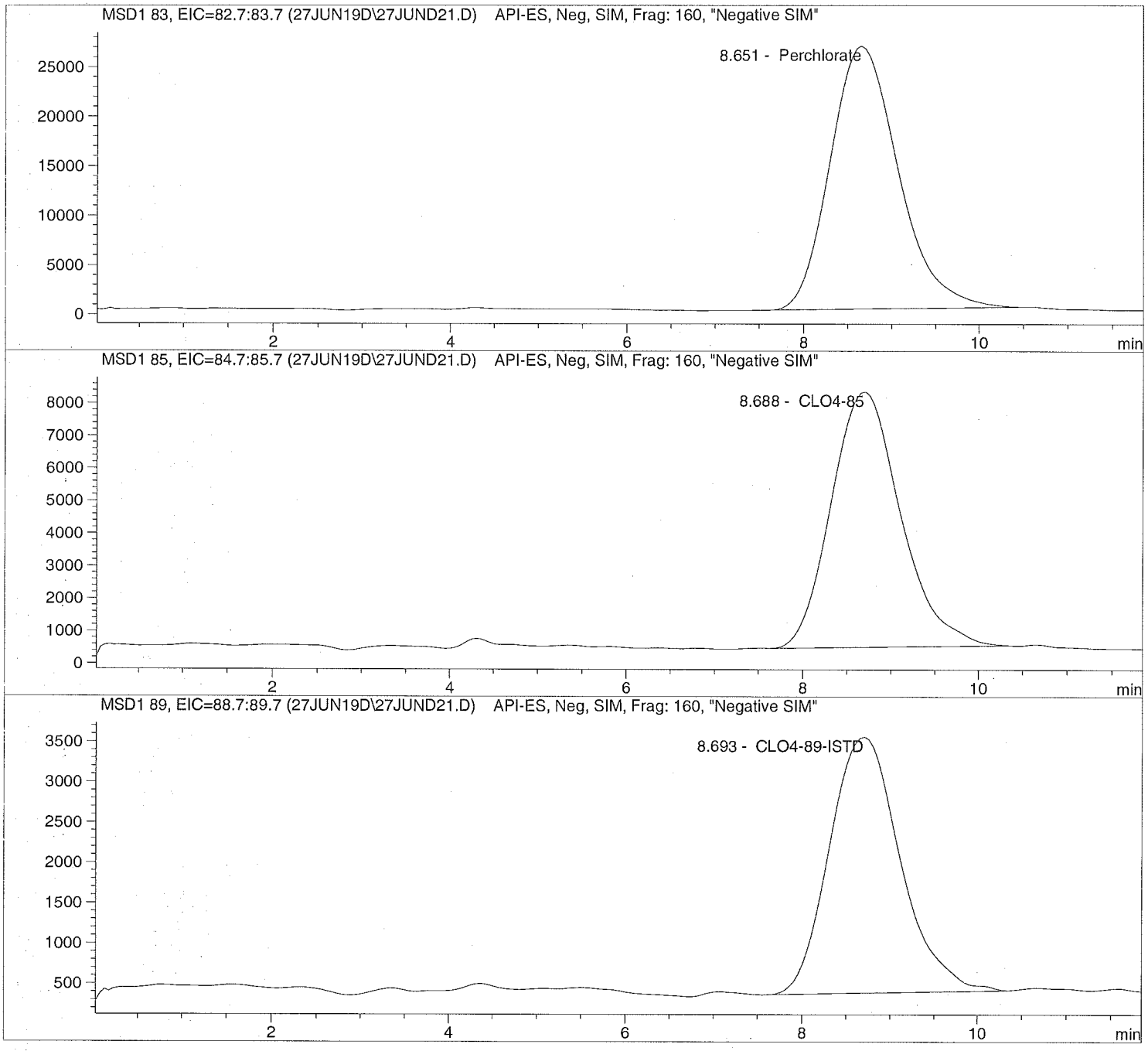
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND21.D Sample Name: 660897 CCV@25

Injection Date:	6/27/2019 13:28:58	Seq Line:	21
Sample Name:	660897 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND21.D Sample Name: 660897 CCV@25

Injection Date:	6/27/2019 13:28:58	Seq Line:	21
Sample Name:	660897 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.651	PBA	1425160.6	24.4244	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.688	PBA	430117.7	24.8091	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.693	PBA	177769.0	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

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Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

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RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

Peak Sum Table

No Entries in table

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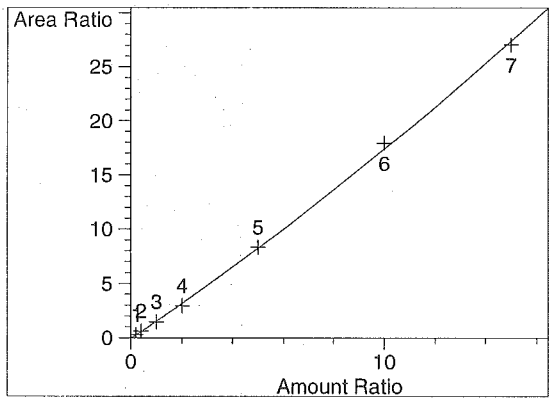
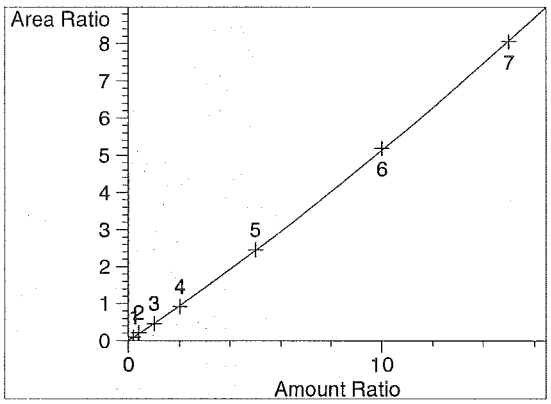
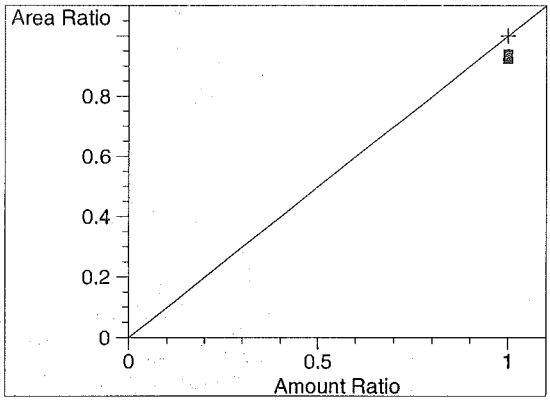
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

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Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

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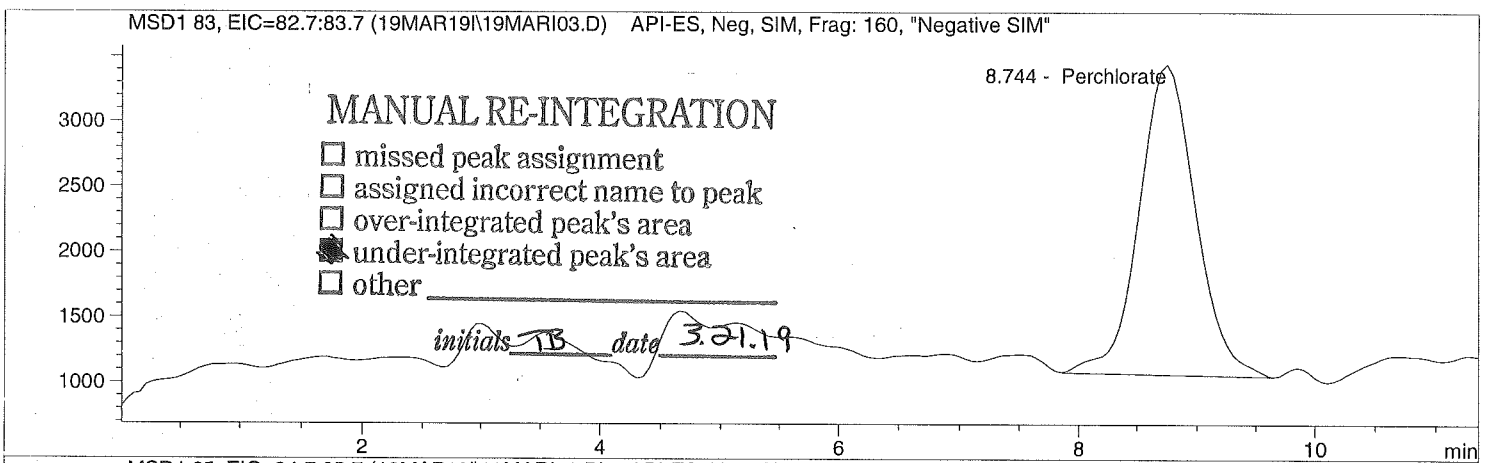
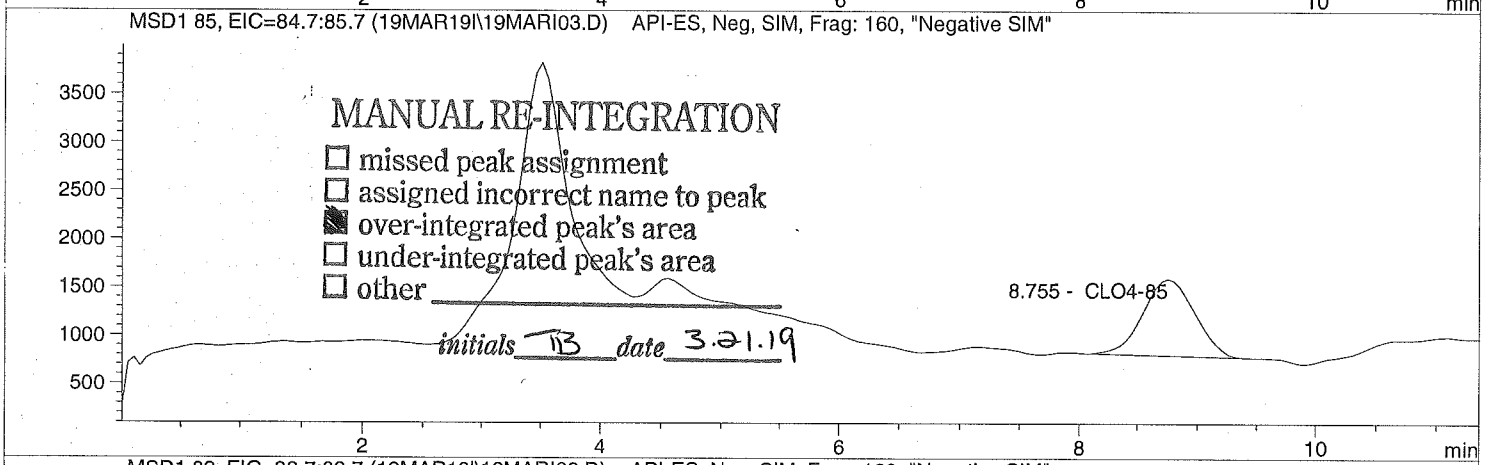
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

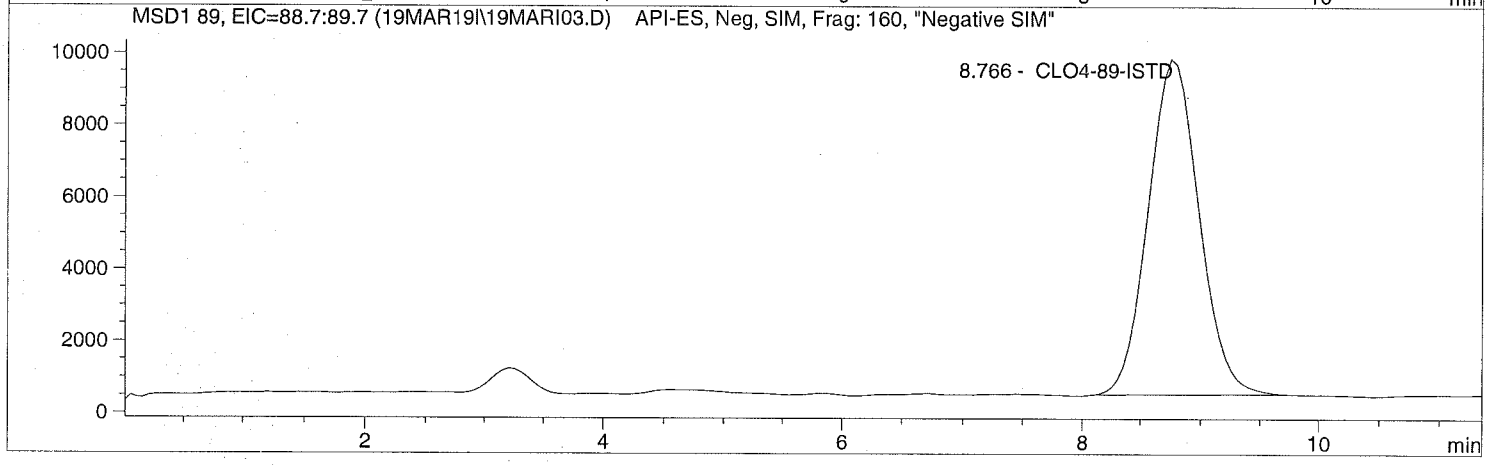
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

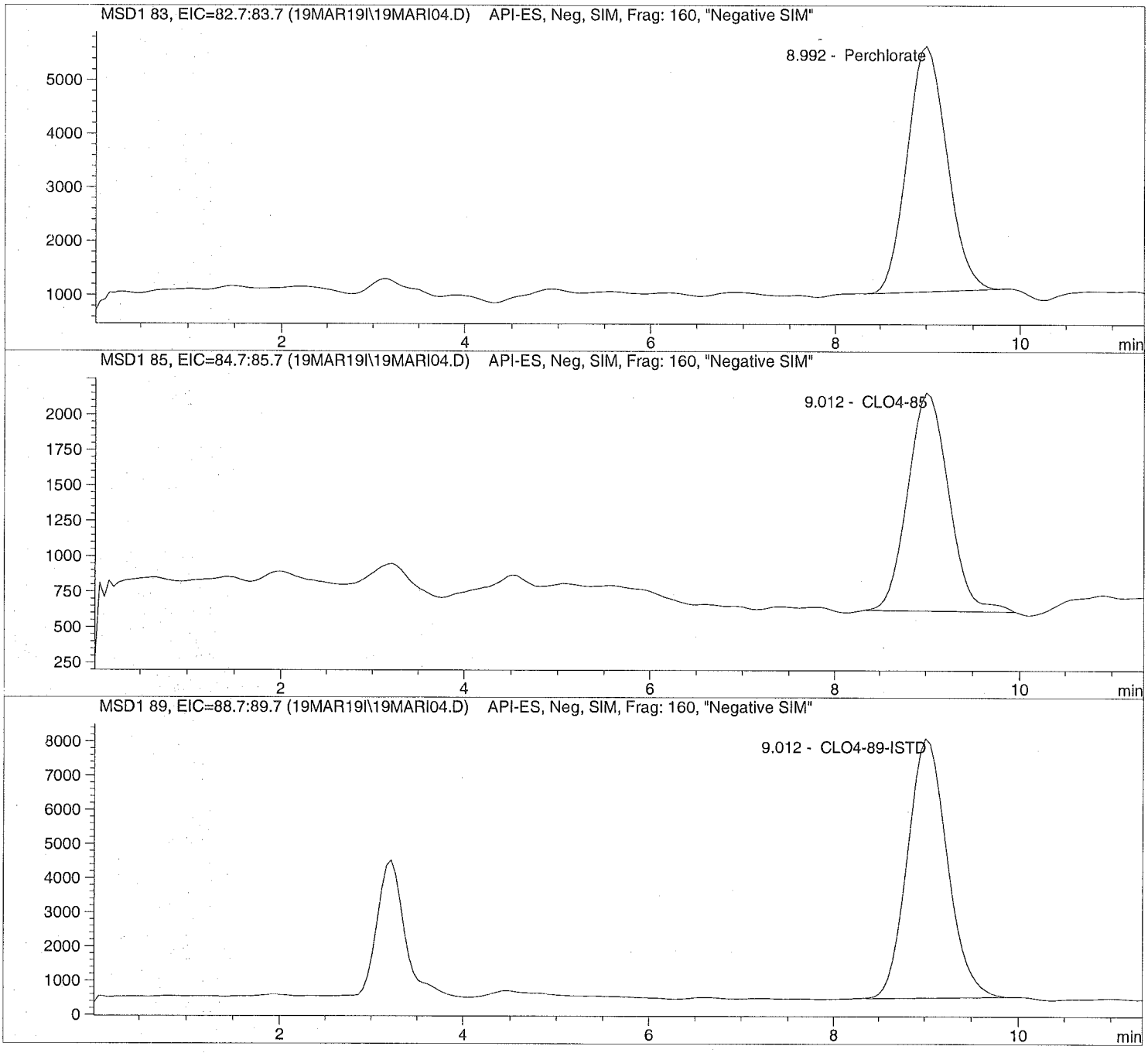
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

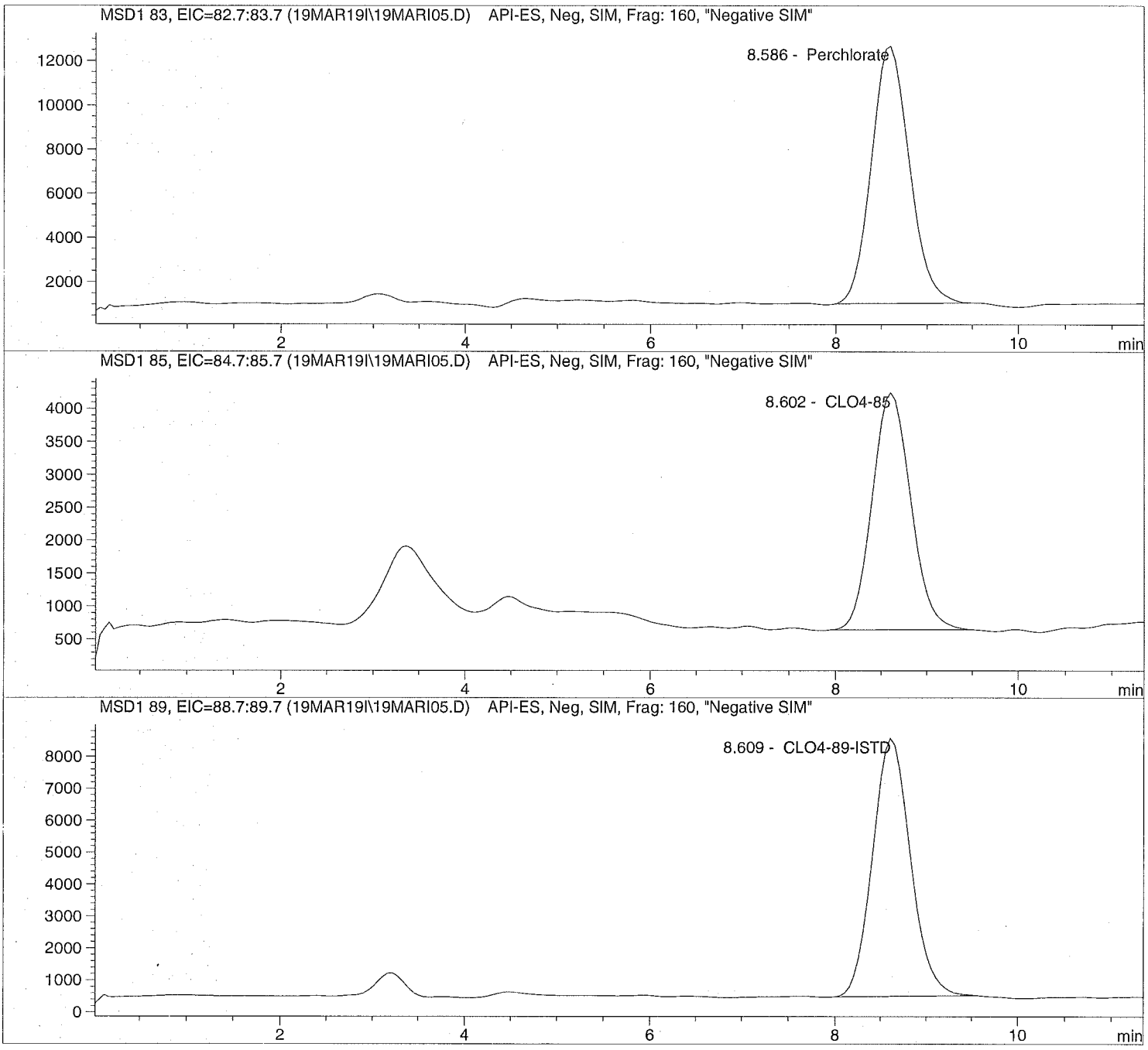
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

*** End of Report ***

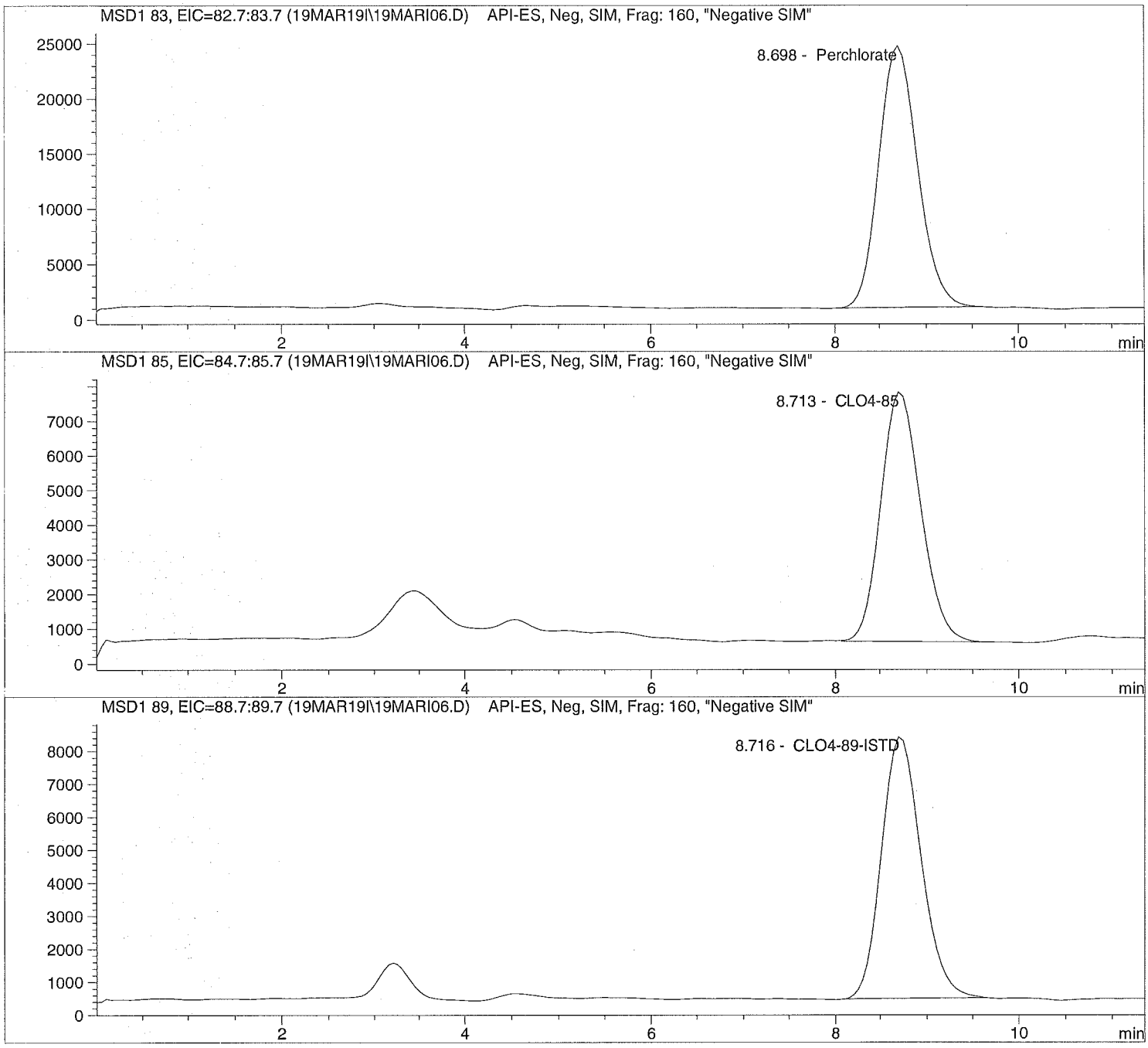
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

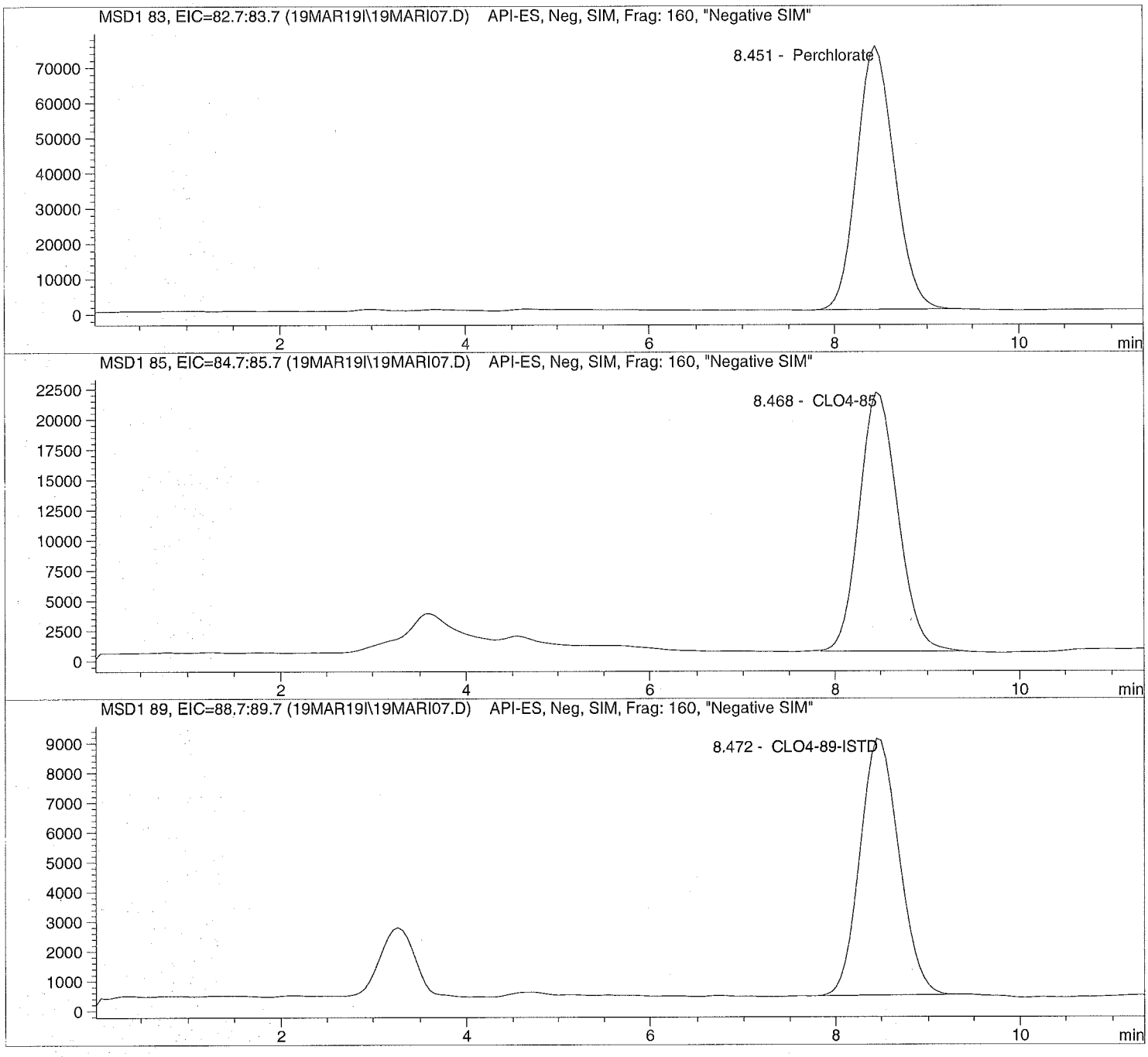
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

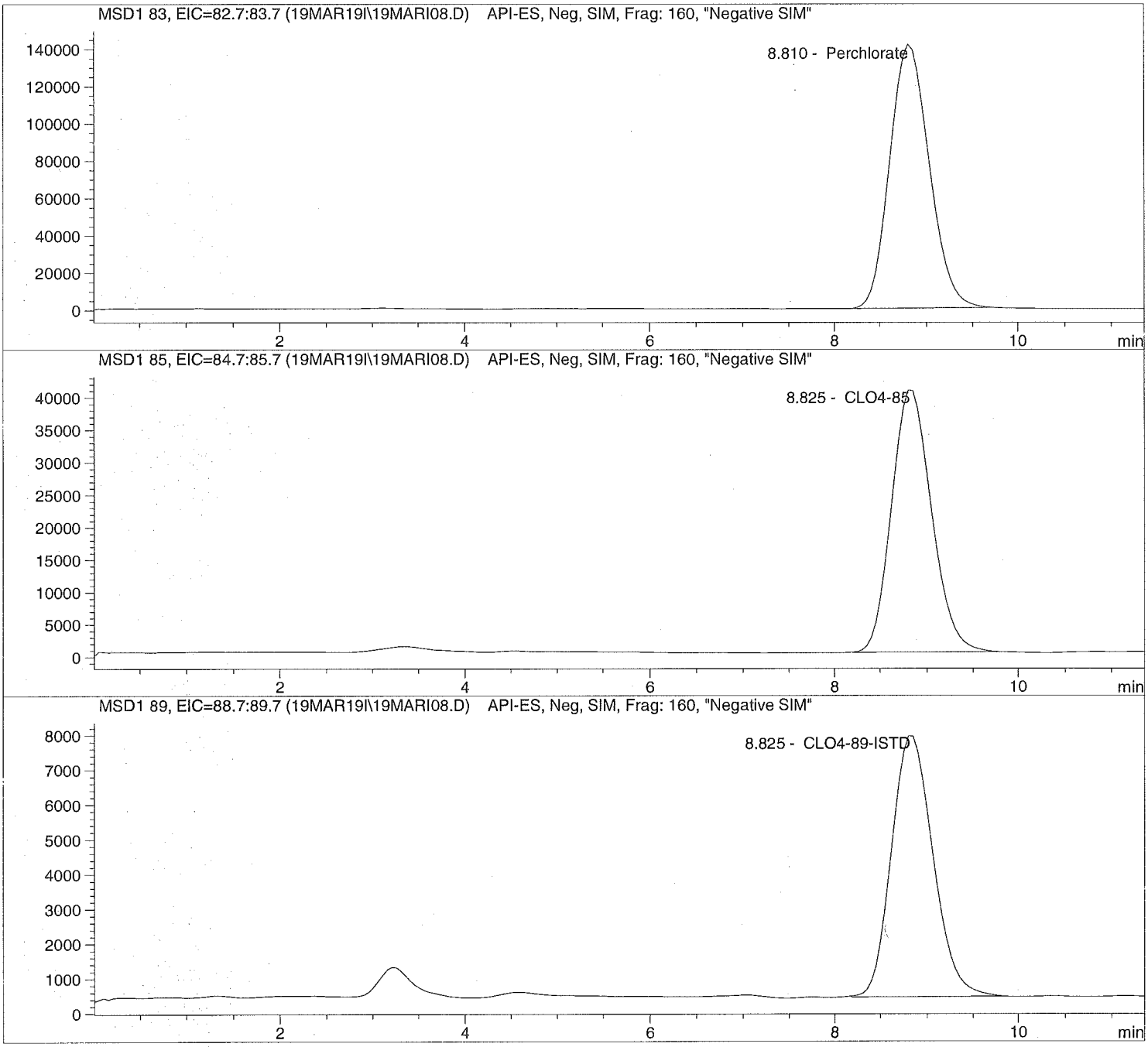
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

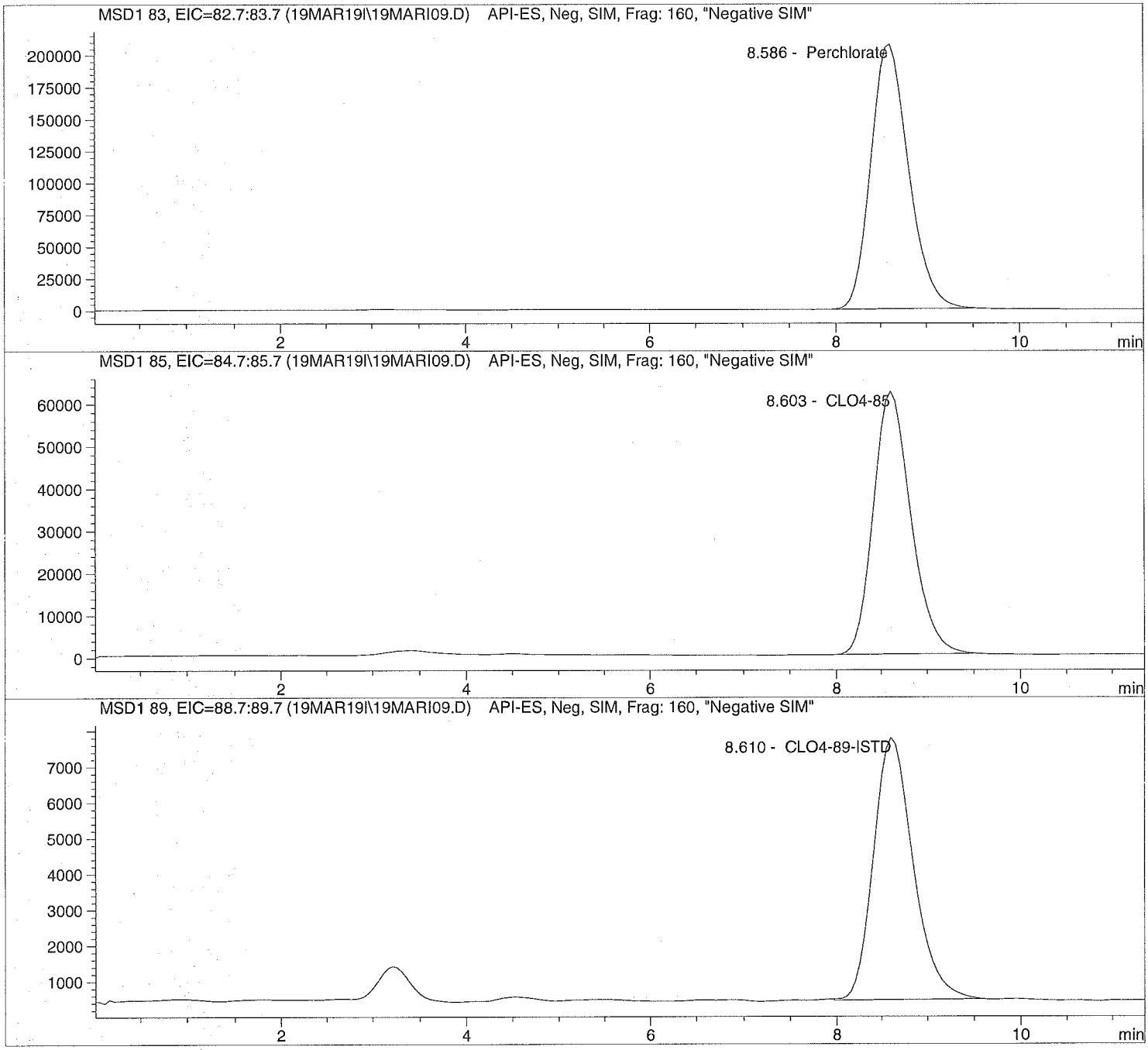
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

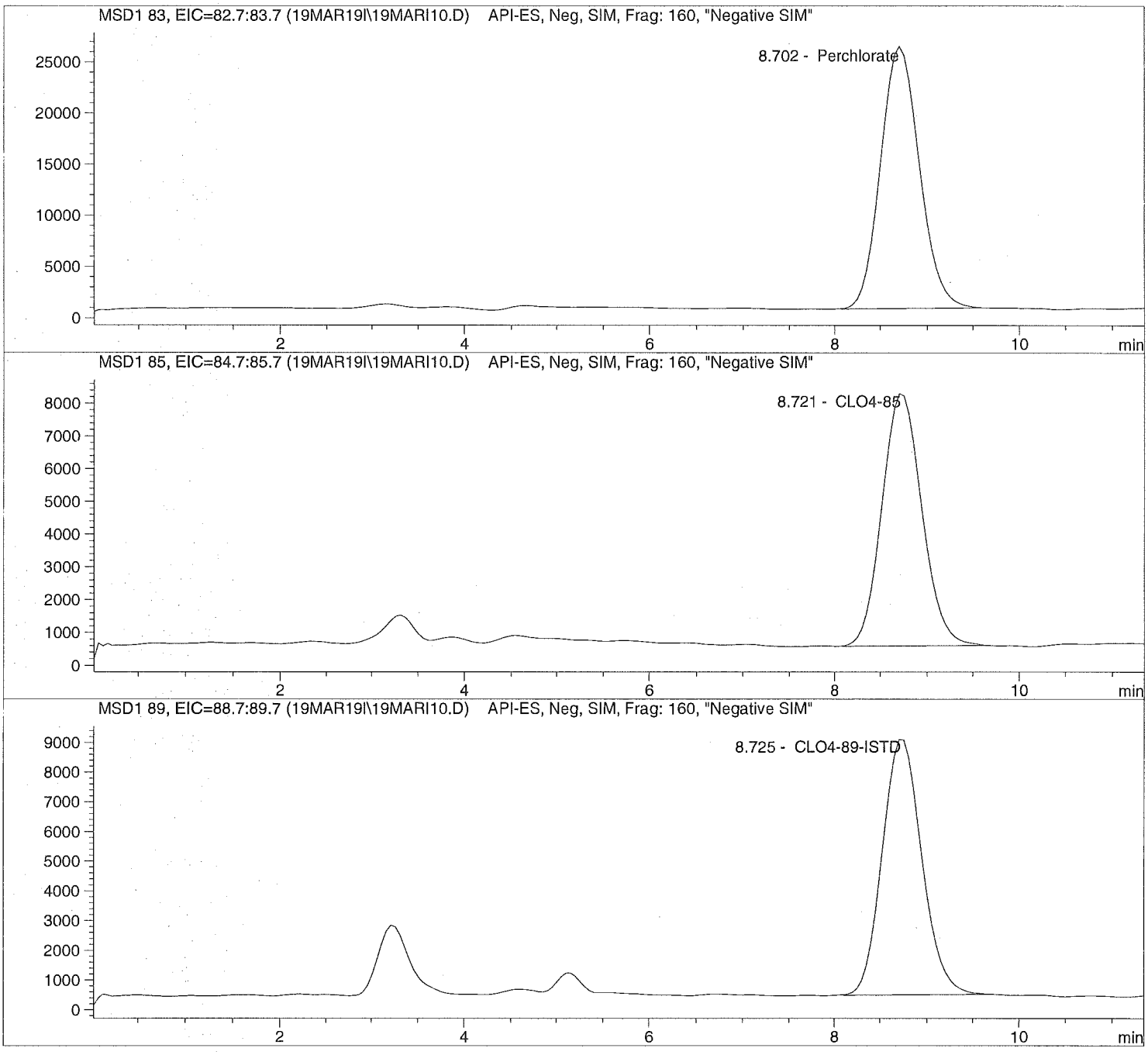
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

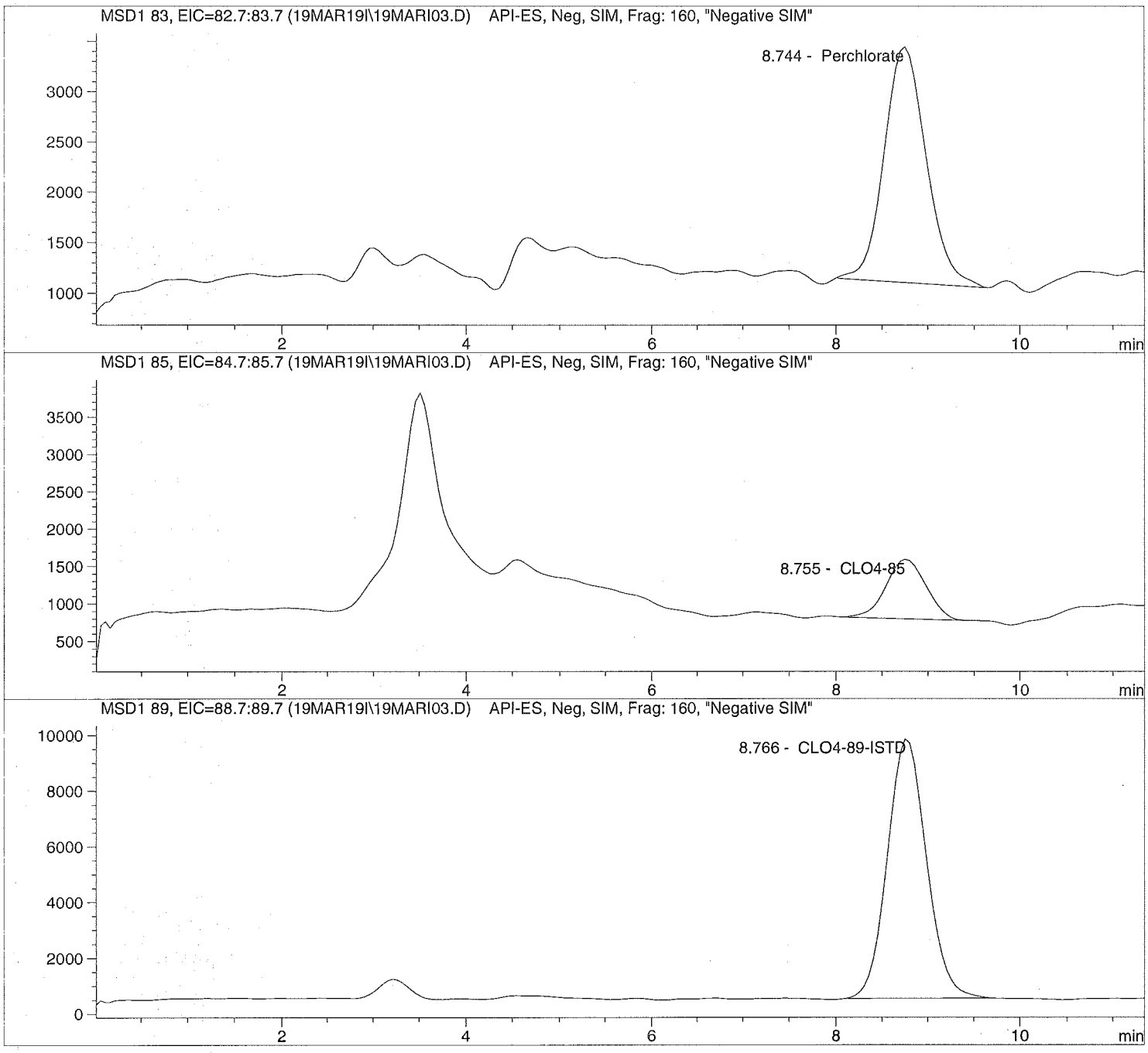
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

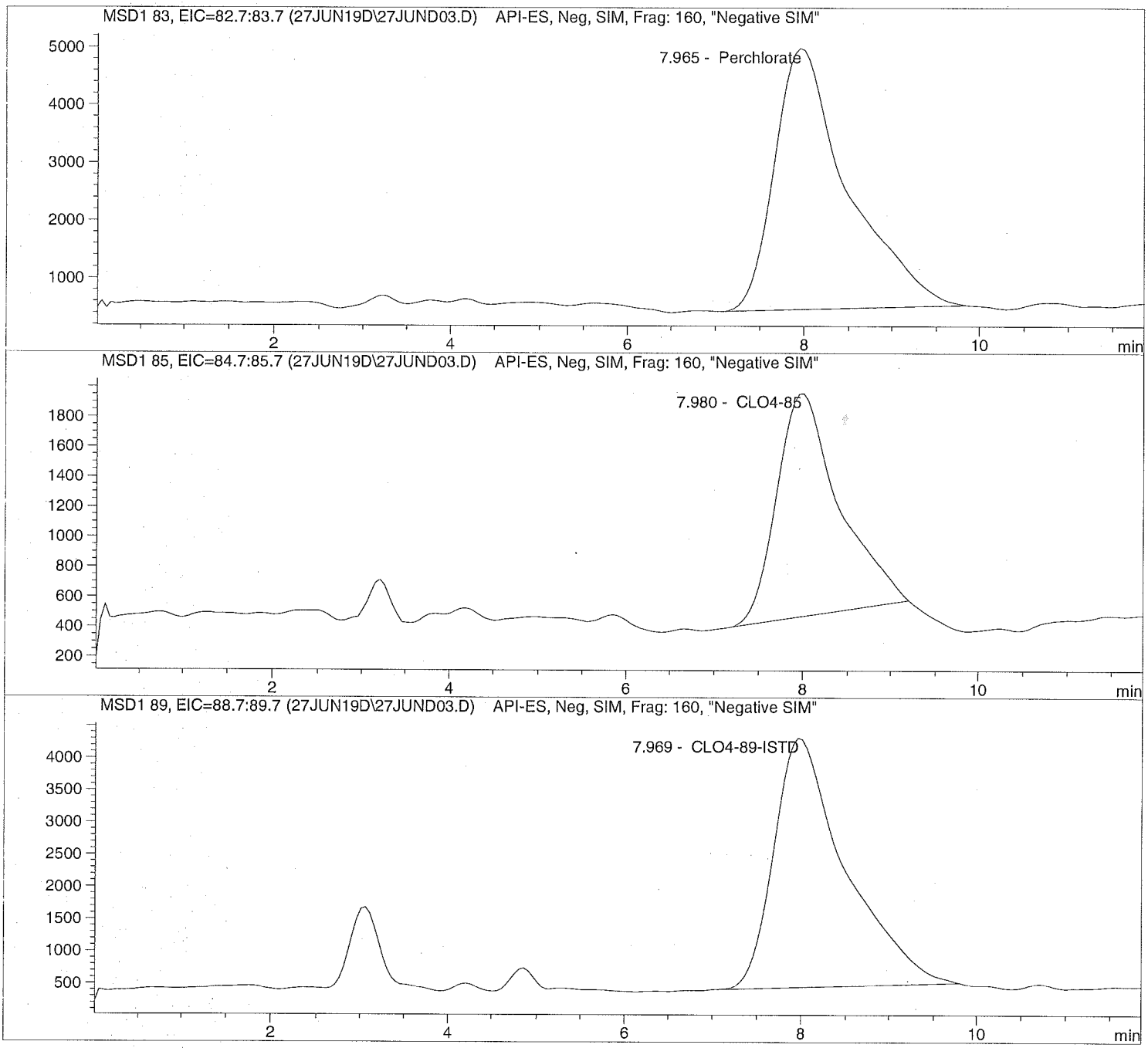
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND03.D Sample Name: 660891 ICS@4.0

Injection Date:	6/27/2019 09:14:16	Seq Line:	3
Sample Name:	660891 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.965	PBA	257330.2	3.9251	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.980	PBA	71973.3	3.5682	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.969	BBA	216232.2	5.0000	CLO4-89-ISTD

*** End of Report ***

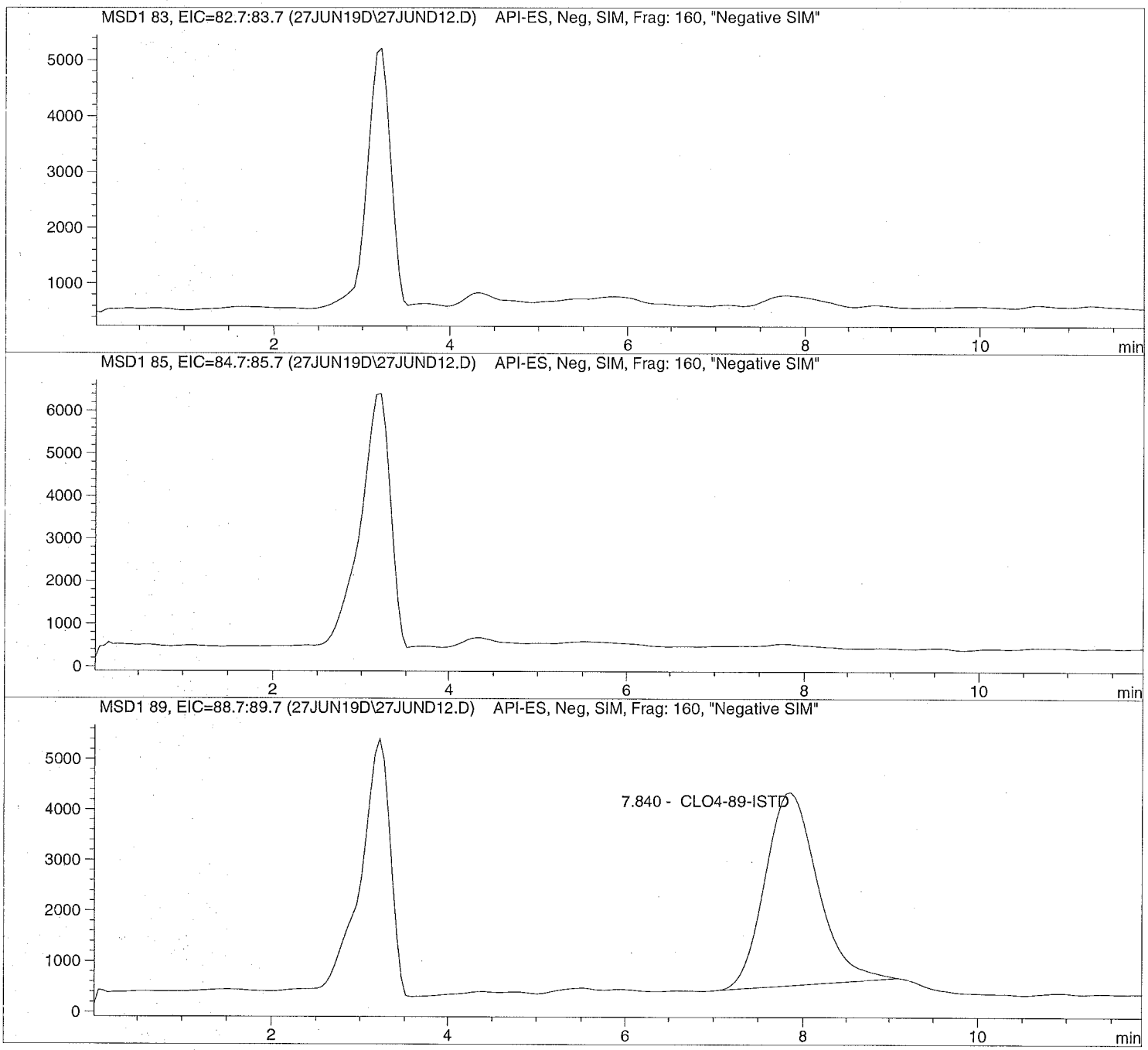
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND12.D Sample Name: 1917489005

Injection Date:	6/27/2019 11:20:03	Seq Line:	12
Sample Name:	1917489005	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.840	PBA	156379.6	5.0000	CLO4-89-ISTD

*** End of Report ***

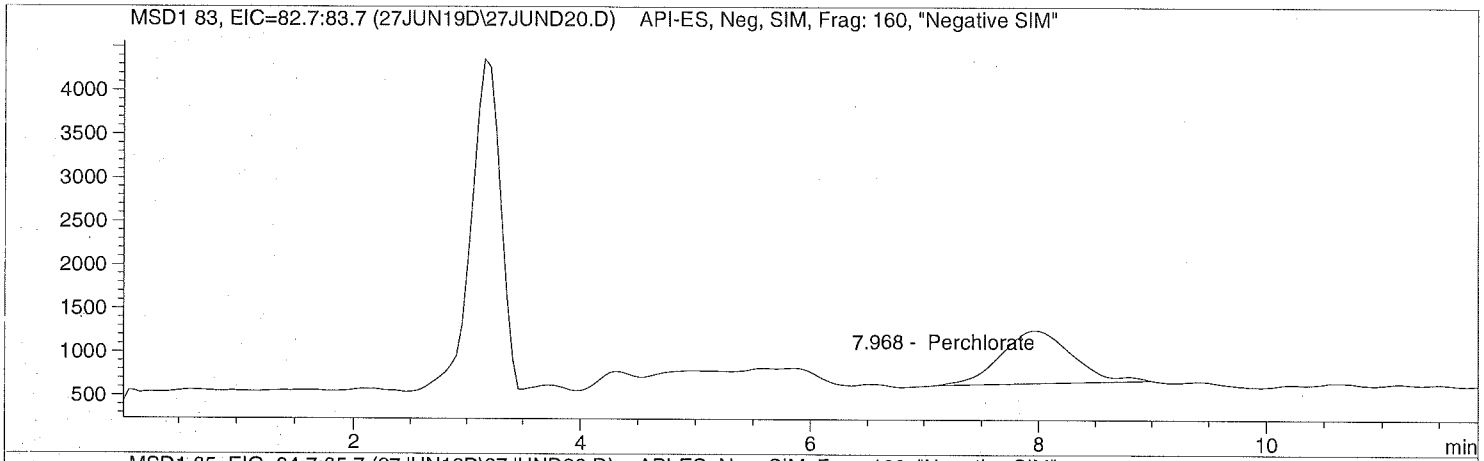
RIGHT SOLUTIONS | RIGHT PARTNER

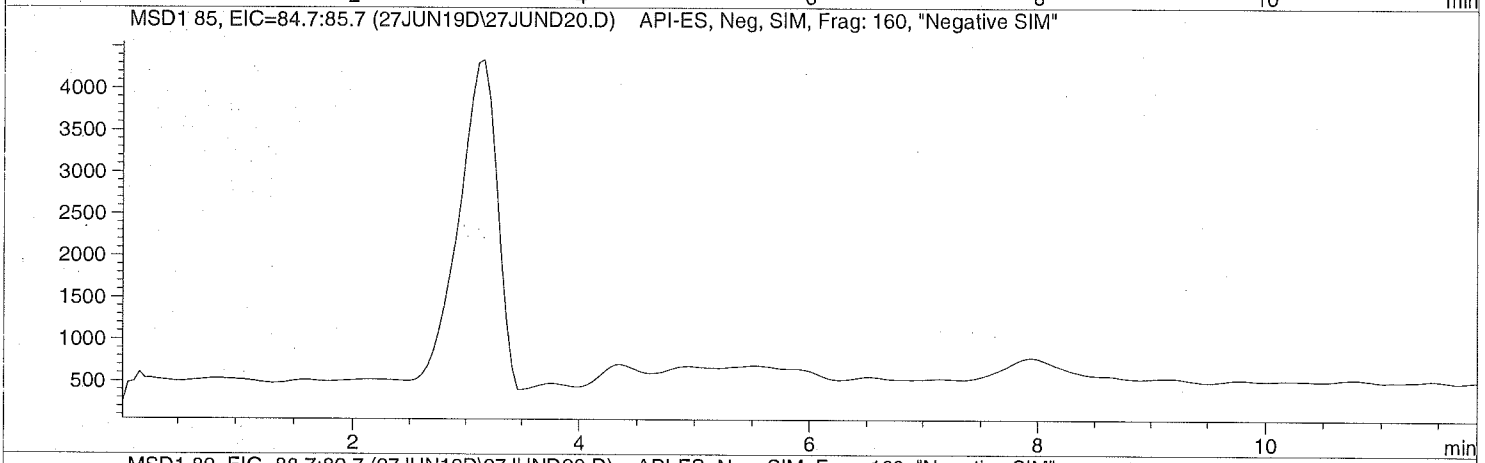
Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

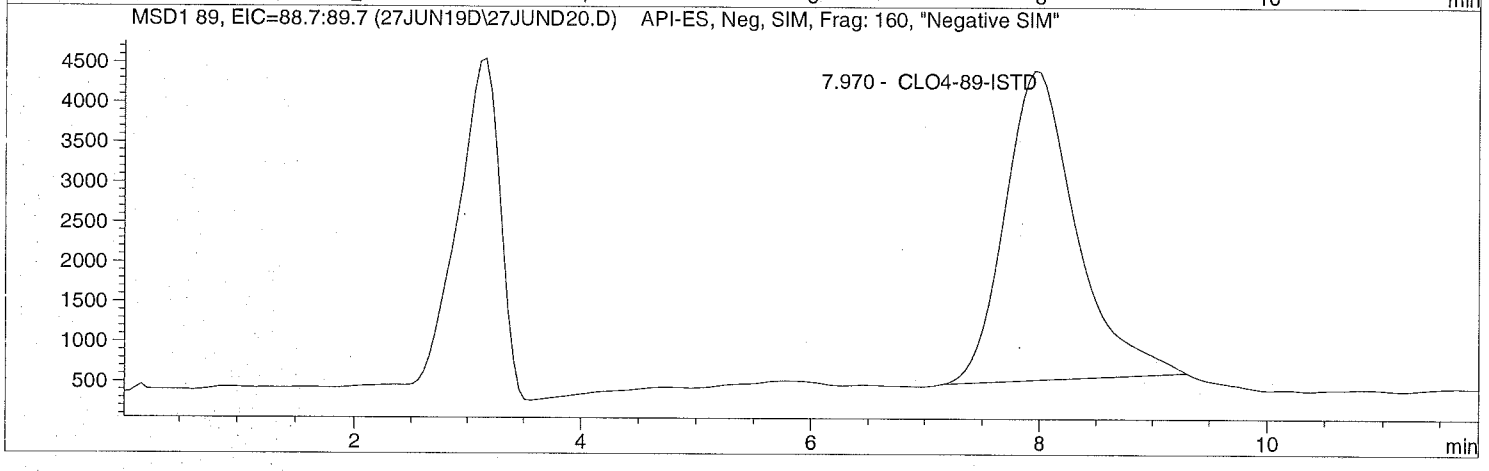
Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\27JUN19D\27JUND20.D Sample Name: 1917672007

Injection Date:	6/27/2019 13:11:15	Seq Line:	20
Sample Name:	1917672007	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.968	PBA	26504.7	0.6583	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.970	PBA	168729.9	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

July 10, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19060986**

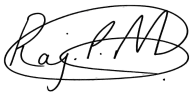
Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 7 sample(s) on Jun 19, 2019 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19060986

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19060986-01	18CpTMW08SW_061819	Groundwater		18-Jun-2019 08:10	19-Jun-2019 08:40	☐
HS19060986-02	MW5_061819	Groundwater		18-Jun-2019 08:55	19-Jun-2019 08:40	☐
HS19060986-03	19CptMW08DW_061819	Groundwater		18-Jun-2019 09:45	19-Jun-2019 08:40	☐
HS19060986-04	MW6_061819	Groundwater		18-Jun-2019 10:40	19-Jun-2019 08:40	☐
HS19060986-05	109_061819	Groundwater		18-Jun-2019 11:40	19-Jun-2019 08:40	☐
HS19060986-06	MW21_061819	Groundwater		18-Jun-2019 12:55	19-Jun-2019 08:40	☐
HS19060986-07	Trip Blank	Water		18-Jun-2019 00:00	19-Jun-2019 08:40	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19060986

Work Order Comments

- Revised to correct the reporting limit for Mercury

Work Order Comments

- The analyses for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final Report attached

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142169

Sample ID: 18CpTMW08SW_061819 (HS19060986-01)

- Sample was spiked with 2X the normal concentration. Surrogates 4-Terphenyl-d14 and Nitrobenzene-d5 recovered outside the control limits

Sample ID: LCSD-142169

- LCS/LCSD RPD recovered above the RPD limit. The individual recoveries met acceptance criteria (Surrogate 4-Terphenyl-d14)

GCMS Volatiles by Method SW8260

Batch ID: R341453

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R341546

Sample ID: VLCSW-190628

- 1,2,3_Trichlorobenzene and Naphthalene exceeded QC limits for LCS. CCV is OK. Samples are ND for these compounds.

Metals by Method SW6020

Batch ID: 142427

Sample ID: MW6_061819 (HS19060986-04MS)

- The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Barium, Calcium, Chromium, Magnesium, Nickel and Sodium.

Sample ID: MW6_061819 (HS19060986-04MSD)

- Manganese failed on MSD but passed for MS and PDS.

Metals by Method SW7470

Batch ID: 142417

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CpTMW08SW_061819
Collection Date: 18-Jun-2019 08:10

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,1-Dichloroethane	**2.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:22
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 18:22
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 18:22
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 18:22
Acetone	**2.7**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 18:22
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 18:22
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CpTMW08SW_061819
Collection Date: 18-Jun-2019 08:10

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
cis-1,2-Dichloroethene	**11**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:22
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 18:22
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 18:22
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 18:22
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:22
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Trichloroethene	**40**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:22
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:22
Vinyl chloride	**5.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:22
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 18:22*
Surr: 4-Bromofluorobenzene	*93.6*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 18:22*
Surr: Dibromofluoromethane	*94.7*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 18:22*
Surr: Toluene-d8	*97.1*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 18:22*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**1.7**		**0.10**	**0.10**	**0.10**	**ug/L**	10	27-Jun-2019 19:06
Surr: 2-Fluorobiphenyl	*101*			**0**	*40-140*	*%REC*	*10*	*27-Jun-2019 19:06*
Surr: 4-Terphenyl-d14	*72.6*			**0**	*40-140*	*%REC*	*10*	*27-Jun-2019 19:06*
Surr: Nitrobenzene-d5	*123*			**0**	*40-140*	*%REC*	*10*	*27-Jun-2019 19:06*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW5_061819
Collection Date: 18-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,1-Dichloroethane	**1.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:46
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 18:46
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 18:46
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 18:46
Acetone	**4.9**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 18:46
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 18:46
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW5_061819
Collection Date: 18-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
cis-1,2-Dichloroethene	**8.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:46
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 18:46
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 18:46
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 18:46
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 18:46
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Trichloroethene	**30**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:46
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 18:46
Vinyl chloride	**1.6**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 18:46
Surr: 1,2-Dichloroethane-d4	*108*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 18:46*
Surr: 4-Bromofluorobenzene	*97.0*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 18:46*
Surr: Dibromofluoromethane	*100*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 18:46*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 18:46*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	27-Jun-2019 16:41
Surr: 2-Fluorobiphenyl	*99.8*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 16:41*
Surr: 4-Terphenyl-d14	*90.6*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 16:41*
Surr: Nitrobenzene-d5	*115*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 16:41*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 19CptMW08DW_061819
Collection Date: 18-Jun-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILES SIM	**Method:SW8270SIM**					Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.38**		**0.010**	**0.010**	**0.010**	**ug/L**	1	27-Jun-2019 17:02
Surr: 2-Fluorobiphenyl	*96.2*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 17:02*
Surr: 4-Terphenyl-d14	*110*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 17:02*
Surr: Nitrobenzene-d5	*109*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 17:02*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)	**Method:NA**							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW6_061819
Collection Date: 18-Jun-2019 10:40

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,3-Dichlorobenzene	**0.62**	J	**0.40**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 13:35
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:35
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 13:35
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 13:35
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:35
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 13:35
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 13:35
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 13:35
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW6_061819
Collection Date: 18-Jun-2019 10:40

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
cis-1,2-Dichloroethene	**4.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 13:35
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 13:35
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 13:35
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 13:35
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 13:35
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Trichloroethene	**14**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 13:35
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 13:35
Surr: 1,2-Dichloroethane-d4	*104*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 13:35*
Surr: 4-Bromofluorobenzene	*98.4*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 13:35*
Surr: Dibromofluoromethane	*97.1*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 13:35*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 13:35*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW6_061819
Collection Date: 18-Jun-2019 10:40

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0152**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:00
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:00
Arsenic	**0.00204**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:00
Barium	**0.700**		**0.0190**	**0.0250**	**0.0500**	**mg/L**	10	28-Jun-2019 15:11
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:00
Cadmium	**0.000205**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 17:00
Calcium	**26.9**		**0.340**	**0.500**	**5.00**	**mg/L**	10	28-Jun-2019 15:11
Chromium	**0.228**		**0.00400**	**0.00500**	**0.0500**	**mg/L**	10	28-Jun-2019 15:11
Cobalt	**0.00561**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:00
Copper	**0.00520**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:00
Iron	**2.15**		**0.120**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:11
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 17:00
Magnesium	**22.9**		**0.100**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:11
Manganese	**0.137**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	28-Jun-2019 15:11
Nickel	**0.168**		**0.00600**	**0.0100**	**0.0500**	**mg/L**	10	28-Jun-2019 15:11
Potassium	**2.16**		**0.180**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:11
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:00
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:00
Sodium	**203**		**0.140**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:11
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:00
Vanadium	**0.00378**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:00
Zinc	**0.0358**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:00
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 25-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	25-Jun-2019 15:04
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 109_061819
Collection Date: 18-Jun-2019 11:40

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 19:10
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	27-Jun-2019 19:10
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	27-Jun-2019 19:10
Acetone	**7.8**		**0.40**	**1.0**	**2.0**	**UG/L**	1	27-Jun-2019 19:10
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	27-Jun-2019 19:10
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 109_061819
Collection Date: 18-Jun-2019 11:40

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
cis-1,2-Dichloroethene	**57**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 19:10
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	27-Jun-2019 19:10
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	27-Jun-2019 19:10
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	27-Jun-2019 19:10
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	27-Jun-2019 19:10
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Trichloroethene	**130**		**0.20**	**0.50**	**1.0**	**UG/L**	1	27-Jun-2019 19:10
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	27-Jun-2019 19:10
Surr: 1,2-Dichloroethane-d4	*105*			**0**	*81-118*	*%REC*	*1*	*27-Jun-2019 19:10*
Surr: 4-Bromofluorobenzene	*98.3*			**0**	*85-114*	*%REC*	*1*	*27-Jun-2019 19:10*
Surr: Dibromofluoromethane	*97.2*			**0**	*80-119*	*%REC*	*1*	*27-Jun-2019 19:10*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*27-Jun-2019 19:10*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**0.50**		**0.010**	**0.010**	**0.010**	**ug/L**	1	27-Jun-2019 17:22
Surr: 2-Fluorobiphenyl	*88.5*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 17:22*
Surr: 4-Terphenyl-d14	*108*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 17:22*
Surr: Nitrobenzene-d5	*114*			**0**	*40-140*	*%REC*	*1*	*27-Jun-2019 17:22*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW21_061819
Collection Date: 18-Jun-2019 12:55

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
1,1,1-Trichloroethane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
1,1,2,2-Tetrachloroethane	10	U	10	10	20	UG/L	20	27-Jun-2019 19:34
1,1,2-Trichloroethane	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
1,1-Dichloroethane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
1,1-Dichloroethene	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
1,1-Dichloropropene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
1,2,3-Trichlorobenzene	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
1,2,3-Trichloropropane	10	U	10	10	20	UG/L	20	27-Jun-2019 19:34
1,2,4-Trichlorobenzene	10	U	10	10	20	UG/L	20	27-Jun-2019 19:34
1,2,4-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
1,2-Dibromo-3-chloropropane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
1,2-Dibromoethane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
1,2-Dichlorobenzene	10	U	10	10	20	UG/L	20	27-Jun-2019 19:34
1,2-Dichloroethane	**38**		**4.0**	**10**	**20**	**UG/L**	20	27-Jun-2019 19:34
1,2-Dichloropropane	10	U	10	10	20	UG/L	20	27-Jun-2019 19:34
1,3,5-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
1,3-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
1,3-Dichloropropane	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
1,4-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
2,2-Dichloropropane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
2-Butanone	20	U	10	20	40	UG/L	20	27-Jun-2019 19:34
2-Chlorotoluene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
2-Hexanone	20	U	20	20	40	UG/L	20	27-Jun-2019 19:34
4-Chlorotoluene	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
4-Isopropyltoluene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
4-Methyl-2-pentanone	20	U	14	20	40	UG/L	20	27-Jun-2019 19:34
Acetone	20	U	8.0	20	40	UG/L	20	27-Jun-2019 19:34
Benzene	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
Bromobenzene	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
Bromochloromethane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
Bromodichloromethane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
Bromoform	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
Bromomethane	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
Carbon disulfide	20	U	12	20	40	UG/L	20	27-Jun-2019 19:34
Carbon tetrachloride	10	U	10	10	20	UG/L	20	27-Jun-2019 19:34
Chlorobenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Chloroethane	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Chloroform	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW21_061819
Collection Date: 18-Jun-2019 12:55

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
cis-1,2-Dichloroethene	**190**		**4.0**	**10**	**20**	**UG/L**	20	27-Jun-2019 19:34
cis-1,3-Dichloropropene	10	U	2.0	10	20	UG/L	20	27-Jun-2019 19:34
Dibromochloromethane	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Dibromomethane	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
Dichlorodifluoromethane	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Ethylbenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Hexachlorobutadiene	20	U	20	20	20	UG/L	20	27-Jun-2019 19:34
Isopropylbenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
m,p-Xylene	20	U	10	20	40	UG/L	20	27-Jun-2019 19:34
Methylene chloride	20	U	8.0	20	40	UG/L	20	27-Jun-2019 19:34
n-Butylbenzene	10	U	8.0	10	20	UG/L	20	27-Jun-2019 19:34
n-Propylbenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Naphthalene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
o-Xylene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
sec-Butylbenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Styrene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
tert-Butylbenzene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Tetrachloroethene	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Toluene	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
trans-1,2-Dichloroethene	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
trans-1,3-Dichloropropene	10	U	4.0	10	20	UG/L	20	27-Jun-2019 19:34
Trichloroethene	**6,300**		**40**	**100**	**200**	**UG/L**	200	27-Jun-2019 19:58
Trichlorofluoromethane	10	U	6.0	10	20	UG/L	20	27-Jun-2019 19:34
Vinyl chloride	**18**	J	**4.0**	**10**	**20**	**UG/L**	20	27-Jun-2019 19:34
Surr: 1,2-Dichloroethane-d4	*105*			**0**	*81-118*	*%REC*	*20*	*27-Jun-2019 19:34*
Surr: 1,2-Dichloroethane-d4	*108*			**0**	*81-118*	*%REC*	*200*	*27-Jun-2019 19:58*
Surr: 4-Bromofluorobenzene	*95.3*			**0**	*85-114*	*%REC*	*200*	*27-Jun-2019 19:58*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*85-114*	*%REC*	*20*	*27-Jun-2019 19:34*
Surr: Dibromofluoromethane	*97.1*			**0**	*80-119*	*%REC*	*20*	*27-Jun-2019 19:34*
Surr: Dibromofluoromethane	*99.8*			**0**	*80-119*	*%REC*	*200*	*27-Jun-2019 19:58*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*20*	*27-Jun-2019 19:34*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*200*	*27-Jun-2019 19:58*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 19-Jun-2019		Analyst: LG
1,4-Dioxane	**1.2**		**0.10**	**0.10**	**0.10**	**ug/L**	10	27-Jun-2019 19:27
Surr: 2-Fluorobiphenyl	*111*			**0**	*40-140*	*%REC*	*10*	*27-Jun-2019 19:27*
Surr: 4-Terphenyl-d14	*23700*	*SE*		**0**	*40-140*	*%REC*	*10*	*27-Jun-2019 19:27*
Surr: Nitrobenzene-d5	*1450*	*S*		**0**	*40-140*	*%REC*	*10*	*27-Jun-2019 19:27*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW21_061819
Collection Date: 18-Jun-2019 12:55

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0299**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 17:58
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 17:58
Arsenic	**0.00241**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
Barium	**9.21**		**0.0380**	**0.0500**	**0.100**	**mg/L**	20	28-Jun-2019 15:45
Beryllium	**0.000301**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 17:58
Cadmium	**0.000837**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 17:58
Calcium	**223**		**0.680**	**1.00**	**10.0**	**mg/L**	20	28-Jun-2019 15:45
Chromium	**1.09**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
Cobalt	**0.117**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
Copper	**0.219**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
Iron	**15.2**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:58
Lead	**0.000663**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
Magnesium	**178**		**0.200**	**1.00**	**4.00**	**mg/L**	20	28-Jun-2019 15:45
Manganese	**2.59**		**0.0140**	**0.0200**	**0.100**	**mg/L**	20	28-Jun-2019 15:45
Nickel	**1.49**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
Potassium	**3.20**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 17:58
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 17:58
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 17:58
Sodium	**552**		**0.280**	**1.00**	**4.00**	**mg/L**	20	28-Jun-2019 15:45
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 17:58
Vanadium	**0.00433**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
Zinc	**0.0462**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 17:58
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 25-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	25-Jun-2019 15:09
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 18-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19060986
Lab ID:HS19060986-07
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 12:01
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 12:01
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 12:01
Acetone	**5.2**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 12:01
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 12:01
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19060986
Sample ID: Trip Blank
Lab ID:HS19060986-07
Collection Date: 18-Jun-2019 00:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 12:01
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 12:01
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 12:01
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:01
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:01
Surr: 1,2-Dichloroethane-d4	*97.0*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 12:01*
Surr: 4-Bromofluorobenzene	*94.9*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 12:01*
Surr: Dibromofluoromethane	*92.9*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 12:01*
Surr: Toluene-d8	*95.7*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 12:01*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

Batch ID: 142169 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060986-01	1	1000	1 (mL)	0.001
HS19060986-02	1	1000	1 (mL)	0.001
HS19060986-03	1	1000	1 (mL)	0.001
HS19060986-05	1	1000	1 (mL)	0.001
HS19060986-06	1	1000	1 (mL)	0.001

Batch ID: 142417 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060986-04	1	10 (mL)	10 (mL)	1
HS19060986-06	1	10 (mL)	10 (mL)	1

Batch ID: 142427 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19060986-04	1	10	10 (mL)	1
HS19060986-06	1	10	10 (mL)	1

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142169 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Groundwater	
HS19060986-01	18CpTMW08SW_061819	18 Jun 2019 08:10		19 Jun 2019 09:21	27 Jun 2019 19:06	10
HS19060986-02	MW5_061819	18 Jun 2019 08:55		19 Jun 2019 09:21	27 Jun 2019 16:41	1
HS19060986-03	19CptMW08DW_061819	18 Jun 2019 09:45		19 Jun 2019 09:21	27 Jun 2019 17:02	1
HS19060986-05	109_061819	18 Jun 2019 11:40		19 Jun 2019 09:21	27 Jun 2019 17:22	1
HS19060986-06	MW21_061819	18 Jun 2019 12:55		19 Jun 2019 09:21	27 Jun 2019 19:27	10
Batch ID: 142417 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19060986-04	MW6_061819	18 Jun 2019 10:40		25 Jun 2019 09:30	25 Jun 2019 15:04	1
HS19060986-06	MW21_061819	18 Jun 2019 12:55		25 Jun 2019 09:30	25 Jun 2019 15:09	1
Batch ID: 142427 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19060986-04	MW6_061819	18 Jun 2019 10:40		25 Jun 2019 11:30	28 Jun 2019 15:11	10
HS19060986-04	MW6_061819	18 Jun 2019 10:40		25 Jun 2019 11:30	27 Jun 2019 17:00	1
HS19060986-06	MW21_061819	18 Jun 2019 12:55		25 Jun 2019 11:30	28 Jun 2019 15:45	20
HS19060986-06	MW21_061819	18 Jun 2019 12:55		25 Jun 2019 11:30	27 Jun 2019 17:58	1
Batch ID: R341453 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19060986-01	18CpTMW08SW_061819	18 Jun 2019 08:10			27 Jun 2019 18:22	1
HS19060986-02	MW5_061819	18 Jun 2019 08:55			27 Jun 2019 18:46	1
HS19060986-04	MW6_061819	18 Jun 2019 10:40			27 Jun 2019 13:35	1
HS19060986-05	109_061819	18 Jun 2019 11:40			27 Jun 2019 19:10	1
HS19060986-06	MW21_061819	18 Jun 2019 12:55			27 Jun 2019 19:58	200
HS19060986-06	MW21_061819	18 Jun 2019 12:55			27 Jun 2019 19:34	20
Batch ID: R341546 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19060986-07	Trip Blank	18 Jun 2019 00:00			28 Jun 2019 12:01	1
Batch ID: R341906 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19060986-01	18CpTMW08SW_061819	18 Jun 2019 08:10			05 Jul 2019 14:42	1
HS19060986-02	MW5_061819	18 Jun 2019 08:55			05 Jul 2019 14:42	1
HS19060986-03	19CptMW08DW_061819	18 Jun 2019 09:45			05 Jul 2019 14:42	1
HS19060986-04	MW6_061819	18 Jun 2019 10:40			05 Jul 2019 14:42	1
HS19060986-05	109_061819	18 Jun 2019 11:40			05 Jul 2019 14:42	1
HS19060986-06	MW21_061819	18 Jun 2019 12:55			05 Jul 2019 14:42	1

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142417 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142417** Units: **mg/L** Analysis Date: **25-Jun-2019 14:58**
Client ID: Run ID: **HG03_341258** SeqNo: **5139847** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142417** Units: **mg/L** Analysis Date: **25-Jun-2019 15:02**
Client ID: Run ID: **HG03_341258** SeqNo: **5139848** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00502	0.000200	0.005	0	100	80 - 120				

MS Sample ID: **HS19060986-04MS** Units: **mg/L** Analysis Date: **25-Jun-2019 15:06**
Client ID: **MW6_061819** Run ID: **HG03_341258** SeqNo: **5139850** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000511	0.000000200	5e-006	0.0000000010	102	75 - 125				

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **25-Jun-2019 15:07**
Client ID: **MW6_061819** Run ID: **HG03_341258** SeqNo: **5139851** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000558	0.000000200	5e-006	0.0000000010	112	75 - 125	0.000005110	8.79	20	

The following samples were analyzed in this batch: HS19060986-04 HS19060986-06

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 17:22**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145221** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002457	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.001932	0.00500								J
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.02437	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.001051	0.00500								J
Zinc	0.00200	0.00500								U

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 16:58**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145214** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1091	0.0100	0.1	0	109	84 - 117				
Antimony	0.0559	0.00500	0.05	0	112	85 - 117				
Arsenic	0.05618	0.00500	0.05	0	112	84 - 116				
Barium	0.05364	0.00500	0.05	0	107	86 - 114				
Beryllium	0.05694	0.00200	0.05	0	114	83 - 121				
Cadmium	0.05632	0.00200	0.05	0	113	87 - 115				
Calcium	5.323	0.500	5	0	106	87 - 118				
Chromium	0.05591	0.00500	0.05	0	112	85 - 116				
Cobalt	0.05561	0.00500	0.05	0	111	86 - 115				
Copper	0.05732	0.00500	0.05	0	115	85 - 118				
Iron	5.504	0.200	5	0	110	87 - 118				
Lead	0.05401	0.00500	0.05	0	108	88 - 115				
Magnesium	5.42	0.200	5	0	108	83 - 118				
Manganese	0.05651	0.00500	0.05	0	113	87 - 115				
Nickel	0.05699	0.00500	0.05	0	114	85 - 117				
Potassium	5.366	0.200	5	0	107	87 - 115				
Selenium	0.05781	0.00500	0.05	0	116	80 - 120				
Silver	0.05393	0.00500	0.05	0	108	85 - 116				
Sodium	5.418	0.200	5	0	108	85 - 117				
Thallium	0.05098	0.00200	0.05	0	102	82 - 116				
Vanadium	0.05441	0.00500	0.05	0	109	86 - 115				
Zinc	0.05821	0.00500	0.05	0	116	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19060986-04MS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:03**
Client ID: **MW6_061819** Run ID: **ICPMS06_341376** SeqNo: **5145217** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.116	0.0100	0.1	0.01515	101	84 - 117				
Antimony	0.05308	0.00500	0.05	0.000258	106	85 - 117				
Arsenic	0.05627	0.00500	0.05	0.002036	108	84 - 116				
Barium	0.8428	0.00500	0.05	0.8565	-27.4	86 - 114				SO
Beryllium	0.05294	0.00200	0.05	0.000048	106	83 - 121				
Cadmium	0.05116	0.00200	0.05	0.000205	102	87 - 115				
Calcium	35.9	0.500	5	33.03	57.3	87 - 118				SO
Chromium	0.3735	0.00500	0.05	0.2809	185	85 - 116				SO
Cobalt	0.0563	0.00500	0.05	0.005607	101	86 - 115				
Copper	0.058	0.00500	0.05	0.005199	106	85 - 118				
Iron	7.669	0.200	5	2.556	102	87 - 118				
Lead	0.05089	0.00500	0.05	0.000094	102	88 - 115				
Magnesium	31.26	0.200	5	27.76	69.9	83 - 118				SO
Manganese	0.2154	0.00500	0.05	0.164	103	87 - 115				
Nickel	0.2401	0.00500	0.05	0.2011	78.0	85 - 117				SO
Potassium	7.654	0.200	5	2.639	100	87 - 115				
Selenium	0.05384	0.00500	0.05	0.000343	107	80 - 120				
Silver	0.04654	0.00500	0.05	0.000013	93.1	85 - 116				
Sodium	233.3	0.200	5	245	-233	85 - 117				SEO
Thallium	0.04975	0.00200	0.05	0.000043	99.4	82 - 116				
Vanadium	0.0572	0.00500	0.05	0.003781	107	86 - 115				
Zinc	0.07874	0.00500	0.05	0.03582	85.8	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:05**
Client ID: **MW6_061819** Run ID: **ICPMS06_341376** SeqNo: **5145218** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1062	0.0100	0.1	0.01515	91.1	84 - 117	0.116	8.82	20	
Antimony	0.04965	0.00500	0.05	0.000258	98.8	85 - 117	0.05308	6.66	20	
Arsenic	0.05281	0.00500	0.05	0.002036	102	84 - 116	0.05627	6.34	20	
Barium	0.8139	0.00500	0.05	0.8565	-85.2	86 - 114	0.8428	3.49	20	SO
Beryllium	0.05024	0.00200	0.05	0.000048	100	83 - 121	0.05294	5.24	20	
Cadmium	0.04833	0.00200	0.05	0.000205	96.2	87 - 115	0.05116	5.7	20	
Calcium	33.36	0.500	5	33.03	6.56	87 - 118	35.9	7.33	20	SO
Cobalt	0.0531	0.00500	0.05	0.005607	95.0	86 - 115	0.0563	5.85	20	
Copper	0.05342	0.00500	0.05	0.005199	96.4	85 - 118	0.058	8.23	20	
Iron	7.023	0.200	5	2.556	89.3	87 - 118	7.669	8.8	20	
Lead	0.04808	0.00500	0.05	0.000094	96.0	88 - 115	0.05089	5.67	20	
Magnesium	28.94	0.200	5	27.76	23.5	83 - 118	31.26	7.71	20	SO
Manganese	0.1904	0.00500	0.05	0.164	52.8	87 - 115	0.2154	12.4	20	S
Nickel	0.2255	0.00500	0.05	0.2011	48.7	85 - 117	0.2401	6.29	20	SO
Potassium	7.309	0.200	5	2.639	93.4	87 - 115	7.654	4.62	20	
Selenium	0.05051	0.00500	0.05	0.000343	100	80 - 120	0.05384	6.37	20	
Silver	0.04575	0.00500	0.05	0.000013	91.5	85 - 116	0.04654	1.71	20	
Sodium	224.6	0.200	5	245	-407	85 - 117	233.3	3.8	20	SEO
Thallium	0.04905	0.00200	0.05	0.000043	98.0	82 - 116	0.04975	1.42	20	
Vanadium	0.05284	0.00500	0.05	0.003781	98.1	86 - 115	0.0572	7.93	20	
Zinc	0.08005	0.00500	0.05	0.03582	88.5	83 - 119	0.07874	1.66	20	

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:07**
Client ID: **MW6_061819** Run ID: **ICPMS06_341483** SeqNo: **5145651** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium	0.343	0.00500	0.05	0.2809	124	85 - 116	0.3735	8.51	20	SO

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:07**
Client ID: **MW6_061819** Run ID: **ICPMS06_341376** SeqNo: **5145219** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1008	0.0100	0.1	0.01515	85.7	80 - 120				
Antimony	0.08752	0.00500	0.1	0.000258	87.3	80 - 120				
Arsenic	0.09313	0.00500	0.1	0.002036	91.1	80 - 120				
Beryllium	0.09784	0.00200	0.1	0.000048	97.8	80 - 120				
Cadmium	0.09096	0.00200	0.1	0.000205	90.8	80 - 120				
Cobalt	0.09093	0.00500	0.1	0.005607	85.3	80 - 120				
Copper	0.09101	0.00500	0.1	0.005199	85.8	80 - 120				
Iron	10.93	0.200	10	2.556	83.8	80 - 120				
Lead	0.09017	0.00500	0.1	0.000094	90.1	80 - 120				
Potassium	11.36	0.200	10	2.639	87.2	80 - 120				
Selenium	0.09025	0.00500	0.1	0.000343	89.9	80 - 120				
Silver	0.08464	0.00500	0.1	0.000013	84.6	80 - 120				
Thallium	0.08892	0.00200	0.1	0.000043	88.9	80 - 120				
Vanadium	0.09309	0.00500	0.1	0.003781	89.3	80 - 120				
Zinc	0.1183	0.00500	0.1	0.03582	82.5	80 - 120				

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **28-Jun-2019 15:14**
Client ID: **MW6_061819** Run ID: **ICPMS06_341483** SeqNo: **5145655** PrepDate: **25-Jun-2019** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	1.703	0.0500	1	0.7	100	80 - 120				
Calcium	129.7	5.00	100	26.89	103	80 - 120				
Chromium	1.283	0.0500	1	0.2283	105	80 - 120				
Iron	107.4	2.00	100	2.151	105	80 - 120				
Magnesium	125.2	2.00	100	22.92	102	80 - 120				
Manganese	1.175	0.0500	1	0.1367	104	80 - 120				
Nickel	1.217	0.0500	1	0.1678	105	80 - 120				
Potassium	106.9	2.00	100	2.16	105	80 - 120				
Sodium	299.8	2.00	100	202.9	96.9	80 - 120				

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:02**
Client ID: **MW6_061819** Run ID: **ICPMS06_341376** SeqNo: **5145216** PrepDate: **25-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.01988	0.0500					0.01515	0	10	J
Antimony	0.00250	0.0250					0.000258	0	10	U
Arsenic	0.002183	0.0250					0.002036	0	10	J
Beryllium	0.00250	0.0100					0.000048	0	10	U
Cadmium	0.00250	0.0100					0.000205	0	10	U
Cobalt	0.004619	0.0250					0.005607	0	10	J
Copper	0.00500	0.0250					0.005199	0	10	U
Lead	0.00500	0.0250					0.000094	0	10	U
Selenium	0.0125	0.0250					0.000343	0	10	U
Silver	0.00250	0.0250					0.000013	0	10	U
Thallium	0.00250	0.0100					0.000043	0	10	U
Vanadium	0.01164	0.0250					0.003781	0	10	J
Zinc	0.038	0.0250					0.03582	6.07	10	

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: **MW6_061819** Run ID: **ICPMS06_341483** SeqNo: **5145654** PrepDate: **25-Jun-2019** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.6998	0.250					0.7	0.0306	10	
Calcium	27.1	25.0					26.89	0.761	10	
Chromium	0.234	0.250					0.2283	0	10	J
Iron	2.19	10.0					2.151	0	10	J
Magnesium	22.74	10.0					22.92	0.776	10	
Manganese	0.1567	0.250					0.1367	0	10	J
Nickel	0.1736	0.250					0.1678	0	10	J
Potassium	2.068	10.0					2.16	0	10	J
Sodium	207.1	10.0					202.9	2.06	10	

The following samples were analyzed in this batch: HS19060986-04 HS19060986-06

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: 142169 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 11:30**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145167** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.07589*	*0*	*0.08*	*0*	*94.9*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.09153*	*0*	*0.08*	*0*	*114*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.09043*	*0*	*0.08*	*0*	*113*	*40 - 140*				

LCS Sample ID: **LCS-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 11:51**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145168** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07581	0.010	0.08	0	94.8	40 - 140				
Surr: 2-Fluorobiphenyl	*0.0738*	*0*	*0.08*	*0*	*92.2*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.07856*	*0*	*0.08*	*0*	*98.2*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08245*	*0*	*0.08*	*0*	*103*	*40 - 140*				

LCSD Sample ID: **LCSD-142169** Units: **ug/L** Analysis Date: **27-Jun-2019 12:11**
Client ID: Run ID: **SV-5_341496** SeqNo: **5145169** PrepDate: **19-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07894	0.010	0.08	0	98.7	40 - 140	0.07581	4.05	20	
Surr: 2-Fluorobiphenyl	*0.07855*	*0*	*0.08*	*0*	*98.2*	*40 - 140*	*0.0738*	*6.23*	*20*	
Surr: 4-Terphenyl-d14	*0.1075*	*0*	*0.08*	*0*	*134*	*40 - 140*	*0.07856*	*31.1*	*20*	R
Surr: Nitrobenzene-d5	*0.08954*	*0*	*0.08*	*0*	*112*	*40 - 140*	*0.08245*	*8.25*	*20*	

The following samples were analyzed in this batch: HS19060986-01 HS19060986-02 HS19060986-03 HS19060986-05 HS19060986-06

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 11:11**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144199** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 11:11**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144199** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*49.36*	*1.0*	*50*	*0*	*98.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.49*	*1.0*	*50*	*0*	*95.0*	*85 - 114*				
Surr: Dibromofluoromethane	*46.28*	*1.0*	*50*	*0*	*92.6*	*80 - 119*				
Surr: Toluene-d8	*49.04*	*1.0*	*50*	*0*	*98.1*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 10:23**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144198** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.77	1.0	20	0	93.8	78 - 124				
1,1,1-Trichloroethane	19.61	1.0	20	0	98.1	74 - 131				
1,1,2,2-Tetrachloroethane	20.69	1.0	20	0	103	71 - 121				
1,1,2-Trichloroethane	20.36	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.43	1.0	20	0	97.1	77 - 125				
1,1-Dichloroethene	19.6	1.0	20	0	98.0	71 - 131				
1,1-Dichloropropene	19.74	1.0	20	0	98.7	78 - 125				
1,2,3-Trichlorobenzene	23.06	1.0	20	0	115	69 - 129				
1,2,3-Trichloropropane	21.25	1.0	20	0	106	73 - 122				
1,2,4-Trichlorobenzene	20.84	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	18.56	1.0	20	0	92.8	76 - 124				
1,2-Dibromo-3-chloropropane	21.57	1.0	20	0	108	62 - 128				
1,2-Dibromoethane	19.54	1.0	20	0	97.7	77 - 121				
1,2-Dichlorobenzene	18.49	1.0	20	0	92.4	80 - 119				
1,2-Dichloroethane	18.7	1.0	20	0	93.5	73 - 128				
1,2-Dichloropropane	19.06	1.0	20	0	95.3	78 - 122				
1,3,5-Trimethylbenzene	18.18	1.0	20	0	90.9	75 - 124				
1,3-Dichlorobenzene	18.01	1.0	20	0	90.1	80 - 119				
1,3-Dichloropropane	19.83	1.0	20	0	99.1	80 - 119				
1,4-Dichlorobenzene	19.42	1.0	20	0	97.1	79 - 118				
2,2-Dichloropropane	20.55	1.0	20	0	103	60 - 139				
2-Butanone	45.99	2.0	40	0	115	56 - 143				
2-Chlorotoluene	19.68	1.0	20	0	98.4	79 - 122				
2-Hexanone	39.89	2.0	40	0	99.7	57 - 139				
4-Chlorotoluene	19.71	1.0	20	0	98.5	78 - 122				
4-Isopropyltoluene	18.53	1.0	20	0	92.6	77 - 127				
4-Methyl-2-pentanone	39.77	2.0	40	0	99.4	67 - 130				
Acetone	49.5	2.0	40	0	124	39 - 160				
Benzene	19.65	1.0	20	0	98.2	79 - 120				
Bromobenzene	17.92	1.0	20	0	89.6	80 - 120				
Bromochloromethane	18.73	1.0	20	0	93.7	78 - 123				
Bromodichloromethane	19.3	1.0	20	0	96.5	79 - 125				
Bromoform	19.68	1.0	20	0	98.4	66 - 130				
Bromomethane	21.59	1.0	20	0	108	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190627** Units: **UG/L** Analysis Date: **27-Jun-2019 10:23**
Client ID: Run ID: **VOA6_341453** SeqNo: **5144198** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.73	2.0	40	0	89.3	64 - 133				
Carbon tetrachloride	19.41	1.0	20	0	97.0	72 - 136				
Chlorobenzene	18.46	1.0	20	0	92.3	82 - 118				
Chloroethane	20.98	1.0	20	0	105	60 - 138				
Chloroform	19.78	1.0	20	0	98.9	79 - 124				
Chloromethane	18.51	1.0	20	0	92.5	50 - 139				
cis-1,2-Dichloroethene	19.31	1.0	20	0	96.6	78 - 123				
cis-1,3-Dichloropropene	19.08	1.0	20	0	95.4	75 - 124				
Dibromochloromethane	18.87	1.0	20	0	94.4	74 - 126				
Dibromomethane	19.13	1.0	20	0	95.6	79 - 123				
Dichlorodifluoromethane	19.8	1.0	20	0	99.0	32 - 152				
Ethylbenzene	18.41	1.0	20	0	92.0	79 - 121				
Hexachlorobutadiene	23.02	1.0	20	0	115	66 - 134				
Isopropylbenzene	18.47	1.0	20	0	92.4	72 - 131				
m,p-Xylene	37.16	2.0	40	0	92.9	80 - 121				
Methylene chloride	18.91	2.0	20	0	94.5	74 - 124				
Naphthalene	21.45	1.0	20	0	107	61 - 128				
n-Butylbenzene	18.85	1.0	20	0	94.2	75 - 128				
n-Propylbenzene	19.66	1.0	20	0	98.3	76 - 126				
o-Xylene	18.48	1.0	20	0	92.4	78 - 122				
sec-Butylbenzene	19.8	1.0	20	0	99.0	77 - 126				
Styrene	19.29	1.0	20	0	96.4	78 - 123				
tert-Butylbenzene	19.57	1.0	20	0	97.8	78 - 124				
Tetrachloroethene	18.01	1.0	20	0	90.1	74 - 129				
Toluene	18.39	1.0	20	0	91.9	80 - 121				
trans-1,2-Dichloroethene	19.44	1.0	20	0	97.2	75 - 124				
trans-1,3-Dichloropropene	19.45	1.0	20	0	97.3	73 - 127				
Trichloroethene	18.29	1.0	20	0	91.4	79 - 123				
Trichlorofluoromethane	20.3	1.0	20	0	102	65 - 141				
Vinyl chloride	19.44	1.0	20	0	97.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*53.25*	*1.0*	*50*	*0*	*106*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.3*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*51.63*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*49.81*	*1.0*	*50*	*0*	*99.6*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19060986-04MS** Units: **UG/L** Analysis Date: **27-Jun-2019 14:47**
Client ID: **MW6_061819** Run ID: **VOA6_341453** SeqNo: **5144208** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.6	1.0	20	0	88.0	78 - 124				
1,1,1-Trichloroethane	19.37	1.0	20	0	96.9	74 - 131				
1,1,2,2-Tetrachloroethane	19.88	1.0	20	0	99.4	71 - 121				
1,1,2-Trichloroethane	18.84	1.0	20	0	94.2	80 - 119				
1,1-Dichloroethane	20.52	1.0	20	0	103	77 - 125				
1,1-Dichloroethene	20.92	1.0	20	0	105	71 - 131				
1,1-Dichloropropene	19.44	1.0	20	0	97.2	78 - 125				
1,2,3-Trichlorobenzene	21.07	1.0	20	0	105	69 - 129				
1,2,3-Trichloropropane	20.06	1.0	20	0	100	73 - 122				
1,2,4-Trichlorobenzene	20.07	1.0	20	0	100	69 - 130				
1,2,4-Trimethylbenzene	18.7	1.0	20	0	93.5	76 - 124				
1,2-Dibromo-3-chloropropane	20.57	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	17.91	1.0	20	0	89.6	77 - 121				
1,2-Dichlorobenzene	18.15	1.0	20	0	90.7	80 - 119				
1,2-Dichloroethane	17.56	1.0	20	0	87.8	73 - 128				
1,2-Dichloropropane	18.1	1.0	20	0	90.5	78 - 122				
1,3,5-Trimethylbenzene	18.75	1.0	20	0	93.7	75 - 124				
1,3-Dichlorobenzene	18.62	1.0	20	0.619	90.0	80 - 119				
1,3-Dichloropropane	18.78	1.0	20	0	93.9	80 - 119				
1,4-Dichlorobenzene	18.97	1.0	20	0	94.9	79 - 118				
2,2-Dichloropropane	19.07	1.0	20	0	95.3	60 - 139				
2-Butanone	40.06	2.0	40	0	100	56 - 143				
2-Chlorotoluene	19.58	1.0	20	0	97.9	79 - 122				
2-Hexanone	35.98	2.0	40	0	90.0	57 - 139				
4-Chlorotoluene	19.71	1.0	20	0	98.5	78 - 122				
4-Isopropyltoluene	19.52	1.0	20	0	97.6	77 - 127				
4-Methyl-2-pentanone	36.25	2.0	40	0	90.6	67 - 130				
Acetone	42.2	2.0	40	0	105	39 - 160				
Benzene	18.94	1.0	20	0	94.7	79 - 120				
Bromobenzene	17	1.0	20	0	85.0	80 - 120				
Bromochloromethane	16.86	1.0	20	0	84.3	78 - 123				
Bromodichloromethane	18.36	1.0	20	0	91.8	79 - 125				
Bromoform	17.93	1.0	20	0	89.6	66 - 130				
Bromomethane	20.38	1.0	20	0	102	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19060986-04MS** Units: **UG/L** Analysis Date: **27-Jun-2019 14:47**
Client ID: **MW6_061819** Run ID: **VOA6_341453** SeqNo: **5144208** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.55	2.0	40	0	88.9	64 - 133				
Carbon tetrachloride	19.35	1.0	20	0	96.8	72 - 136				
Chlorobenzene	17.87	1.0	20	0	89.3	82 - 118				
Chloroethane	19.94	1.0	20	0	99.7	60 - 138				
Chloroform	18.71	1.0	20	0	93.6	79 - 124				
Chloromethane	19.86	1.0	20	0	99.3	50 - 139				
cis-1,2-Dichloroethene	24.44	1.0	20	4.696	98.7	78 - 123				
cis-1,3-Dichloropropene	17.14	1.0	20	0	85.7	75 - 124				
Dibromochloromethane	17.35	1.0	20	0	86.8	74 - 126				
Dibromomethane	17.39	1.0	20	0	86.9	79 - 123				
Dichlorodifluoromethane	18.96	1.0	20	0	94.8	32 - 152				
Ethylbenzene	18.23	1.0	20	0	91.2	79 - 121				
Hexachlorobutadiene	22.45	1.0	20	0	112	66 - 134				
Isopropylbenzene	19.04	1.0	20	0	95.2	72 - 131				
m,p-Xylene	37.06	2.0	40	0	92.7	80 - 121				
Methylene chloride	17.62	2.0	20	0	88.1	74 - 124				
Naphthalene	20.33	1.0	20	0	102	61 - 128				
n-Butylbenzene	19.95	1.0	20	0	99.7	75 - 128				
n-Propylbenzene	20.39	1.0	20	0	102	76 - 126				
o-Xylene	17.97	1.0	20	0	89.9	78 - 122				
sec-Butylbenzene	20.69	1.0	20	0	103	77 - 126				
Styrene	18.28	1.0	20	0	91.4	78 - 123				
tert-Butylbenzene	20.4	1.0	20	0	102	78 - 124				
Tetrachloroethene	18.26	1.0	20	0	91.3	74 - 129				
Toluene	18.16	1.0	20	0	90.8	80 - 121				
trans-1,2-Dichloroethene	19.19	1.0	20	0	96.0	75 - 124				
trans-1,3-Dichloropropene	17.78	1.0	20	0	88.9	73 - 127				
Trichloroethene	32.63	1.0	20	13.8	94.2	79 - 123				
Trichlorofluoromethane	20.12	1.0	20	0	101	65 - 141				
Vinyl chloride	20.24	1.0	20	0	101	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.63*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.94*	*1.0*	*50*	*0*	*99.9*	*85 - 114*				
Surr: Dibromofluoromethane	*49.14*	*1.0*	*50*	*0*	*98.3*	*80 - 119*				
Surr: Toluene-d8	*48.68*	*1.0*	*50*	*0*	*97.4*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19060986-04MSD** Units: **UG/L** Analysis Date: **27-Jun-2019 15:10**
Client ID: **MW6_061819** Run ID: **VOA6_341453** SeqNo: **5144209** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.76	1.0	20	0	88.8	78 - 124	17.6	0.896	20	
1,1,1-Trichloroethane	19.21	1.0	20	0	96.0	74 - 131	19.37	0.855	20	
1,1,2,2-Tetrachloroethane	20.67	1.0	20	0	103	71 - 121	19.88	3.87	20	
1,1,2-Trichloroethane	19.42	1.0	20	0	97.1	80 - 119	18.84	3.01	20	
1,1-Dichloroethane	20.68	1.0	20	0	103	77 - 125	20.52	0.772	20	
1,1-Dichloroethene	20.95	1.0	20	0	105	71 - 131	20.92	0.151	20	
1,1-Dichloropropene	19.47	1.0	20	0	97.4	78 - 125	19.44	0.197	20	
1,2,3-Trichlorobenzene	22.82	1.0	20	0	114	69 - 129	21.07	7.97	20	
1,2,3-Trichloropropane	20.8	1.0	20	0	104	73 - 122	20.06	3.63	20	
1,2,4-Trichlorobenzene	21.1	1.0	20	0	105	69 - 130	20.07	4.98	20	
1,2,4-Trimethylbenzene	19.03	1.0	20	0	95.2	76 - 124	18.7	1.75	20	
1,2-Dibromo-3-chloropropane	21.34	1.0	20	0	107	62 - 128	20.57	3.7	20	
1,2-Dibromoethane	18.27	1.0	20	0	91.4	77 - 121	17.91	1.99	20	
1,2-Dichlorobenzene	18.58	1.0	20	0	92.9	80 - 119	18.15	2.37	20	
1,2-Dichloroethane	17.68	1.0	20	0	88.4	73 - 128	17.56	0.689	20	
1,2-Dichloropropane	18.34	1.0	20	0	91.7	78 - 122	18.1	1.29	20	
1,3,5-Trimethylbenzene	18.93	1.0	20	0	94.7	75 - 124	18.75	0.991	20	
1,3-Dichlorobenzene	18.6	1.0	20	0.619	89.9	80 - 119	18.62	0.134	20	
1,3-Dichloropropane	18.98	1.0	20	0	94.9	80 - 119	18.78	1.08	20	
1,4-Dichlorobenzene	19.29	1.0	20	0	96.5	79 - 118	18.97	1.68	20	
2,2-Dichloropropane	18.72	1.0	20	0	93.6	60 - 139	19.07	1.86	20	
2-Butanone	41.72	2.0	40	0	104	56 - 143	40.06	4.07	20	
2-Chlorotoluene	19.83	1.0	20	0	99.2	79 - 122	19.58	1.26	20	
2-Hexanone	37.6	2.0	40	0	94.0	57 - 139	35.98	4.41	20	
4-Chlorotoluene	19.88	1.0	20	0	99.4	78 - 122	19.71	0.902	20	
4-Isopropyltoluene	19.73	1.0	20	0	98.7	77 - 127	19.52	1.07	20	
4-Methyl-2-pentanone	37.65	2.0	40	0	94.1	67 - 130	36.25	3.77	20	
Acetone	43.42	2.0	40	0	109	39 - 160	42.2	2.86	20	
Benzene	18.88	1.0	20	0	94.4	79 - 120	18.94	0.299	20	
Bromobenzene	17.22	1.0	20	0	86.1	80 - 120	17	1.29	20	
Bromochloromethane	17.4	1.0	20	0	87.0	78 - 123	16.86	3.17	20	
Bromodichloromethane	18.44	1.0	20	0	92.2	79 - 125	18.36	0.421	20	
Bromoform	18.53	1.0	20	0	92.6	66 - 130	17.93	3.28	20	
Bromomethane	19.72	1.0	20	0	98.6	53 - 141	20.38	3.28	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19060986-04MSD** Units: **UG/L** Analysis Date: **27-Jun-2019 15:10**
Client ID: **MW6_061819** Run ID: **VOA6_341453** SeqNo: **5144209** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.97	2.0	40	0	87.4	64 - 133	35.55	1.65	20	
Carbon tetrachloride	19.12	1.0	20	0	95.6	72 - 136	19.35	1.2	20	
Chlorobenzene	17.91	1.0	20	0	89.5	82 - 118	17.87	0.216	20	
Chloroethane	21.79	1.0	20	0	109	60 - 138	19.94	8.88	20	
Chloroform	18.72	1.0	20	0	93.6	79 - 124	18.71	0.043	20	
Chloromethane	18.15	1.0	20	0	90.8	50 - 139	19.86	8.97	20	
cis-1,2-Dichloroethene	24.78	1.0	20	4.696	100	78 - 123	24.44	1.39	20	
cis-1,3-Dichloropropene	17.28	1.0	20	0	86.4	75 - 124	17.14	0.79	20	
Dibromochloromethane	17.72	1.0	20	0	88.6	74 - 126	17.35	2.1	20	
Dibromomethane	18.15	1.0	20	0	90.8	79 - 123	17.39	4.3	20	
Dichlorodifluoromethane	18.36	1.0	20	0	91.8	32 - 152	18.96	3.24	20	
Ethylbenzene	18.31	1.0	20	0	91.6	79 - 121	18.23	0.456	20	
Hexachlorobutadiene	23.53	1.0	20	0	118	66 - 134	22.45	4.71	20	
Isopropylbenzene	18.92	1.0	20	0	94.6	72 - 131	19.04	0.611	20	
m,p-Xylene	37.08	2.0	40	0	92.7	80 - 121	37.06	0.0437	20	
Methylene chloride	17.83	2.0	20	0	89.2	74 - 124	17.62	1.2	20	
Naphthalene	21.72	1.0	20	0	109	61 - 128	20.33	6.62	20	
n-Butylbenzene	20.3	1.0	20	0	102	75 - 128	19.95	1.76	20	
n-Propylbenzene	20.51	1.0	20	0	103	76 - 126	20.39	0.609	20	
o-Xylene	17.89	1.0	20	0	89.5	78 - 122	17.97	0.445	20	
sec-Butylbenzene	21.03	1.0	20	0	105	77 - 126	20.69	1.6	20	
Styrene	18.48	1.0	20	0	92.4	78 - 123	18.28	1.12	20	
tert-Butylbenzene	20.44	1.0	20	0	102	78 - 124	20.4	0.178	20	
Tetrachloroethene	18.1	1.0	20	0	90.5	74 - 129	18.26	0.894	20	
Toluene	18.1	1.0	20	0	90.5	80 - 121	18.16	0.31	20	
trans-1,2-Dichloroethene	18.55	1.0	20	0	92.8	75 - 124	19.19	3.4	20	
trans-1,3-Dichloropropene	17.86	1.0	20	0	89.3	73 - 127	17.78	0.461	20	
Trichloroethene	32.01	1.0	20	13.8	91.0	79 - 123	32.63	1.94	20	
Trichlorofluoromethane	20.09	1.0	20	0	100	65 - 141	20.12	0.15	20	
Vinyl chloride	19.45	1.0	20	0	97.3	58 - 137	20.24	3.94	20	
Surr: 1,2-Dichloroethane-d4	*51.82*	*1.0*	*50*	*0*	*104*	*81 - 118*	*50.63*	*2.31*	*20*	
Surr: 4-Bromofluorobenzene	*49.79*	*1.0*	*50*	*0*	*99.6*	*85 - 114*	*49.94*	*0.285*	*20*	
Surr: Dibromofluoromethane	*49.79*	*1.0*	*50*	*0*	*99.6*	*80 - 119*	*49.14*	*1.3*	*20*	
Surr: Toluene-d8	*48.19*	*1.0*	*50*	*0*	*96.4*	*89 - 112*	*48.68*	*0.999*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341453 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS19060986-01	HS19060986-02	HS19060986-04	HS19060986-05
HS19060986-06			

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 11:38**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146430** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 11:38**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146430** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.64*	*1.0*	*50*	*0*	*93.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.03*	*1.0*	*50*	*0*	*90.1*	*85 - 114*				
Surr: Dibromofluoromethane	*44.27*	*1.0*	*50*	*0*	*88.5*	*80 - 119*				
Surr: Toluene-d8	*45.03*	*1.0*	*50*	*0*	*90.1*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 10:50**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.71	1.0	20	0	93.5	78 - 124				
1,1,1-Trichloroethane	18.86	1.0	20	0	94.3	74 - 131				
1,1,2,2-Tetrachloroethane	21.83	1.0	20	0	109	71 - 121				
1,1,2-Trichloroethane	20.31	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.37	1.0	20	0	96.9	77 - 125				
1,1-Dichloroethene	19.49	1.0	20	0	97.5	71 - 131				
1,1-Dichloropropene	18.57	1.0	20	0	92.9	78 - 125				
1,2,3-Trichlorobenzene	27.19	1.0	20	0	136	69 - 129				S
1,2,3-Trichloropropane	22.5	1.0	20	0	113	73 - 122				
1,2,4-Trichlorobenzene	23.25	1.0	20	0	116	69 - 130				
1,2,4-Trimethylbenzene	18.63	1.0	20	0	93.2	76 - 124				
1,2-Dibromo-3-chloropropane	23.82	1.0	20	0	119	62 - 128				
1,2-Dibromoethane	20.03	1.0	20	0	100	77 - 121				
1,2-Dichlorobenzene	19.12	1.0	20	0	95.6	80 - 119				
1,2-Dichloroethane	18.81	1.0	20	0	94.1	73 - 128				
1,2-Dichloropropane	18.83	1.0	20	0	94.2	78 - 122				
1,3,5-Trimethylbenzene	17.9	1.0	20	0	89.5	75 - 124				
1,3-Dichlorobenzene	18.42	1.0	20	0	92.1	80 - 119				
1,3-Dichloropropane	20.28	1.0	20	0	101	80 - 119				
1,4-Dichlorobenzene	19.67	1.0	20	0	98.3	79 - 118				
2,2-Dichloropropane	19.99	1.0	20	0	99.9	60 - 139				
2-Butanone	49.3	2.0	40	0	123	56 - 143				
2-Chlorotoluene	19.48	1.0	20	0	97.4	79 - 122				
2-Hexanone	43.05	2.0	40	0	108	57 - 139				
4-Chlorotoluene	19.99	1.0	20	0	99.9	78 - 122				
4-Isopropyltoluene	17.77	1.0	20	0	88.9	77 - 127				
4-Methyl-2-pentanone	41.38	2.0	40	0	103	67 - 130				
Acetone	54.41	2.0	40	0	136	39 - 160				
Benzene	19.29	1.0	20	0	96.4	79 - 120				
Bromobenzene	18.42	1.0	20	0	92.1	80 - 120				
Bromochloromethane	18.67	1.0	20	0	93.3	78 - 123				
Bromodichloromethane	19.53	1.0	20	0	97.6	79 - 125				
Bromoform	20.73	1.0	20	0	104	66 - 130				
Bromomethane	22.75	1.0	20	0	114	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 10:50**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	37.03	2.0	40	0	92.6	64 - 133				
Carbon tetrachloride	18.08	1.0	20	0	90.4	72 - 136				
Chlorobenzene	18.69	1.0	20	0	93.5	82 - 118				
Chloroethane	20.86	1.0	20	0	104	60 - 138				
Chloroform	20.01	1.0	20	0	100	79 - 124				
Chloromethane	18.7	1.0	20	0	93.5	50 - 139				
cis-1,2-Dichloroethene	19.38	1.0	20	0	96.9	78 - 123				
cis-1,3-Dichloropropene	18.8	1.0	20	0	94.0	75 - 124				
Dibromochloromethane	19.26	1.0	20	0	96.3	74 - 126				
Dibromomethane	19.49	1.0	20	0	97.4	79 - 123				
Dichlorodifluoromethane	17.68	1.0	20	0	88.4	32 - 152				
Ethylbenzene	18.26	1.0	20	0	91.3	79 - 121				
Hexachlorobutadiene	21.78	1.0	20	0	109	66 - 134				
Isopropylbenzene	17.76	1.0	20	0	88.8	72 - 131				
m,p-Xylene	36.78	2.0	40	0	92.0	80 - 121				
Methylene chloride	19.74	2.0	20	0	98.7	74 - 124				
Naphthalene	25.7	1.0	20	0	128	61 - 128				S
n-Butylbenzene	17.78	1.0	20	0	88.9	75 - 128				
n-Propylbenzene	19.05	1.0	20	0	95.3	76 - 126				
o-Xylene	18.37	1.0	20	0	91.8	78 - 122				
sec-Butylbenzene	18.27	1.0	20	0	91.4	77 - 126				
Styrene	19.37	1.0	20	0	96.9	78 - 123				
tert-Butylbenzene	18.73	1.0	20	0	93.7	78 - 124				
Tetrachloroethene	17.11	1.0	20	0	85.5	74 - 129				
Toluene	18.5	1.0	20	0	92.5	80 - 121				
trans-1,2-Dichloroethene	19.5	1.0	20	0	97.5	75 - 124				
trans-1,3-Dichloropropene	19.19	1.0	20	0	96.0	73 - 127				
Trichloroethene	18.25	1.0	20	0	91.2	79 - 123				
Trichlorofluoromethane	18.83	1.0	20	0	94.1	65 - 141				
Vinyl chloride	18.93	1.0	20	0	94.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.6*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.75*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*51.89*	*1.0*	*50*	*0*	*104*	*80 - 119*				
Surr: Toluene-d8	*47.75*	*1.0*	*50*	*0*	*95.5*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061157-02MS** Units: **UG/L** Analysis Date: **28-Jun-2019 14:49**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.73	1.0	20	0	88.6	78 - 124				
1,1,1-Trichloroethane	19.03	1.0	20	0	95.2	74 - 131				
1,1,2,2-Tetrachloroethane	20.66	1.0	20	0	103	71 - 121				
1,1,2-Trichloroethane	18.94	1.0	20	0	94.7	80 - 119				
1,1-Dichloroethane	17.57	1.0	20	0	87.9	77 - 125				
1,1-Dichloroethene	19.66	1.0	20	0	98.3	71 - 131				
1,1-Dichloropropene	19.33	1.0	20	0	96.6	78 - 125				
1,2,3-Trichlorobenzene	24.14	1.0	20	0	121	69 - 129				
1,2,3-Trichloropropane	20.5	1.0	20	0	102	73 - 122				
1,2,4-Trichlorobenzene	21.59	1.0	20	0	108	69 - 130				
1,2,4-Trimethylbenzene	18.47	1.0	20	0	92.3	76 - 124				
1,2-Dibromo-3-chloropropane	21.81	1.0	20	0	109	62 - 128				
1,2-Dibromoethane	17.9	1.0	20	0	89.5	77 - 121				
1,2-Dichlorobenzene	18.33	1.0	20	0	91.7	80 - 119				
1,2-Dichloroethane	17.43	1.0	20	0	87.1	73 - 128				
1,2-Dichloropropane	17.55	1.0	20	0	87.7	78 - 122				
1,3,5-Trimethylbenzene	18.27	1.0	20	0	91.4	75 - 124				
1,3-Dichlorobenzene	17.46	1.0	20	0	87.3	80 - 119				
1,3-Dichloropropane	18.65	1.0	20	0	93.2	80 - 119				
1,4-Dichlorobenzene	18.88	1.0	20	0	94.4	79 - 118				
2,2-Dichloropropane	18.91	1.0	20	0	94.5	60 - 139				
2-Butanone	42.59	2.0	40	0	106	56 - 143				
2-Chlorotoluene	19.4	1.0	20	0	97.0	79 - 122				
2-Hexanone	38.42	2.0	40	0	96.0	57 - 139				
4-Chlorotoluene	19.35	1.0	20	0	96.7	78 - 122				
4-Isopropyltoluene	19.33	1.0	20	0	96.6	77 - 127				
4-Methyl-2-pentanone	38.74	2.0	40	0	96.9	67 - 130				
Acetone	46.92	2.0	40	5.359	104	39 - 160				
Benzene	18.35	1.0	20	0	91.7	79 - 120				
Bromobenzene	16.8	1.0	20	0	84.0	80 - 120				
Bromochloromethane	16.09	1.0	20	0	80.4	78 - 123				
Bromodichloromethane	18.04	1.0	20	0	90.2	79 - 125				
Bromoform	18.53	1.0	20	0	92.6	66 - 130				
Bromomethane	13.53	1.0	20	0	67.6	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061157-02MS** Units: **UG/L** Analysis Date: **28-Jun-2019 14:49**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	34.31	2.0	40	0	85.8	64 - 133				
Carbon tetrachloride	19.13	1.0	20	0	95.6	72 - 136				
Chlorobenzene	17.61	1.0	20	0	88.1	82 - 118				
Chloroethane	20.41	1.0	20	0	102	60 - 138				
Chloroform	18.1	1.0	20	0	90.5	79 - 124				
Chloromethane	29.09	1.0	20	0	145	50 - 139				S
cis-1,2-Dichloroethene	19.95	1.0	20	0	99.8	78 - 123				
cis-1,3-Dichloropropene	17.23	1.0	20	0	86.1	75 - 124				
Dibromochloromethane	17.55	1.0	20	0	87.7	74 - 126				
Dibromomethane	17.65	1.0	20	0	88.3	79 - 123				
Dichlorodifluoromethane	18.02	1.0	20	0	90.1	32 - 152				
Ethylbenzene	18.28	1.0	20	0	91.4	79 - 121				
Hexachlorobutadiene	23.73	1.0	20	0	119	66 - 134				
Isopropylbenzene	18.91	1.0	20	0	94.5	72 - 131				
m,p-Xylene	37.07	2.0	40	0	92.7	80 - 121				
Methylene chloride	25.8	2.0	20	0	129	74 - 124				S
Naphthalene	23.22	1.0	20	0	116	61 - 128				
n-Butylbenzene	19.75	1.0	20	0	98.7	75 - 128				
n-Propylbenzene	20.08	1.0	20	0	100	76 - 126				
o-Xylene	17.73	1.0	20	0	88.6	78 - 122				
sec-Butylbenzene	20.67	1.0	20	0	103	77 - 126				
Styrene	18.57	1.0	20	0	92.9	78 - 123				
tert-Butylbenzene	20.06	1.0	20	0	100	78 - 124				
Tetrachloroethene	18.08	1.0	20	0	90.4	74 - 129				
Toluene	17.83	1.0	20	0	89.2	80 - 121				
trans-1,2-Dichloroethene	18.21	1.0	20	0	91.0	75 - 124				
trans-1,3-Dichloropropene	17.88	1.0	20	0	89.4	73 - 127				
Trichloroethene	17.77	1.0	20	0	88.9	79 - 123				
Trichlorofluoromethane	20.23	1.0	20	0	101	65 - 141				
Vinyl chloride	18.22	1.0	20	0	91.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.38*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.99*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*49.29*	*1.0*	*50*	*0*	*98.6*	*80 - 119*				
Surr: Toluene-d8	*48.04*	*1.0*	*50*	*0*	*96.1*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061157-02MSD** Units: **UG/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146439** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.53	1.0	20	0	87.7	78 - 124	17.73	1.11	20	
1,1,1-Trichloroethane	18.55	1.0	20	0	92.7	74 - 131	19.03	2.57	20	
1,1,2,2-Tetrachloroethane	21.38	1.0	20	0	107	71 - 121	20.66	3.41	20	
1,1,2-Trichloroethane	19.17	1.0	20	0	95.9	80 - 119	18.94	1.26	20	
1,1-Dichloroethane	17.86	1.0	20	0	89.3	77 - 125	17.57	1.63	20	
1,1-Dichloroethene	19.11	1.0	20	0	95.5	71 - 131	19.66	2.85	20	
1,1-Dichloropropene	19.03	1.0	20	0	95.1	78 - 125	19.33	1.56	20	
1,2,3-Trichlorobenzene	25.23	1.0	20	0	126	69 - 129	24.14	4.4	20	
1,2,3-Trichloropropane	20.93	1.0	20	0	105	73 - 122	20.5	2.06	20	
1,2,4-Trichlorobenzene	21.92	1.0	20	0	110	69 - 130	21.59	1.52	20	
1,2,4-Trimethylbenzene	18.33	1.0	20	0	91.7	76 - 124	18.47	0.739	20	
1,2-Dibromo-3-chloropropane	22.89	1.0	20	0	114	62 - 128	21.81	4.81	20	
1,2-Dibromoethane	18.73	1.0	20	0	93.7	77 - 121	17.9	4.54	20	
1,2-Dichlorobenzene	18.43	1.0	20	0	92.1	80 - 119	18.33	0.521	20	
1,2-Dichloroethane	17.55	1.0	20	0	87.8	73 - 128	17.43	0.726	20	
1,2-Dichloropropane	17.93	1.0	20	0	89.7	78 - 122	17.55	2.16	20	
1,3,5-Trimethylbenzene	18.28	1.0	20	0	91.4	75 - 124	18.27	0.0341	20	
1,3-Dichlorobenzene	17.74	1.0	20	0	88.7	80 - 119	17.46	1.57	20	
1,3-Dichloropropane	19.01	1.0	20	0	95.1	80 - 119	18.65	1.93	20	
1,4-Dichlorobenzene	19.13	1.0	20	0	95.6	79 - 118	18.88	1.28	20	
2,2-Dichloropropane	18.53	1.0	20	0	92.6	60 - 139	18.91	2.03	20	
2-Butanone	44.5	2.0	40	0	111	56 - 143	42.59	4.39	20	
2-Chlorotoluene	19.45	1.0	20	0	97.2	79 - 122	19.4	0.245	20	
2-Hexanone	40.16	2.0	40	0	100	57 - 139	38.42	4.43	20	
4-Chlorotoluene	19.29	1.0	20	0	96.5	78 - 122	19.35	0.277	20	
4-Isopropyltoluene	19.26	1.0	20	0	96.3	77 - 127	19.33	0.313	20	
4-Methyl-2-pentanone	39.71	2.0	40	0	99.3	67 - 130	38.74	2.45	20	
Acetone	50.25	2.0	40	5.359	112	39 - 160	46.92	6.85	20	
Benzene	18.36	1.0	20	0	91.8	79 - 120	18.35	0.0865	20	
Bromobenzene	16.88	1.0	20	0	84.4	80 - 120	16.8	0.466	20	
Bromochloromethane	16.49	1.0	20	0	82.4	78 - 123	16.09	2.45	20	
Bromodichloromethane	18.36	1.0	20	0	91.8	79 - 125	18.04	1.78	20	
Bromoform	19.36	1.0	20	0	96.8	66 - 130	18.53	4.42	20	
Bromomethane	16.13	1.0	20	0	80.7	53 - 141	13.53	17.6	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19060986

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061157-02MSD** Units: **UG/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146439** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.41	2.0	40	0	86.0	64 - 133	34.31	0.298	20	
Carbon tetrachloride	18.94	1.0	20	0	94.7	72 - 136	19.13	0.978	20	
Chlorobenzene	17.62	1.0	20	0	88.1	82 - 118	17.61	0.0136	20	
Chloroethane	18.76	1.0	20	0	93.8	60 - 138	20.41	8.41	20	
Chloroform	18.25	1.0	20	0	91.3	79 - 124	18.1	0.822	20	
Chloromethane	23.96	1.0	20	0	120	50 - 139	29.09	19.4	20	
cis-1,2-Dichloroethene	18.61	1.0	20	0	93.1	78 - 123	19.95	6.93	20	
cis-1,3-Dichloropropene	17.39	1.0	20	0	87.0	75 - 124	17.23	0.946	20	
Dibromochloromethane	18.07	1.0	20	0	90.3	74 - 126	17.55	2.93	20	
Dibromomethane	18.25	1.0	20	0	91.3	79 - 123	17.65	3.33	20	
Dichlorodifluoromethane	17.78	1.0	20	0	88.9	32 - 152	18.02	1.36	20	
Ethylbenzene	18.25	1.0	20	0	91.3	79 - 121	18.28	0.178	20	
Hexachlorobutadiene	23.8	1.0	20	0	119	66 - 134	23.73	0.3	20	
Isopropylbenzene	18.76	1.0	20	0	93.8	72 - 131	18.91	0.782	20	
m,p-Xylene	36.69	2.0	40	0	91.7	80 - 121	37.07	1.03	20	
Methylene chloride	20.47	2.0	20	0	102	74 - 124	25.8	23.1	20	R
Naphthalene	24.28	1.0	20	0	121	61 - 128	23.22	4.46	20	
n-Butylbenzene	20.17	1.0	20	0	101	75 - 128	19.75	2.1	20	
n-Propylbenzene	20.11	1.0	20	0	101	76 - 126	20.08	0.148	20	
o-Xylene	17.67	1.0	20	0	88.4	78 - 122	17.73	0.292	20	
sec-Butylbenzene	20.54	1.0	20	0	103	77 - 126	20.67	0.606	20	
Styrene	18.44	1.0	20	0	92.2	78 - 123	18.57	0.717	20	
tert-Butylbenzene	20.01	1.0	20	0	100	78 - 124	20.06	0.251	20	
Tetrachloroethene	18.05	1.0	20	0	90.2	74 - 129	18.08	0.156	20	
Toluene	17.82	1.0	20	0	89.1	80 - 121	17.83	0.055	20	
trans-1,2-Dichloroethene	18.18	1.0	20	0	90.9	75 - 124	18.21	0.146	20	
trans-1,3-Dichloropropene	18	1.0	20	0	90.0	73 - 127	17.88	0.68	20	
Trichloroethene	17.66	1.0	20	0	88.3	79 - 123	17.77	0.648	20	
Trichlorofluoromethane	19.72	1.0	20	0	98.6	65 - 141	20.23	2.53	20	
Vinyl chloride	17.84	1.0	20	0	89.2	58 - 137	18.22	2.1	20	
Surr: 1,2-Dichloroethane-d4	*51.79*	*1.0*	*50*	*0*	*104*	*81 - 118*	*50.38*	*2.77*	*20*	
Surr: 4-Bromofluorobenzene	*50.7*	*1.0*	*50*	*0*	*101*	*85 - 114*	*50.99*	*0.571*	*20*	
Surr: Dibromofluoromethane	*49.25*	*1.0*	*50*	*0*	*98.5*	*80 - 119*	*49.29*	*0.0914*	*20*	
Surr: Toluene-d8	*47.25*	*1.0*	*50*	*0*	*94.5*	*89 - 112*	*48.04*	*1.66*	*20*	

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP 18 24
WorkOrder:	HS19060986

QC BATCH REPORT

Batch ID:	**R341546 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19060986-07

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19060986**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

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ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19060986

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19060986-01	18CpTMW08SW_061819	Login	19/06/2019 11:34:13	RPG	Sub
HS19060986-01	18CpTMW08SW_061819	Login	19/06/2019 11:34:13	RPG	EXT177
HS19060986-01	18CpTMW08SW_061819	Login	19/06/2019 11:34:13	RPG	VOA123
HS19060986-06	MW21_061819	Login	19/06/2019 11:34:13	RPG	MET091
HS19060986-06	MW21_061819	Login	19/06/2019 11:34:13	RPG	Sub
HS19060986-06	MW21_061819	Login	19/06/2019 11:34:13	RPG	EXT177
HS19060986-06	MW21_061819	Login	19/06/2019 11:34:13	RPG	VOA123
HS19060986-07	Trip Blank	Login	19/06/2019 11:34:13	RPG	VOA123

Revision:1

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ALS Houston, US Date: 10-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19060986
Date/Time Received: **19-Jun-2019 08:40**
Received by: **NDR**

Checklist completed by: *Raegen Giga* eSignature 19-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature 19-Jun-2019 Date

Matrices: **GW**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	0.4c uc/c	11
Cooler(s)/Kit(s):	23949	
Date/Time sample(s) sent to storage:	06/19/2019 11:59	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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bhate ENVIRONMENTAL ASSOCIATES, INC.

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
18SPTMW08SW_061819		18-Jun-2019	0810	-	N		WG	5	X	X		X				
MW5_061819		18-Jun-2019	0855	-	N		WG	5	X	X		X				
18SPTMW08PW_061819		18-Jun-2019	0945	-	N		WG	2		X		X				
MW6_061819		18-Jun-2019	1040	-	N		WG	5	X	X	X					
MW6_061819_MS		18-Jun-2019	1040	-	MS		WG	5	X	X	X					
MW6_061819_MSD		18-Jun-2019	1040	-	SD		WG	5	X	X	X					
109_061819		18-Jun-2019	1140	-	N		WG	5	X	X		X				
MW21_061819		18-Jun-2019	1255	-	N		WG	6	X	X	X	X				
TRIP BLANK		18-Jun-2019		-	TB		W	2	X							
				-												
				-												

Sample Analysis Requested (5) | Quality Assurance Samples (6)

HS19060986

Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS: _____

Custody Transfers Prior to Receipt by Laboratory

Relinquished by (signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	6/18/19	1430	1. NR	6/19/19	0840
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped No.:

Method of Shipment: _____

_____ Fed Ex _____ Airbill Number:

Analytical Lab: ALS 10450 Stanfiff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 03-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested. Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

Temp 4/c 0.4. 23949

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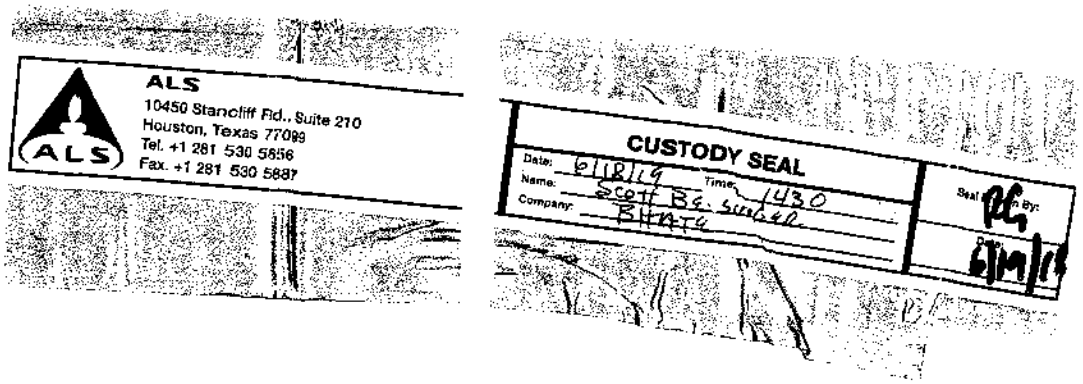
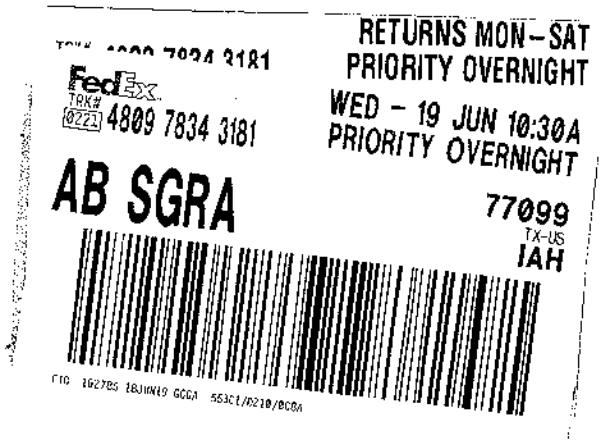
00940492





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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1917698, 1917856, 1918052

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2266 (242597)

General Set Information: There were seventeen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 661480) was less than 1/2 the CRDL. The recovery for the LCS (661481) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on samples 1917698005/06 (Client ID: MW5_061819). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The parent sample and the MS/MSD were analyzed and reported from 1:1,000 dilutions. The effective spike target was 4,000.µg/L. The MS/MSD percent recoveries and relative percent difference were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 661478) is reported from the analysis of the Laboratory Control Sample (LCS – 661481) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafile 01JULD15.

Thomas Bosch July 5, 2019
Analyst Date

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ANALYTICAL REPORT

Report Date: July 05, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1917698**
Project ID: HS19060986
Purchase Order: HS19060986
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
18CPTMW08SW_061819	1917698001	06/18/19	06/20/19	
MW5_061819	1917698002	06/18/19	06/20/19	
19CPTMW08DW_061819	1917698003	06/18/19	06/20/19	
MW6_061819	1917698004	06/18/19	06/20/19	
109_061819	1917698007	06/18/19	06/20/19	
MW21_061819	1917698008	06/18/19	06/20/19	

Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
MW6_061819MS	1917698005	06/18/19	06/20/19	
MW6_061819MSD	1917698006	06/18/19	06/20/19	

***Client QC is reported as part of the Quality Control results report, if requested.**

ANALYTICAL REPORT

Workorder: 34-1917698
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW08SW_061819** | Sampling Site: NA | Collected: 06/18/2019
Lab ID: 1917698001 | Media: 125 mL Nalgene | Received: 06/20/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 09:30 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**23000**	1000	2000	4000	1000	

Sample ID: **MW5_061819** | Sampling Site: NA | Collected: 06/18/2019
Lab ID: 1917698002 | Media: 125 mL Nalgene | Received: 06/20/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 09:44 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**26000**	1000	2000	4000	1000	

Sample ID: **19CPTMW08DW_061819** | Sampling Site: NA | Collected: 06/18/2019
Lab ID: 1917698003 | Media: 125 mL Nalgene | Received: 06/20/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 14:11 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**4300**	100	200	400	100	

Sample ID: **MW6_061819** | Sampling Site: NA | Collected: 06/18/2019
Lab ID: 1917698004 | Media: 125 mL Nalgene | Received: 06/20/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 10:12 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**4400**	1000	2000	4000	1000	

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ANALYTICAL REPORT

Workorder: 34-1917698
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **109_061819** | Sampling Site: NA | Collected: 06/18/2019
Lab ID: 1917698007 | Media: 125 mL Nalgene | Received: 06/20/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 10:56 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**10000**	1000	2000	4000	1000	

Sample ID: **MW21_061819** | Sampling Site: NA | Collected: 06/18/2019
Lab ID: 1917698008 | Media: 125 mL Nalgene | Received: 06/20/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 14:25 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**24000**	1000	2000	4000	1000	

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 242597)**

The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/03/2019 09:40	/S/ Stephen Brose 07/05/2019 11:57

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1917698
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1917698

Limits:	Client SOW/Contract Specified	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	ELMS/2266 (HBN: 242597)
Preparation:	NA	**Analyzed By:**	Thomas Bosch
Batch:	NA		
Prepared By:	NA		

Blank

LMB: 661480
Analyzed: 07/01/2019 09:16
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 661481
Analyzed: 07/01/2019 08:48
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.28	4.00	107	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1917698004	**MS:**	1917698005	**MSD:**	1917698006
Analyzed:	07/01/2019 10:12	**Analyzed:**	07/01/2019 10:28	**Analyzed:**	07/01/2019 10:43
Dilution:	1000	**Dilution:**	1000	**Dilution:**	1000
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	4400	8910	4000	113	78.8	123.8	8810	110	1.19	0.0	20.0

Comments

The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/03/2019 12:16	07/05/2019 11:57

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **11625**

1917698

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19060986
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19060986-01**	**18CpTMW08SW_061819**	**Groundwater**	**18 Jun 2019 08:10**
	SUB_Perch-6850			03 Jul 2019
2.	**HS19060986-02**	**MW5_061819**	**Groundwater**	**18 Jun 2019 08:55**
	SUB_Perch-6850			03 Jul 2019
3.	**HS19060986-03**	**19CptMW08DW_061819**	**Groundwater**	**18 Jun 2019 09:45**
	SUB_Perch-6850			03 Jul 2019
4.	**HS19060986-04**	**MW6_061819**	**Groundwater**	**18 Jun 2019 10:40**
	SUB_Perch-6850 Designated MS/MSD			03 Jul 2019
5.	**HS19060986-05**	**109_061819**	**Groundwater**	**18 Jun 2019 11:40**
	SUB_Perch-6850			03 Jul 2019
6.	**HS19060986-06**	**MW21_061819**	**Groundwater**	**18 Jun 2019 12:55**
	SUB_Perch-6850			03 Jul 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

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Subcontract Chain of Custody

SAMPLING STATE: Texas

COC ID: 11625

Relinquished By: R Grigg

Date/Time: 6/19/19

Received By:

Date/Time: 6/20/19

Cooler ID(s):

Temperature(s):

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ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS19060986	Split:	Workorder ID: 1917698	Level: ENV_LVL4
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly
Comments:			Preservatives: COOL

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Count	Requested Analysis: EPA 6850, DoD QSM
1	06/18/2019 08:10	18CPTMW08SW_061819	1917698001		Water	A	1	A
2	06/18/2019 08:55	MW5_061819	1917698002		Water	A	1	A
3	06/18/2019 09:45	19CPTMW08DW_061819	1917698003		Water	A	1	A
4	06/18/2019 10:40	MW6_061819	1917698004		Water	A	1	A
5	06/18/2019 10:40	MW6_061819MS	1917698005	MS	Water	A	1	A
6	06/18/2019 10:40	MW6_061819MSD	1917698006	MSD	Water	A	1	A
7	06/18/2019 11:40	109_061819	1917698007		Water	A	1	A
8	06/18/2019 12:55	MW21_061819	1917698008		Water	A	1	A
9								
10								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Wrath, Julie	06/20/2019 10:13	ALS Sample Receiving	Sample Login
Julie Wrath 6/20/19 1200		4C	Storage
R.33.1	6/27.19/12:20	T. Bush	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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00940503

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 191698

Date/Time of Receipt: 6/20/19 10:13

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA		
	Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C199715	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Jaylynn J. (Signature) Jaylynn Johnson (Printed Name) 6/20/19 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Recieved 3 of HS1906098 6-04*

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018

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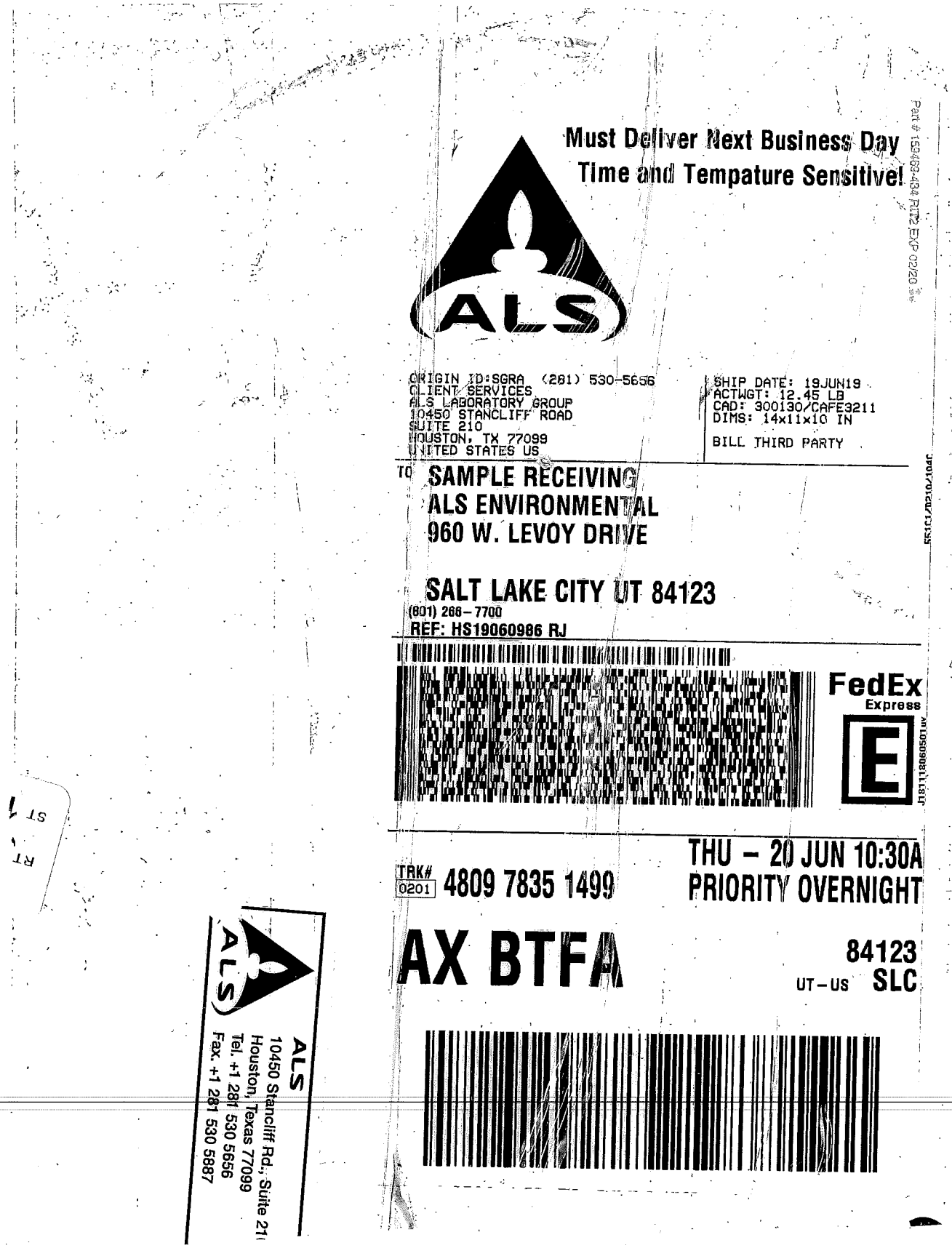

Must Deliver Next Business Day
Time and Tempature Sensitive!

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 19JUN19
ACTWGT: 12.45 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN
BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19060986 RJ

FedEx Express

TRK# 0201 4809 7835 1499

THU - 20 JUN 10:30A
PRIORITY OVERNIGHT

AX BTFA

84123
UT-US SLC

ALS
10450 Stancliff Rd., Suite 21
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

RIGHT SOLUTIONS | RIGHT PARTNER

Batch Worklist

Batch: ELMS/ 2266 **Created:** 7/1/2019 08:25 **Instrument:** LCMS04 **HBN:** 242597
Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1917698 [ENV_LVL4]
Workorder: 1917856 [ENV_LVL4]
Workorder: 1918052 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	661477	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019
2	661481	LCS for HBN 242597 [ELMS/2266]				LCS	3		E6850Q413Q	5311		7/3/2019	7/1/2019
3	661479	ICS for HBN 242597 [ELMS/2266]				ICS	3		E6850..D3Q	5311		7/3/2019	7/1/2019
4	661480	LMB for HBN 242597 [ELMS/2266]				LMB	3		E6850Q413Q	5311		7/3/2019	7/1/2019
5	1917698001	18CPTMW08SW_061819				SAMPLE	3	1917698001-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
6	1917698002	MW5_061819				SAMPLE	3	1917698002-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
7	1917698004	MW6_061819				SAMPLE	3	1917698004-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
8	1917698005	MW6_061819MS				MS	3	1917698005-A	E6850Q413Q	5480		7/3/2019	7/1/2019
9	1917698006	MW6_061819MSD				MSD	3	1917698006-A	E6850Q413Q	5480		7/3/2019	7/1/2019
10	1917698007	109_061819				SAMPLE	3	1917698007-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
13	1917856003	18CPTMW01DW_061919				SAMPLE	3	1917856003-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
14	1917856004	18CPTMW015W_061919				SAMPLE	3	1917856004-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
15	661482	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019
16	1917856005	18CPTMW045W_061919				SAMPLE	3	1917856005-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
17	1917856006	18CPTMW04_061919				SAMPLE	3	1917856006-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
18	1917856007	MW1_061919				SAMPLE	3	1917856007-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
19	1918052001	120_062019				SAMPLE	3	1918052001-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
20	1918052002	MW14_062019				SAMPLE	3	1918052002-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
21	1918052003	MW14_062019_a				SAMPLE	3	1918052003-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
22	1918052004	MW12_062019				SAMPLE	3	1918052004-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
23	1917698003	19CPTMW08DW_061819				SAMPLE	3	1917698003-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
24	1917698008	MW21_061819				SAMPLE	3	1917698008-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
25	1917856001	MW2_061919				SAMPLE	3	1917856001-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
26	661483	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019
27	1917856002	MW2_061919_a				SAMPLE	3	1917856002-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
28	661478	RLVS for HBN 242597 [ELMS/2266				RLVS	3		E685041C3Q	5311		7/3/2019	7/1/2019
29	661661	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019

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00940506

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1917698 (001-08), 1917856 (001-07), 1918052 (001-04)
ELMS Batch/HBN ID: 2266 (242597)
Prep Date: 06/27/2019 Analysis Date: 07/01/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\01JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 661481; Target = 4.0µg/L. ASTM type II water was used for LMB 661480.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on samples 1917698005/06 (Client ID: MW6_061819). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L. The parent sample and the MS/MSD were analyzed and reported from 1:1,000 dilutions. The effective spike target was 4,000.µg/L.

COMMENTS:

1) Results reported in µg/L. The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\242597-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 661478) is reported from the analysis of the Laboratory Control Sample (LCS – 661481) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 01JULD15.

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2266 HBN: 242597 Sample Set IDs if Applicable: 1917698/1917856/1918052	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR# _____	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ANAB ACCREDITED

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

OR-ORG/NO-001
Rev. 5/18

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Report: C:\HPCHEM\1\DATA\01JUL19D\01JUL19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	661477 CCV@25	Vial 71	1	Control	1	1.94364e6	8.502	26.12624
*	661481 QC@4.0	Vial 72	1	Control	2	3.56116e5	8.215	4.27672
*	661479 ICS@4.0	Vial 73	1	Control	3	2.74101e5	8.013	3.76269
*	661480 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917698001 1K	Vial 75	1	Sample	5	1.80575e6	8.547	2.30697e4
*	1917698002 1K	Vial 76	1	Sample	6	2.06010e6	8.593	2.58627e4
*	1917698004 1K	Vial 78	1	Sample	8	3.25841e5	8.618	4410.00331
*	1917698005 MS	Vial 79	1	Sample	9	6.67091e5	8.655	8914.28717
*	1917698006 MSD	Vial 80	1	Sample	10	6.51482e5	8.597	8808.96977
*	1917698007 1K	Vial 81	1	Sample	11	7.47888e5	8.647	1.04112e4
*	1917856001	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1917856002	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1917856003	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1917856004	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	661482 CCV@25	Vial 71	1	Control	17	1.60409e6	8.558	25.00349
*	1917856005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917856006 100	Vial 88	1	Sample	19	4.03838e5	8.639	621.06433
*	1917856007 100	Vial 89	1	Sample	20	4.34274e5	8.657	588.15812
*	1918052001 1K	Vial 90	1	Sample	21	9.58579e5	8.665	1.34755e4
*	1918052002 10K	Vial 91	1	Sample	22	1.70174e6	8.689	2.36511e5
*	1918052003 10K	Vial 92	1	Sample	23	1.68203e6	8.679	2.30798e5
*	1918052004	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	1917698003 100	Vial 94	1	Sample	25	3.02113e6	8.615	4300.62656
*	1917698008 1K	Vial 95	1	Sample	26	1.64048e6	8.691	2.37316e4
*	1917856001 RE	Vial 83	1	Sample	27	0.00000	0.000	0.00000
*	661483 CCV@25	Vial 71	1	Control	28	1.50603e6	8.597	25.41985
*	1917856002 RE	Vial 84	1	Sample	29	0.00000	0.000	0.00000
*	661661 CCV@25	Vial 71	1	Control	30	1.45949e6	8.576	25.10137

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	661477 CCV@25	Vial 71	1	Control	1	5.88479e5	8.517	26.62967
*	661481 QC@4.0	Vial 72	1	Control	2	1.16200e5	8.258	4.54646
*	661479 ICS@4.0	Vial 73	1	Control	3	8.51455e4	8.028	3.78922
*	661480 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917698001 1K	Vial 75	1	Sample	5	5.48648e5	8.553	2.35743e4
*	1917698002 1K	Vial 76	1	Sample	6	6.20226e5	8.595	2.62187e4
*	1917698004 1K	Vial 78	1	Sample	8	1.08064e5	8.621	4769.85352
*	1917698005 MS	Vial 79	1	Sample	9	2.16450e5	8.652	9609.46002
*	1917698006 MSD	Vial 80	1	Sample	10	2.06556e5	8.628	9281.28672
*	1917698007 1K	Vial 81	1	Sample	11	2.34170e5	8.675	1.08652e4
*	1917856001	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1917856002	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1917856003	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1917856004	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	661482 CCV@25	Vial 71	1	Control	17	4.85334e5	8.571	25.46167
*	1917856005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917856006 100	Vial 88	1	Sample	19	1.32726e5	8.663	672.87107
*	1917856007 100	Vial 89	1	Sample	20	1.40119e5	8.663	624.82071
*	1918052001 1K	Vial 90	1	Sample	21	2.95207e5	8.681	1.38848e4
*	1918052002 10K	Vial 91	1	Sample	22	5.16167e5	8.701	2.41334e5
*	1918052003 10K	Vial 92	1	Sample	23	5.17000e5	8.701	2.38460e5
*	1918052004	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	1917698003 100	Vial 94	1	Sample	25	8.88076e5	8.626	4275.40488
*	1917698008 1K	Vial 95	1	Sample	26	4.99687e5	8.711	2.43133e4
*	1917856001 RE	Vial 83	1	Sample	27	0.00000	0.000	0.00000
*	661483 CCV@25	Vial 71	1	Control	28	4.53099e5	8.615	25.74994
*	1917856002 RE	Vial 84	1	Sample	29	0.00000	0.000	0.00000
*	661661 CCV@25	Vial 71	1	Control	30	4.45116e5	8.600	25.75597

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Batch Report: C:\HPCHEM\1\DATA\01JUL19D\01JUL19S.B

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	661477 CCV@25	Vial 71	1	Control	1	2.25730e5	8.518	5.00000
*	661481 QC@4.0	Vial 72	1	Control	2	2.73485e5	8.237	5.00000
*	661479 ICS@4.0	Vial 73	1	Control	3	2.40789e5	8.048	5.00000
*	661480 LMB	Vial 74	1	Control	4	2.63576e5	8.496	5.00000
*	1917698001 1K	Vial 75	1	Sample	5	2.39255e5	8.564	5000.00000
*	1917698002 1K	Vial 76	1	Sample	6	2.41844e5	8.612	5000.00000
*	1917698004 1K	Vial 78	1	Sample	8	2.42320e5	8.640	5000.00000
*	1917698005 MS	Vial 79	1	Sample	9	2.38518e5	8.669	5000.00000
*	1917698006 MSD	Vial 80	1	Sample	10	2.35827e5	8.629	5000.00000
*	1917698007 1K	Vial 81	1	Sample	11	2.27615e5	8.679	5000.00000
*	1917856001	Vial 83	1	Sample	13	9.31342e4	7.613	5.00000
*	1917856002	Vial 84	1	Sample	14	8.79498e4	7.621	5.00000
*	1917856003	Vial 85	1	Sample	15	2.30973e5	7.860	5.00000
*	1917856004	Vial 86	1	Sample	16	2.08544e5	7.904	5.00000
*	661482 CCV@25	Vial 71	1	Control	17	1.95182e5	8.589	5.00000
*	1917856005	Vial 87	1	Sample	18	2.92027e5	7.936	5.00000
*	1917856006 100	Vial 88	1	Sample	19	2.10142e5	8.654	500.00000
*	1917856007 100	Vial 89	1	Sample	20	2.39145e5	8.684	500.00000
*	1918052001 1K	Vial 90	1	Sample	21	2.23102e5	8.672	5000.00000
*	1918052002 10K	Vial 91	1	Sample	22	2.19618e5	8.709	5.00000e4
*	1918052003 10K	Vial 92	1	Sample	23	2.22758e5	8.695	5.00000e4
*	1918052004	Vial 93	1	Sample	24	1.88746e5	7.876	5.00000
*	1917698003 100	Vial 94	1	Sample	25	2.05249e5	8.640	500.00000
*	1917698008 1K	Vial 95	1	Sample	26	2.10954e5	8.695	5000.00000
*	1917856001 RE	Vial 83	1	Sample	27	1.44962e5	7.630	5.00000
*	661483 CCV@25	Vial 71	1	Control	28	1.80070e5	8.618	5.00000
*	1917856002 RE	Vial 84	1	Sample	29	1.42651e5	7.637	5.00000
*	661661 CCV@25	Vial 71	1	Control	30	1.76854e5	8.601	5.00000

*** End of Report ***

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Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	661477 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	661481 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	661479 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	661480 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1917698001 1K	CLO4-AQN	1	Sample		
6	Vial 76	1917698002 1K	CLO4-AQN	1	Sample		
7	Vial 77	1917698003 1K	CLO4-AQN	1	Sample		
8	Vial 78	1917698004 1K	CLO4-AQN	1	Sample		
9	Vial 79	1917698005 MS	CLO4-AQN	1	Sample		
10	Vial 80	1917698006 MSD	CLO4-AQN	1	Sample		
11	Vial 81	1917698007 1K	CLO4-AQN	1	Sample		
12	Vial 82	1917698008 10K	CLO4-AQN	1	Sample		
13	Vial 83	1917856001	CLO4-AQN	1	Sample		
14	Vial 84	1917856002	CLO4-AQN	1	Sample		
15	Vial 85	1917856003	CLO4-AQN	1	Sample		
16	Vial 86	1917856004	CLO4-AQN	1	Sample		
17	Vial 71	661482 CCV@25	CLO4-AQN	1	Ctrl Samp		
18	Vial 87	1917856005	CLO4-AQN	1	Sample		
19	Vial 88	1917856006 100	CLO4-AQN	1	Sample		
20	Vial 89	1917856007 100	CLO4-AQN	1	Sample		
21	Vial 90	1918052001 1K	CLO4-AQN	1	Sample		
22	Vial 91	1918052002 10K	CLO4-AQN	1	Sample		
23	Vial 92	1918052003 10K	CLO4-AQN	1	Sample		
24	Vial 93	1918052004	CLO4-AQN	1	Sample		
25	Vial 94	1917698003 100	CLO4-AQN	1	Sample		
26	Vial 95	1917698008 1K	CLO4-AQN	1	Sample		
27	Vial 83	1917856001 RE	CLO4-AQN	1	Sample		
28	Vial 71	661483 CCV@25	CLO4-AQN	1	Ctrl Samp		
29	Vial 84	1917856002 RE	CLO4-AQN	1	Sample		
30	Vial 71	661661 CCV@25	CLO4-AQN	1	Ctrl Samp		

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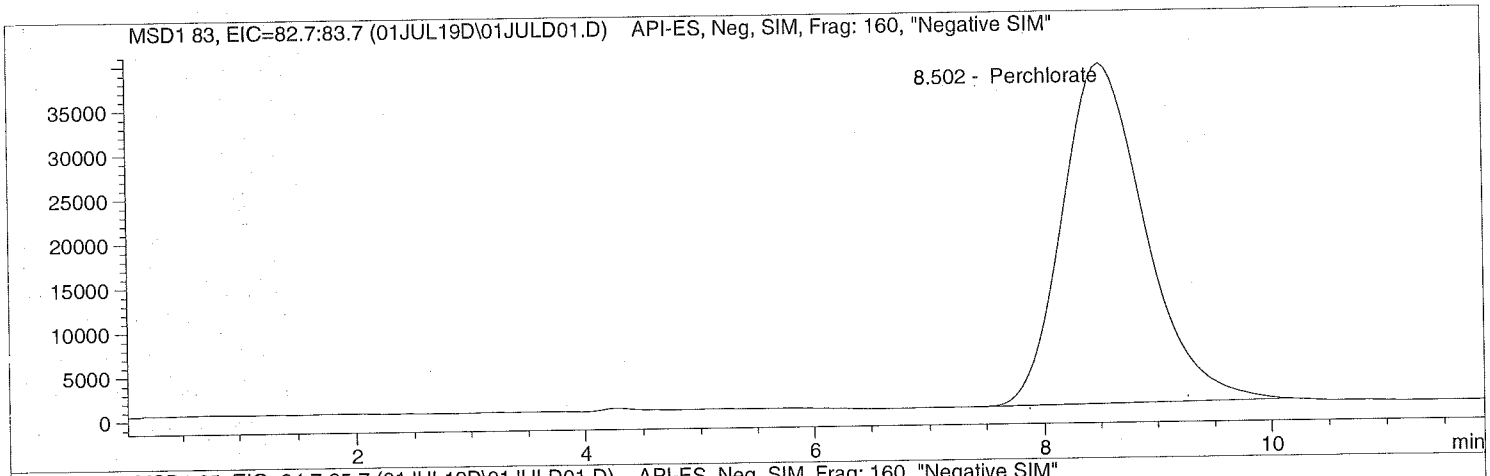
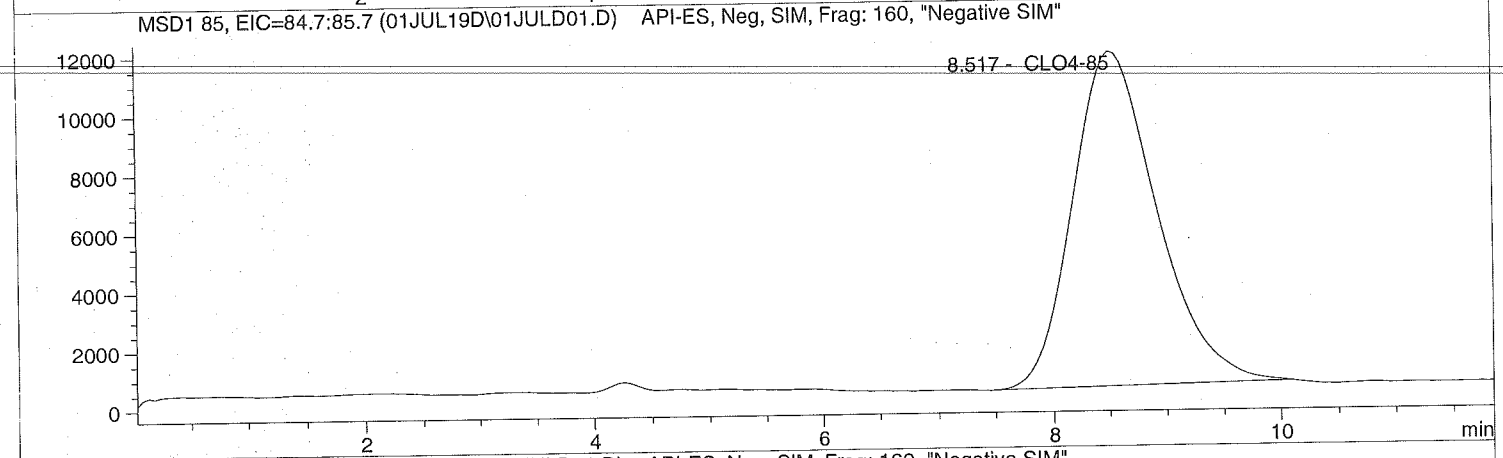
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD01.D Sample Name: 661477 CCV@25

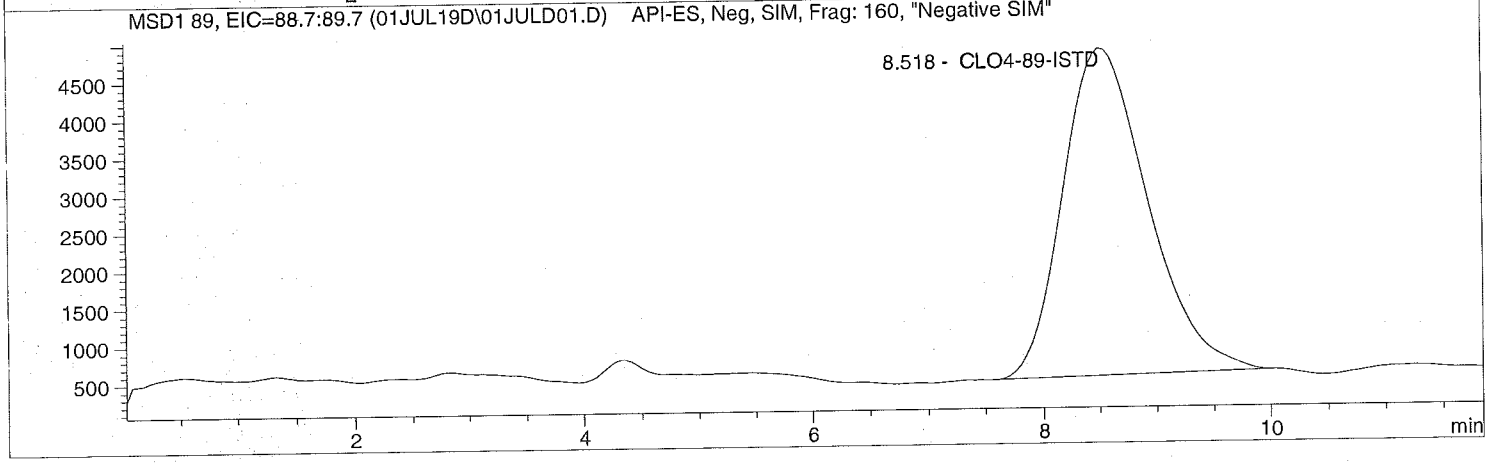
Injection Date:	7/01/2019 08:34:23	Seq Line:	1
Sample Name:	661477 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD01.D Sample Name: 661477 CCV@25

Injection Date:	7/01/2019 08:34:23	Seq Line:	1
Sample Name:	661477 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	PBA	1943636.6	26.1262	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.517	PBA	588479.1	26.6297	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.518	PBA	225730.5	5.0000	CLO4-89-ISTD

*** End of Report ***

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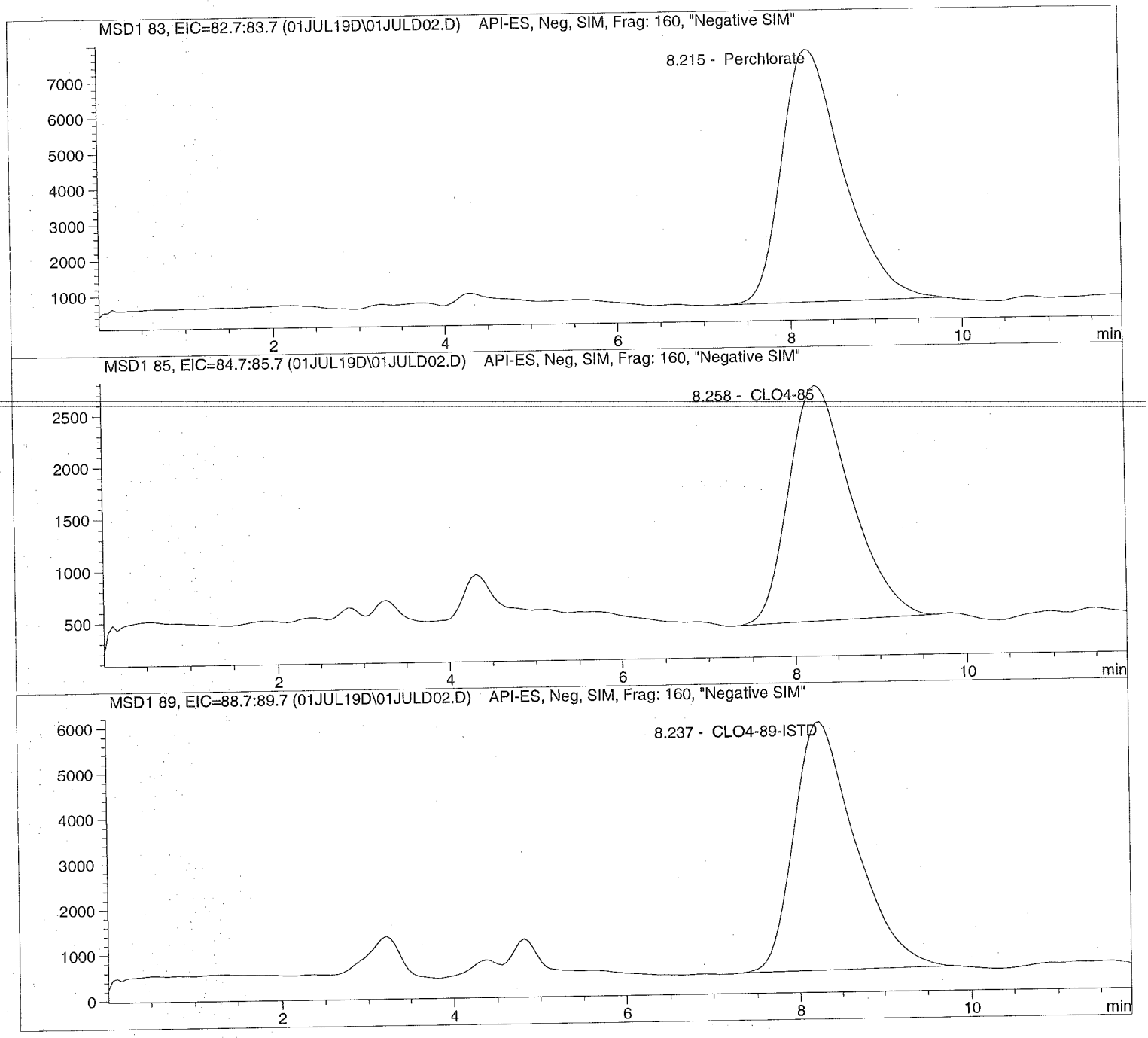
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD02.D Sample Name: 661481 QC@4.0

Injection Date:	7/01/2019 08:48:56	Seq Line:	2
Sample Name:	661481 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD02.D Sample Name: 661481 QC@4.0

Injection Date:	7/01/2019 08:48:56	Seq Line:	2
Sample Name:	661481 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.215	PBA	356116.2	4.2767	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.258	PBA	116199.5	4.5465	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.237	PBA	273484.5	5.0000	CLO4-89-ISTD

*** End of Report ***

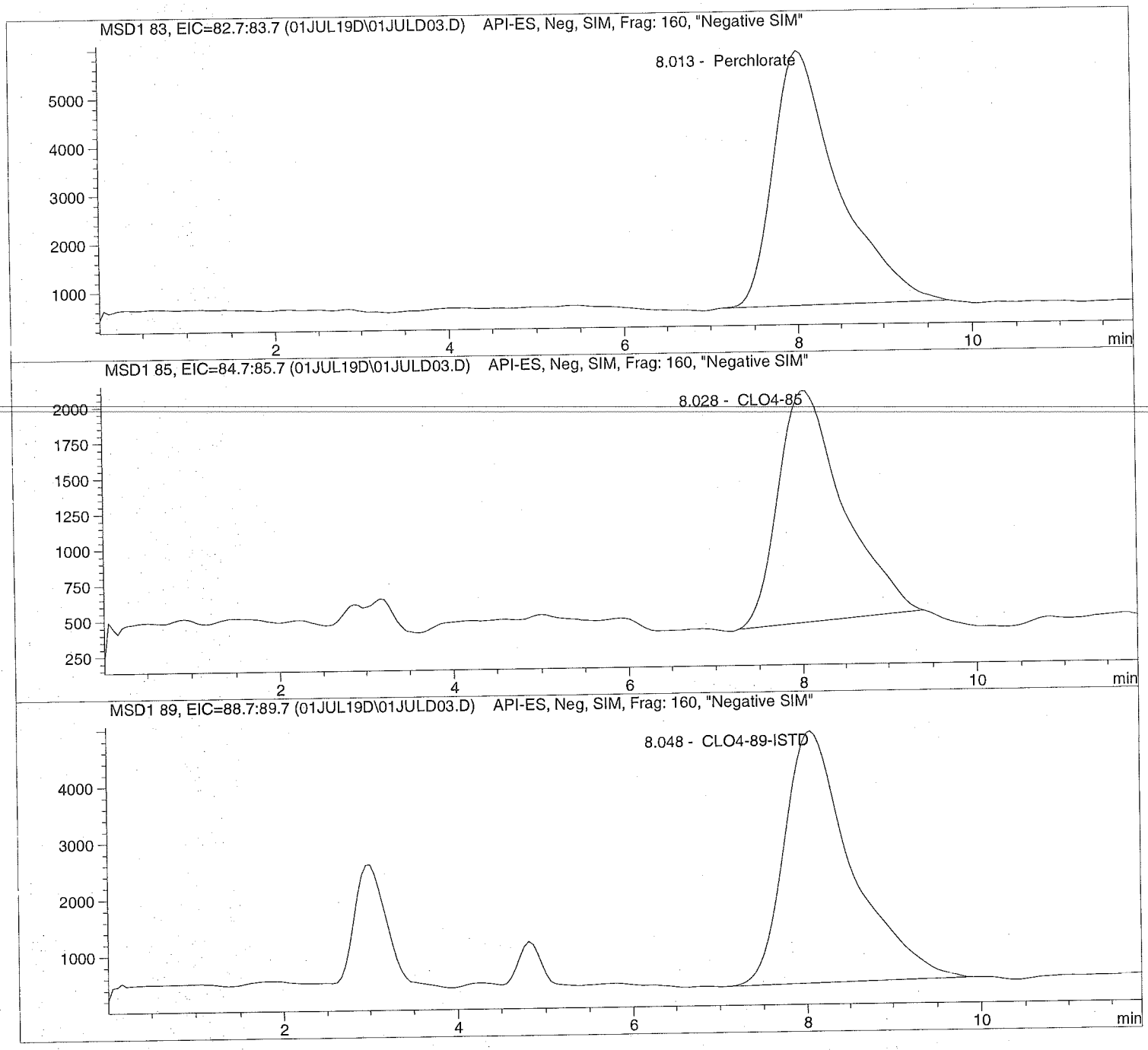
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD03.D Sample Name: 661479 ICS@4.0

Injection Date:	7/01/2019 09:02:47	Seq Line:	3
Sample Name:	661479 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD03.D Sample Name: 661479 ICS@4.0

Injection Date:	7/01/2019 09:02:47	Seq Line:	3
Sample Name:	661479 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.013	BBA	274101.4	3.7627	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.028	PBA	85145.5	3.7892	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.048	PBA	240788.6	5.0000	CLO4-89-ISTD

*** End of Report ***

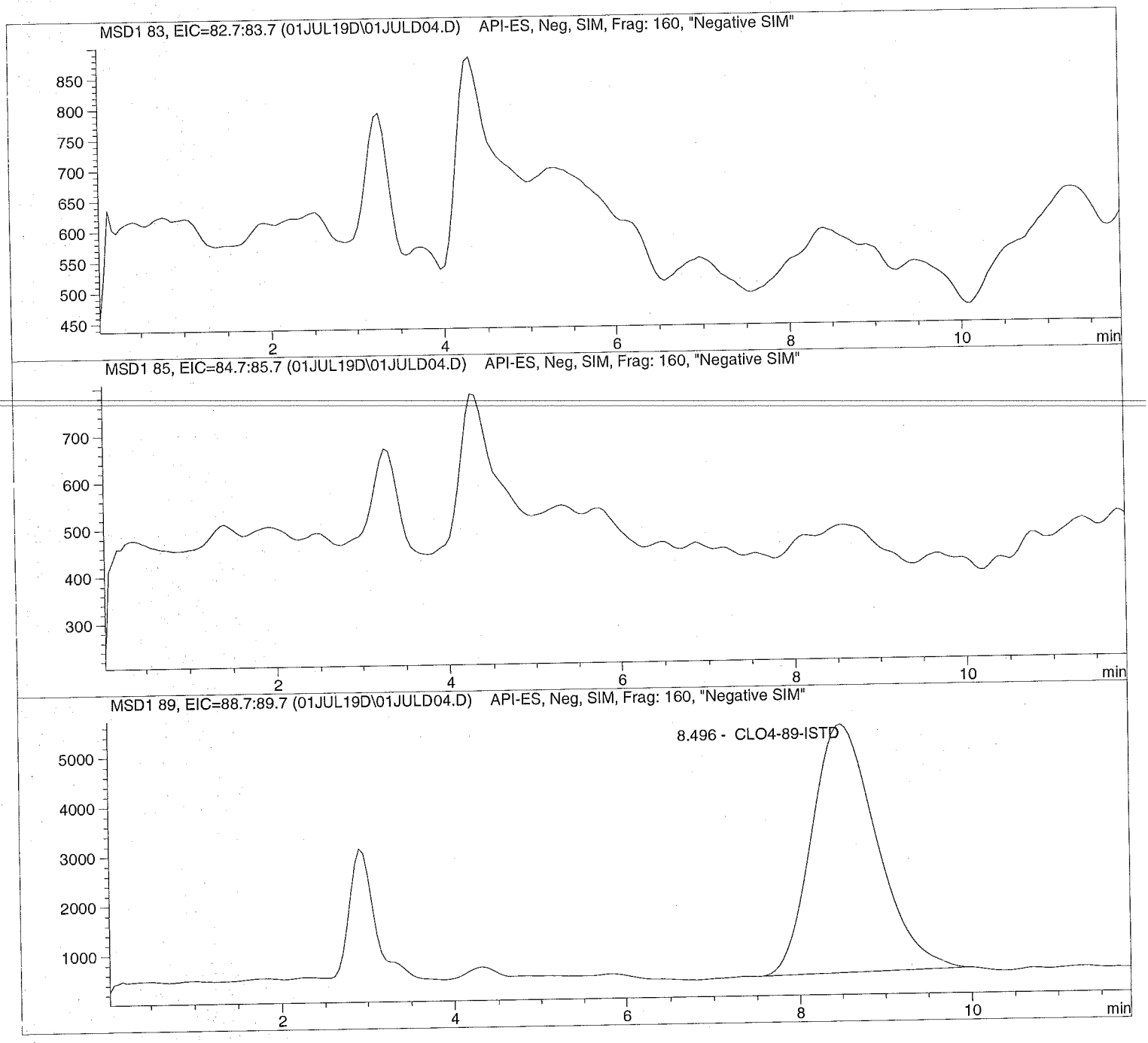
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD04.D Sample Name: 661480 LMB

Injection Date:	7/01/2019 09:16:47	Seq Line:	4
Sample Name:	661480 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD04.D Sample Name: 661480 LMB

Injection Date:	7/01/2019 09:16:47	Seq Line:	4
Sample Name:	661480 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.496	PBA	263576.3	5.0000	CLO4-89-ISTD

*** End of Report ***

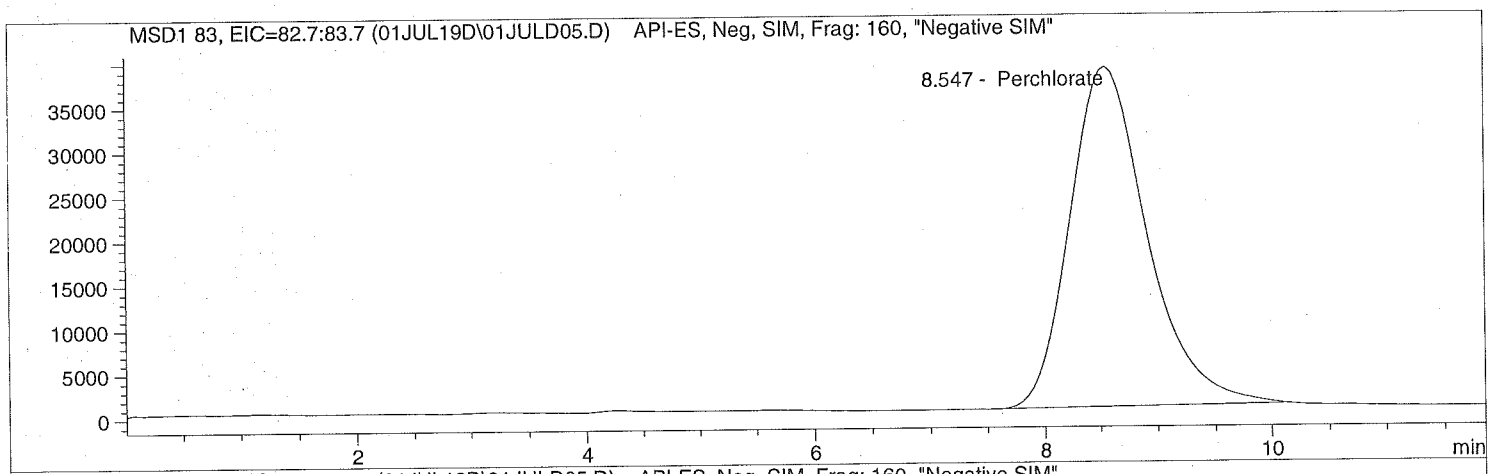
RIGHT SOLUTIONS | RIGHT PARTNER

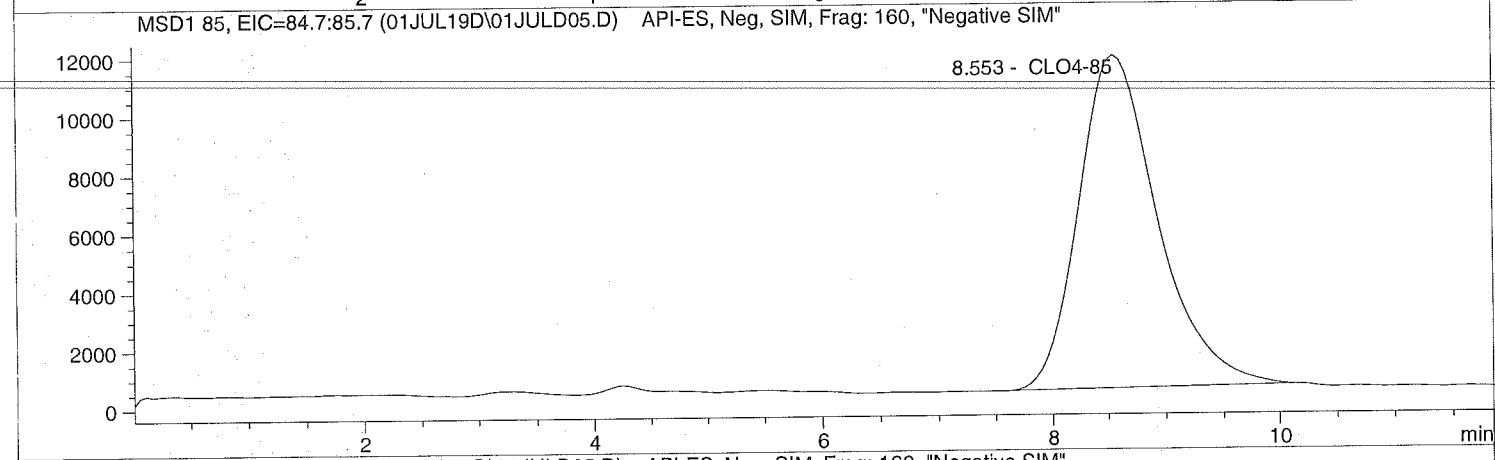
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD05.D Sample Name: 1917698001 1K

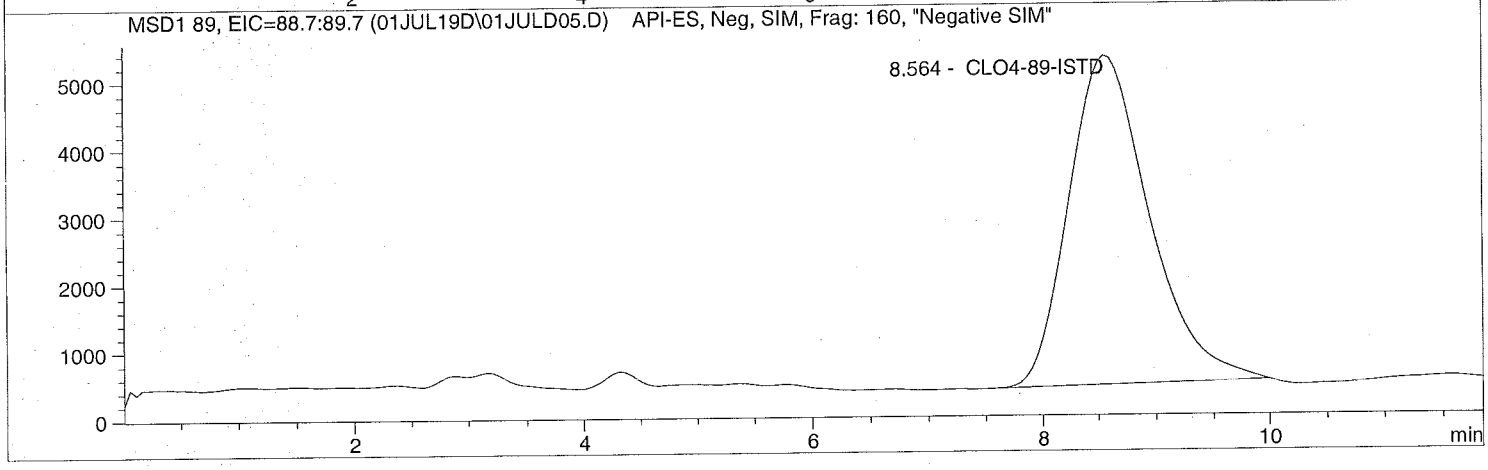
Injection Date:	7/01/2019 09:30:40	Seq Line:	5
Sample Name:	1917698001 1K	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD05.D Sample Name: 1917698001 1K

Injection Date:	7/01/2019 09:30:40	Seq Line:	5
Sample Name:	1917698001 1K	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.547	PBA	1805754.9	23069.7173	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.553	PBA	548647.9	23574.3344	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.564	PBA	239254.8	5000.0000	CLO4-89-ISTD

*** End of Report ***

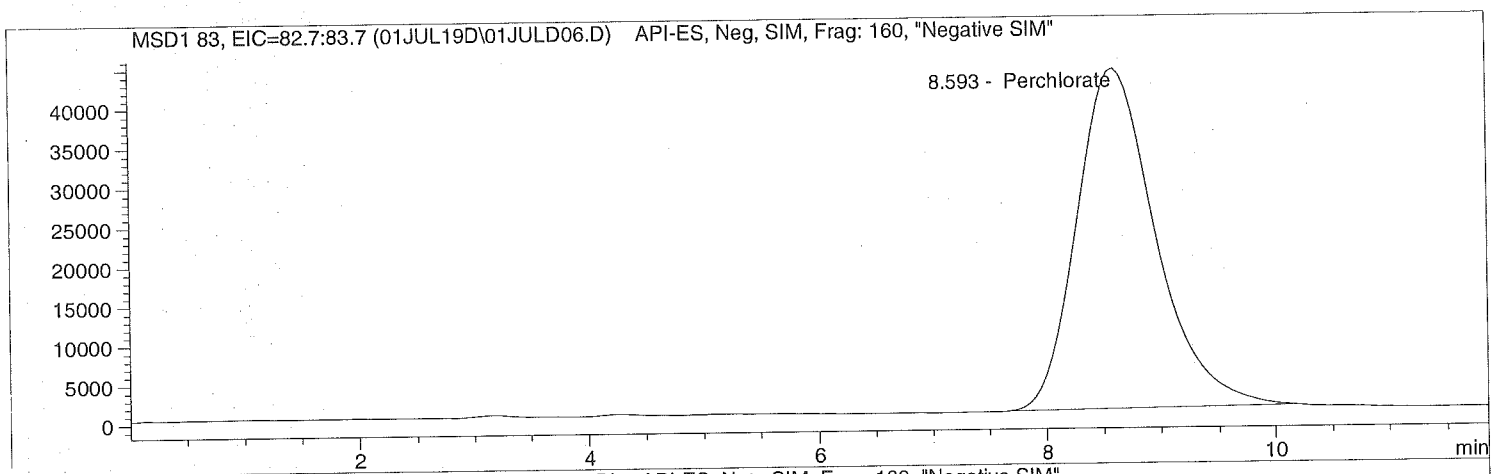
RIGHT SOLUTIONS | RIGHT PARTNER

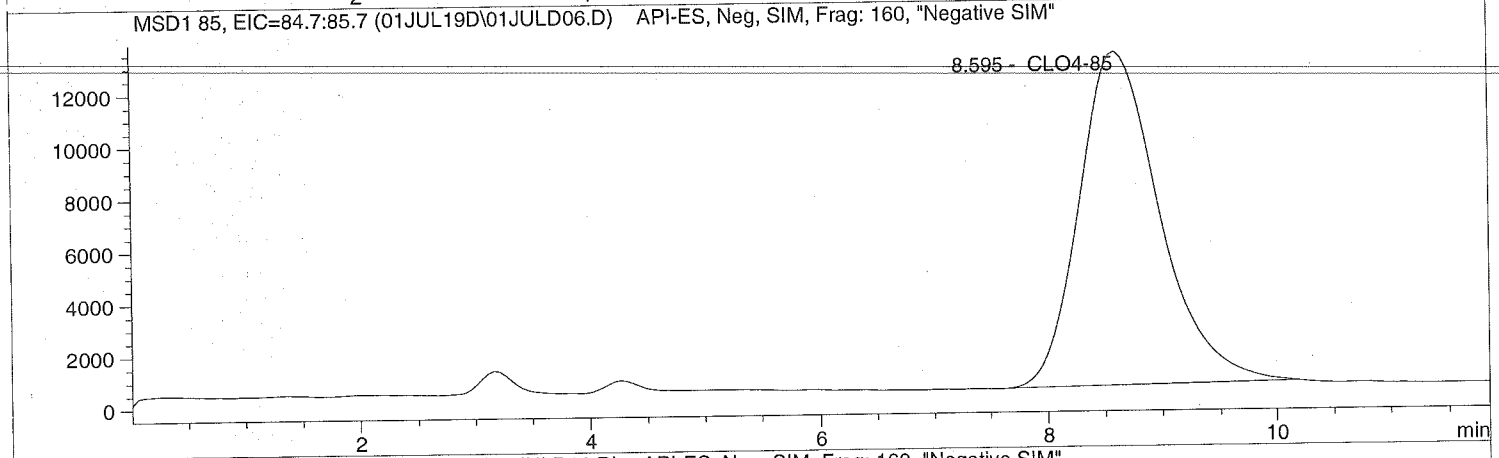
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD06.D Sample Name: 1917698002 1K

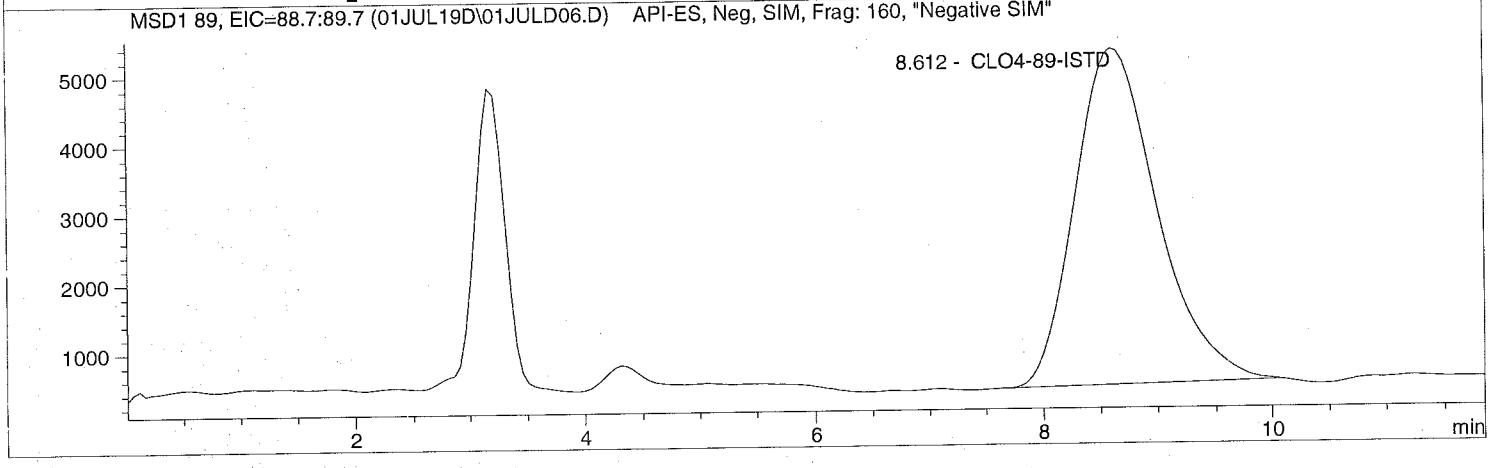
Injection Date:	7/01/2019 09:44:35	Seq Line:	6
Sample Name:	1917698002 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD06.D Sample Name: 1917698002 1K

Injection Date:	7/01/2019 09:44:35	Seq Line:	6
Sample Name:	1917698002 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.593	PBA	2060095.9	25862.7348	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.595	PBA	620225.7	26218.7320	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.612	PBA	241844.5	5000.0000	CLO4-89-ISTD

*** End of Report ***

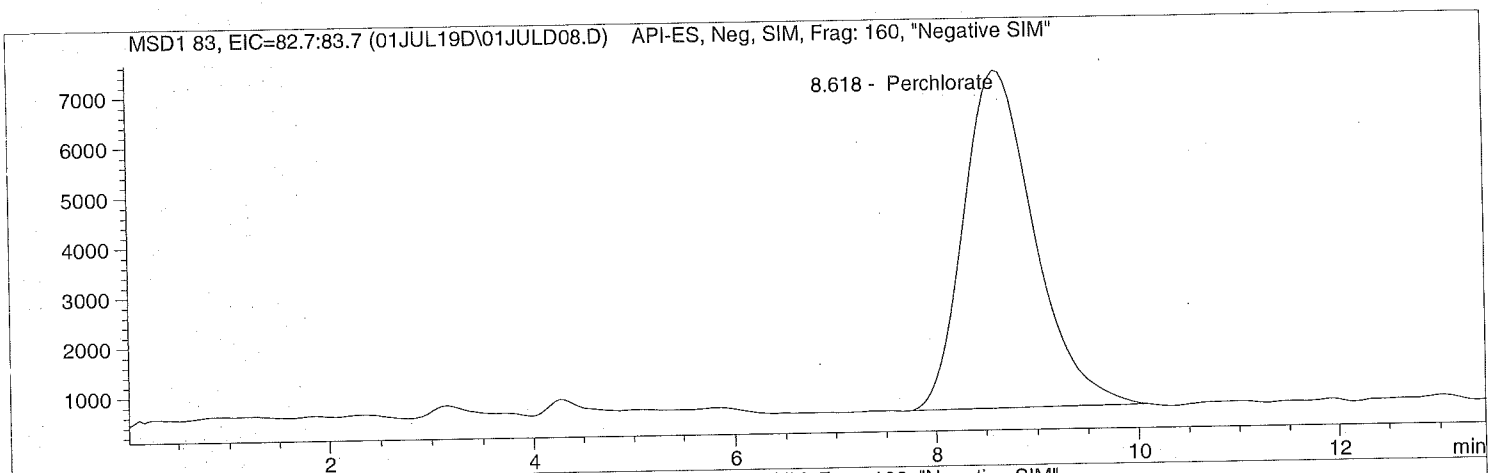
RIGHT SOLUTIONS | RIGHT PARTNER

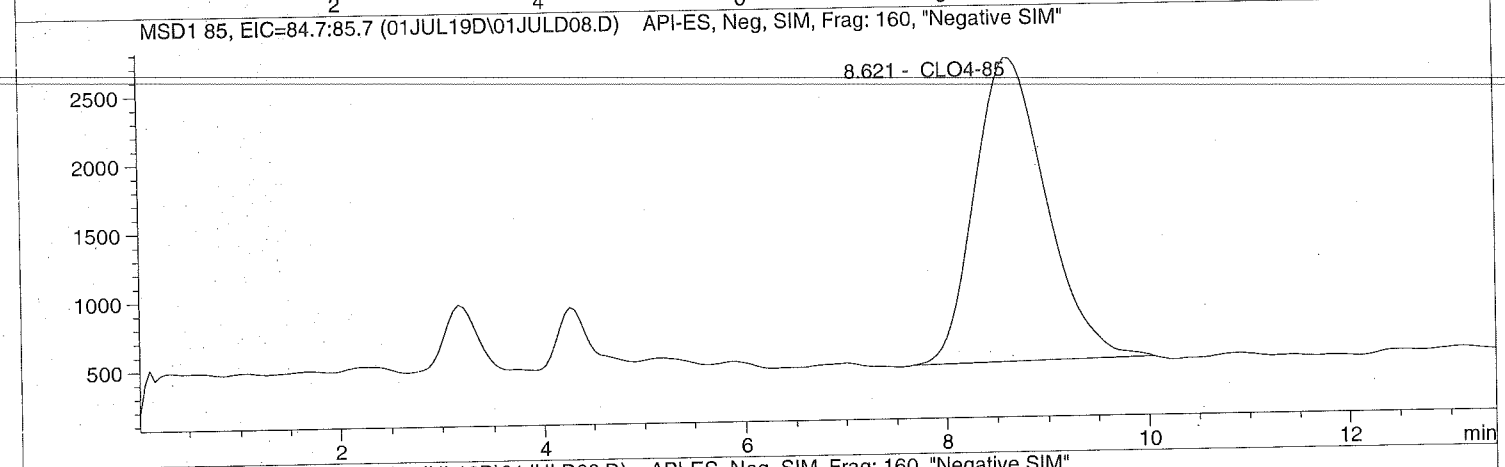
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD08.D Sample Name: 1917698004 1K

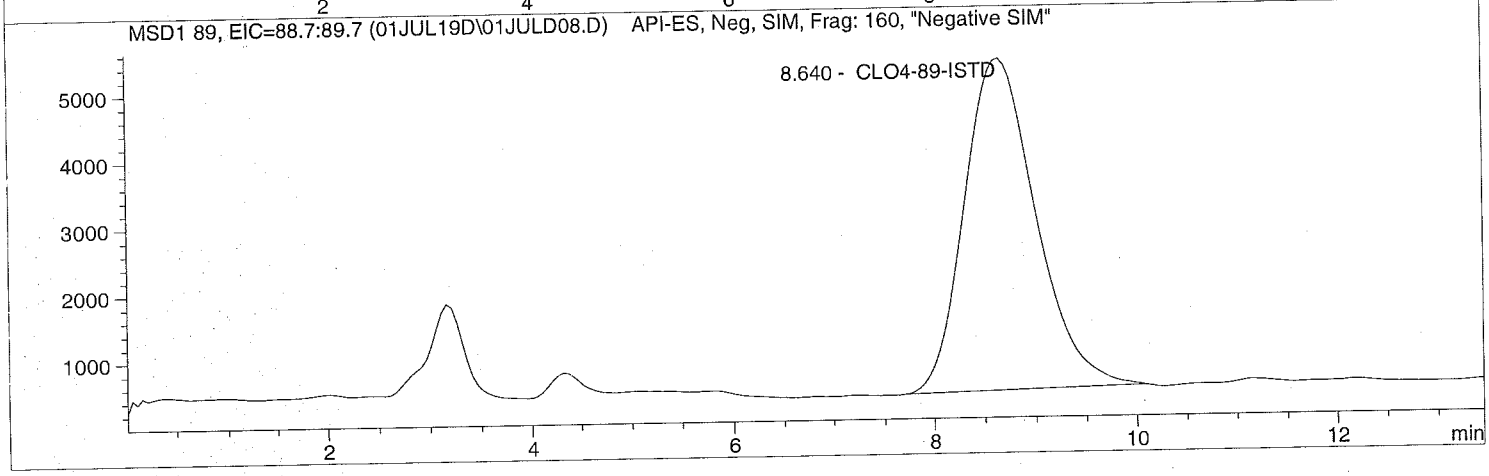
Injection Date:	7/01/2019 10:12:34	Seq Line:	8
Sample Name:	1917698004 1K	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD08.D Sample Name: 1917698004 1K

Injection Date:	7/01/2019 10:12:34	Seq Line:	8
Sample Name:	1917698004 1K	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.618	PBA	325841.4	4410.0033	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.621	PBA	108064.0	4769.8535	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.640	PBA	242319.7	5000.0000	CLO4-89-ISTD

*** End of Report ***

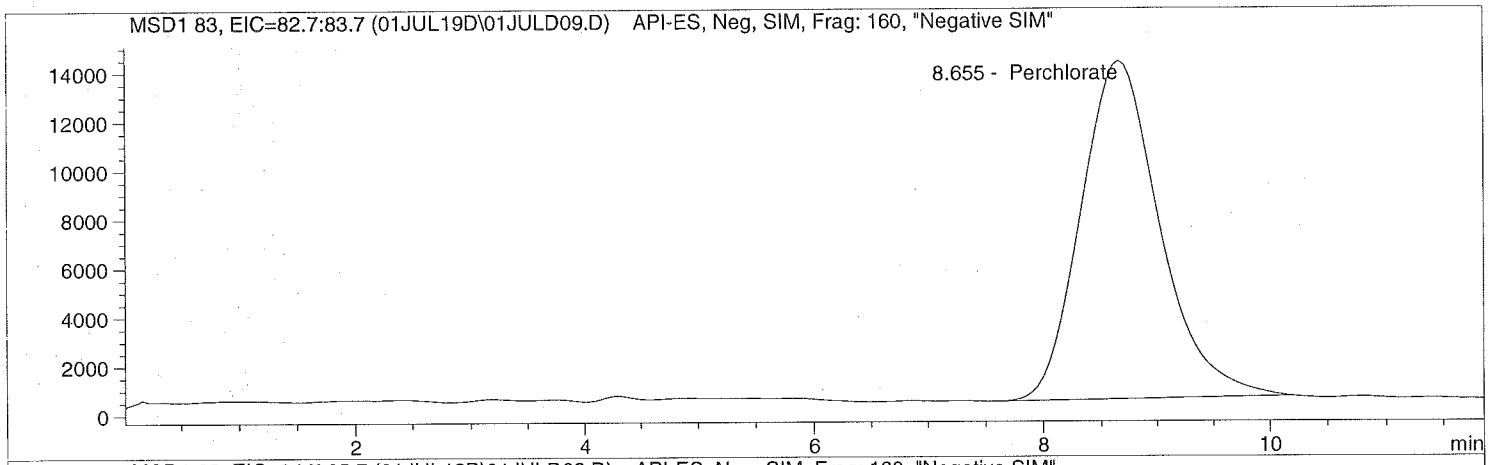
RIGHT SOLUTIONS | RIGHT PARTNER

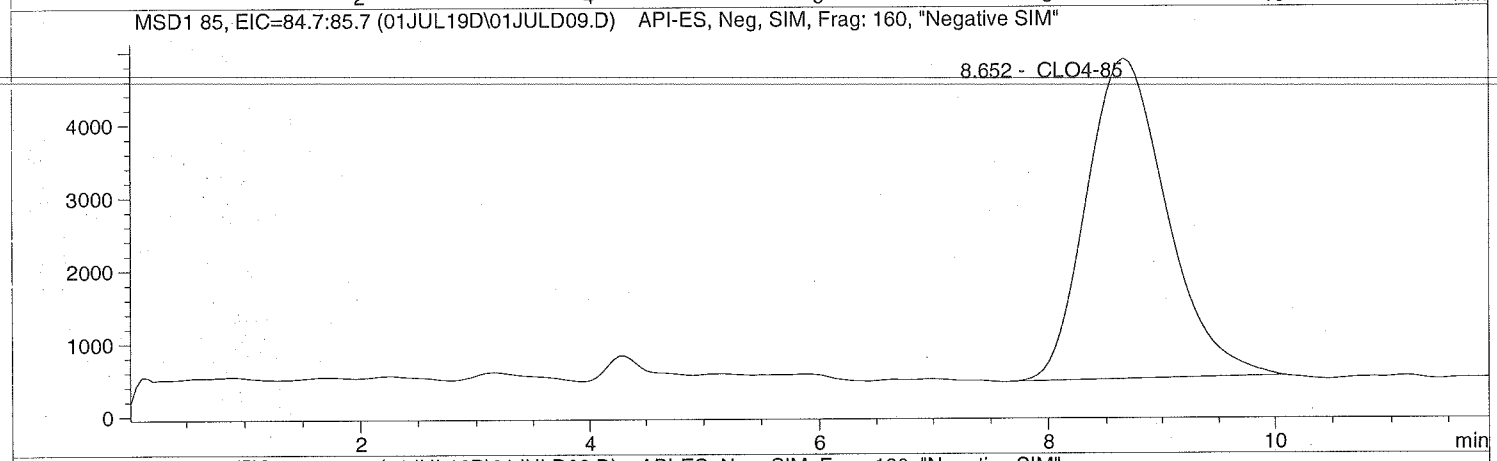
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD09.D Sample Name: 1917698005 MS

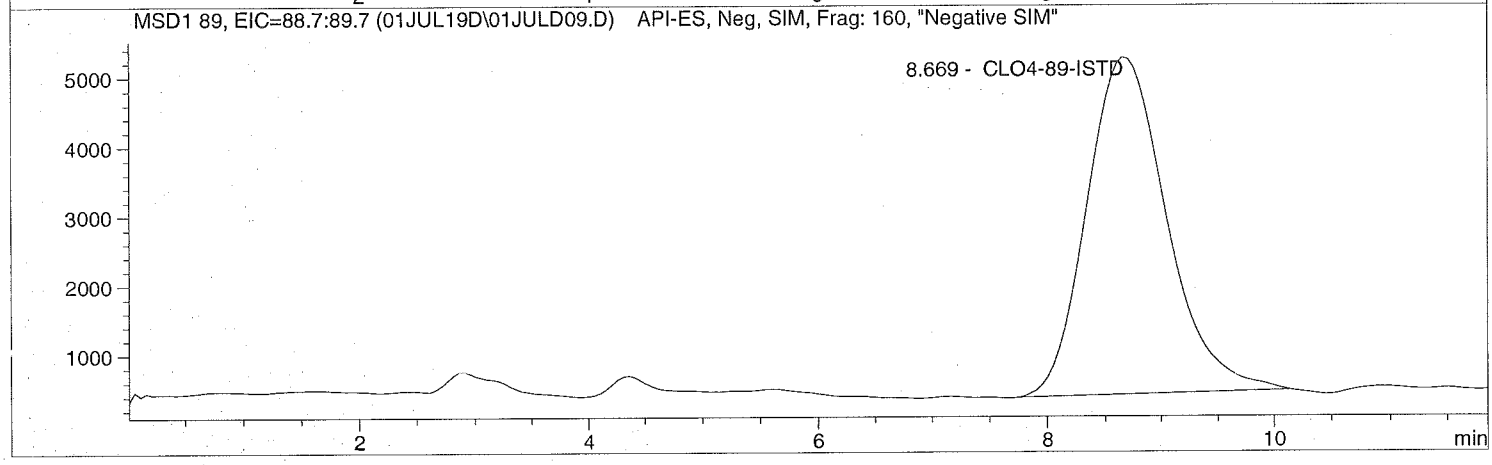
Injection Date:	7/01/2019 10:28:15	Seq Line:	9
Sample Name:	1917698005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD09.D Sample Name: 1917698005 MS

Injection Date:	7/01/2019 10:28:15	Seq Line:	9
Sample Name:	1917698005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.655	PBA	667091.1	8914.2872	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.652	PBA	216450.0	9609.4600	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.669	PBA	238517.6	5000.0000	CLO4-89-ISTD

*** End of Report ***

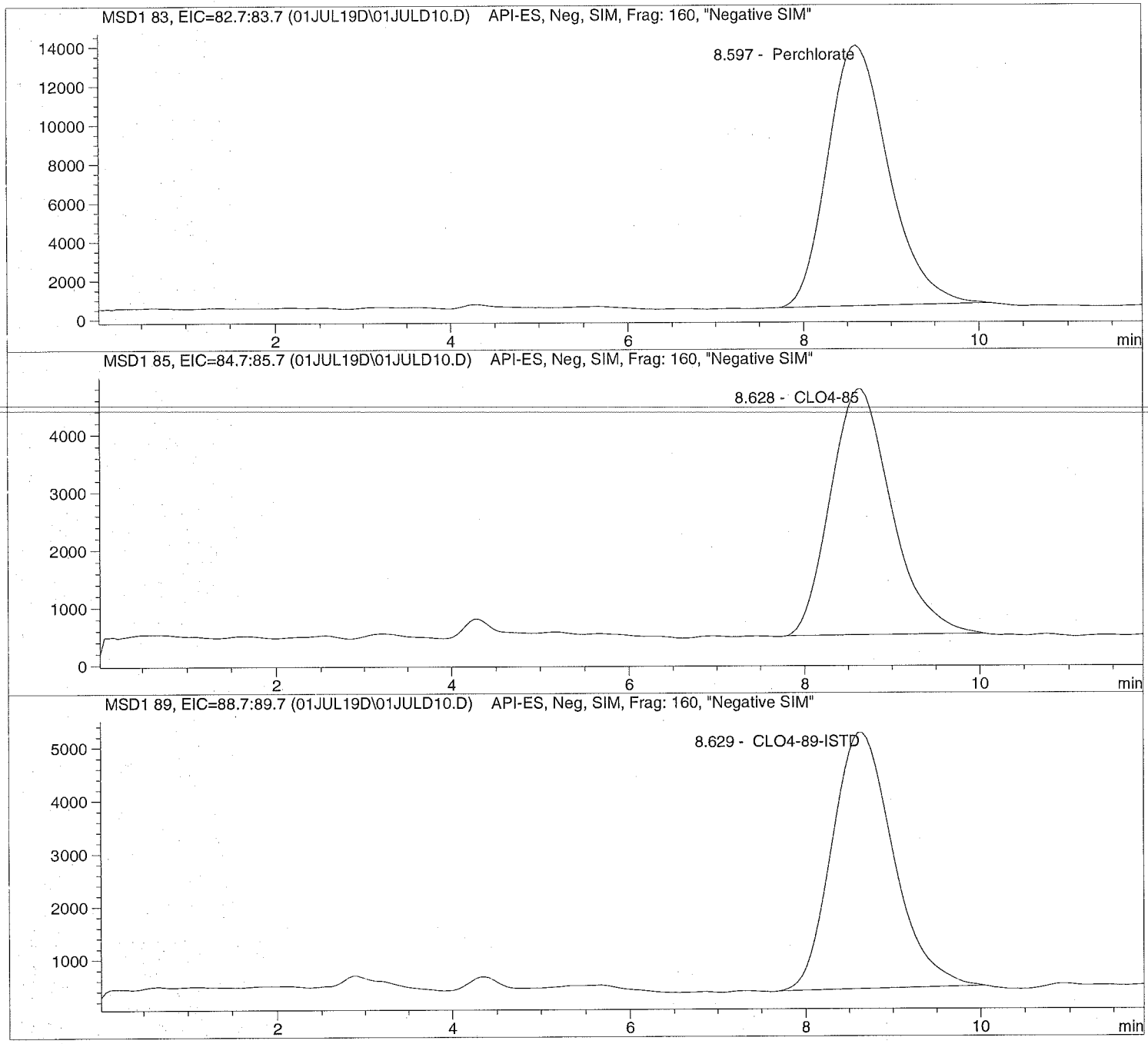
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD10.D Sample Name: 1917698006 MSD

Injection Date:	7/01/2019 10:43:07	Seq Line:	10
Sample Name:	1917698006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD10.D Sample Name: 1917698006 MSD

Injection Date:	7/01/2019 10:43:07	Seq Line:	10
Sample Name:	1917698006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.597	PBA	651481.5	8808.9698	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.628	BBA	206556.3	9281.2867	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.629	PBA	235827.1	5000.0000	CLO4-89-ISTD

*** End of Report ***

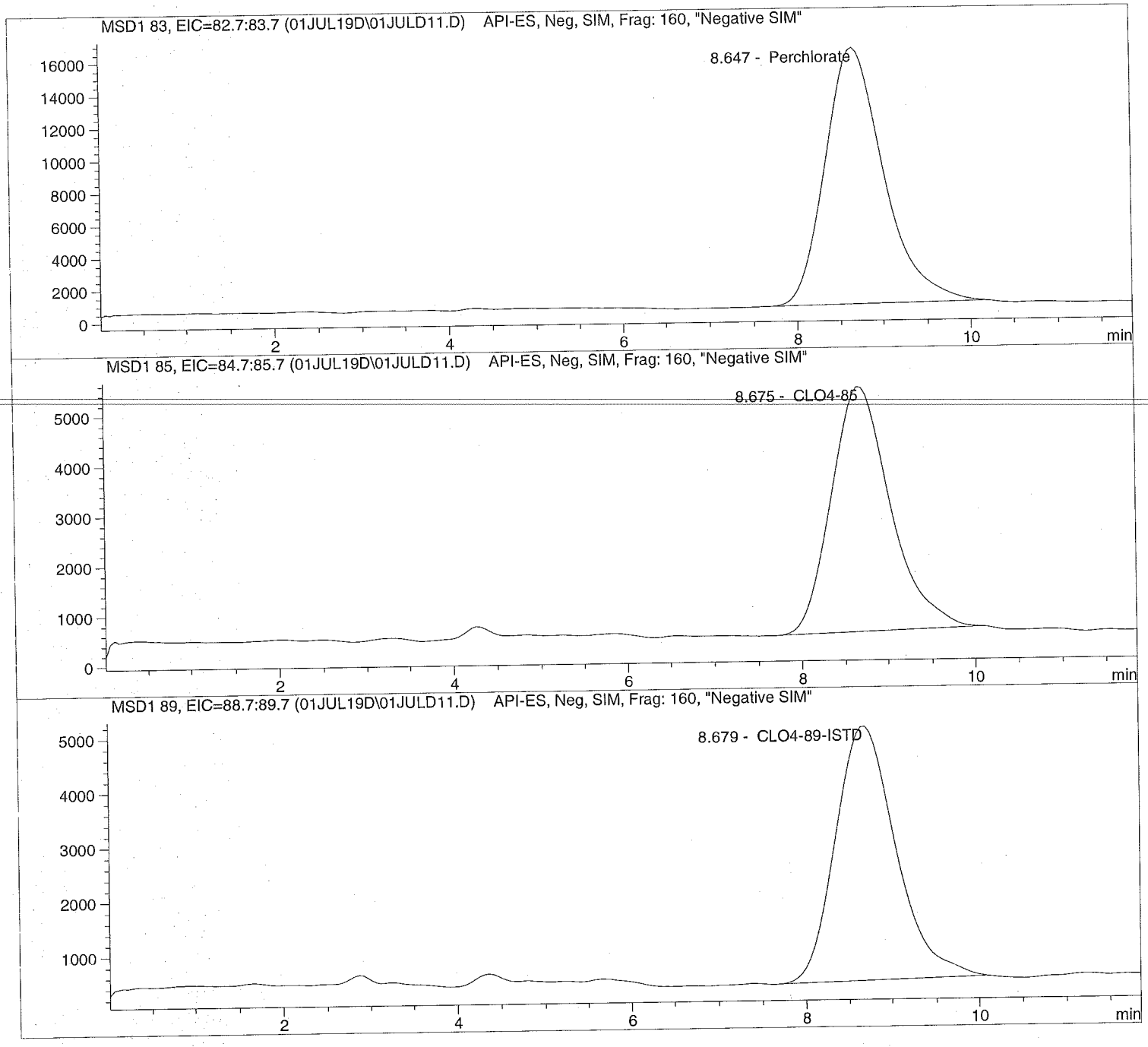
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD11.D Sample Name: 1917698007 1K

Injection Date:	7/01/2019 10:56:59	Seq Line:	11
Sample Name:	1917698007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD11.D Sample Name: 1917698007 1K

Injection Date:	7/01/2019 10:56:59	Seq Line:	11
Sample Name:	1917698007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.647	PBA	747887.6	10411.1564	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.675	PBA	234170.4	10865.1642	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.679	PBA	227614.9	5000.0000	CLO4-89-ISTD

*** End of Report ***

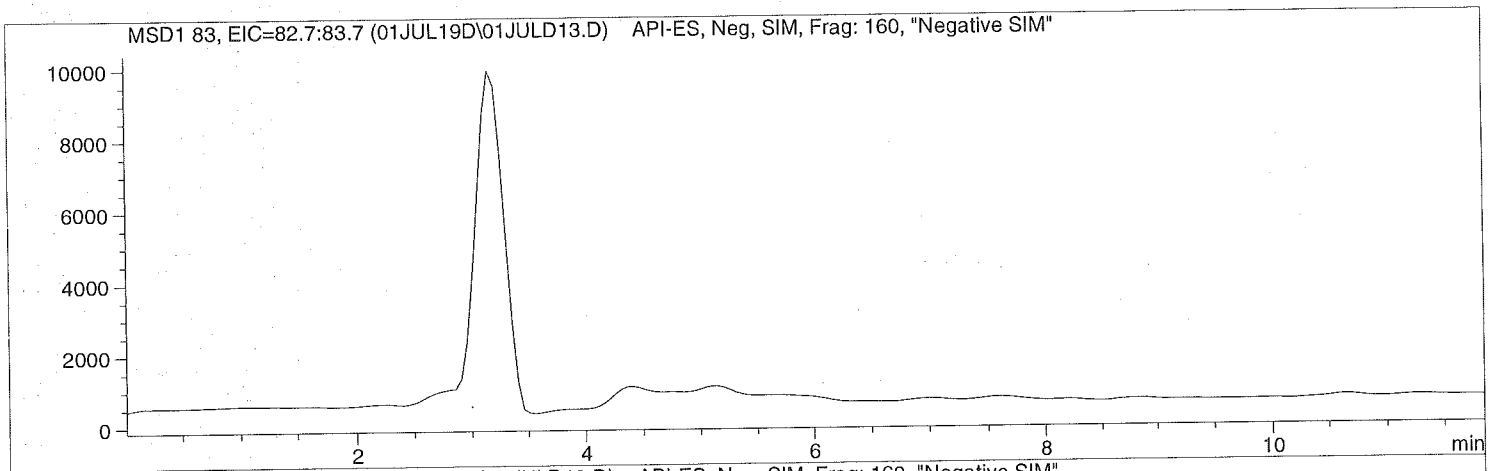
RIGHT SOLUTIONS | RIGHT PARTNER

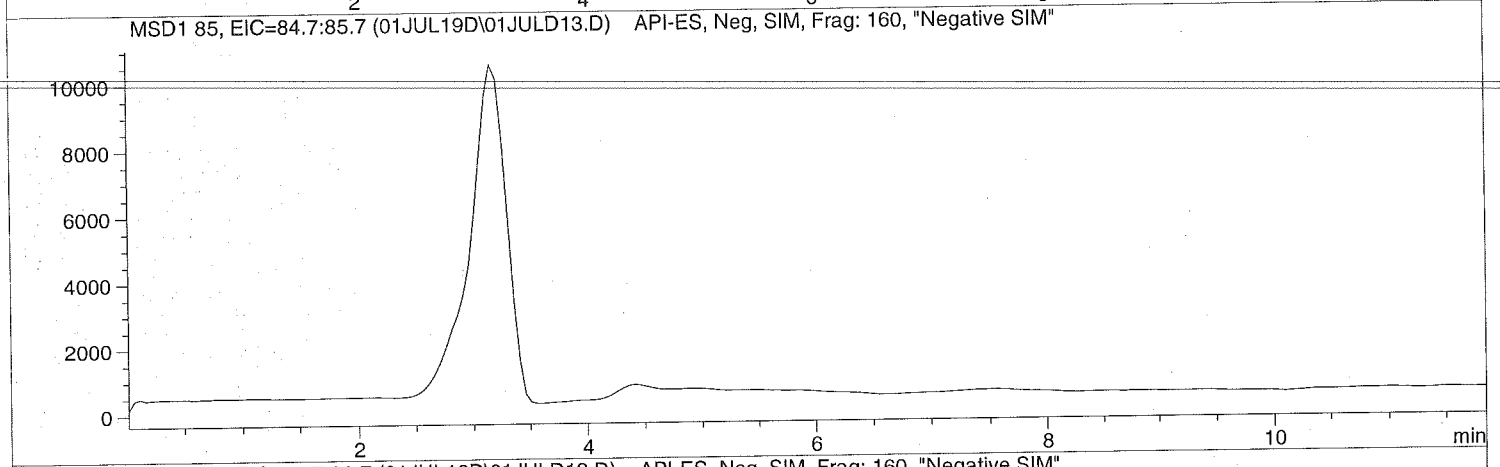
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD13.D Sample Name: 1917856001

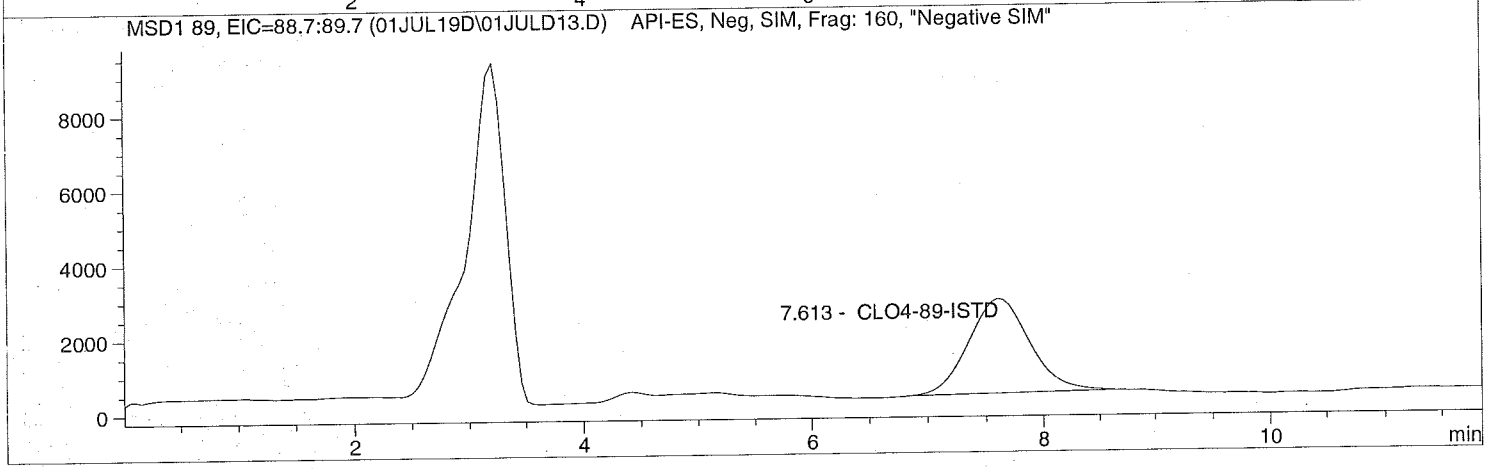
Injection Date:	7/01/2019 11:24:46	Seq Line:	13
Sample Name:	1917856001	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD13.D Sample Name: 1917856001

Injection Date:	7/01/2019 11:24:46	Seq Line:	13
Sample Name:	1917856001	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.613	PBA	93134.2	5.0000	CLO4-89-ISTD

*** End of Report ***

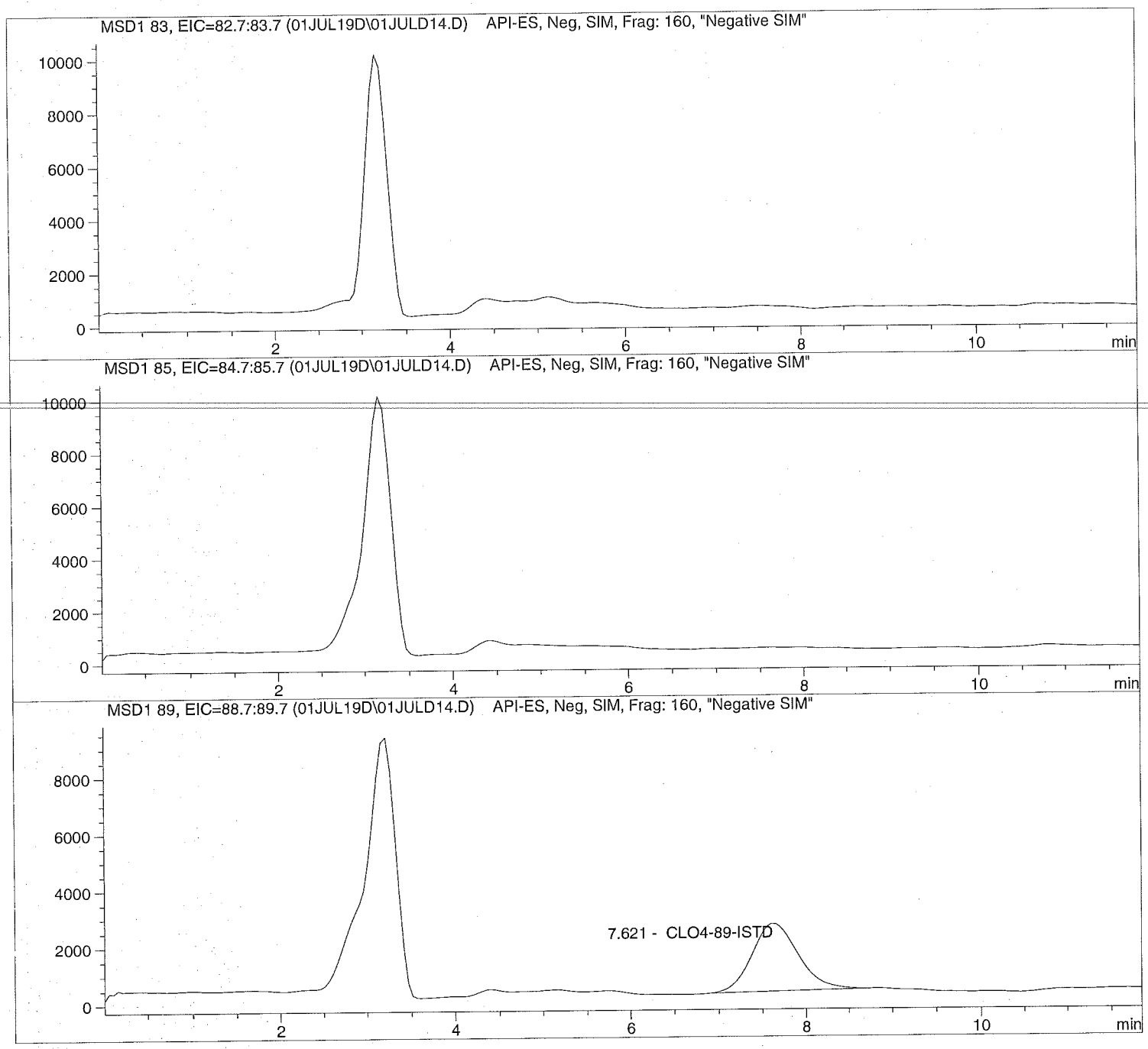
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD14.D Sample Name: 1917856002

Injection Date:	7/01/2019 11:38:38	Seq Line:	14
Sample Name:	1917856002	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD14.D Sample Name: 1917856002

Injection Date:	7/01/2019 11:38:38	Seq Line:	14
Sample Name:	1917856002	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.621	PBA	87949.8	5.0000	CLO4-89-ISTD

*** End of Report ***

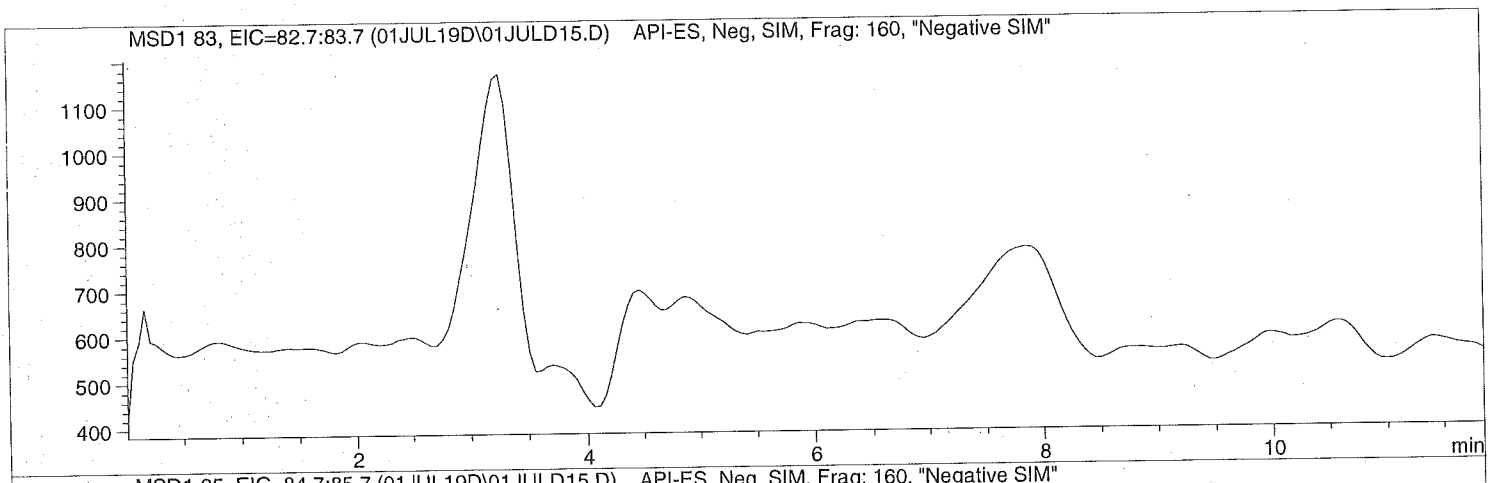
RIGHT SOLUTIONS | RIGHT PARTNER

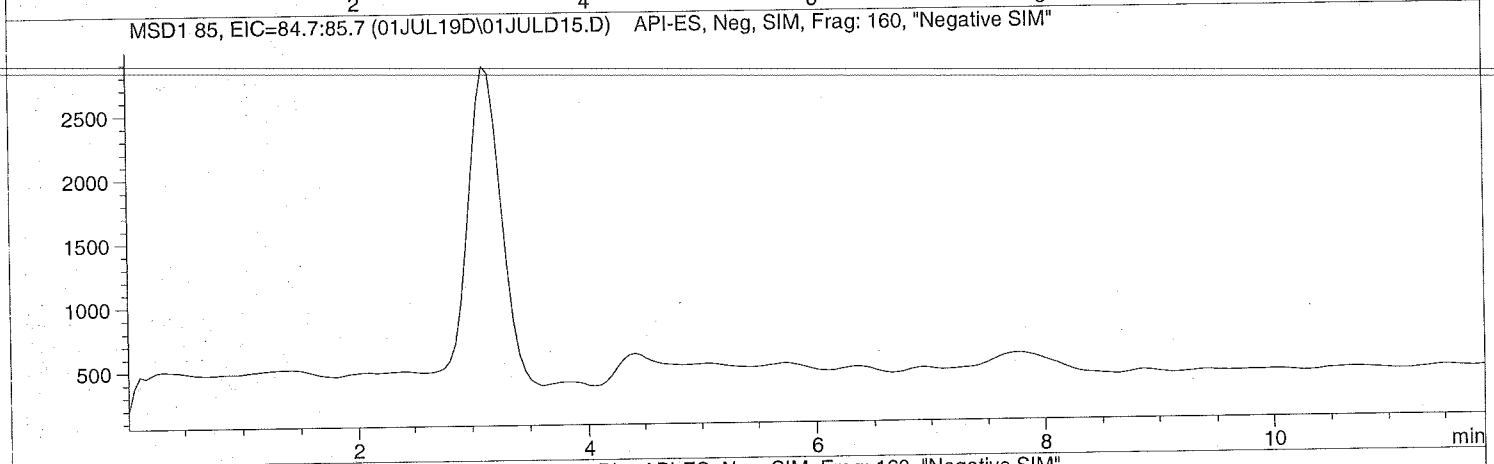
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

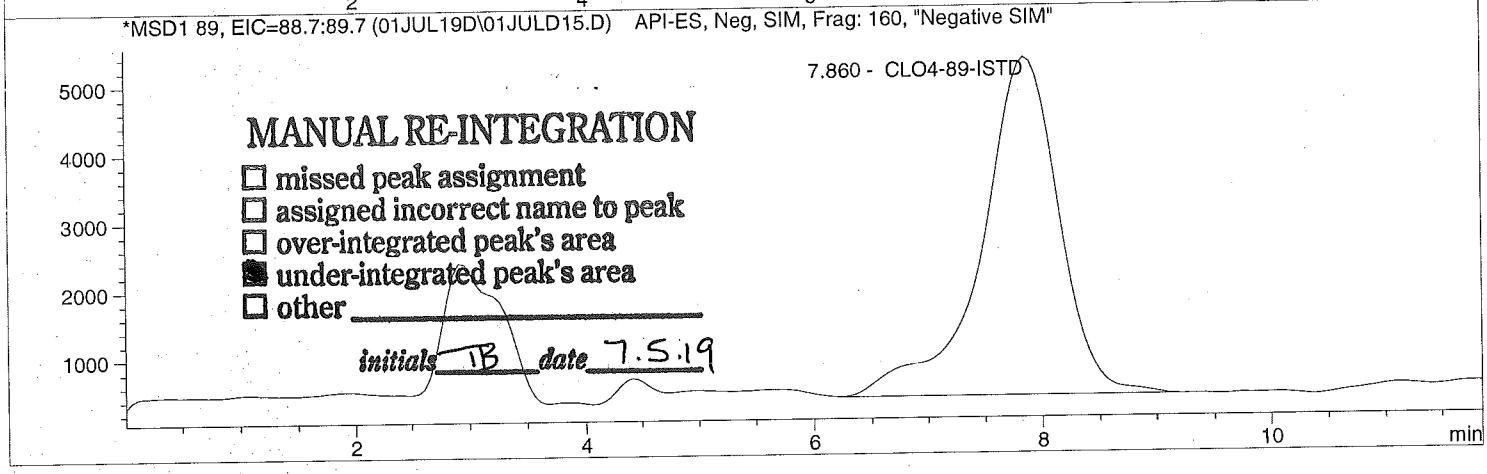
Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







MANUAL RE-INTEGRATION

- ☐ missed peak assignment
- ☐ assigned incorrect name to peak
- ☐ over-integrated peak's area
- ■ under-integrated peak's area
- ☐ other _____

initials TB date 7.5.19

RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.860	MM	230973.5	5.0000	CLO4-89-ISTD

*** End of Report ***

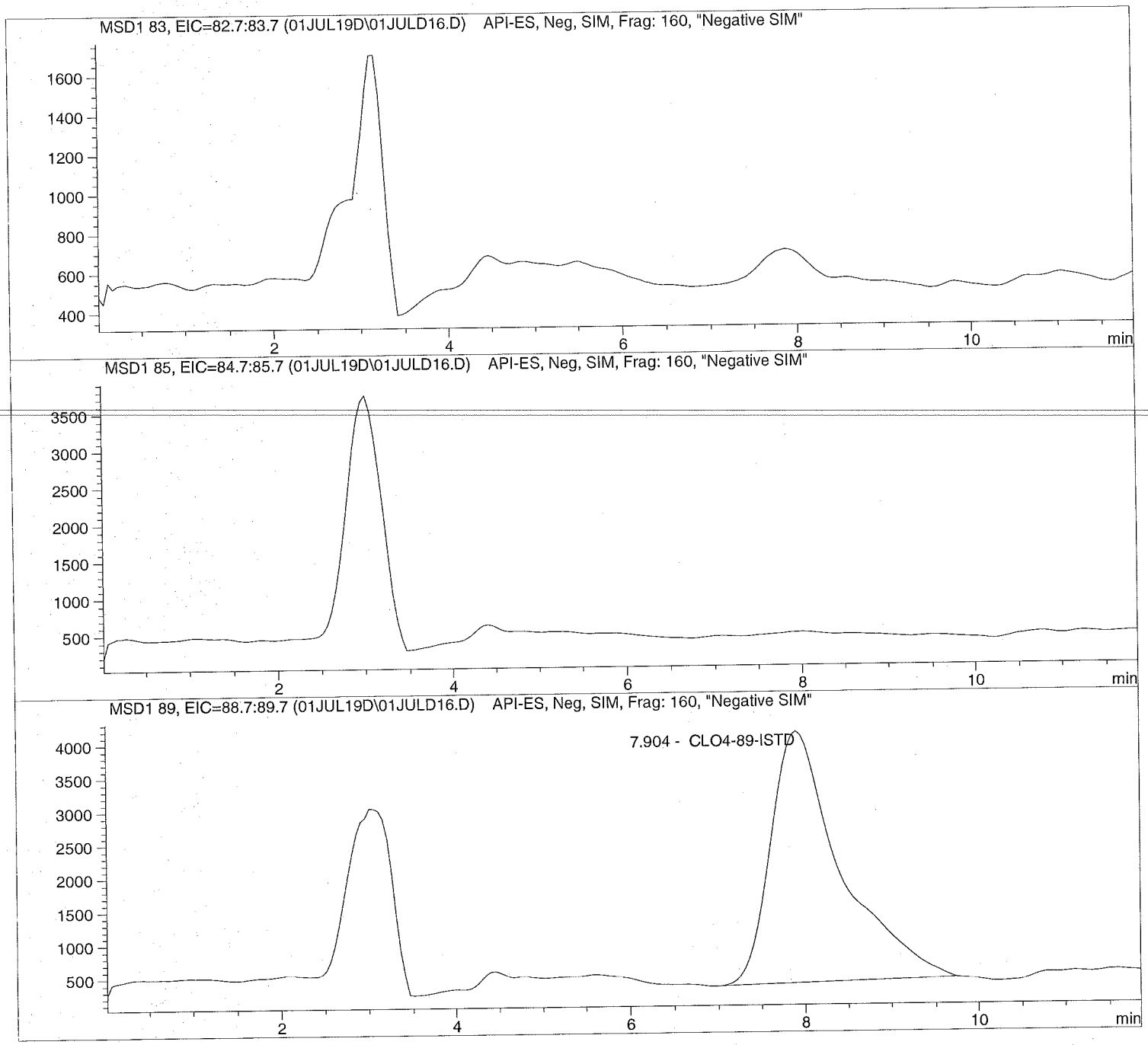
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD16.D Sample Name: 1917856004

Injection Date:	7/01/2019 12:06:28	Seq Line:	16
Sample Name:	1917856004	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD16.D Sample Name: 1917856004

Injection Date:	7/01/2019 12:06:28	Seq Line:	16
Sample Name:	1917856004	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.904	PBA	208544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

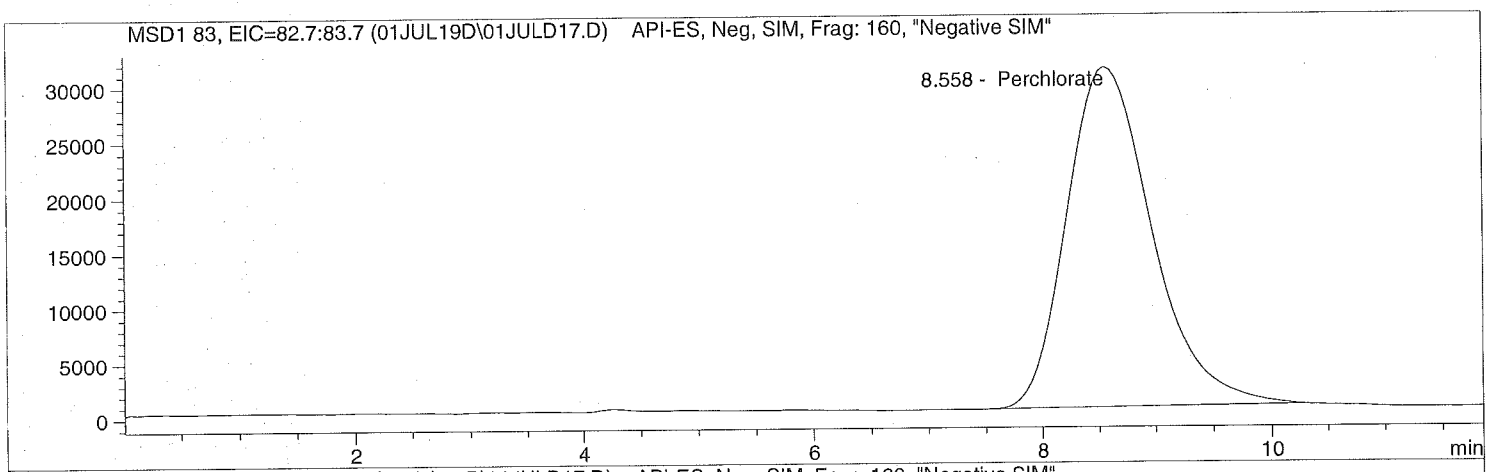
RIGHT SOLUTIONS | RIGHT PARTNER

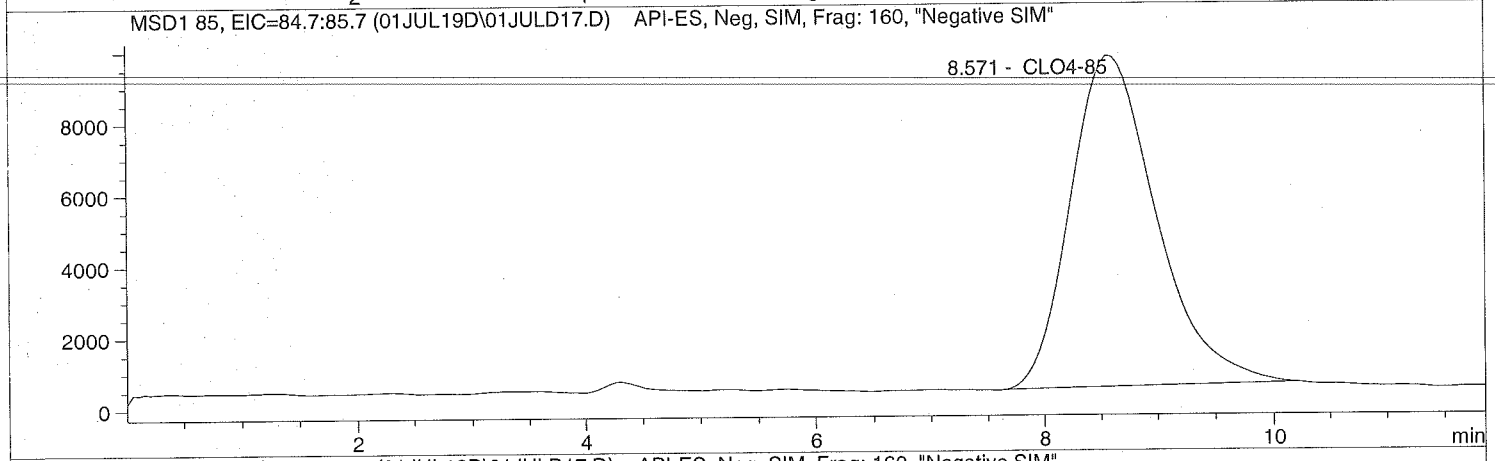
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD17.D Sample Name: 661482 CCV@25

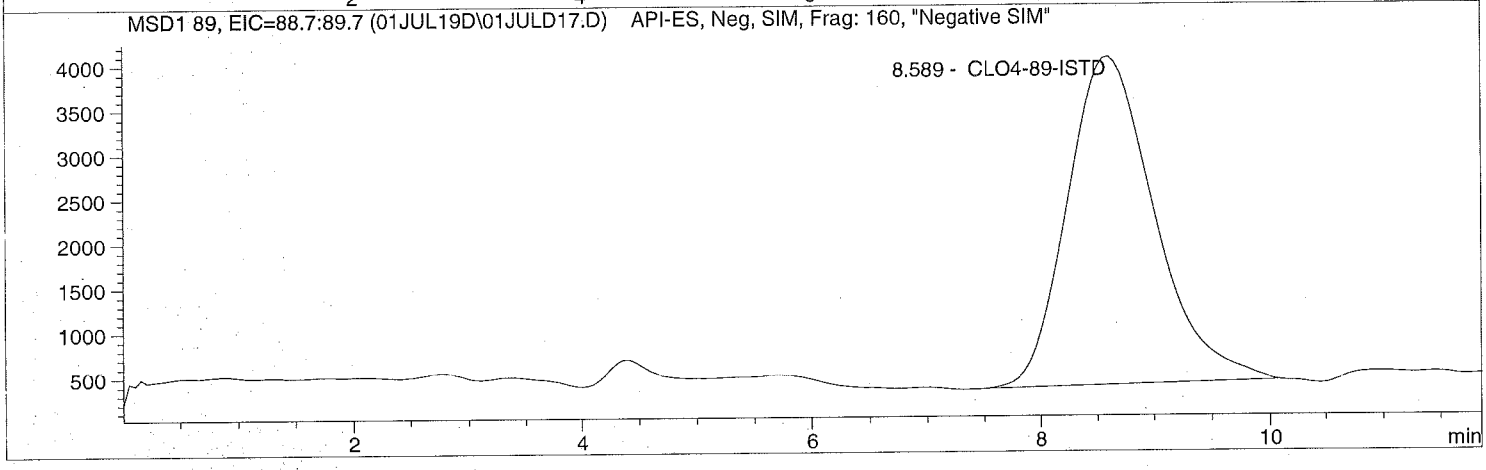
Injection Date:	7/01/2019 12:20:29	Seq Line:	17
Sample Name:	661482 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD17.D Sample Name: 661482 CCV@25

Injection Date:	7/01/2019 12:20:29	Seq Line:	17
Sample Name:	661482 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.558	PBA	1604090.1	25.0035	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.571	PBA	485334.3	25.4617	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.589	PBA	195182.3	5.0000	CLO4-89-ISTD

*** End of Report ***

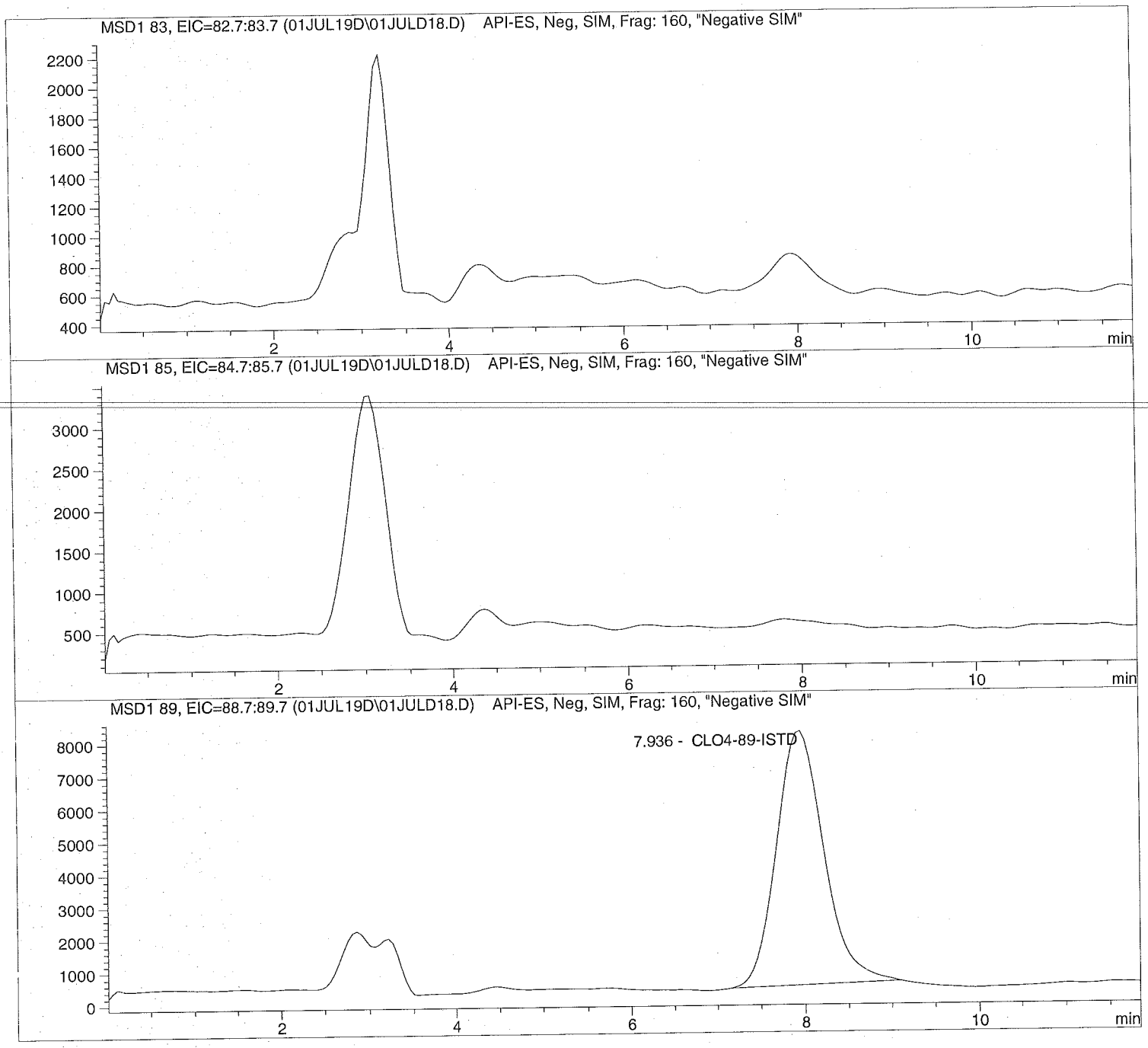
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD18.D Sample Name: 1917856005

Injection Date:	7/01/2019 12:34:22	Seq Line:	18
Sample Name:	1917856005	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD18.D Sample Name: 1917856005

Injection Date:	7/01/2019 12:34:22	Seq Line:	18
Sample Name:	1917856005	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.936	PBA	292027.4	5.0000	CLO4-89-ISTD

*** End of Report ***

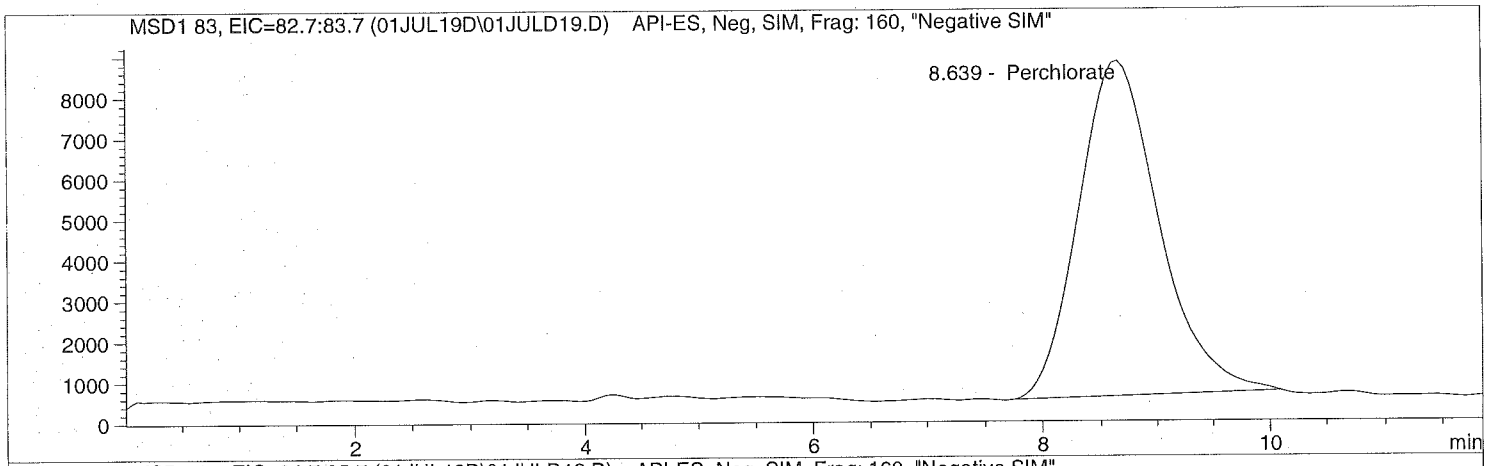
RIGHT SOLUTIONS | RIGHT PARTNER

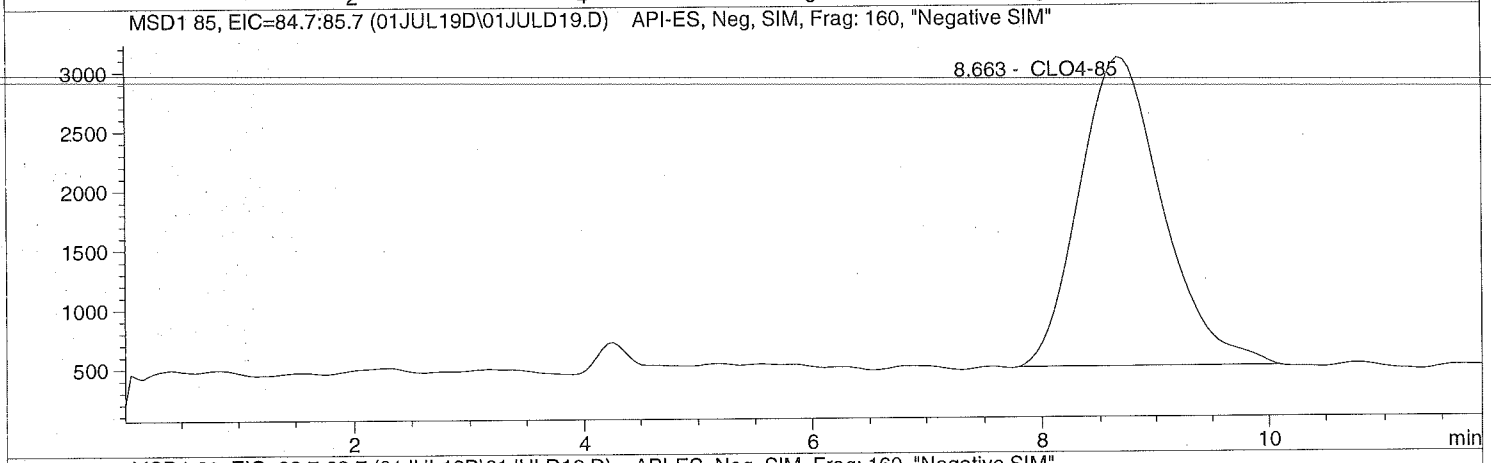
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD19.D Sample Name: 1917856006 100

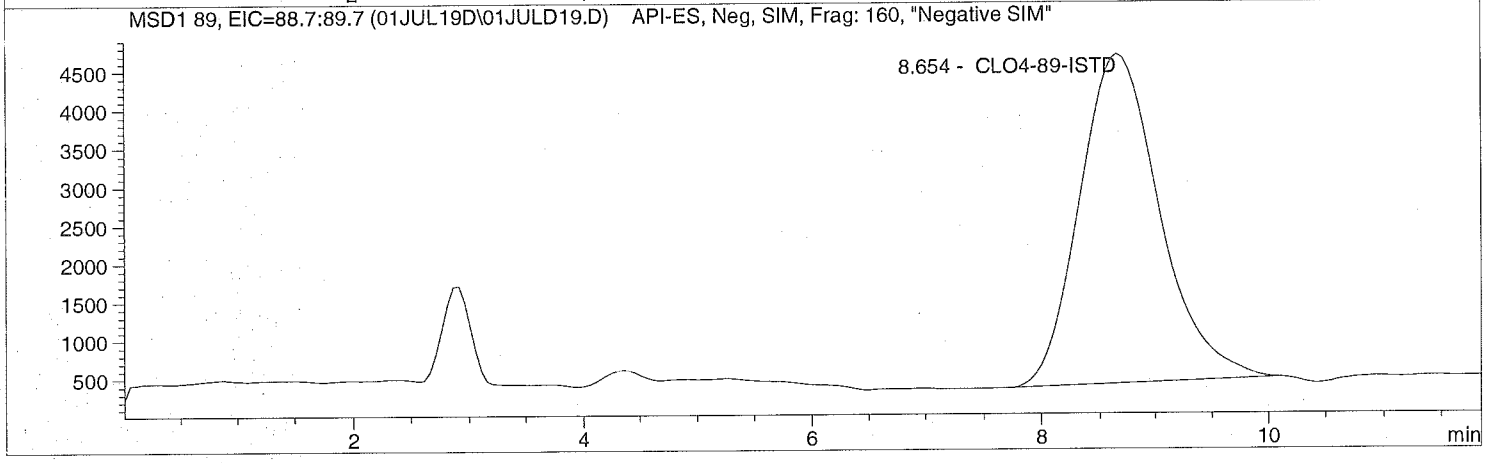
Injection Date:	7/01/2019 12:48:15	Seq Line:	19
Sample Name:	1917856006 100	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD19.D Sample Name: 1917856006 100

Injection Date:	7/01/2019 12:48:15	Seq Line:	19
Sample Name:	1917856006 100	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.639	PBA	403838.0	621.0643	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.663	BBA	132725.9	672.8711	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.654	PBA	210141.8	500.0000	CLO4-89-ISTD

*** End of Report ***

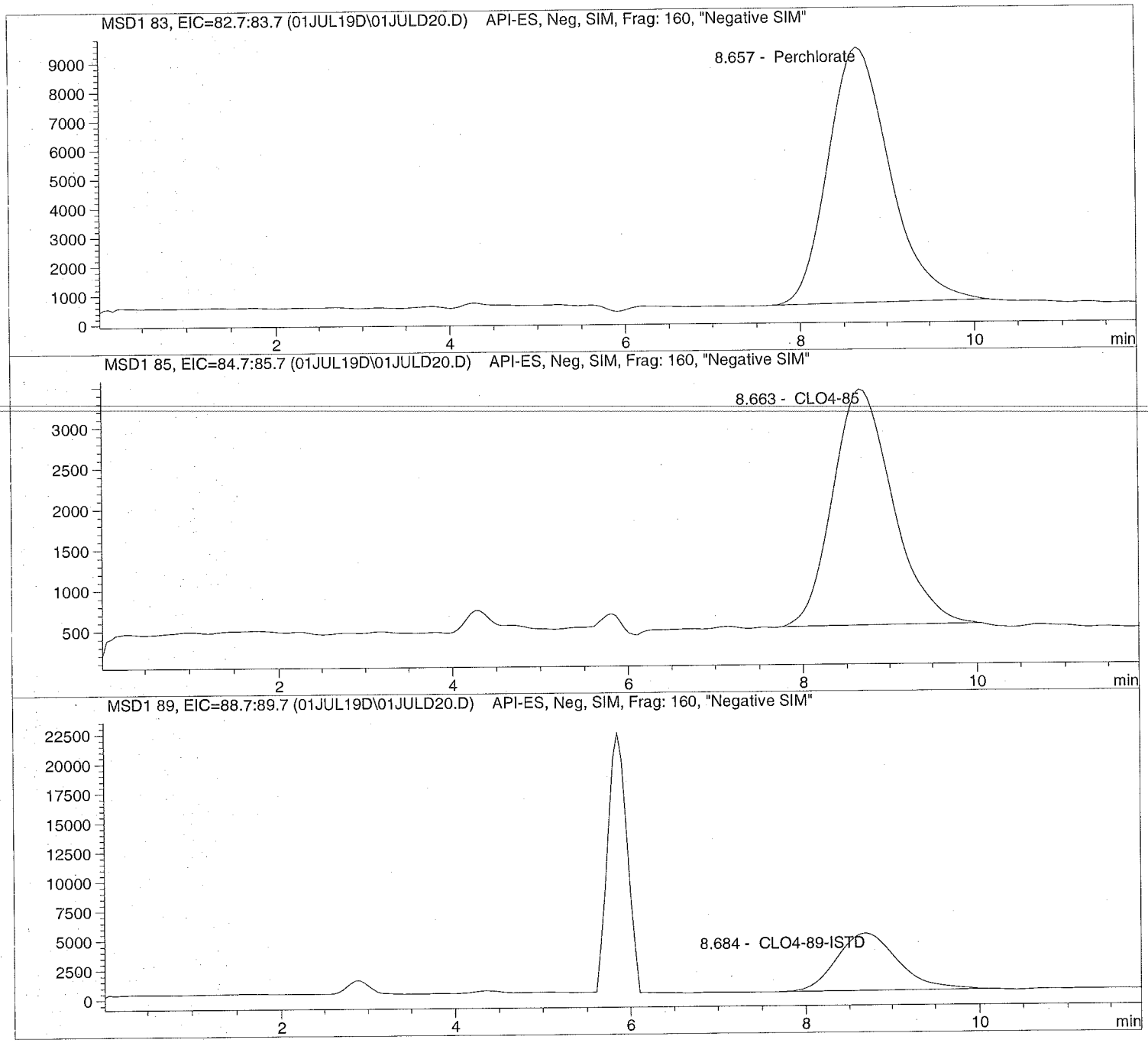
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD20.D Sample Name: 1917856007 100

Injection Date:	7/01/2019 13:02:10	Seq Line:	20
Sample Name:	1917856007 100	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD20.D Sample Name: 1917856007 100

Injection Date:	7/01/2019 13:02:10	Seq Line:	20
Sample Name:	1917856007 100	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.657	PBA	434273.7	588.1581	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.663	BBA	140119.4	624.8207	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.684	PBA	239145.3	500.0000	CLO4-89-ISTD

*** End of Report ***

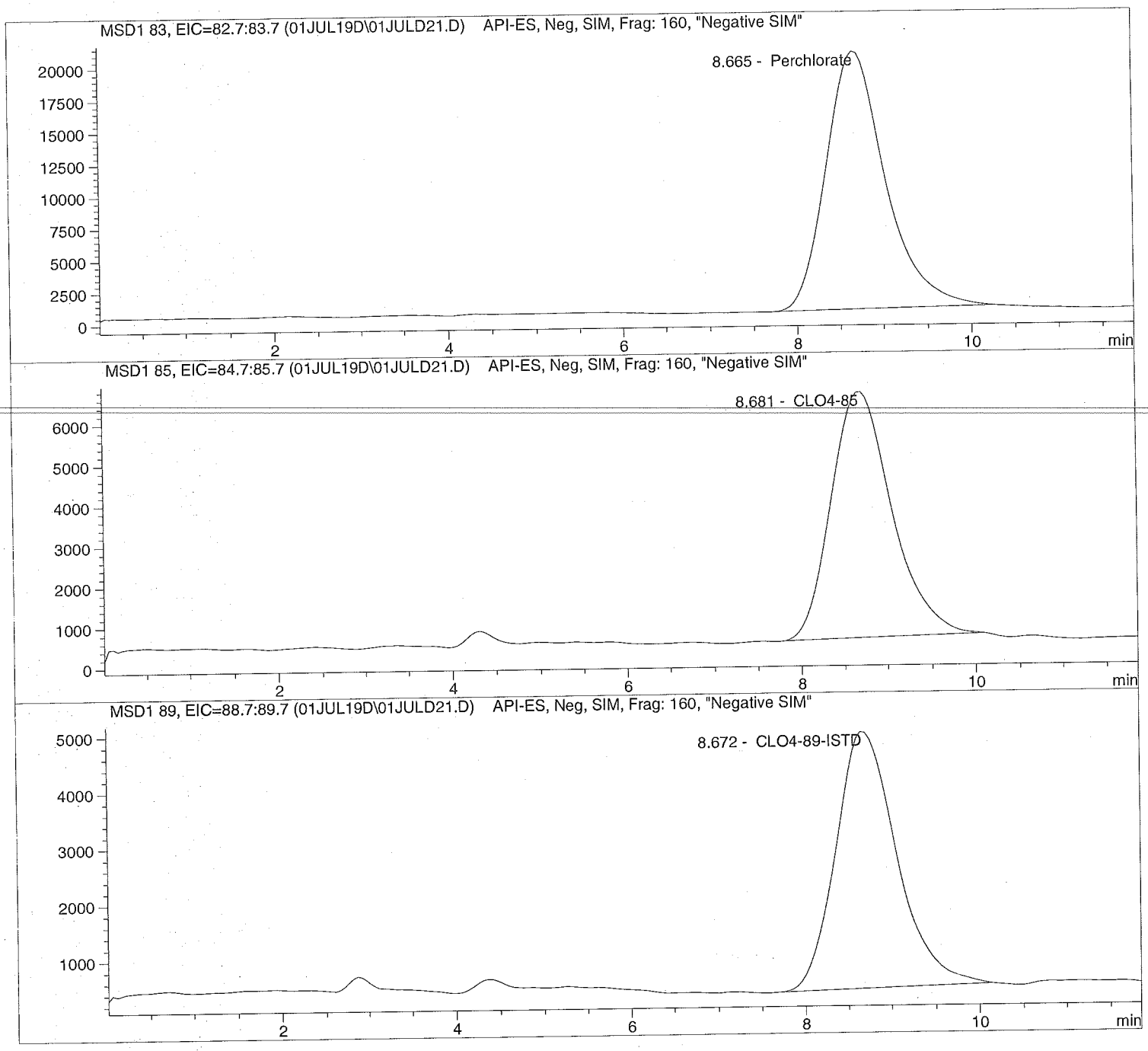
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD21.D Sample Name: 1918052001 1K

Injection Date:	7/01/2019 13:16:12	Seq Line:	21
Sample Name:	1918052001 1K	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD21.D Sample Name: 1918052001 1K

Injection Date:	7/01/2019 13:16:12	Seq Line:	21
Sample Name:	1918052001 1K	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.665	PBA	958578.9	13475.4930	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.681	PBA	295207.3	13884.7680	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.672	PBA	223102.2	5000.0000	CLO4-89-ISTD

*** End of Report ***

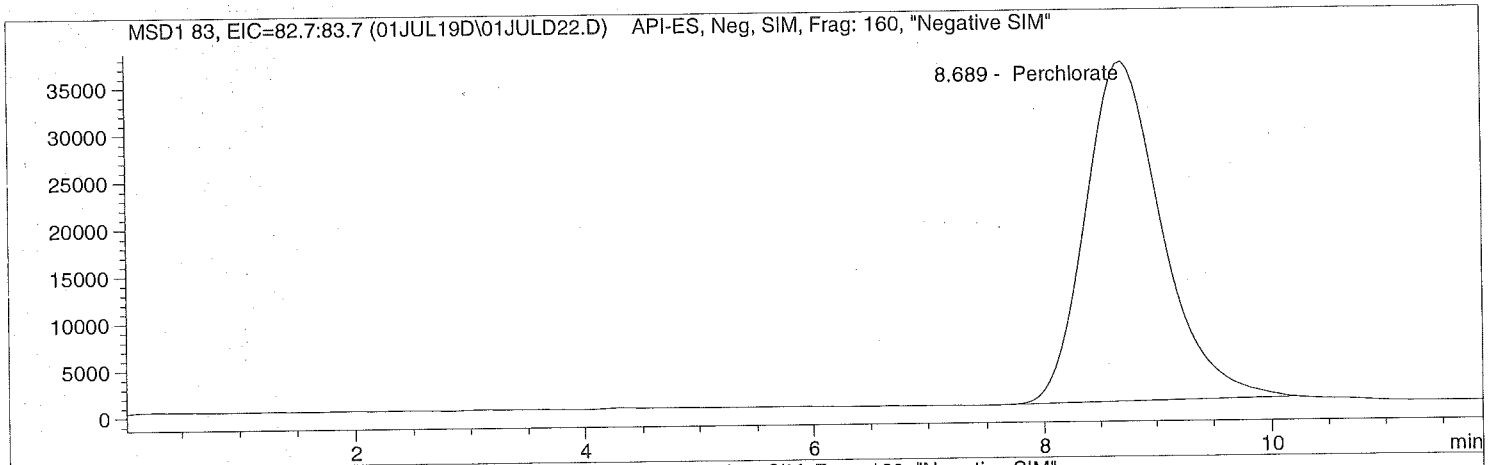
RIGHT SOLUTIONS | RIGHT PARTNER

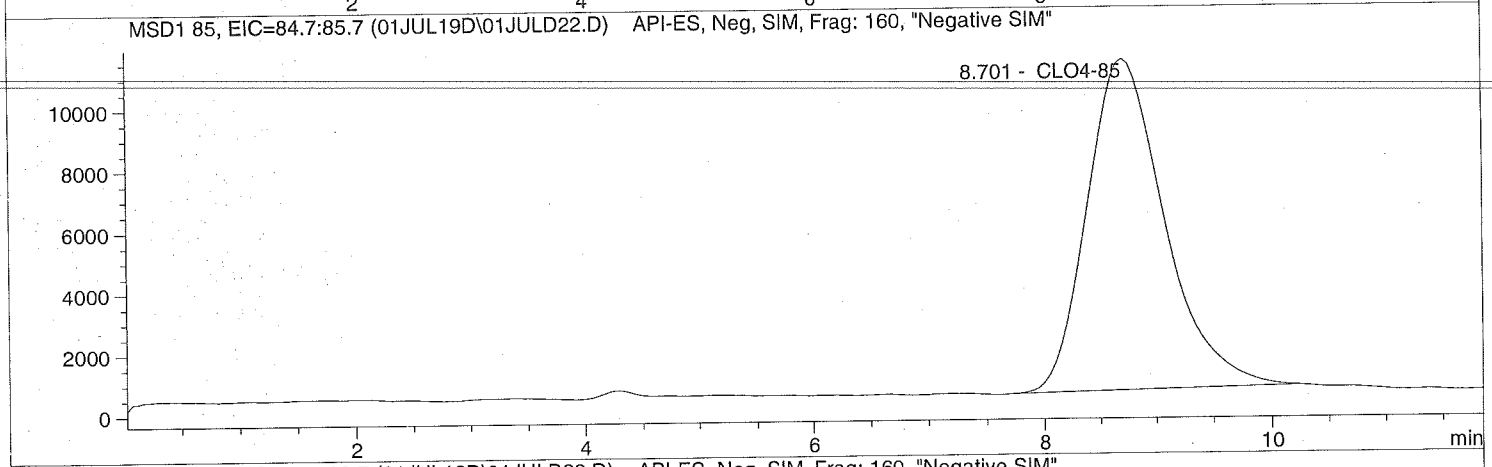
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD22.D Sample Name: 1918052002 10K

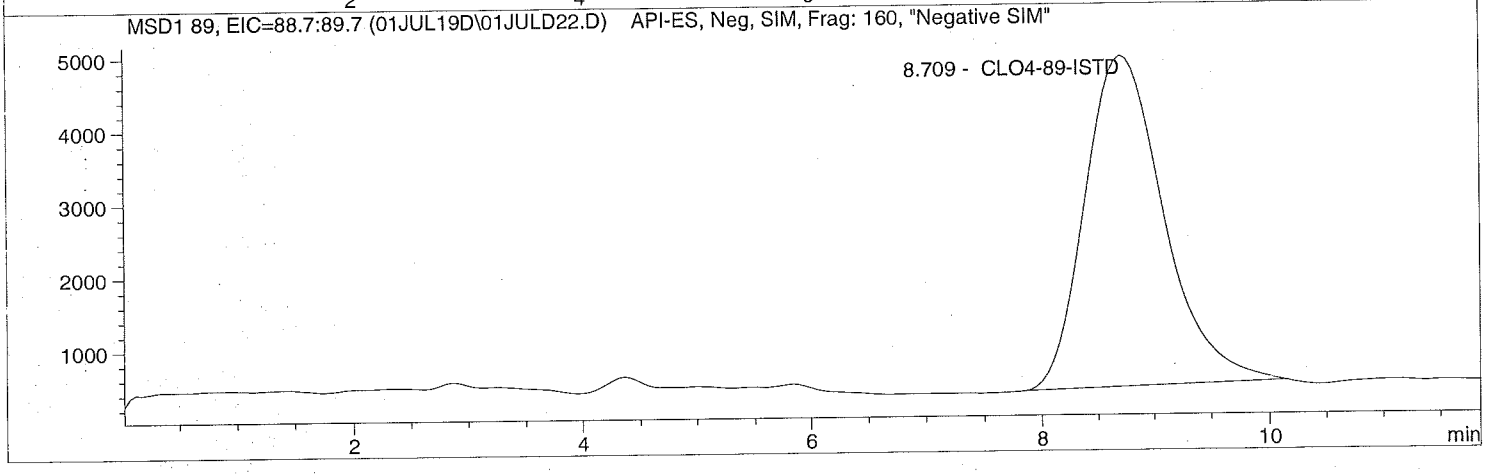
Injection Date:	7/01/2019 13:30:09	Seq Line:	22
Sample Name:	1918052002 10K	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD22.D Sample Name: 1918052002 10K

Injection Date:	7/01/2019 13:30:09	Seq Line:	22
Sample Name:	1918052002 10K	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.689	PBA	1701736.0	236511.4245	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.701	PBA	516167.1	241333.7557	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.709	PBA	219618.3	50000.0000	CLO4-89-ISTD

*** End of Report ***

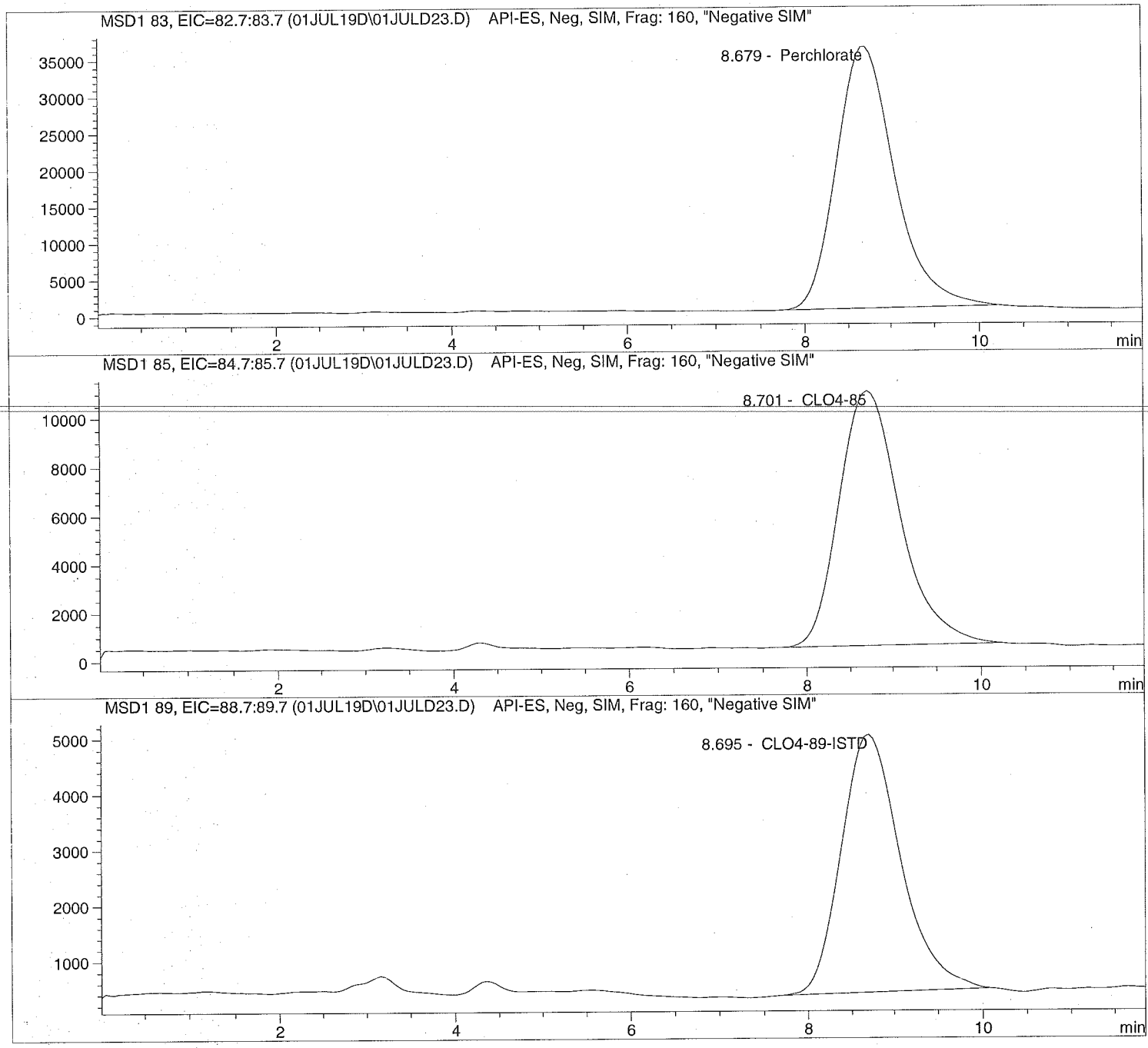
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD23.D Sample Name: 1918052003 10K

Injection Date:	7/01/2019 13:44:04	Seq Line:	23
Sample Name:	1918052003 10K	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD23.D Sample Name: 1918052003 10K

Injection Date:	7/01/2019 13:44:04	Seq Line:	23
Sample Name:	1918052003 10K	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.679	PBA	1682027.8	230798.4297	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.701	PBA	516999.9	238459.8445	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.695	PBA	222758.2	50000.0000	CLO4-89-ISTD

*** End of Report ***

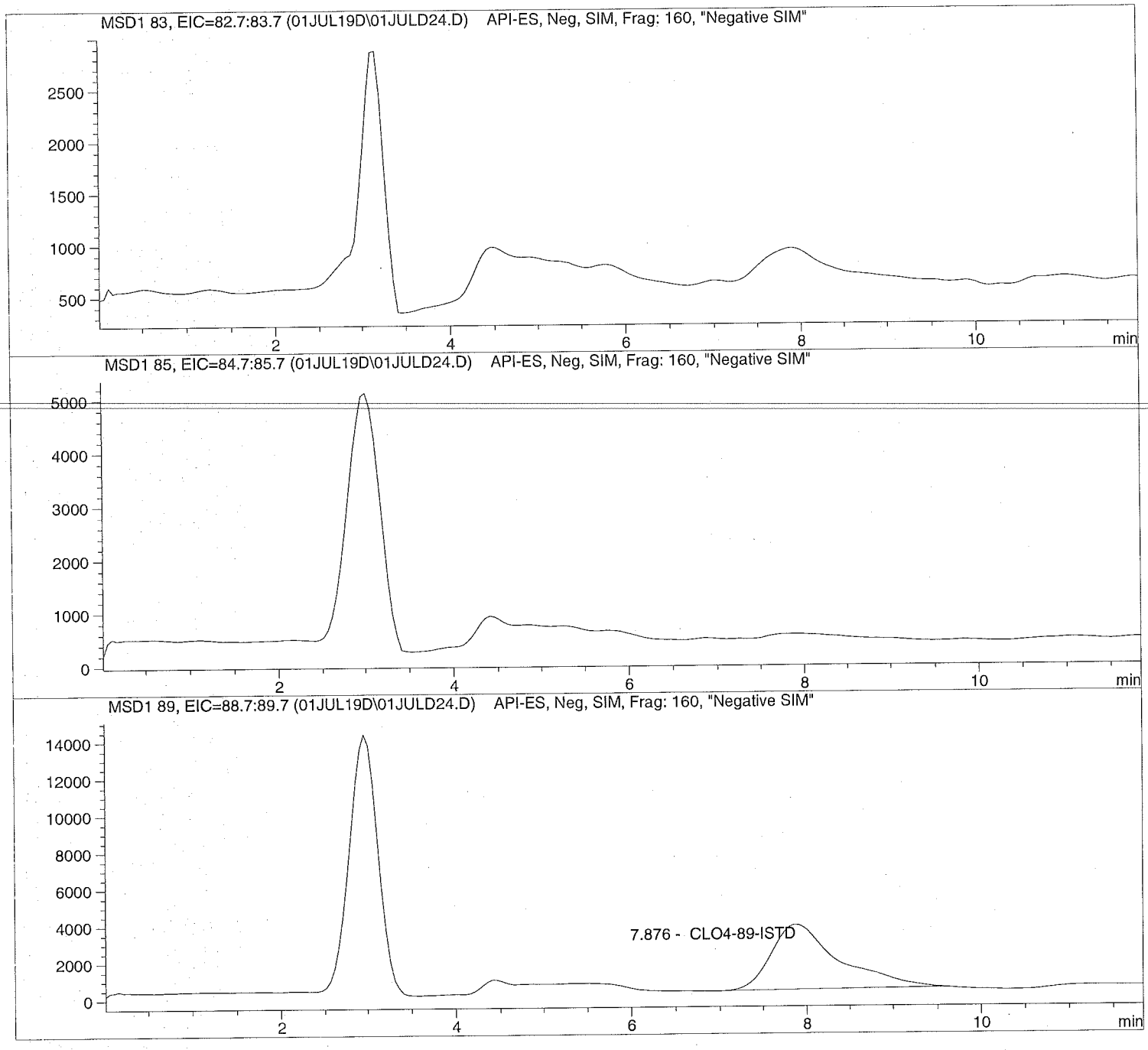
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD24.D Sample Name: 1918052004

Injection Date:	7/01/2019 13:57:58	Seq Line:	24
Sample Name:	1918052004	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD24.D Sample Name: 1918052004

Injection Date:	7/01/2019 13:57:58	Seq Line:	24
Sample Name:	1918052004	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.876	PBA	188746.5	5.0000	CLO4-89-ISTD

*** End of Report ***

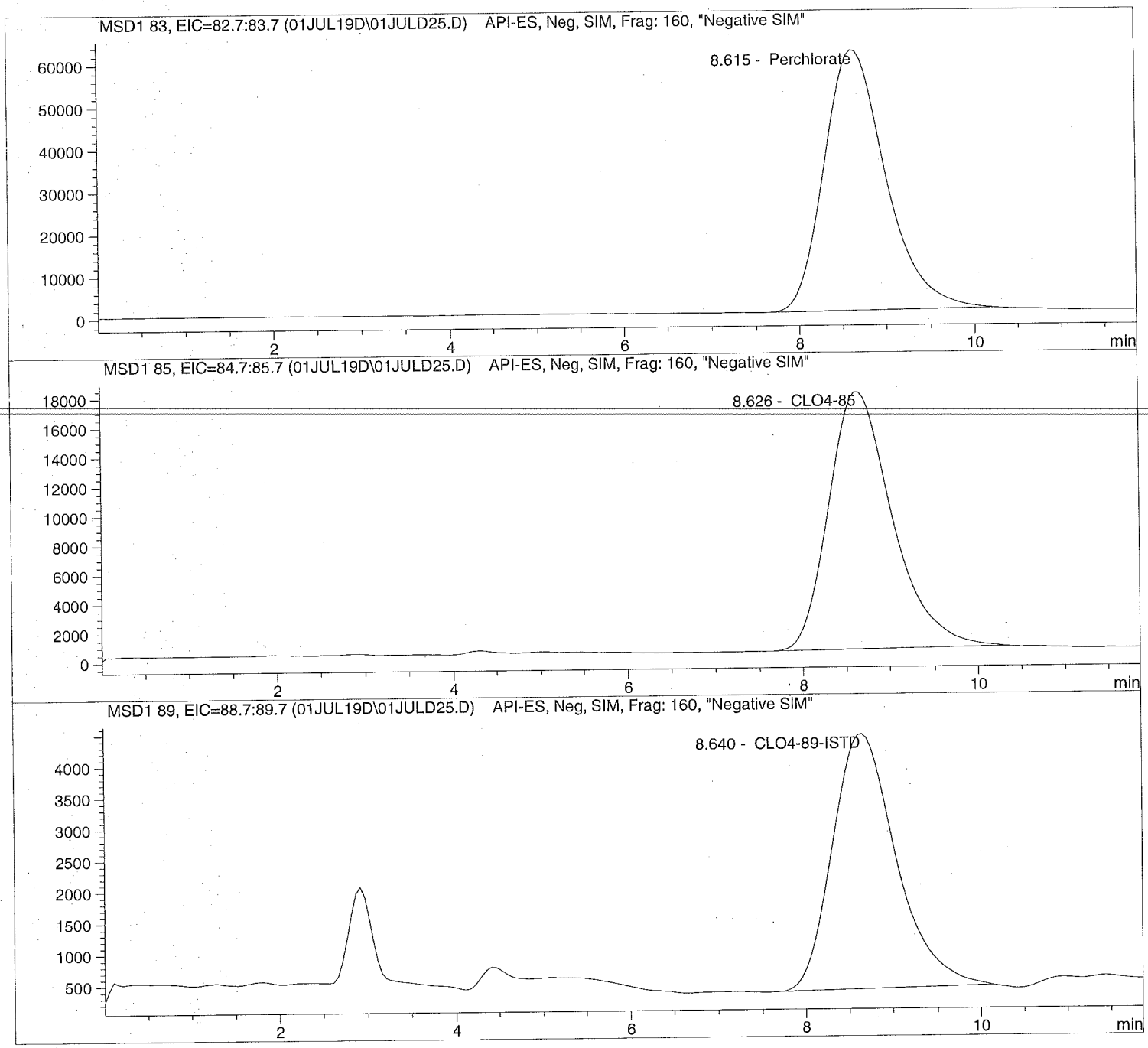
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD25.D Sample Name: 1917698003 100

Injection Date:	7/01/2019 14:11:59	Seq Line:	25
Sample Name:	1917698003 100	Location:	Vial 94
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD25.D Sample Name: 1917698003 100

Injection Date:	7/01/2019 14:11:59	Seq Line:	25
Sample Name:	1917698003 100	Location:	Vial 94
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.615	PBA	3021130.8	4300.6266	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.626	PBA	888075.5	4275.4049	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.640	PBA	205249.1	500.0000	CLO4-89-ISTD

*** End of Report ***

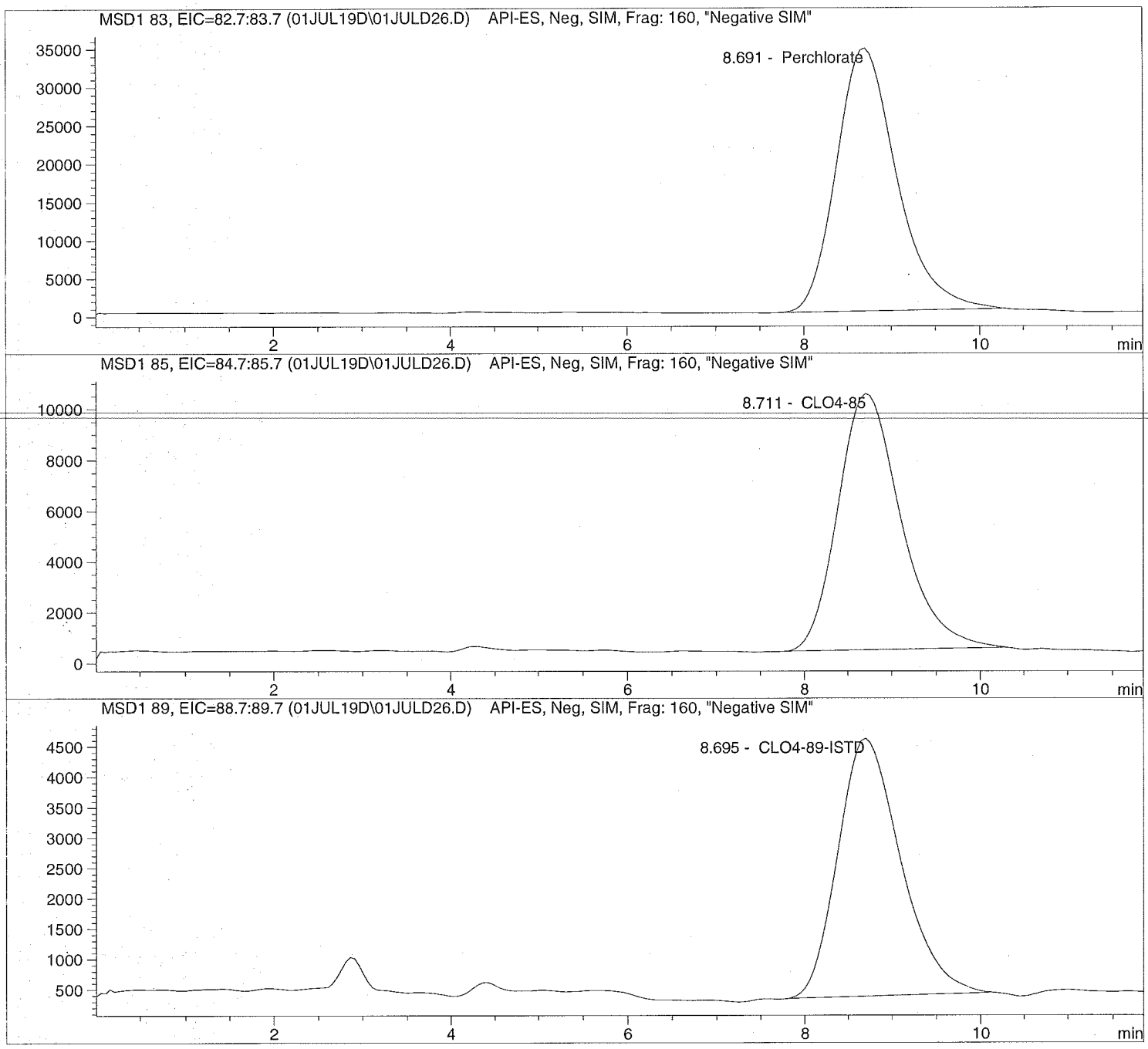
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD26.D Sample Name: 1917698008 1K

Injection Date:	7/01/2019 14:25:54	Seq Line:	26
Sample Name:	1917698008 1K	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD26.D Sample Name: 1917698008 1K

Injection Date:	7/01/2019 14:25:54	Seq Line:	26
Sample Name:	1917698008 1K	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.691	PBA	1640477.0	23731.5795	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.711	PBA	499687.1	24313.2650	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.695	PBA	210953.7	5000.0000	CLO4-89-ISTD

*** End of Report ***

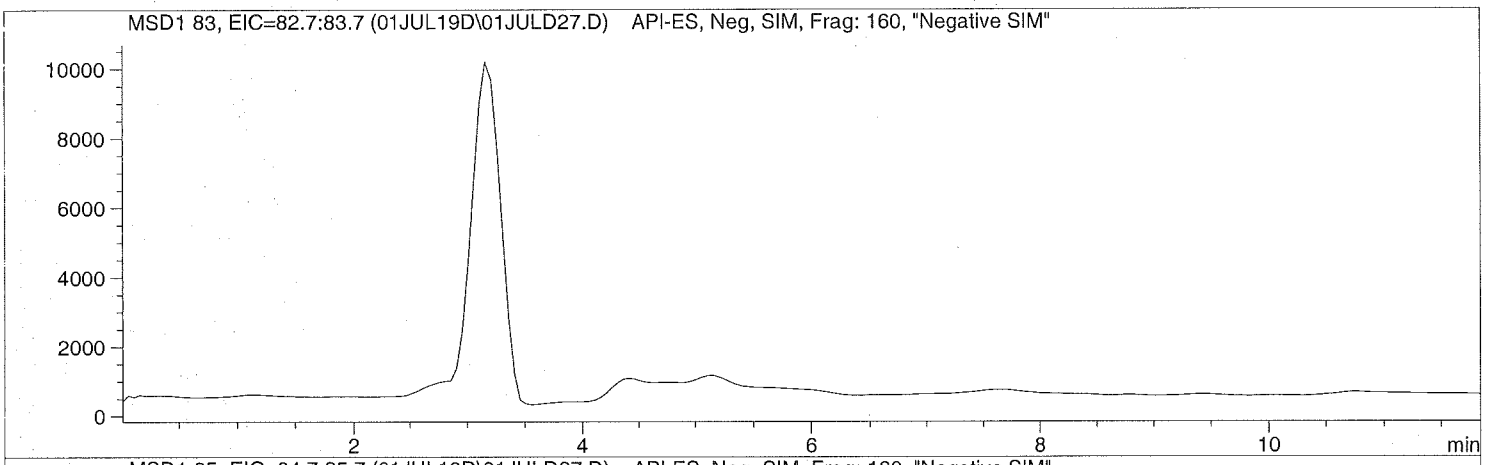
RIGHT SOLUTIONS | RIGHT PARTNER

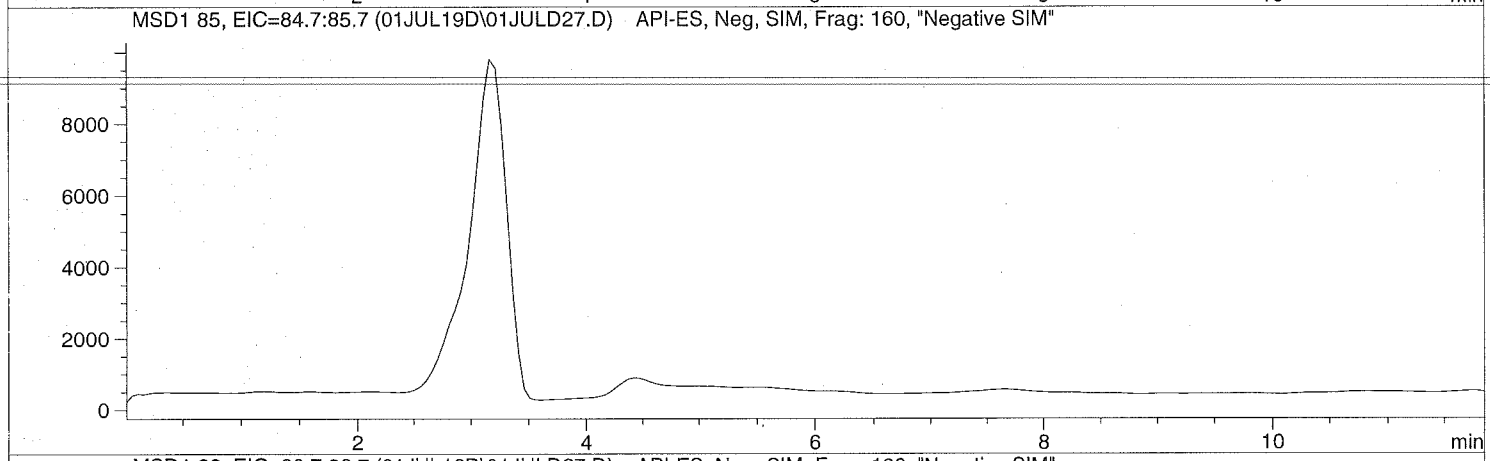
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD27.D Sample Name: 1917856001 RE

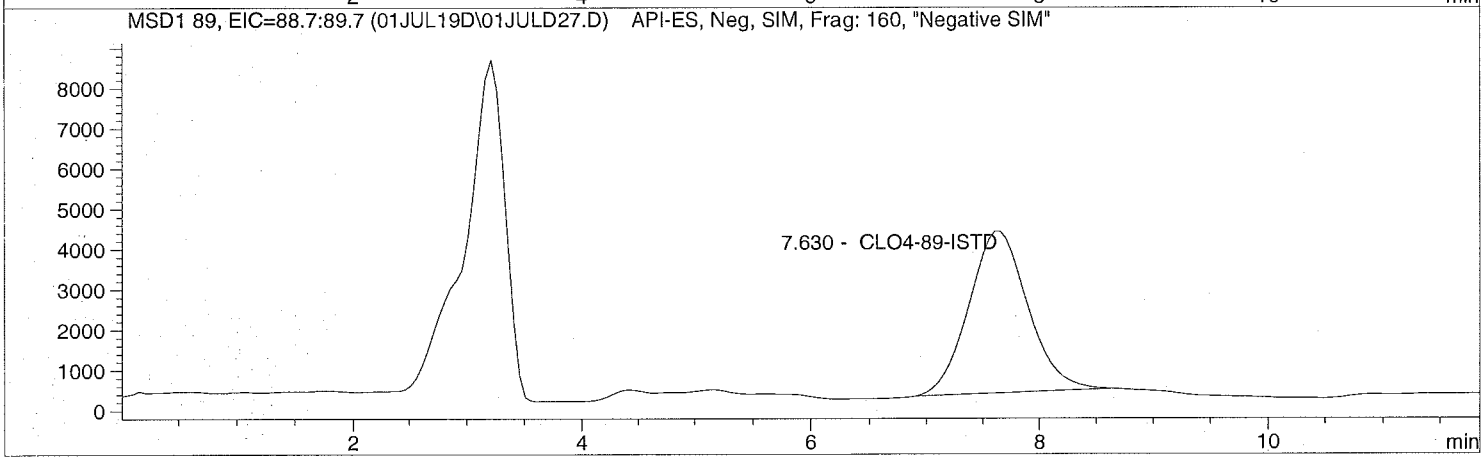
Injection Date:	7/01/2019 14:39:49	Seq Line:	27
Sample Name:	1917856001 RE	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD27.D Sample Name: 1917856001 RE

Injection Date:	7/01/2019 14:39:49	Seq Line:	27
Sample Name:	1917856001 RE	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.630	PBA	144962.0	5.0000	CLO4-89-ISTD

*** End of Report ***

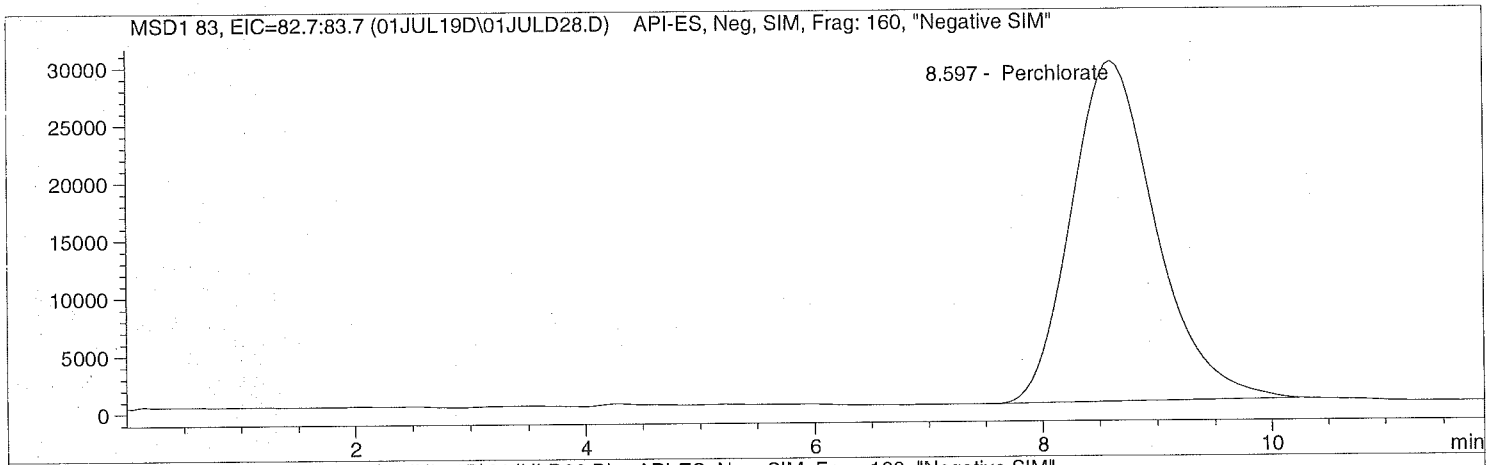
RIGHT SOLUTIONS | RIGHT PARTNER

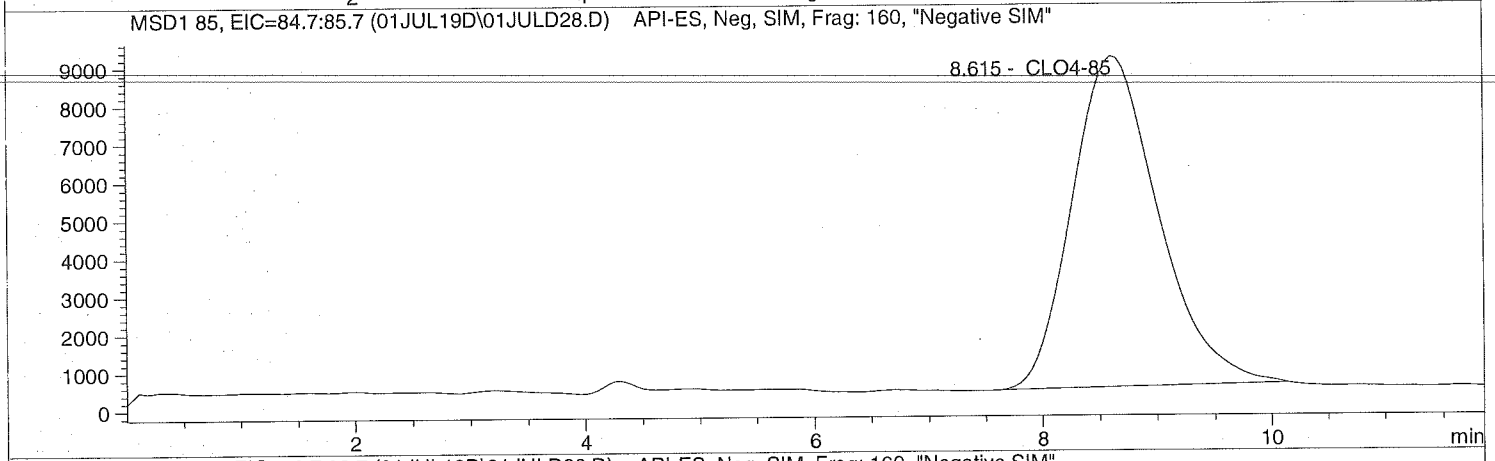
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD28.D Sample Name: 661483 CCV@25

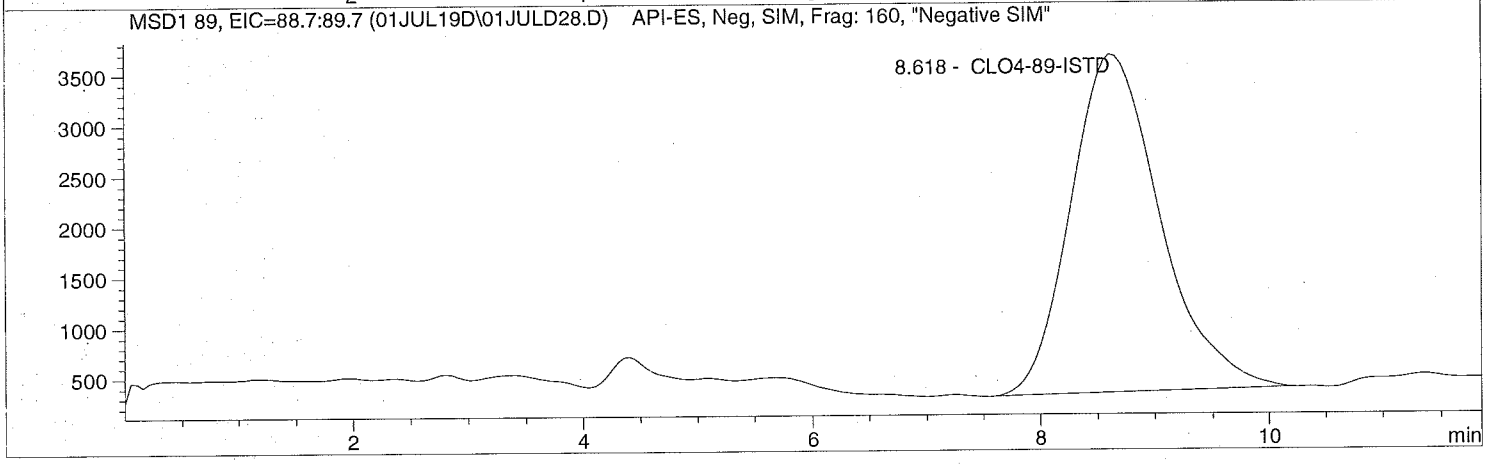
Injection Date:	7/01/2019 14:53:42	Seq Line:	28
Sample Name:	661483 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD28.D Sample Name: 661483 CCV@25

Injection Date:	7/01/2019 14:53:42	Seq Line:	28
Sample Name:	661483 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.597	PBA	1506029.6	25.4198	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.615	PBA	453099.1	25.7499	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.618	PBA	180069.9	5.0000	CLO4-89-ISTD

*** End of Report ***

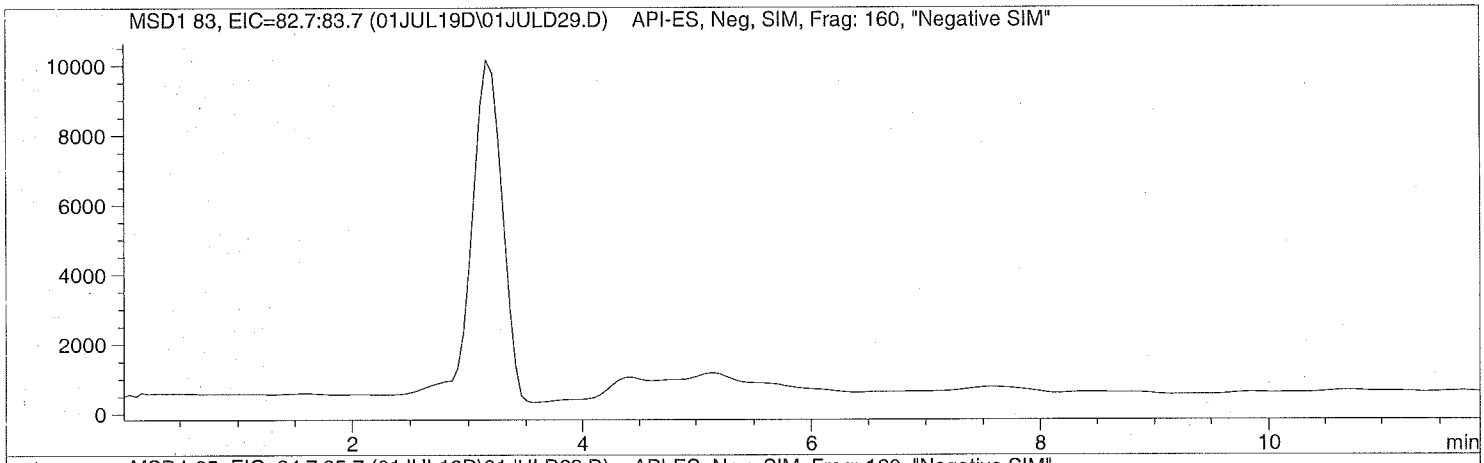
RIGHT SOLUTIONS | RIGHT PARTNER

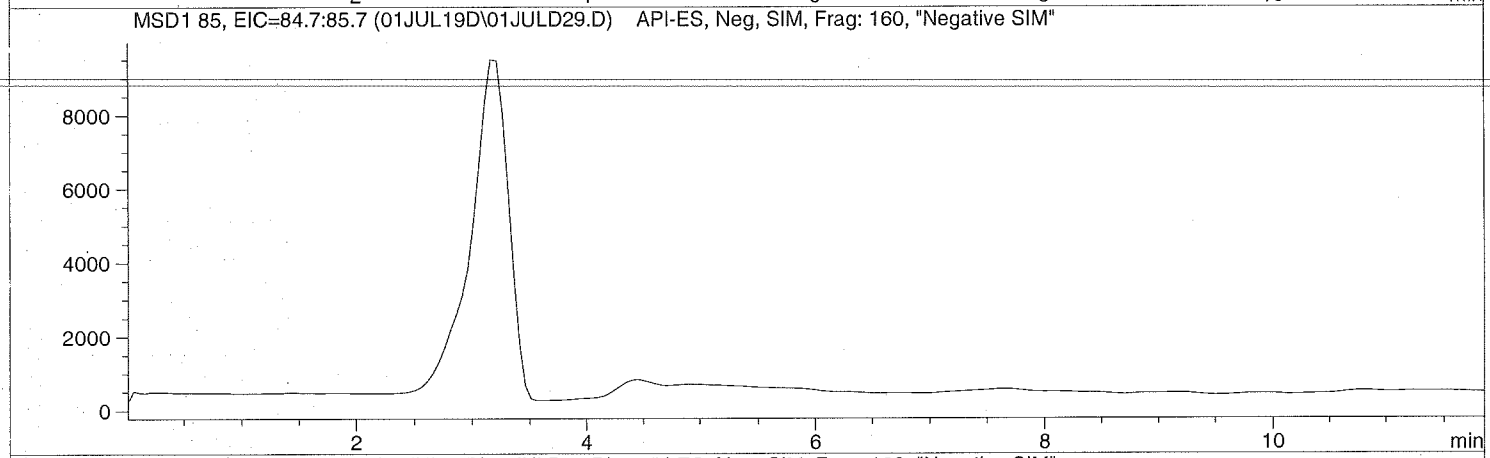
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD29.D Sample Name: 1917856002 RE

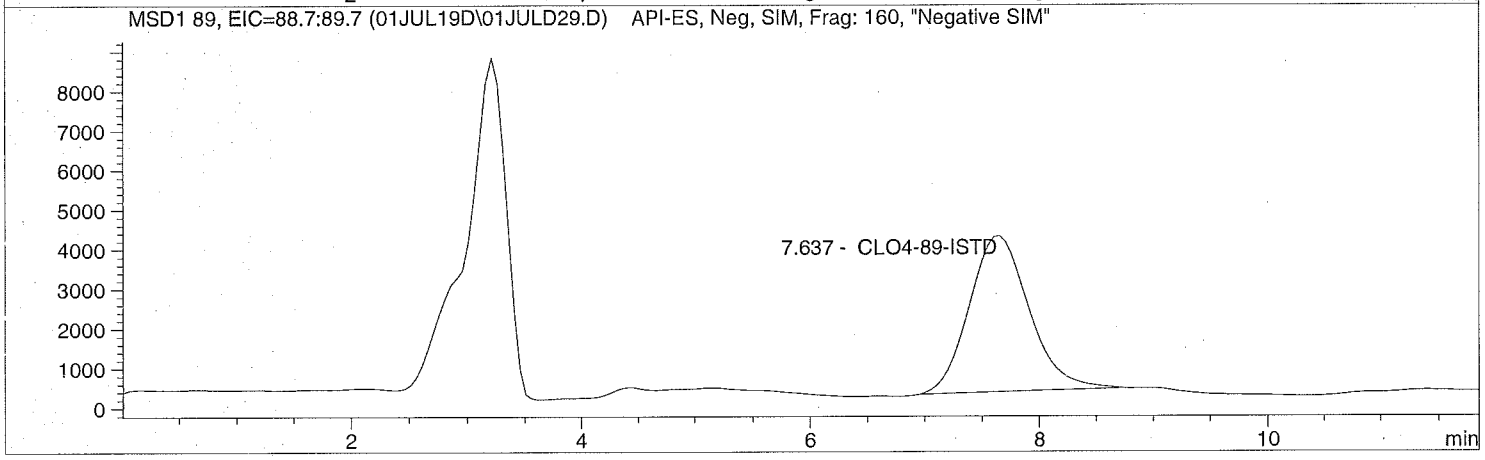
Injection Date:	7/01/2019 15:07:32	Seq Line:	29
Sample Name:	1917856002 RE	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD29.D Sample Name: 1917856002 RE

Injection Date:	7/01/2019 15:07:32	Seq Line:	29
Sample Name:	1917856002 RE	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.637	PBA	142651.0	5.0000	CLO4-89-ISTD

*** End of Report ***

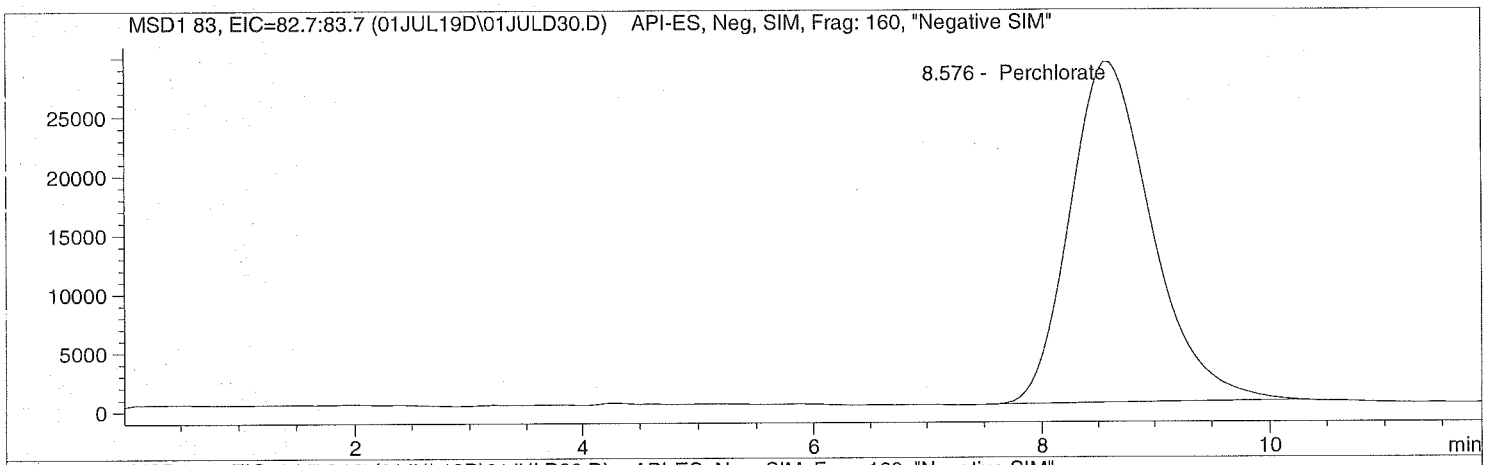
RIGHT SOLUTIONS | RIGHT PARTNER

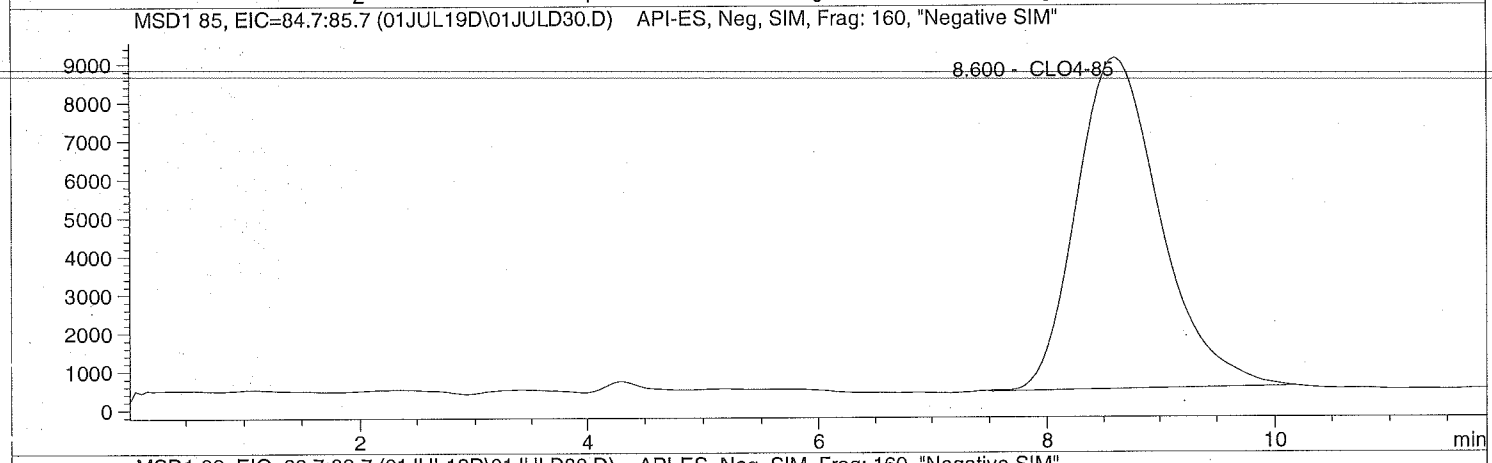
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD30.D Sample Name: 661661 CCV@25

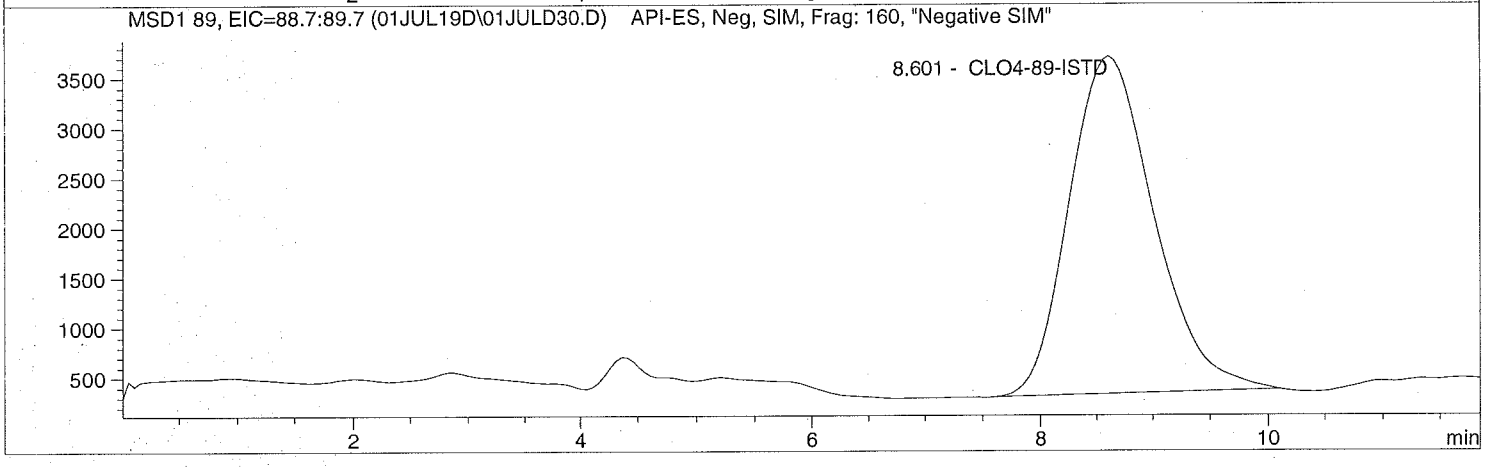
Injection Date:	7/01/2019 15:21:25	Seq Line:	30
Sample Name:	661661 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD30.D Sample Name: 661661 CCV@25

Injection Date:	7/01/2019 15:21:25	Seq Line:	30
Sample Name:	661661 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.576	PBA	1459488.9	25.1014	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.600	BBA	445116.2	25.7560	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.601	PBA	176853.7	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

RIGHT SOLUTIONS | RIGHT PARTNER

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RIGHT SOLUTIONS | RIGHT PARTNER

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

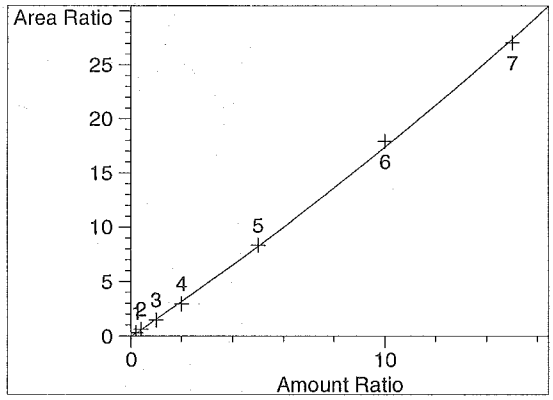
Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

Peak Sum Table

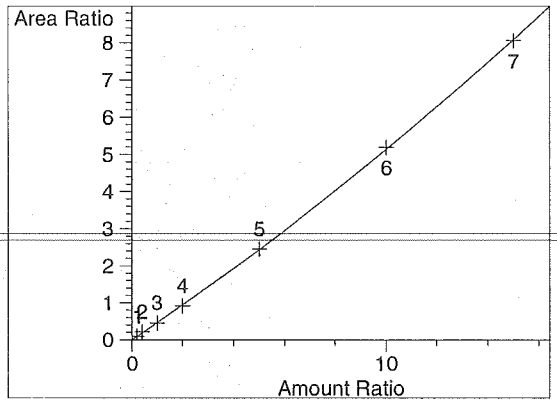
No Entries in table

RIGHT SOLUTIONS | RIGHT PARTNER

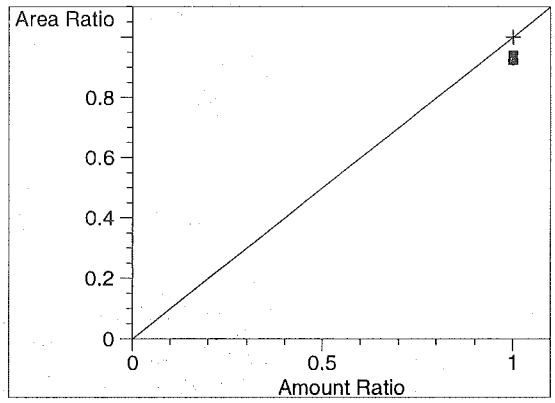
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: y = ax² + bx + c
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: y = ax² + bx + c
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: y = mx + b
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

RIGHT SOLUTIONS | RIGHT PARTNER

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

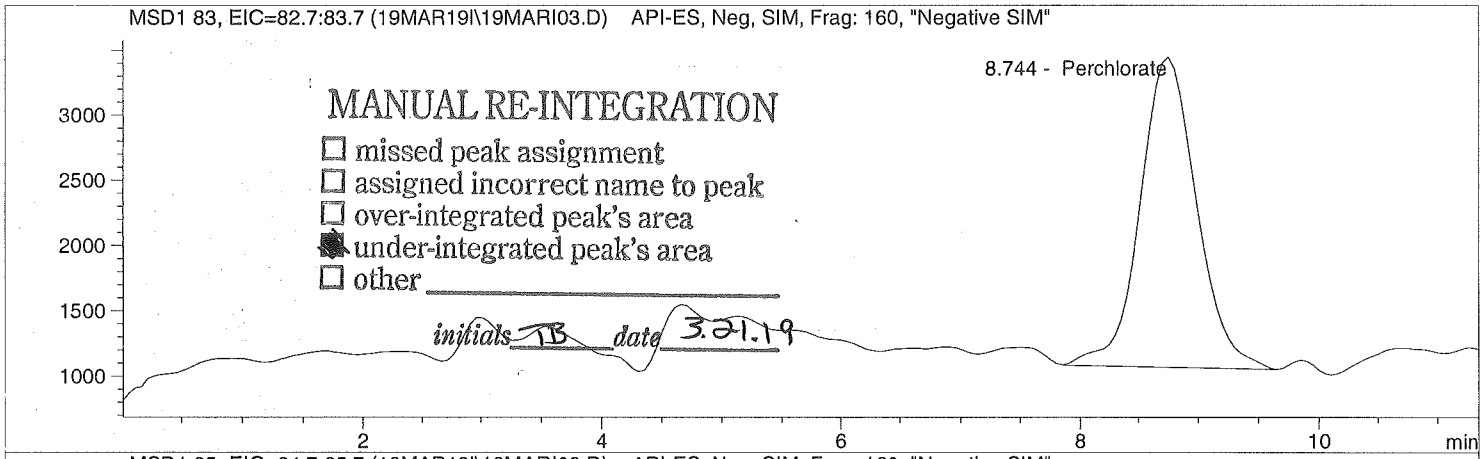
RIGHT SOLUTIONS | RIGHT PARTNER

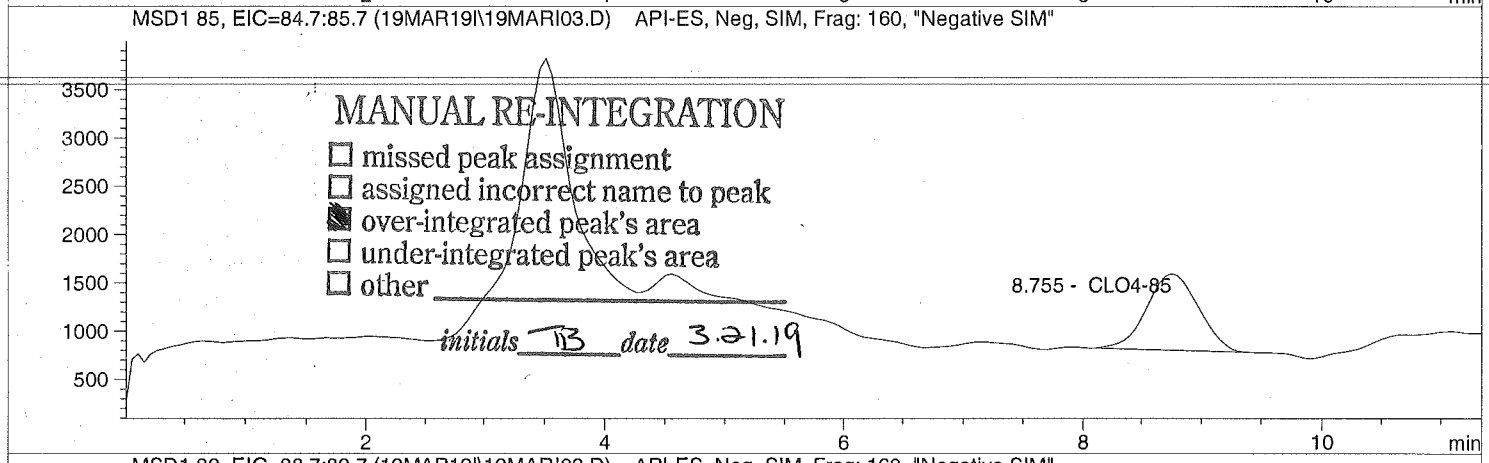
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

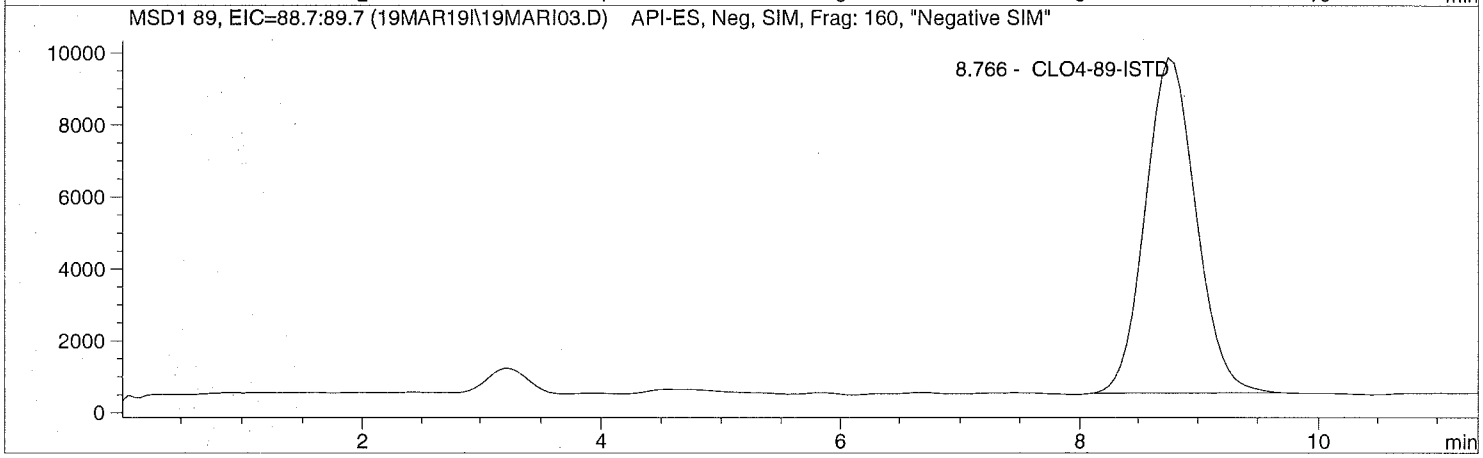
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

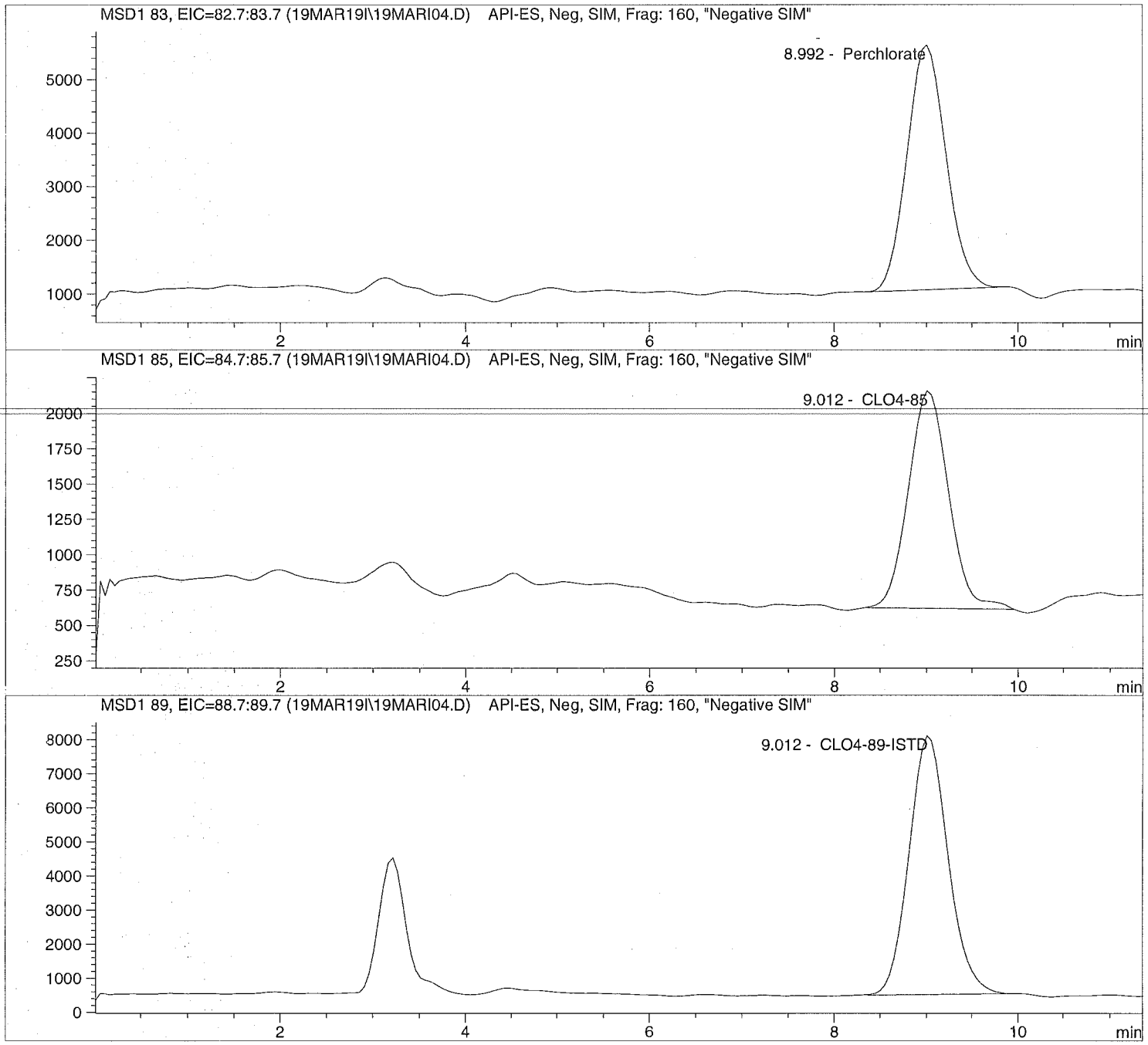
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

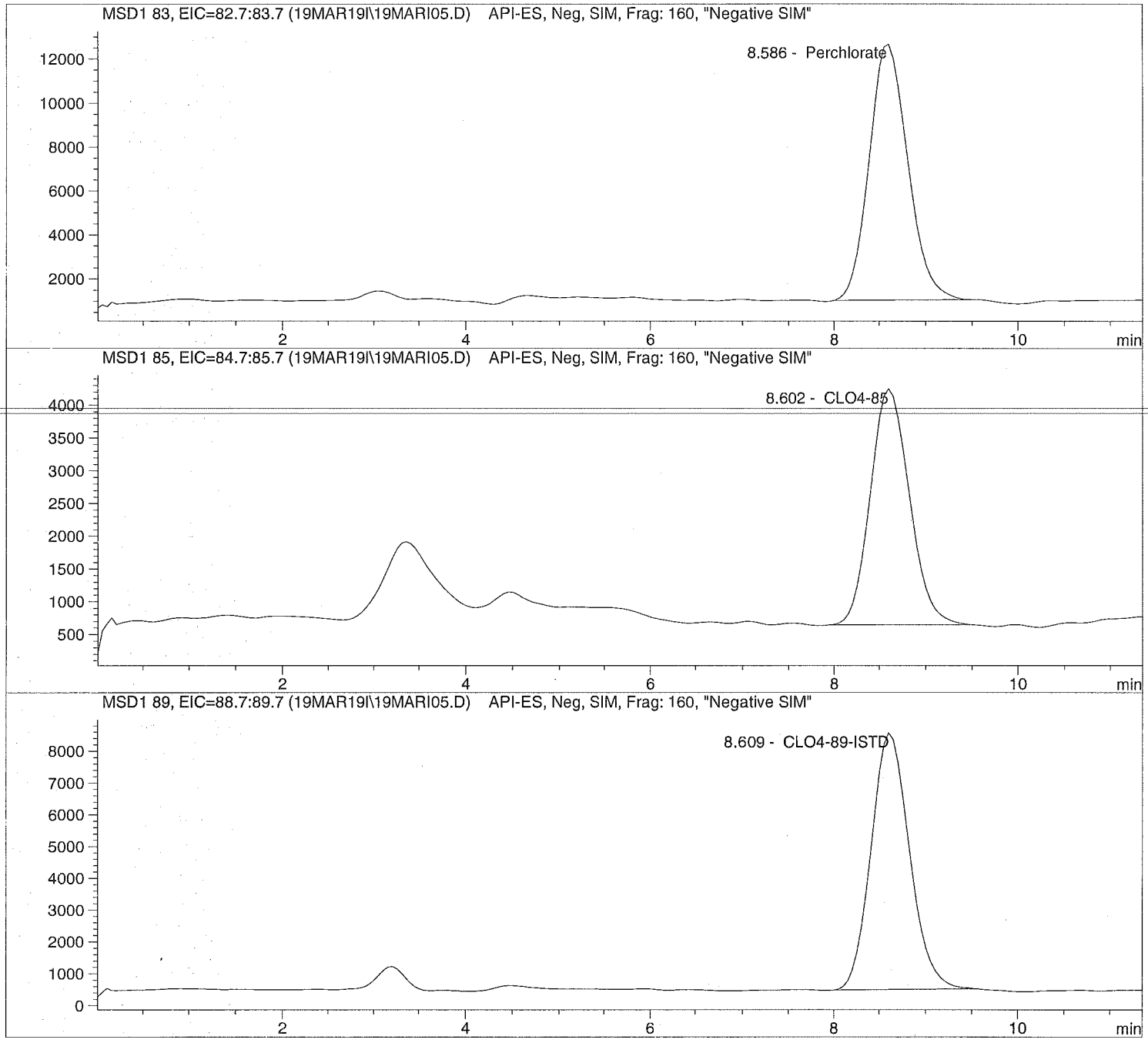
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

*** End of Report ***

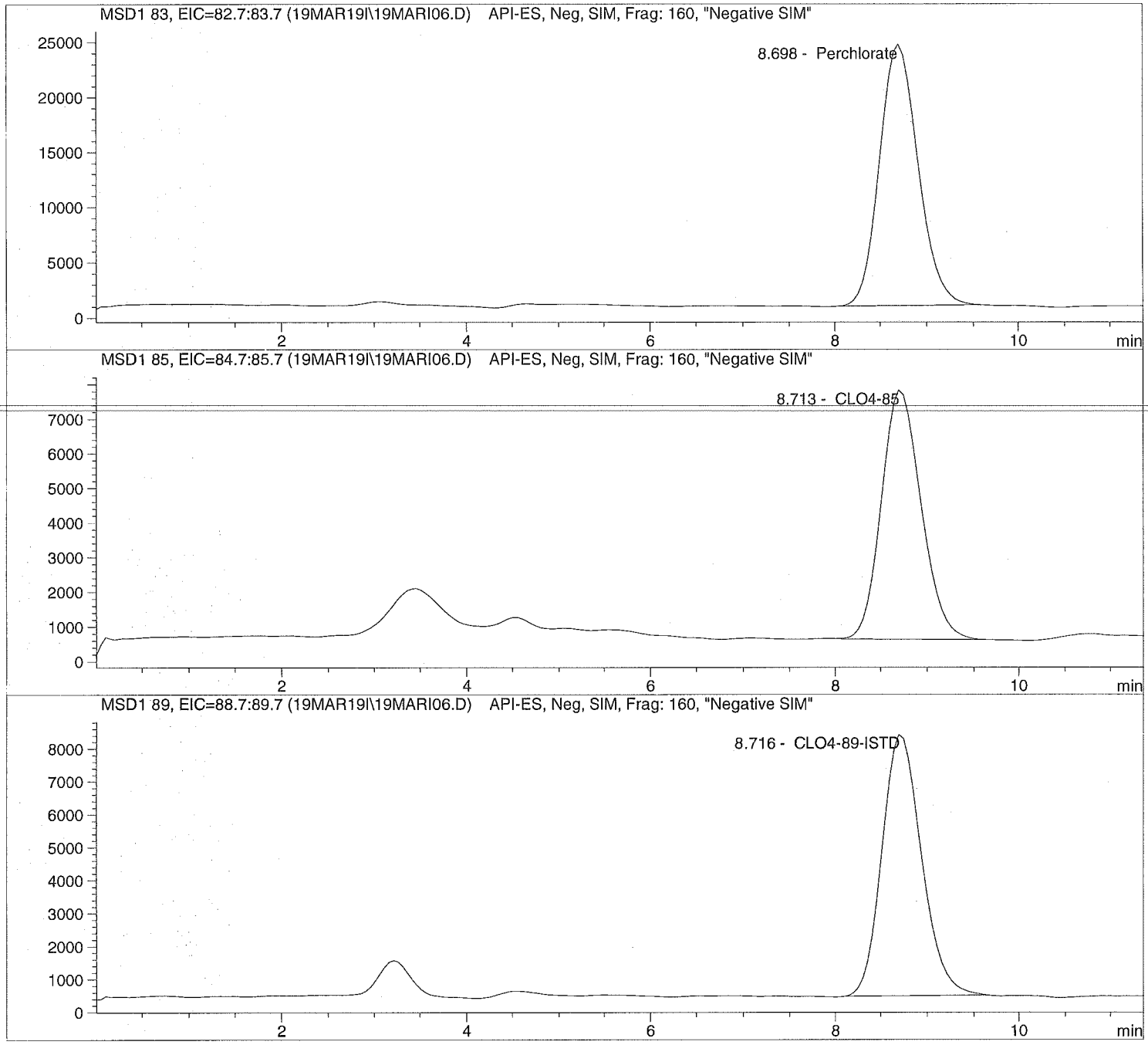
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

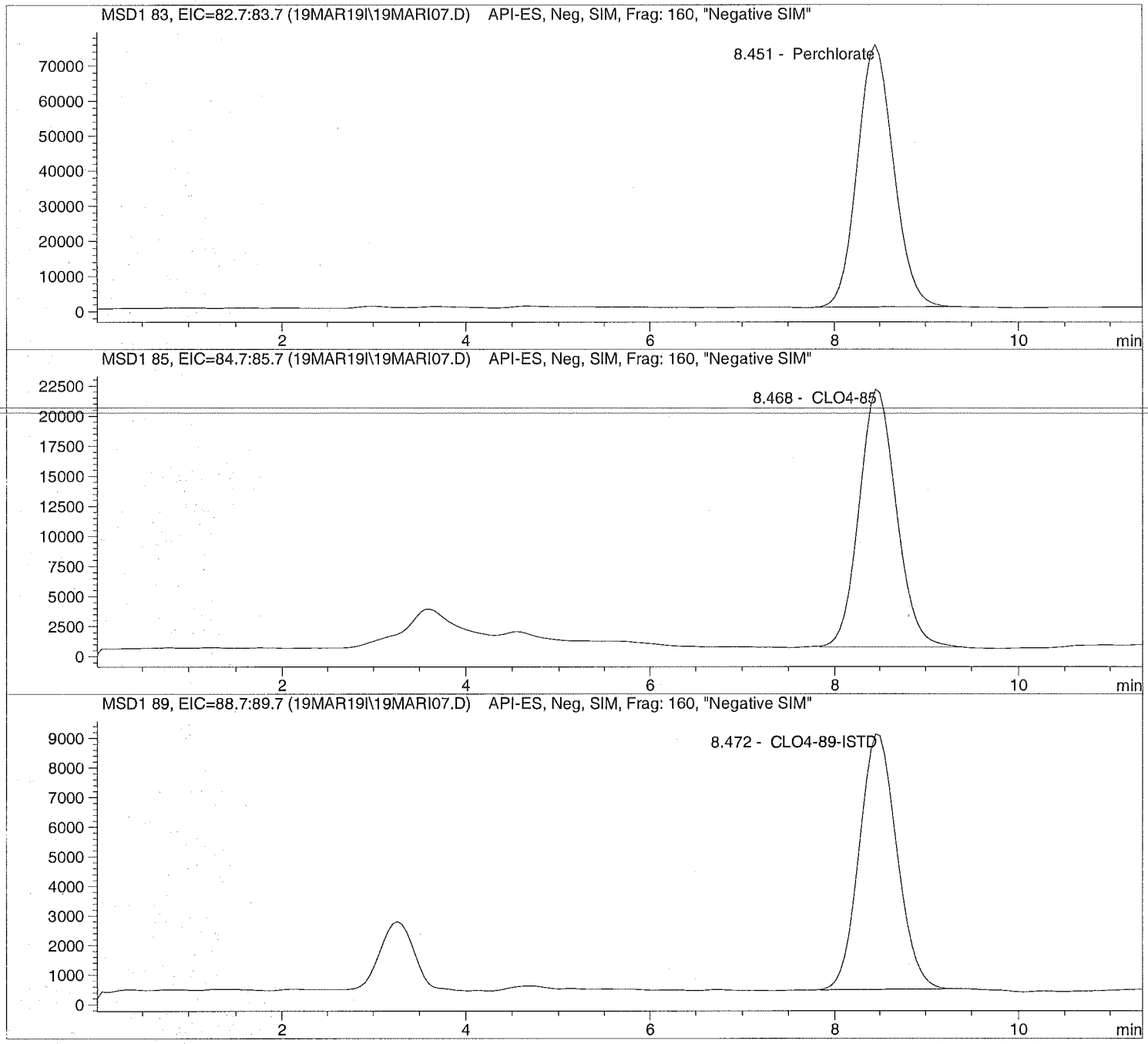
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

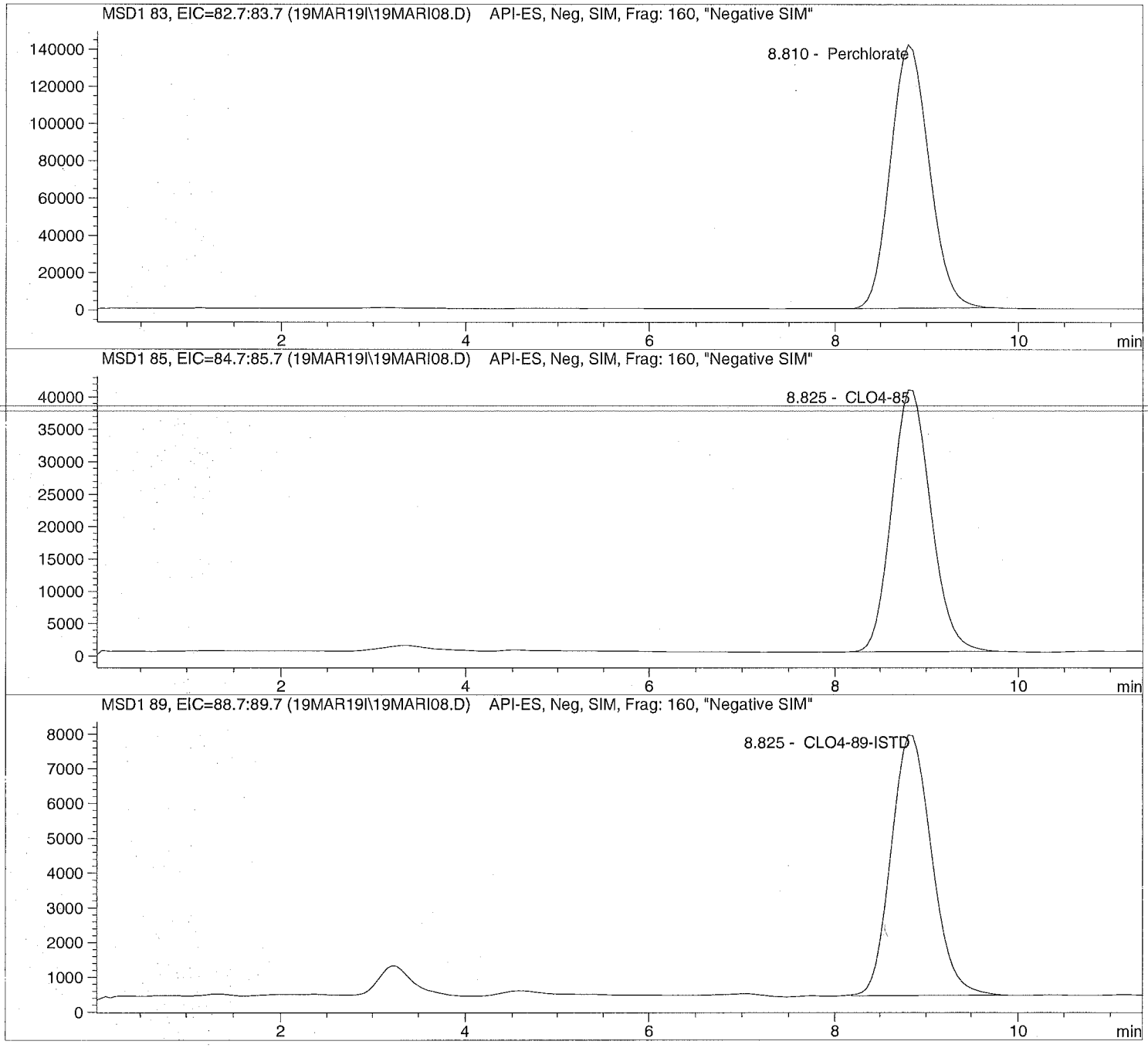
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

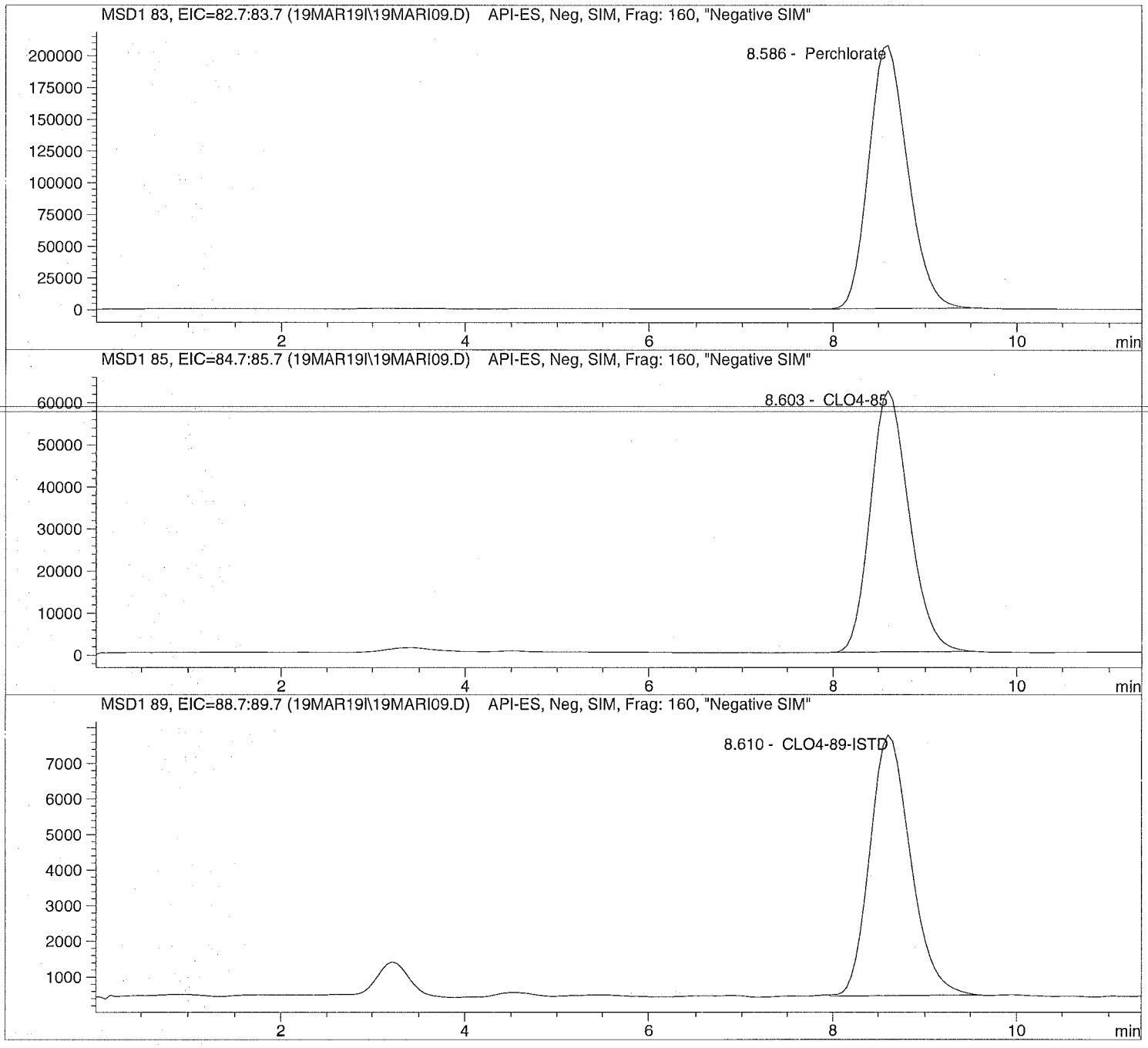
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

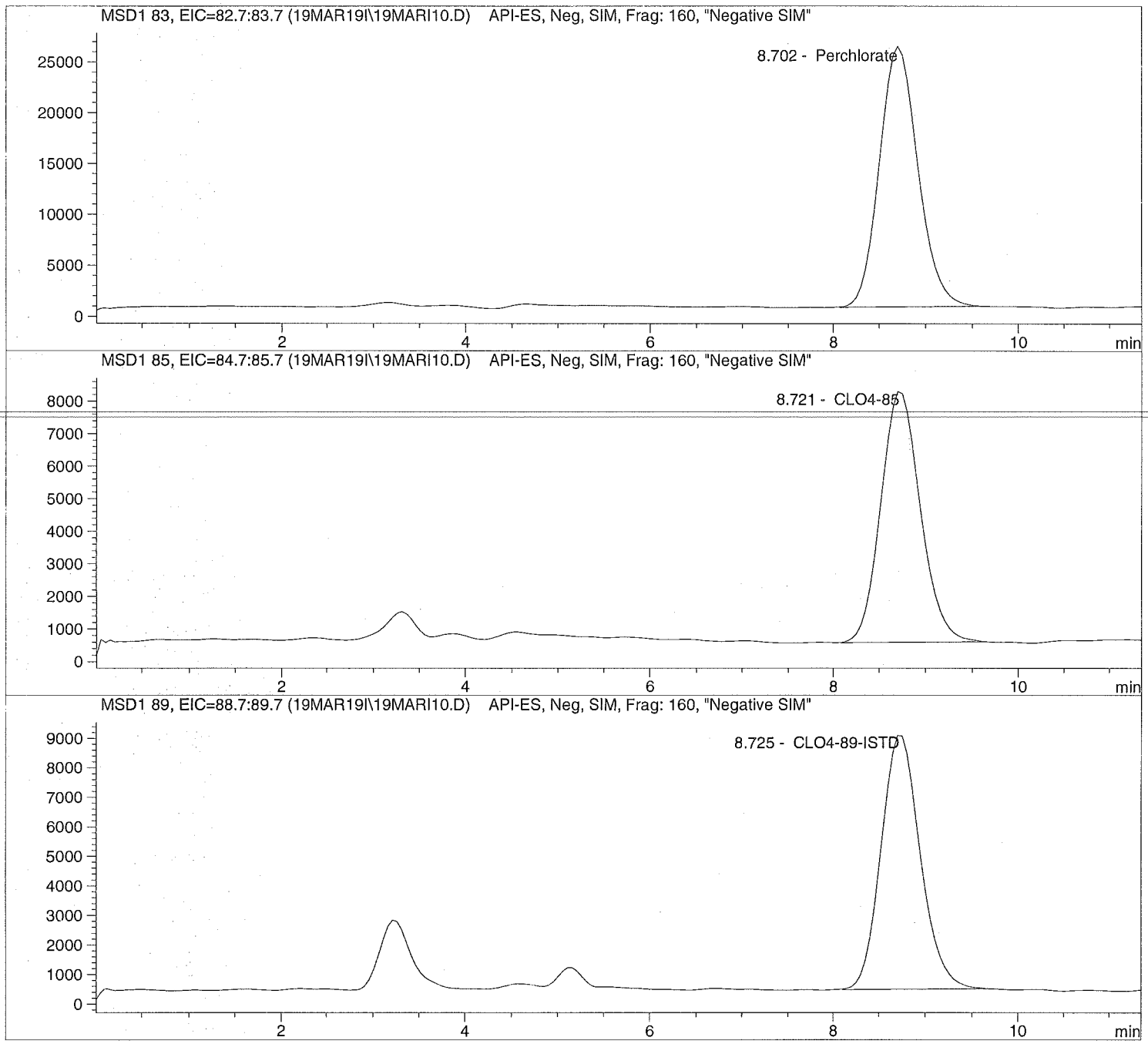
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

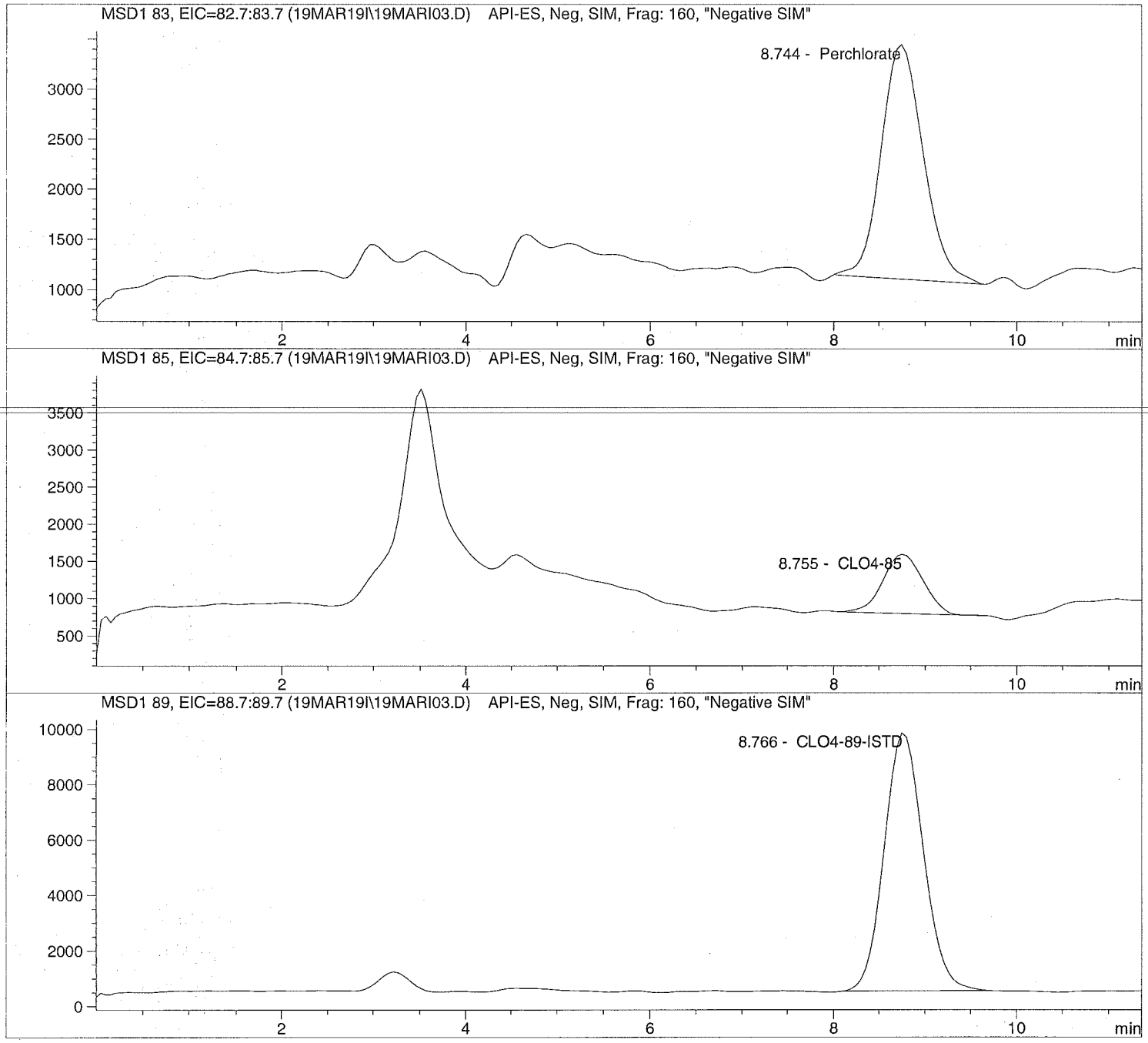
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

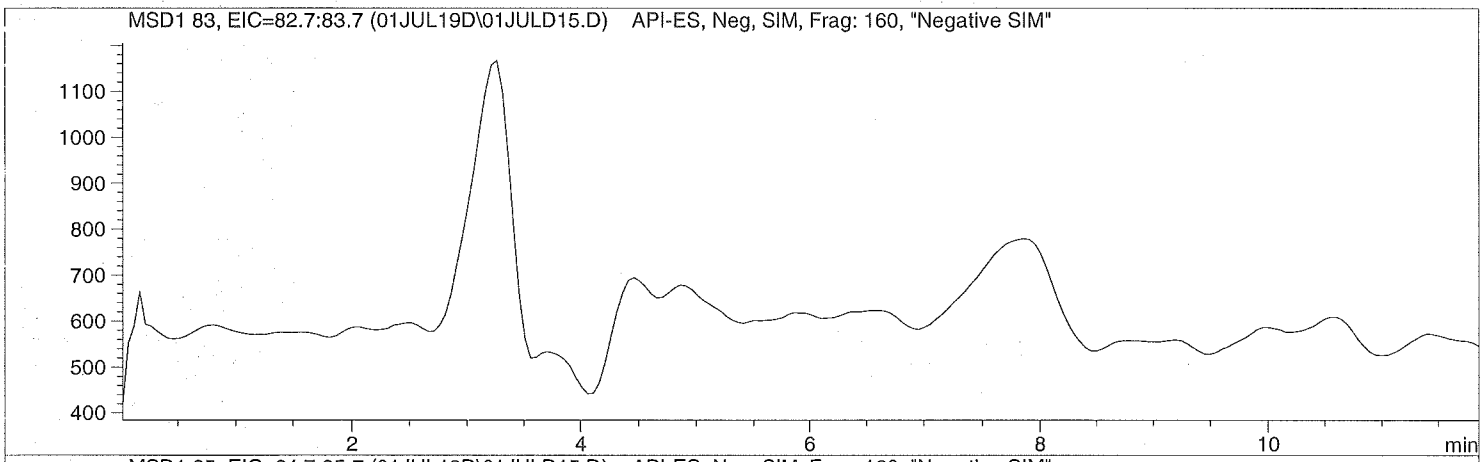
RIGHT SOLUTIONS | RIGHT PARTNER

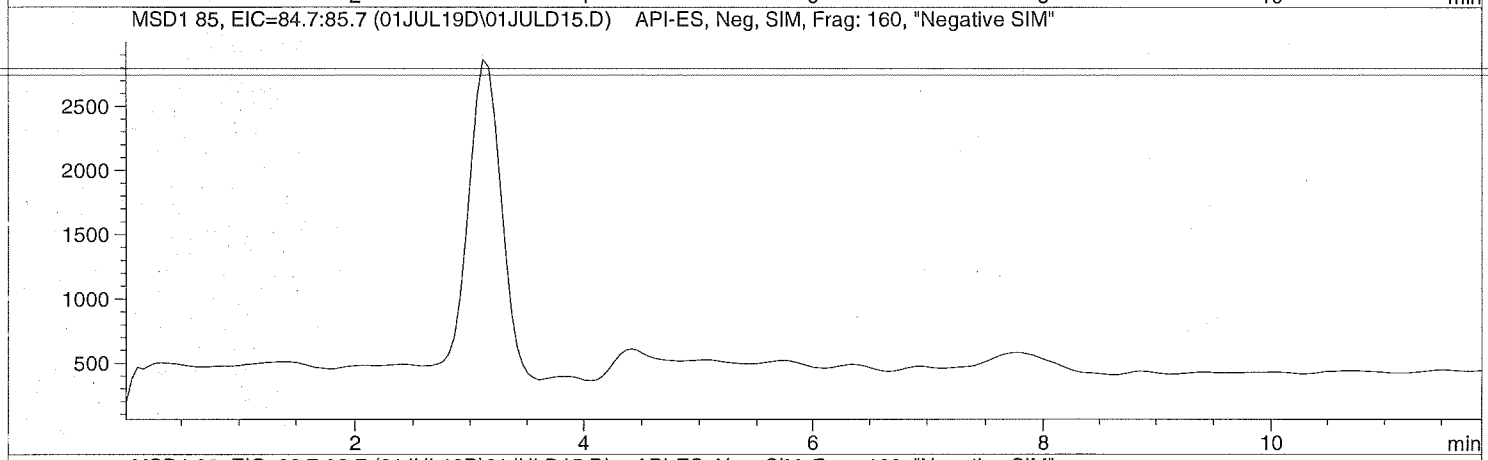
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

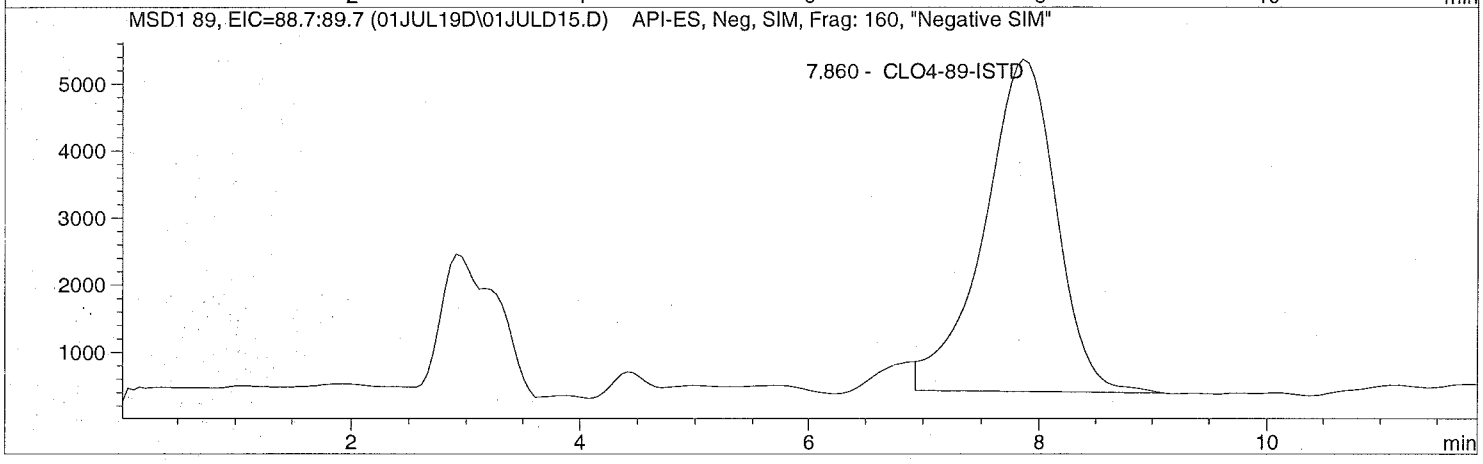
Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.860	BBA	216713.3	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

July 11, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19061083**

Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 8 sample(s) on Jun 20, 2019 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,

Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Houston, US Date: 11-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061083

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19061083-01	MW2_061919	Groundwater		19-Jun-2019 08:55	20-Jun-2019 08:30	☐
HS19061083-02	MW2_061919_a	Groundwater		19-Jun-2019 08:55	20-Jun-2019 08:30	☐
HS19061083-03	18CPTMW01DW_061919	Groundwater		19-Jun-2019 09:50	20-Jun-2019 08:30	☐
HS19061083-04	18CPTMW01SW_061919	Groundwater		19-Jun-2019 10:40	20-Jun-2019 08:30	☐
HS19061083-05	18CPTMW04SW_061919	Groundwater		19-Jun-2019 11:35	20-Jun-2019 08:30	☐
HS19061083-06	18CPTMW04_061919	Groundwater		19-Jun-2019 12:25	20-Jun-2019 08:30	☐
HS19061083-07	MW1_061919	Groundwater		19-Jun-2019 13:15	20-Jun-2019 08:30	☐
HS19061083-08	Trip Blank	Water	C&G-050119-183	19-Jun-2019 00:00	20-Jun-2019 08:30	☐

Revision:2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19061083

Work Order Comments

- Revised to correct the reporting limit for Mercury
- Revised to updated the sample IDs for 18CPTMW01SW_061919 and 18CPTMW04SW_061919.

Work Order Comments

- The analyses for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final Report attached

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142429

Sample ID: LCSD-142429

- LCS/LCSD RPD recovered above the RPD limit. The individual recoveries met acceptance criteria (Surrogate 4-Terphenyl-d14)

GCMS Volatiles by Method SW8260

Batch ID: R341546

Sample ID: 18CPTMW015W_061919 (HS19061083-04)

- Lowest practical dilution for sample HS19061083-04 due to high concentration of non-target compound.

Sample ID: VLCSW-190628

- 1,2,3_Trichlorobenzene and Naphthalene exceeded QC limits for LCS. CCV is OK. Samples are ND for these compounds.

Sample ID: HS19061157-02MS

- MS and MSD are for an unrelated sample

Batch ID: R341659

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 142427

Sample ID: HS19060986-04MS

- MS and MSD are for an unrelated sample

Metals by Method SW7470

Batch ID: 142417

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW2_061919
Collection Date: 19-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
1,1,1-Trichloroethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
1,1,2,2-Tetrachloroethane	25	U	25	25	50	UG/L	50	28-Jun-2019 14:01
1,1,2-Trichloroethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
1,1-Dichloroethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
1,1-Dichloroethene	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
1,1-Dichloropropene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
1,2,3-Trichlorobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
1,2,3-Trichloropropane	25	U	25	25	50	UG/L	50	28-Jun-2019 14:01
1,2,4-Trichlorobenzene	25	U	25	25	50	UG/L	50	28-Jun-2019 14:01
1,2,4-Trimethylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
1,2-Dibromo-3-chloropropane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
1,2-Dibromoethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
1,2-Dichlorobenzene	25	U	25	25	50	UG/L	50	28-Jun-2019 14:01
1,2-Dichloroethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
1,2-Dichloropropane	25	U	25	25	50	UG/L	50	28-Jun-2019 14:01
1,3,5-Trimethylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
1,3-Dichlorobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
1,3-Dichloropropane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
1,4-Dichlorobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
2,2-Dichloropropane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
2-Butanone	50	U	25	50	100	UG/L	50	28-Jun-2019 14:01
2-Chlorotoluene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
2-Hexanone	50	U	50	50	100	UG/L	50	28-Jun-2019 14:01
4-Chlorotoluene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
4-Isopropyltoluene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
4-Methyl-2-pentanone	50	U	35	50	100	UG/L	50	28-Jun-2019 14:01
Acetone	50	U	20	50	100	UG/L	50	28-Jun-2019 14:01
Benzene	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
Bromobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
Bromochloromethane	**660**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:01
Bromodichloromethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
Bromoform	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
Bromomethane	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
Carbon disulfide	50	U	30	50	100	UG/L	50	28-Jun-2019 14:01
Carbon tetrachloride	25	U	25	25	50	UG/L	50	28-Jun-2019 14:01
Chlorobenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Chloroethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Chloroform	**75**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:01

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW2_061919
Collection Date: 19-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
cis-1,2-Dichloroethene	**58,000**		**1000**	**2500**	**5000**	**UG/L**	5000	28-Jun-2019 15:37
cis-1,3-Dichloropropene	25	U	5.0	25	50	UG/L	50	28-Jun-2019 14:01
Dibromochloromethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Dibromomethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
Dichlorodifluoromethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Ethylbenzene	**32**	J	**15**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:01
Hexachlorobutadiene	50	U	50	50	50	UG/L	50	28-Jun-2019 14:01
Isopropylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
m,p-Xylene	50	U	25	50	100	UG/L	50	28-Jun-2019 14:01
Methylene chloride	**510,000**		**2000**	**5000**	**10000**	**UG/L**	5000	28-Jun-2019 15:37
n-Butylbenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:01
n-Propylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Naphthalene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
o-Xylene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
sec-Butylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Styrene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
tert-Butylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Tetrachloroethene	**43**	J	**15**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:01
Toluene	**30**	J	**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:01
trans-1,2-Dichloroethene	**150**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:01
trans-1,3-Dichloropropene	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
Trichloroethene	**1,400**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:01
Trichlorofluoromethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:01
Vinyl chloride	25	U	10	25	50	UG/L	50	28-Jun-2019 14:01
Surr: 1,2-Dichloroethane-d4	*95.1*			**0**	*81-118*	*%REC*	*50*	*28-Jun-2019 14:01*
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*5000*	*28-Jun-2019 15:37*
Surr: 4-Bromofluorobenzene	*95.2*			**0**	*85-114*	*%REC*	*5000*	*28-Jun-2019 15:37*
Surr: 4-Bromofluorobenzene	*93.6*			**0**	*85-114*	*%REC*	*50*	*28-Jun-2019 14:01*
Surr: Dibromofluoromethane	*92.7*			**0**	*80-119*	*%REC*	*50*	*28-Jun-2019 14:01*
Surr: Dibromofluoromethane	*95.6*			**0**	*80-119*	*%REC*	*5000*	*28-Jun-2019 15:37*
Surr: Toluene-d8	*93.0*			**0**	*89-112*	*%REC*	*50*	*28-Jun-2019 14:01*
Surr: Toluene-d8	*95.6*			**0**	*89-112*	*%REC*	*5000*	*28-Jun-2019 15:37*
SEMIVOLATILES SIM	**Method:SW8270SIM**					Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**3.5**		**0.20**	**0.20**	**0.20**	**ug/L**	20	28-Jun-2019 16:20
Surr: 2-Fluorobiphenyl	*112*			**0**	*40-140*	*%REC*	*20*	*28-Jun-2019 16:20*
Surr: 4-Terphenyl-d14	*138*			**0**	*40-140*	*%REC*	*20*	*28-Jun-2019 16:20*
Surr: Nitrobenzene-d5	*78.3*			**0**	*40-140*	*%REC*	*20*	*28-Jun-2019 16:20*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW2_061919
Collection Date: 19-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW2_061919_a
Collection Date: 19-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
1,1,1-Trichloroethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
1,1,2,2-Tetrachloroethane	25	U	25	25	50	UG/L	50	28-Jun-2019 14:25
1,1,2-Trichloroethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
1,1-Dichloroethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
1,1-Dichloroethene	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
1,1-Dichloropropene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
1,2,3-Trichlorobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
1,2,3-Trichloropropane	25	U	25	25	50	UG/L	50	28-Jun-2019 14:25
1,2,4-Trichlorobenzene	25	U	25	25	50	UG/L	50	28-Jun-2019 14:25
1,2,4-Trimethylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
1,2-Dibromo-3-chloropropane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
1,2-Dibromoethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
1,2-Dichlorobenzene	25	U	25	25	50	UG/L	50	28-Jun-2019 14:25
1,2-Dichloroethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
1,2-Dichloropropane	25	U	25	25	50	UG/L	50	28-Jun-2019 14:25
1,3,5-Trimethylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
1,3-Dichlorobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
1,3-Dichloropropane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
1,4-Dichlorobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
2,2-Dichloropropane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
2-Butanone	50	U	25	50	100	UG/L	50	28-Jun-2019 14:25
2-Chlorotoluene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
2-Hexanone	50	U	50	50	100	UG/L	50	28-Jun-2019 14:25
4-Chlorotoluene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
4-Isopropyltoluene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
4-Methyl-2-pentanone	50	U	35	50	100	UG/L	50	28-Jun-2019 14:25
Acetone	50	U	20	50	100	UG/L	50	28-Jun-2019 14:25
Benzene	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
Bromobenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
Bromochloromethane	**460**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:25
Bromodichloromethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
Bromoform	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
Bromomethane	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
Carbon disulfide	50	U	30	50	100	UG/L	50	28-Jun-2019 14:25
Carbon tetrachloride	25	U	25	25	50	UG/L	50	28-Jun-2019 14:25
Chlorobenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Chloroethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Chloroform	**74**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:25

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW2_061919_a
Collection Date: 19-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
cis-1,2-Dichloroethene	**59,000**		**1000**	**2500**	**5000**	**UG/L**	5000	28-Jun-2019 16:01
cis-1,3-Dichloropropene	25	U	5.0	25	50	UG/L	50	28-Jun-2019 14:25
Dibromochloromethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Dibromomethane	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
Dichlorodifluoromethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Ethylbenzene	**33**	J	**15**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:25
Hexachlorobutadiene	50	U	50	50	50	UG/L	50	28-Jun-2019 14:25
Isopropylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
m,p-Xylene	50	U	25	50	100	UG/L	50	28-Jun-2019 14:25
Methylene chloride	**500,000**		**2000**	**5000**	**10000**	**UG/L**	5000	28-Jun-2019 16:01
n-Butylbenzene	25	U	20	25	50	UG/L	50	28-Jun-2019 14:25
n-Propylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Naphthalene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
o-Xylene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
sec-Butylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Styrene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
tert-Butylbenzene	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Tetrachloroethene	**44**	J	**15**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:25
Toluene	**31**	J	**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:25
trans-1,2-Dichloroethene	**150**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:25
trans-1,3-Dichloropropene	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
Trichloroethene	**1,400**		**10**	**25**	**50**	**UG/L**	50	28-Jun-2019 14:25
Trichlorofluoromethane	25	U	15	25	50	UG/L	50	28-Jun-2019 14:25
Vinyl chloride	25	U	10	25	50	UG/L	50	28-Jun-2019 14:25
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*5000*	*28-Jun-2019 16:01*
Surr: 1,2-Dichloroethane-d4	*95.4*			**0**	*81-118*	*%REC*	*50*	*28-Jun-2019 14:25*
Surr: 4-Bromofluorobenzene	*90.8*			**0**	*85-114*	*%REC*	*50*	*28-Jun-2019 14:25*
Surr: 4-Bromofluorobenzene	*96.9*			**0**	*85-114*	*%REC*	*5000*	*28-Jun-2019 16:01*
Surr: Dibromofluoromethane	*92.4*			**0**	*80-119*	*%REC*	*50*	*28-Jun-2019 14:25*
Surr: Dibromofluoromethane	*95.3*			**0**	*80-119*	*%REC*	*5000*	*28-Jun-2019 16:01*
Surr: Toluene-d8	*91.9*			**0**	*89-112*	*%REC*	*50*	*28-Jun-2019 14:25*
Surr: Toluene-d8	*96.9*			**0**	*89-112*	*%REC*	*5000*	*28-Jun-2019 16:01*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**6.2**		**0.20**	**0.20**	**0.20**	**ug/L**	20	28-Jun-2019 16:41
Surr: 2-Fluorobiphenyl	*111*			**0**	*40-140*	*%REC*	*20*	*28-Jun-2019 16:41*
Surr: 4-Terphenyl-d14	*120*			**0**	*40-140*	*%REC*	*20*	*28-Jun-2019 16:41*
Surr: Nitrobenzene-d5	*106*			**0**	*40-140*	*%REC*	*20*	*28-Jun-2019 16:41*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW2_061919_a
Collection Date: 19-Jun-2019 08:55

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW01DW_061919
Collection Date: 19-Jun-2019 09:50

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 18:48
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 18:48
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 18:48
Acetone	**5.1**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 18:48
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 18:48
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW01DW_061919
Collection Date: 19-Jun-2019 09:50

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 18:48
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 18:48
Methylene chloride	**1.1**	J	**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 18:48
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:48
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:48
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 18:48*
Surr: 4-Bromofluorobenzene	*94.2*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 18:48*
Surr: Dibromofluoromethane	*95.1*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 18:48*
Surr: Toluene-d8	*94.4*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 18:48*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**0.27**		**0.010**	**0.010**	**0.010**	**ug/L**	1	28-Jun-2019 00:21
Surr: 2-Fluorobiphenyl	*87.1*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 00:21*
Surr: 4-Terphenyl-d14	*113*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 00:21*
Surr: Nitrobenzene-d5	*110*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 00:21*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW01DW_061919
Collection Date: 19-Jun-2019 09:50

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.110**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:00
Antimony	**0.000408**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Arsenic	**0.00152**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Barium	**0.412**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:53
Cadmium	**0.000345**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 18:00
Calcium	**40.3**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:00
Chromium	**0.0949**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Cobalt	**0.00121**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Copper	**0.00332**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Iron	**1.65**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:00
Lead	**0.00104**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Magnesium	**11.7**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:00
Manganese	**0.115**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Nickel	**0.00669**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Potassium	**147**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:00
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:00
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:00
Sodium	**370**		**0.140**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 15:54
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:00
Vanadium	**0.00102**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
Zinc	**0.0266**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:00
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 25-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	25-Jun-2019 15:17
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW01SW_061919
Collection Date: 19-Jun-2019 10:40

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
1,1,1-Trichloroethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
1,1,2,2-Tetrachloroethane	12	U	12	12	25	UG/L	25	28-Jun-2019 20:00
1,1,2-Trichloroethane	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
1,1-Dichloroethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
1,1-Dichloroethene	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
1,1-Dichloropropene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
1,2,3-Trichlorobenzene	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
1,2,3-Trichloropropane	12	U	12	12	25	UG/L	25	28-Jun-2019 20:00
1,2,4-Trichlorobenzene	12	U	12	12	25	UG/L	25	28-Jun-2019 20:00
1,2,4-Trimethylbenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
1,2-Dibromo-3-chloropropane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
1,2-Dibromoethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
1,2-Dichlorobenzene	12	U	12	12	25	UG/L	25	28-Jun-2019 20:00
1,2-Dichloroethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
1,2-Dichloropropane	12	U	12	12	25	UG/L	25	28-Jun-2019 20:00
1,3,5-Trimethylbenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
1,3-Dichlorobenzene	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
1,3-Dichloropropane	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
1,4-Dichlorobenzene	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
2,2-Dichloropropane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
2-Butanone	25	U	12	25	50	UG/L	25	28-Jun-2019 20:00
2-Chlorotoluene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
2-Hexanone	25	U	25	25	50	UG/L	25	28-Jun-2019 20:00
4-Chlorotoluene	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
4-Isopropyltoluene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
4-Methyl-2-pentanone	25	U	18	25	50	UG/L	25	28-Jun-2019 20:00
Acetone	25	U	10	25	50	UG/L	25	28-Jun-2019 20:00
Benzene	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
Bromobenzene	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
Bromochloromethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
Bromodichloromethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
Bromoform	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
Bromomethane	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
Carbon disulfide	25	U	15	25	50	UG/L	25	28-Jun-2019 20:00
Carbon tetrachloride	12	U	12	12	25	UG/L	25	28-Jun-2019 20:00
Chlorobenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Chloroethane	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Chloroform	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW01SW_061919
Collection Date: 19-Jun-2019 10:40

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
cis-1,2-Dichloroethene	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
cis-1,3-Dichloropropene	12	U	2.5	12	25	UG/L	25	28-Jun-2019 20:00
Dibromochloromethane	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Dibromomethane	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
Dichlorodifluoromethane	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Ethylbenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Hexachlorobutadiene	25	U	25	25	25	UG/L	25	28-Jun-2019 20:00
Isopropylbenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
m,p-Xylene	25	U	12	25	50	UG/L	25	28-Jun-2019 20:00
Methylene chloride	**100**		**10**	**25**	**50**	**UG/L**	25	28-Jun-2019 20:00
n-Butylbenzene	12	U	10	12	25	UG/L	25	28-Jun-2019 20:00
n-Propylbenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Naphthalene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
o-Xylene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
sec-Butylbenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Styrene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
tert-Butylbenzene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Tetrachloroethene	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Toluene	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
trans-1,2-Dichloroethene	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
trans-1,3-Dichloropropene	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
Trichloroethene	**32**		**5.0**	**12**	**25**	**UG/L**	25	28-Jun-2019 20:00
Trichlorofluoromethane	12	U	7.5	12	25	UG/L	25	28-Jun-2019 20:00
Vinyl chloride	12	U	5.0	12	25	UG/L	25	28-Jun-2019 20:00
Surr: 1,2-Dichloroethane-d4	*104*			**0**	*81-118*	*%REC*	*25*	*28-Jun-2019 20:00*
Surr: 4-Bromofluorobenzene	*98.4*			**0**	*85-114*	*%REC*	*25*	*28-Jun-2019 20:00*
Surr: Dibromofluoromethane	*97.3*			**0**	*80-119*	*%REC*	*25*	*28-Jun-2019 20:00*
Surr: Toluene-d8	*99.0*			**0**	*89-112*	*%REC*	*25*	*28-Jun-2019 20:00*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 00:42
Surr: 2-Fluorobiphenyl	*84.6*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 00:42*
Surr: 4-Terphenyl-d14	*111*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 00:42*
Surr: Nitrobenzene-d5	*113*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 00:42*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW01SW_061919
Collection Date: 19-Jun-2019 10:40

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0504**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:02
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:02
Arsenic	**0.00871**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:02
Barium	**1.07**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:02
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:02
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:02
Calcium	**32.9**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:02
Chromium	**0.00638**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:02
Cobalt	**0.000511**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:02
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 18:02
Iron	**51.3**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:02
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:02
Magnesium	**22.6**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:02
Manganese	**0.635**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:02
Nickel	**0.00112**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:02
Potassium	**18.4**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:02
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:02
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:02
Sodium	**115**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:02
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:02
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:02
Zinc	**0.0209**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:02
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 25-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	25-Jun-2019 15:19
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW04SW_061919
Collection Date: 19-Jun-2019 11:35

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 19:12
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 19:12
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 19:12
Acetone	**5.0**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 19:12
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 19:12
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW04SW_061919
Collection Date: 19-Jun-2019 11:35

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 19:12
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 19:12
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 19:12
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:12
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:12
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 19:12*
Surr: 4-Bromofluorobenzene	*95.6*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 19:12*
Surr: Dibromofluoromethane	*94.4*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 19:12*
Surr: Toluene-d8	*95.9*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 19:12*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 01:03
Surr: 2-Fluorobiphenyl	*100*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 01:03*
Surr: 4-Terphenyl-d14	*112*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 01:03*
Surr: Nitrobenzene-d5	*124*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 01:03*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW04SW_061919
Collection Date: 19-Jun-2019 11:35

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0645**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:05
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:05
Arsenic	**0.00326**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:05
Barium	**0.911**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:05
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:05
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:05
Calcium	**30.3**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:05
Chromium	**0.0219**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:05
Cobalt	**0.00473**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:05
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 18:05
Iron	**10.4**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:05
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:05
Magnesium	**18.3**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:05
Manganese	**0.455**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:05
Nickel	**0.00641**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:05
Potassium	**108**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:05
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:05
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:05
Sodium	**130**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:05
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:05
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:05
Zinc	**0.0400**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:05
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 25-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	25-Jun-2019 15:20
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW04_061919
Collection Date: 19-Jun-2019 12:25

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,2-Dichloroethane	**0.75**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	28-Jun-2019 19:36
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 19:36
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 19:36
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 19:36
Acetone	**4.6**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 19:36
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 19:36
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW04_061919
Collection Date: 19-Jun-2019 12:25

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
cis-1,2-Dichloroethene	**16**		**0.20**	**0.50**	**1.0**	**UG/L**	1	28-Jun-2019 19:36
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 19:36
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 19:36
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 19:36
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 19:36
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Trichloroethene	**510**		**2.0**	**5.0**	**10**	**UG/L**	10	01-Jul-2019 16:01
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 19:36
Surr: 1,2-Dichloroethane-d4	*99.0*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 19:36*
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*10*	*01-Jul-2019 16:01*
Surr: 4-Bromofluorobenzene	*94.8*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 19:36*
Surr: 4-Bromofluorobenzene	*95.4*			**0**	*85-114*	*%REC*	*10*	*01-Jul-2019 16:01*
Surr: Dibromofluoromethane	*93.2*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 19:36*
Surr: Dibromofluoromethane	*95.5*			**0**	*80-119*	*%REC*	*10*	*01-Jul-2019 16:01*
Surr: Toluene-d8	*95.7*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 19:36*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*10*	*01-Jul-2019 16:01*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**1.3**		**0.050**	**0.050**	**0.050**	**ug/L**	5	28-Jun-2019 17:01
Surr: 2-Fluorobiphenyl	*90.6*			**0**	*40-140*	*%REC*	*5*	*28-Jun-2019 17:01*
Surr: 4-Terphenyl-d14	*133*			**0**	*40-140*	*%REC*	*5*	*28-Jun-2019 17:01*
Surr: Nitrobenzene-d5	*89.2*			**0**	*40-140*	*%REC*	*5*	*28-Jun-2019 17:01*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW04_061919
Collection Date: 19-Jun-2019 12:25

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW1_061919
Collection Date: 19-Jun-2019 13:15

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
1,1,1-Trichloroethane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
1,1,2,2-Tetrachloroethane	10	U	10	10	20	UG/L	20	28-Jun-2019 20:24
1,1,2-Trichloroethane	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
1,1-Dichloroethane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
1,1-Dichloroethene	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
1,1-Dichloropropene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
1,2,3-Trichlorobenzene	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
1,2,3-Trichloropropane	10	U	10	10	20	UG/L	20	28-Jun-2019 20:24
1,2,4-Trichlorobenzene	10	U	10	10	20	UG/L	20	28-Jun-2019 20:24
1,2,4-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
1,2-Dibromo-3-chloropropane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
1,2-Dibromoethane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
1,2-Dichlorobenzene	10	U	10	10	20	UG/L	20	28-Jun-2019 20:24
1,2-Dichloroethane	**300**		**4.0**	**10**	**20**	**UG/L**	20	28-Jun-2019 20:24
1,2-Dichloropropane	10	U	10	10	20	UG/L	20	28-Jun-2019 20:24
1,3,5-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
1,3-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
1,3-Dichloropropane	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
1,4-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
2,2-Dichloropropane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
2-Butanone	20	U	10	20	40	UG/L	20	28-Jun-2019 20:24
2-Chlorotoluene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
2-Hexanone	20	U	20	20	40	UG/L	20	28-Jun-2019 20:24
4-Chlorotoluene	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
4-Isopropyltoluene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
4-Methyl-2-pentanone	20	U	14	20	40	UG/L	20	28-Jun-2019 20:24
Acetone	20	U	8.0	20	40	UG/L	20	28-Jun-2019 20:24
Benzene	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
Bromobenzene	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
Bromochloromethane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
Bromodichloromethane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
Bromoform	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
Bromomethane	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
Carbon disulfide	20	U	12	20	40	UG/L	20	28-Jun-2019 20:24
Carbon tetrachloride	10	U	10	10	20	UG/L	20	28-Jun-2019 20:24
Chlorobenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Chloroethane	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Chloroform	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW1_061919
Collection Date: 19-Jun-2019 13:15

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
cis-1,2-Dichloroethene	**4,000**		**4.0**	**10**	**20**	**UG/L**	20	28-Jun-2019 20:24
cis-1,3-Dichloropropene	10	U	2.0	10	20	UG/L	20	28-Jun-2019 20:24
Dibromochloromethane	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Dibromomethane	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
Dichlorodifluoromethane	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Ethylbenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Hexachlorobutadiene	20	U	20	20	20	UG/L	20	28-Jun-2019 20:24
Isopropylbenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
m,p-Xylene	20	U	10	20	40	UG/L	20	28-Jun-2019 20:24
Methylene chloride	20	U	8.0	20	40	UG/L	20	28-Jun-2019 20:24
n-Butylbenzene	10	U	8.0	10	20	UG/L	20	28-Jun-2019 20:24
n-Propylbenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Naphthalene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
o-Xylene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
sec-Butylbenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Styrene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
tert-Butylbenzene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Tetrachloroethene	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Toluene	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
trans-1,2-Dichloroethene	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
trans-1,3-Dichloropropene	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
Trichloroethene	**15,000**		**50**	**120**	**250**	**UG/L**	250	01-Jul-2019 16:25
Trichlorofluoromethane	10	U	6.0	10	20	UG/L	20	28-Jun-2019 20:24
Vinyl chloride	10	U	4.0	10	20	UG/L	20	28-Jun-2019 20:24
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*20*	*28-Jun-2019 20:24*
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*250*	*01-Jul-2019 16:25*
Surr: 4-Bromofluorobenzene	*94.6*			**0**	*85-114*	*%REC*	*20*	*28-Jun-2019 20:24*
Surr: 4-Bromofluorobenzene	*95.6*			**0**	*85-114*	*%REC*	*250*	*01-Jul-2019 16:25*
Surr: Dibromofluoromethane	*94.7*			**0**	*80-119*	*%REC*	*20*	*28-Jun-2019 20:24*
Surr: Dibromofluoromethane	*95.2*			**0**	*80-119*	*%REC*	*250*	*01-Jul-2019 16:25*
Surr: Toluene-d8	*96.0*			**0**	*89-112*	*%REC*	*20*	*28-Jun-2019 20:24*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*250*	*01-Jul-2019 16:25*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW1_061919
Collection Date: 19-Jun-2019 13:15

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0775**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:07
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:07
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:07
Barium	**0.406**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:07
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:07
Calcium	**17.9**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:07
Chromium	**0.358**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
Cobalt	**0.0170**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
Copper	**0.00256**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
Iron	**5.03**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:07
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:07
Magnesium	**14.4**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:07
Manganese	**0.703**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
Nickel	**1.07**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
Potassium	**2.47**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:07
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:07
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:07
Sodium	**170**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:07
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:07
Vanadium	**0.00117**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
Zinc	**0.00816**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:07
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 25-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	25-Jun-2019 15:22
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 19-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 12:25
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 12:25
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 12:25
Acetone	**29**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 12:25
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 12:25
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 19-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061083
Lab ID:HS19061083-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 12:25
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 12:25
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 12:25
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:25
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:25
Surr: 1,2-Dichloroethane-d4	*95.9*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 12:25*
Surr: 4-Bromofluorobenzene	*93.2*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 12:25*
Surr: Dibromofluoromethane	*91.3*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 12:25*
Surr: Toluene-d8	*93.3*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 12:25*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

RIGHT SOLUTIONS | RIGHT PARTNER

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

Batch ID: 142417 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061083-03	1	10 (mL)	10 (mL)	1
HS19061083-04	1	10 (mL)	10 (mL)	1
HS19061083-05	1	10 (mL)	10 (mL)	1
HS19061083-07	1	10 (mL)	10 (mL)	1

Batch ID: 142427 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061083-03	1	10	10 (mL)	1
HS19061083-04	1	10	10 (mL)	1
HS19061083-05	1	10	10 (mL)	1
HS19061083-07	1	10	10 (mL)	1

Batch ID: 142429 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061083-01	1	1000	1 (mL)	0.001
HS19061083-02	1	1000	1 (mL)	0.001
HS19061083-03	1	1000	1 (mL)	0.001
HS19061083-04	1	1000	1 (mL)	0.001
HS19061083-05	1	1000	1 (mL)	0.001
HS19061083-06	1	1000	1 (mL)	0.001

ALS Houston, US Date: 11-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142417 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19061083-03	18CPTMW01DW_061919	19 Jun 2019 09:50		25 Jun 2019 09:30	25 Jun 2019 15:17	1
HS19061083-04	18CPTMW01SW_061919	19 Jun 2019 10:40		25 Jun 2019 09:30	25 Jun 2019 15:19	1
HS19061083-05	18CPTMW04SW_061919	19 Jun 2019 11:35		25 Jun 2019 09:30	25 Jun 2019 15:20	1
HS19061083-07	MW1_061919	19 Jun 2019 13:15		25 Jun 2019 09:30	25 Jun 2019 15:22	1
Batch ID: 142427 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19061083-03	18CPTMW01DW_061919	19 Jun 2019 09:50		25 Jun 2019 11:30	28 Jun 2019 15:54	10
HS19061083-03	18CPTMW01DW_061919	19 Jun 2019 09:50		25 Jun 2019 11:30	28 Jun 2019 15:53	1
HS19061083-03	18CPTMW01DW_061919	19 Jun 2019 09:50		25 Jun 2019 11:30	27 Jun 2019 18:00	1
HS19061083-04	18CPTMW01SW_061919	19 Jun 2019 10:40		25 Jun 2019 11:30	27 Jun 2019 18:02	1
HS19061083-05	18CPTMW04SW_061919	19 Jun 2019 11:35		25 Jun 2019 11:30	28 Jun 2019 15:05	1
HS19061083-05	18CPTMW04SW_061919	19 Jun 2019 11:35		25 Jun 2019 11:30	27 Jun 2019 18:05	1
HS19061083-07	MW1_061919	19 Jun 2019 13:15		25 Jun 2019 11:30	27 Jun 2019 18:07	1
Batch ID: 142429 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Groundwater	
HS19061083-01	MW2_061919	19 Jun 2019 08:55		25 Jun 2019 16:16	28 Jun 2019 16:20	20
HS19061083-02	MW2_061919_a	19 Jun 2019 08:55		25 Jun 2019 16:16	28 Jun 2019 16:41	20
HS19061083-03	18CPTMW01DW_061919	19 Jun 2019 09:50		25 Jun 2019 16:16	28 Jun 2019 00:21	1
HS19061083-04	18CPTMW01SW_061919	19 Jun 2019 10:40		25 Jun 2019 16:16	28 Jun 2019 00:42	1
HS19061083-05	18CPTMW04SW_061919	19 Jun 2019 11:35		25 Jun 2019 16:16	28 Jun 2019 01:03	1
HS19061083-06	18CPTMW04_061919	19 Jun 2019 12:25		25 Jun 2019 16:16	28 Jun 2019 17:01	5
Batch ID: R341546 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19061083-08	Trip Blank	19 Jun 2019 00:00			28 Jun 2019 12:25	1
Batch ID: R341546 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19061083-01	MW2_061919	19 Jun 2019 08:55			28 Jun 2019 15:37	5000
HS19061083-01	MW2_061919	19 Jun 2019 08:55			28 Jun 2019 14:01	50
HS19061083-02	MW2_061919_a	19 Jun 2019 08:55			28 Jun 2019 16:01	5000
HS19061083-02	MW2_061919_a	19 Jun 2019 08:55			28 Jun 2019 14:25	50
HS19061083-03	18CPTMW01DW_061919	19 Jun 2019 09:50			28 Jun 2019 18:48	1
HS19061083-04	18CPTMW01SW_061919	19 Jun 2019 10:40			28 Jun 2019 20:00	25
HS19061083-05	18CPTMW04SW_061919	19 Jun 2019 11:35			28 Jun 2019 19:12	1
HS19061083-06	18CPTMW04_061919	19 Jun 2019 12:25			28 Jun 2019 19:36	1
HS19061083-07	MW1_061919	19 Jun 2019 13:15			28 Jun 2019 20:24	20
Batch ID: R341659 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19061083-06	18CPTMW04_061919	19 Jun 2019 12:25			01 Jul 2019 16:01	10
HS19061083-07	MW1_061919	19 Jun 2019 13:15			01 Jul 2019 16:25	250

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R341906 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19061083-01	MW2_061919	19 Jun 2019 08:55			05 Jul 2019 14:42	1
HS19061083-02	MW2_061919_a	19 Jun 2019 08:55			05 Jul 2019 14:42	1
HS19061083-03	18CPTMW01DW_061919	19 Jun 2019 09:50			05 Jul 2019 14:42	1
HS19061083-04	18CPTMW01SW_061919	19 Jun 2019 10:40			05 Jul 2019 14:42	1
HS19061083-05	18CPTMW04SW_061919	19 Jun 2019 11:35			05 Jul 2019 14:42	1
HS19061083-06	18CPTMW04_061919	19 Jun 2019 12:25			05 Jul 2019 14:42	1
HS19061083-07	MW1_061919	19 Jun 2019 13:15			05 Jul 2019 14:42	1

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142417 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142417** Units: **mg/L** Analysis Date: **25-Jun-2019 14:58**
Client ID: Run ID: **HG03_341258** SeqNo: **5139847** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142417** Units: **mg/L** Analysis Date: **25-Jun-2019 15:02**
Client ID: Run ID: **HG03_341258** SeqNo: **5139848** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00502	0.000200	0.005	0	100	80 - 120				

MS Sample ID: **HS19060986-04MS** Units: **mg/L** Analysis Date: **25-Jun-2019 15:06**
Client ID: Run ID: **HG03_341258** SeqNo: **5139850** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000511	0.000000200	5e-006	0.0000000010	102	75 - 125				

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **25-Jun-2019 15:07**
Client ID: Run ID: **HG03_341258** SeqNo: **5139851** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000558	0.000000200	5e-006	0.0000000010	112	75 - 125	0.000005110	8.79	20	

The following samples were analyzed in this batch: HS19061083-03 HS19061083-04 HS19061083-05 HS19061083-07

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 17:22**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145221** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002457	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.001932	0.00500								J
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.02437	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.001051	0.00500								J
Zinc	0.00200	0.00500								U

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 16:58**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145214** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1091	0.0100	0.1	0	109	84 - 117				
Antimony	0.0559	0.00500	0.05	0	112	85 - 117				
Arsenic	0.05618	0.00500	0.05	0	112	84 - 116				
Barium	0.05364	0.00500	0.05	0	107	86 - 114				
Beryllium	0.05694	0.00200	0.05	0	114	83 - 121				
Cadmium	0.05632	0.00200	0.05	0	113	87 - 115				
Calcium	5.323	0.500	5	0	106	87 - 118				
Chromium	0.05591	0.00500	0.05	0	112	85 - 116				
Cobalt	0.05561	0.00500	0.05	0	111	86 - 115				
Copper	0.05732	0.00500	0.05	0	115	85 - 118				
Iron	5.504	0.200	5	0	110	87 - 118				
Lead	0.05401	0.00500	0.05	0	108	88 - 115				
Magnesium	5.42	0.200	5	0	108	83 - 118				
Manganese	0.05651	0.00500	0.05	0	113	87 - 115				
Nickel	0.05699	0.00500	0.05	0	114	85 - 117				
Potassium	5.366	0.200	5	0	107	87 - 115				
Selenium	0.05781	0.00500	0.05	0	116	80 - 120				
Silver	0.05393	0.00500	0.05	0	108	85 - 116				
Sodium	5.418	0.200	5	0	108	85 - 117				
Thallium	0.05098	0.00200	0.05	0	102	82 - 116				
Vanadium	0.05441	0.00500	0.05	0	109	86 - 115				
Zinc	0.05821	0.00500	0.05	0	116	83 - 119				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19060986-04MS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:03**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145217** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.116	0.0100	0.1	0.01515	101	84 - 117				
Antimony	0.05308	0.00500	0.05	0.000258	106	85 - 117				
Arsenic	0.05627	0.00500	0.05	0.002036	108	84 - 116				
Barium	0.8428	0.00500	0.05	0.8565	-27.4	86 - 114				SO
Beryllium	0.05294	0.00200	0.05	0.000048	106	83 - 121				
Cadmium	0.05116	0.00200	0.05	0.000205	102	87 - 115				
Calcium	35.9	0.500	5	33.03	57.3	87 - 118				SO
Chromium	0.3735	0.00500	0.05	0.2809	185	85 - 116				SO
Cobalt	0.0563	0.00500	0.05	0.005607	101	86 - 115				
Copper	0.058	0.00500	0.05	0.005199	106	85 - 118				
Iron	7.669	0.200	5	2.556	102	87 - 118				
Lead	0.05089	0.00500	0.05	0.000094	102	88 - 115				
Magnesium	31.26	0.200	5	27.76	69.9	83 - 118				SO
Manganese	0.2154	0.00500	0.05	0.164	103	87 - 115				
Nickel	0.2401	0.00500	0.05	0.2011	78.0	85 - 117				SO
Potassium	7.654	0.200	5	2.639	100	87 - 115				
Selenium	0.05384	0.00500	0.05	0.000343	107	80 - 120				
Silver	0.04654	0.00500	0.05	0.000013	93.1	85 - 116				
Sodium	233.3	0.200	5	245	-233	85 - 117				SEO
Thallium	0.04975	0.00200	0.05	0.000043	99.4	82 - 116				
Vanadium	0.0572	0.00500	0.05	0.003781	107	86 - 115				
Zinc	0.07874	0.00500	0.05	0.03582	85.8	83 - 119				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:05**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145218** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1062	0.0100	0.1	0.01515	91.1	84 - 117	0.116	8.82	20	
Antimony	0.04965	0.00500	0.05	0.000258	98.8	85 - 117	0.05308	6.66	20	
Arsenic	0.05281	0.00500	0.05	0.002036	102	84 - 116	0.05627	6.34	20	
Barium	0.8139	0.00500	0.05	0.8565	-85.2	86 - 114	0.8428	3.49	20	SO
Beryllium	0.05024	0.00200	0.05	0.000048	100	83 - 121	0.05294	5.24	20	
Cadmium	0.04833	0.00200	0.05	0.000205	96.2	87 - 115	0.05116	5.7	20	
Calcium	33.36	0.500	5	33.03	6.56	87 - 118	35.9	7.33	20	SO
Cobalt	0.0531	0.00500	0.05	0.005607	95.0	86 - 115	0.0563	5.85	20	
Copper	0.05342	0.00500	0.05	0.005199	96.4	85 - 118	0.058	8.23	20	
Iron	7.023	0.200	5	2.556	89.3	87 - 118	7.669	8.8	20	
Lead	0.04808	0.00500	0.05	0.000094	96.0	88 - 115	0.05089	5.67	20	
Magnesium	28.94	0.200	5	27.76	23.5	83 - 118	31.26	7.71	20	SO
Manganese	0.1904	0.00500	0.05	0.164	52.8	87 - 115	0.2154	12.4	20	S
Nickel	0.2255	0.00500	0.05	0.2011	48.7	85 - 117	0.2401	6.29	20	SO
Potassium	7.309	0.200	5	2.639	93.4	87 - 115	7.654	4.62	20	
Selenium	0.05051	0.00500	0.05	0.000343	100	80 - 120	0.05384	6.37	20	
Silver	0.04575	0.00500	0.05	0.000013	91.5	85 - 116	0.04654	1.71	20	
Sodium	224.6	0.200	5	245	-407	85 - 117	233.3	3.8	20	SEO
Thallium	0.04905	0.00200	0.05	0.000043	98.0	82 - 116	0.04975	1.42	20	
Vanadium	0.05284	0.00500	0.05	0.003781	98.1	86 - 115	0.0572	7.93	20	
Zinc	0.08005	0.00500	0.05	0.03582	88.5	83 - 119	0.07874	1.66	20	

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:07**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145651** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium	0.343	0.00500	0.05	0.2809	124	85 - 116	0.3735	8.51	20	SO

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:07**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145219** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1008	0.0100	0.1	0.01515	85.7	80 - 120				
Antimony	0.08752	0.00500	0.1	0.000258	87.3	80 - 120				
Arsenic	0.09313	0.00500	0.1	0.002036	91.1	80 - 120				
Beryllium	0.09784	0.00200	0.1	0.000048	97.8	80 - 120				
Cadmium	0.09096	0.00200	0.1	0.000205	90.8	80 - 120				
Cobalt	0.09093	0.00500	0.1	0.005607	85.3	80 - 120				
Copper	0.09101	0.00500	0.1	0.005199	85.8	80 - 120				
Iron	10.93	0.200	10	2.556	83.8	80 - 120				
Lead	0.09017	0.00500	0.1	0.000094	90.1	80 - 120				
Potassium	11.36	0.200	10	2.639	87.2	80 - 120				
Selenium	0.09025	0.00500	0.1	0.000343	89.9	80 - 120				
Silver	0.08464	0.00500	0.1	0.000013	84.6	80 - 120				
Thallium	0.08892	0.00200	0.1	0.000043	88.9	80 - 120				
Vanadium	0.09309	0.00500	0.1	0.003781	89.3	80 - 120				
Zinc	0.1183	0.00500	0.1	0.03582	82.5	80 - 120				

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **28-Jun-2019 15:14**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145655** PrepDate: **25-Jun-2019** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	1.703	0.0500	1	0.7	100	80 - 120				
Calcium	129.7	5.00	100	26.89	103	80 - 120				
Chromium	1.283	0.0500	1	0.2283	105	80 - 120				
Iron	107.4	2.00	100	2.151	105	80 - 120				
Magnesium	125.2	2.00	100	22.92	102	80 - 120				
Manganese	1.175	0.0500	1	0.1367	104	80 - 120				
Nickel	1.217	0.0500	1	0.1678	105	80 - 120				
Potassium	106.9	2.00	100	2.16	105	80 - 120				
Sodium	299.8	2.00	100	202.9	96.9	80 - 120				

Revision: 2

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ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:02**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145216** PrepDate: **25-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.01988	0.0500					0.01515	0	10	J
Antimony	0.00250	0.0250					0.000258	0	10	U
Arsenic	0.002183	0.0250					0.002036	0	10	J
Beryllium	0.00250	0.0100					0.000048	0	10	U
Cadmium	0.00250	0.0100					0.000205	0	10	U
Cobalt	0.004619	0.0250					0.005607	0	10	J
Copper	0.00500	0.0250					0.005199	0	10	U
Lead	0.00500	0.0250					0.000094	0	10	U
Selenium	0.0125	0.0250					0.000343	0	10	U
Silver	0.00250	0.0250					0.000013	0	10	U
Thallium	0.00250	0.0100					0.000043	0	10	U
Vanadium	0.01164	0.0250					0.003781	0	10	J
Zinc	0.038	0.0250					0.03582	6.07	10	

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145654** PrepDate: **25-Jun-2019** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.6998	0.250					0.7	0.0306	10	
Calcium	27.1	25.0					26.89	0.761	10	
Chromium	0.234	0.250					0.2283	0	10	J
Iron	2.19	10.0					2.151	0	10	J
Magnesium	22.74	10.0					22.92	0.776	10	
Manganese	0.1567	0.250					0.1367	0	10	J
Nickel	0.1736	0.250					0.1678	0	10	J
Potassium	2.068	10.0					2.16	0	10	J
Sodium	207.1	10.0					202.9	2.06	10	

The following samples were analyzed in this batch: HS19061083-03 HS19061083-04 HS19061083-05 HS19061083-07

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RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: 142429 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142429** Units: **ug/L** Analysis Date: **27-Jun-2019 21:35**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146405** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.0702*	*0*	*0.08*	*0*	*87.7*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.0811*	*0*	*0.08*	*0*	*101*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07172*	*0*	*0.08*	*0*	*89.6*	*40 - 140*				

LCS Sample ID: **LCS-142429** Units: **ug/L** Analysis Date: **27-Jun-2019 21:56**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146406** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.0905	0.010	0.08	0	113	40 - 140				
Surr: 2-Fluorobiphenyl	*0.07767*	*0*	*0.08*	*0*	*97.1*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.08433*	*0*	*0.08*	*0*	*105*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08991*	*0*	*0.08*	*0*	*112*	*40 - 140*				

LCSD Sample ID: **LCSD-142429** Units: **ug/L** Analysis Date: **27-Jun-2019 22:17**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146407** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.09101	0.010	0.08	0	114	40 - 140	0.0905	0.564	20	
Surr: 2-Fluorobiphenyl	*0.09652*	*0*	*0.08*	*0*	*121*	*40 - 140*	*0.07767*	*21.6*	*20*	R
Surr: 4-Terphenyl-d14	*0.09713*	*0*	*0.08*	*0*	*121*	*40 - 140*	*0.08433*	*14.1*	*20*	
Surr: Nitrobenzene-d5	*0.1084*	*0*	*0.08*	*0*	*135*	*40 - 140*	*0.08991*	*18.6*	*20*	

The following samples were analyzed in this batch: HS19061083-01 HS19061083-02 HS19061083-03 HS19061083-04 HS19061083-05 HS19061083-06

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RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 11:38**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146430** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

Revision: 2

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ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 11:38**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146430** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.64*	*1.0*	*50*	*0*	*93.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.03*	*1.0*	*50*	*0*	*90.1*	*85 - 114*				
Surr: Dibromofluoromethane	*44.27*	*1.0*	*50*	*0*	*88.5*	*80 - 119*				
Surr: Toluene-d8	*45.03*	*1.0*	*50*	*0*	*90.1*	*89 - 112*				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 10:50**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.71	1.0	20	0	93.5	78 - 124				
1,1,1-Trichloroethane	18.86	1.0	20	0	94.3	74 - 131				
1,1,2,2-Tetrachloroethane	21.83	1.0	20	0	109	71 - 121				
1,1,2-Trichloroethane	20.31	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.37	1.0	20	0	96.9	77 - 125				
1,1-Dichloroethene	19.49	1.0	20	0	97.5	71 - 131				
1,1-Dichloropropene	18.57	1.0	20	0	92.9	78 - 125				
1,2,3-Trichlorobenzene	27.19	1.0	20	0	136	69 - 129				S
1,2,3-Trichloropropane	22.5	1.0	20	0	113	73 - 122				
1,2,4-Trichlorobenzene	23.25	1.0	20	0	116	69 - 130				
1,2,4-Trimethylbenzene	18.63	1.0	20	0	93.2	76 - 124				
1,2-Dibromo-3-chloropropane	23.82	1.0	20	0	119	62 - 128				
1,2-Dibromoethane	20.03	1.0	20	0	100	77 - 121				
1,2-Dichlorobenzene	19.12	1.0	20	0	95.6	80 - 119				
1,2-Dichloroethane	18.81	1.0	20	0	94.1	73 - 128				
1,2-Dichloropropane	18.83	1.0	20	0	94.2	78 - 122				
1,3,5-Trimethylbenzene	17.9	1.0	20	0	89.5	75 - 124				
1,3-Dichlorobenzene	18.42	1.0	20	0	92.1	80 - 119				
1,3-Dichloropropane	20.28	1.0	20	0	101	80 - 119				
1,4-Dichlorobenzene	19.67	1.0	20	0	98.3	79 - 118				
2,2-Dichloropropane	19.99	1.0	20	0	99.9	60 - 139				
2-Butanone	49.3	2.0	40	0	123	56 - 143				
2-Chlorotoluene	19.48	1.0	20	0	97.4	79 - 122				
2-Hexanone	43.05	2.0	40	0	108	57 - 139				
4-Chlorotoluene	19.99	1.0	20	0	99.9	78 - 122				
4-Isopropyltoluene	17.77	1.0	20	0	88.9	77 - 127				
4-Methyl-2-pentanone	41.38	2.0	40	0	103	67 - 130				
Acetone	54.41	2.0	40	0	136	39 - 160				
Benzene	19.29	1.0	20	0	96.4	79 - 120				
Bromobenzene	18.42	1.0	20	0	92.1	80 - 120				
Bromochloromethane	18.67	1.0	20	0	93.3	78 - 123				
Bromodichloromethane	19.53	1.0	20	0	97.6	79 - 125				
Bromoform	20.73	1.0	20	0	104	66 - 130				
Bromomethane	22.75	1.0	20	0	114	53 - 141				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 10:50**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	37.03	2.0	40	0	92.6	64 - 133				
Carbon tetrachloride	18.08	1.0	20	0	90.4	72 - 136				
Chlorobenzene	18.69	1.0	20	0	93.5	82 - 118				
Chloroethane	20.86	1.0	20	0	104	60 - 138				
Chloroform	20.01	1.0	20	0	100	79 - 124				
Chloromethane	18.7	1.0	20	0	93.5	50 - 139				
cis-1,2-Dichloroethene	19.38	1.0	20	0	96.9	78 - 123				
cis-1,3-Dichloropropene	18.8	1.0	20	0	94.0	75 - 124				
Dibromochloromethane	19.26	1.0	20	0	96.3	74 - 126				
Dibromomethane	19.49	1.0	20	0	97.4	79 - 123				
Dichlorodifluoromethane	17.68	1.0	20	0	88.4	32 - 152				
Ethylbenzene	18.26	1.0	20	0	91.3	79 - 121				
Hexachlorobutadiene	21.78	1.0	20	0	109	66 - 134				
Isopropylbenzene	17.76	1.0	20	0	88.8	72 - 131				
m,p-Xylene	36.78	2.0	40	0	92.0	80 - 121				
Methylene chloride	19.74	2.0	20	0	98.7	74 - 124				
Naphthalene	25.7	1.0	20	0	128	61 - 128				S
n-Butylbenzene	17.78	1.0	20	0	88.9	75 - 128				
n-Propylbenzene	19.05	1.0	20	0	95.3	76 - 126				
o-Xylene	18.37	1.0	20	0	91.8	78 - 122				
sec-Butylbenzene	18.27	1.0	20	0	91.4	77 - 126				
Styrene	19.37	1.0	20	0	96.9	78 - 123				
tert-Butylbenzene	18.73	1.0	20	0	93.7	78 - 124				
Tetrachloroethene	17.11	1.0	20	0	85.5	74 - 129				
Toluene	18.5	1.0	20	0	92.5	80 - 121				
trans-1,2-Dichloroethene	19.5	1.0	20	0	97.5	75 - 124				
trans-1,3-Dichloropropene	19.19	1.0	20	0	96.0	73 - 127				
Trichloroethene	18.25	1.0	20	0	91.2	79 - 123				
Trichlorofluoromethane	18.83	1.0	20	0	94.1	65 - 141				
Vinyl chloride	18.93	1.0	20	0	94.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.6*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.75*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*51.89*	*1.0*	*50*	*0*	*104*	*80 - 119*				
Surr: Toluene-d8	*47.75*	*1.0*	*50*	*0*	*95.5*	*89 - 112*				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061157-02MS** Units: **UG/L** Analysis Date: **28-Jun-2019 14:49**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.73	1.0	20	0	88.6	78 - 124				
1,1,1-Trichloroethane	19.03	1.0	20	0	95.2	74 - 131				
1,1,2,2-Tetrachloroethane	20.66	1.0	20	0	103	71 - 121				
1,1,2-Trichloroethane	18.94	1.0	20	0	94.7	80 - 119				
1,1-Dichloroethane	17.57	1.0	20	0	87.9	77 - 125				
1,1-Dichloroethene	19.66	1.0	20	0	98.3	71 - 131				
1,1-Dichloropropene	19.33	1.0	20	0	96.6	78 - 125				
1,2,3-Trichlorobenzene	24.14	1.0	20	0	121	69 - 129				
1,2,3-Trichloropropane	20.5	1.0	20	0	102	73 - 122				
1,2,4-Trichlorobenzene	21.59	1.0	20	0	108	69 - 130				
1,2,4-Trimethylbenzene	18.47	1.0	20	0	92.3	76 - 124				
1,2-Dibromo-3-chloropropane	21.81	1.0	20	0	109	62 - 128				
1,2-Dibromoethane	17.9	1.0	20	0	89.5	77 - 121				
1,2-Dichlorobenzene	18.33	1.0	20	0	91.7	80 - 119				
1,2-Dichloroethane	17.43	1.0	20	0	87.1	73 - 128				
1,2-Dichloropropane	17.55	1.0	20	0	87.7	78 - 122				
1,3,5-Trimethylbenzene	18.27	1.0	20	0	91.4	75 - 124				
1,3-Dichlorobenzene	17.46	1.0	20	0	87.3	80 - 119				
1,3-Dichloropropane	18.65	1.0	20	0	93.2	80 - 119				
1,4-Dichlorobenzene	18.88	1.0	20	0	94.4	79 - 118				
2,2-Dichloropropane	18.91	1.0	20	0	94.5	60 - 139				
2-Butanone	42.59	2.0	40	0	106	56 - 143				
2-Chlorotoluene	19.4	1.0	20	0	97.0	79 - 122				
2-Hexanone	38.42	2.0	40	0	96.0	57 - 139				
4-Chlorotoluene	19.35	1.0	20	0	96.7	78 - 122				
4-Isopropyltoluene	19.33	1.0	20	0	96.6	77 - 127				
4-Methyl-2-pentanone	38.74	2.0	40	0	96.9	67 - 130				
Acetone	46.92	2.0	40	5.359	104	39 - 160				
Benzene	18.35	1.0	20	0	91.7	79 - 120				
Bromobenzene	16.8	1.0	20	0	84.0	80 - 120				
Bromochloromethane	16.09	1.0	20	0	80.4	78 - 123				
Bromodichloromethane	18.04	1.0	20	0	90.2	79 - 125				
Bromoform	18.53	1.0	20	0	92.6	66 - 130				
Bromomethane	13.53	1.0	20	0	67.6	53 - 141				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061157-02MS** Units: **UG/L** Analysis Date: **28-Jun-2019 14:49**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	34.31	2.0	40	0	85.8	64 - 133				
Carbon tetrachloride	19.13	1.0	20	0	95.6	72 - 136				
Chlorobenzene	17.61	1.0	20	0	88.1	82 - 118				
Chloroethane	20.41	1.0	20	0	102	60 - 138				
Chloroform	18.1	1.0	20	0	90.5	79 - 124				
Chloromethane	29.09	1.0	20	0	145	50 - 139				S
cis-1,2-Dichloroethene	19.95	1.0	20	0	99.8	78 - 123				
cis-1,3-Dichloropropene	17.23	1.0	20	0	86.1	75 - 124				
Dibromochloromethane	17.55	1.0	20	0	87.7	74 - 126				
Dibromomethane	17.65	1.0	20	0	88.3	79 - 123				
Dichlorodifluoromethane	18.02	1.0	20	0	90.1	32 - 152				
Ethylbenzene	18.28	1.0	20	0	91.4	79 - 121				
Hexachlorobutadiene	23.73	1.0	20	0	119	66 - 134				
Isopropylbenzene	18.91	1.0	20	0	94.5	72 - 131				
m,p-Xylene	37.07	2.0	40	0	92.7	80 - 121				
Methylene chloride	25.8	2.0	20	0	129	74 - 124				S
Naphthalene	23.22	1.0	20	0	116	61 - 128				
n-Butylbenzene	19.75	1.0	20	0	98.7	75 - 128				
n-Propylbenzene	20.08	1.0	20	0	100	76 - 126				
o-Xylene	17.73	1.0	20	0	88.6	78 - 122				
sec-Butylbenzene	20.67	1.0	20	0	103	77 - 126				
Styrene	18.57	1.0	20	0	92.9	78 - 123				
tert-Butylbenzene	20.06	1.0	20	0	100	78 - 124				
Tetrachloroethene	18.08	1.0	20	0	90.4	74 - 129				
Toluene	17.83	1.0	20	0	89.2	80 - 121				
trans-1,2-Dichloroethene	18.21	1.0	20	0	91.0	75 - 124				
trans-1,3-Dichloropropene	17.88	1.0	20	0	89.4	73 - 127				
Trichloroethene	17.77	1.0	20	0	88.9	79 - 123				
Trichlorofluoromethane	20.23	1.0	20	0	101	65 - 141				
Vinyl chloride	18.22	1.0	20	0	91.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.38*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.99*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*49.29*	*1.0*	*50*	*0*	*98.6*	*80 - 119*				
Surr: Toluene-d8	*48.04*	*1.0*	*50*	*0*	*96.1*	*89 - 112*				

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19061157-02MSD** Units: **UG/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146439** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.53	1.0	20	0	87.7	78 - 124	17.73	1.11	20	
1,1,1-Trichloroethane	18.55	1.0	20	0	92.7	74 - 131	19.03	2.57	20	
1,1,2,2-Tetrachloroethane	21.38	1.0	20	0	107	71 - 121	20.66	3.41	20	
1,1,2-Trichloroethane	19.17	1.0	20	0	95.9	80 - 119	18.94	1.26	20	
1,1-Dichloroethane	17.86	1.0	20	0	89.3	77 - 125	17.57	1.63	20	
1,1-Dichloroethene	19.11	1.0	20	0	95.5	71 - 131	19.66	2.85	20	
1,1-Dichloropropene	19.03	1.0	20	0	95.1	78 - 125	19.33	1.56	20	
1,2,3-Trichlorobenzene	25.23	1.0	20	0	126	69 - 129	24.14	4.4	20	
1,2,3-Trichloropropane	20.93	1.0	20	0	105	73 - 122	20.5	2.06	20	
1,2,4-Trichlorobenzene	21.92	1.0	20	0	110	69 - 130	21.59	1.52	20	
1,2,4-Trimethylbenzene	18.33	1.0	20	0	91.7	76 - 124	18.47	0.739	20	
1,2-Dibromo-3-chloropropane	22.89	1.0	20	0	114	62 - 128	21.81	4.81	20	
1,2-Dibromoethane	18.73	1.0	20	0	93.7	77 - 121	17.9	4.54	20	
1,2-Dichlorobenzene	18.43	1.0	20	0	92.1	80 - 119	18.33	0.521	20	
1,2-Dichloroethane	17.55	1.0	20	0	87.8	73 - 128	17.43	0.726	20	
1,2-Dichloropropane	17.93	1.0	20	0	89.7	78 - 122	17.55	2.16	20	
1,3,5-Trimethylbenzene	18.28	1.0	20	0	91.4	75 - 124	18.27	0.0341	20	
1,3-Dichlorobenzene	17.74	1.0	20	0	88.7	80 - 119	17.46	1.57	20	
1,3-Dichloropropane	19.01	1.0	20	0	95.1	80 - 119	18.65	1.93	20	
1,4-Dichlorobenzene	19.13	1.0	20	0	95.6	79 - 118	18.88	1.28	20	
2,2-Dichloropropane	18.53	1.0	20	0	92.6	60 - 139	18.91	2.03	20	
2-Butanone	44.5	2.0	40	0	111	56 - 143	42.59	4.39	20	
2-Chlorotoluene	19.45	1.0	20	0	97.2	79 - 122	19.4	0.245	20	
2-Hexanone	40.16	2.0	40	0	100	57 - 139	38.42	4.43	20	
4-Chlorotoluene	19.29	1.0	20	0	96.5	78 - 122	19.35	0.277	20	
4-Isopropyltoluene	19.26	1.0	20	0	96.3	77 - 127	19.33	0.313	20	
4-Methyl-2-pentanone	39.71	2.0	40	0	99.3	67 - 130	38.74	2.45	20	
Acetone	50.25	2.0	40	5.359	112	39 - 160	46.92	6.85	20	
Benzene	18.36	1.0	20	0	91.8	79 - 120	18.35	0.0865	20	
Bromobenzene	16.88	1.0	20	0	84.4	80 - 120	16.8	0.466	20	
Bromochloromethane	16.49	1.0	20	0	82.4	78 - 123	16.09	2.45	20	
Bromodichloromethane	18.36	1.0	20	0	91.8	79 - 125	18.04	1.78	20	
Bromoform	19.36	1.0	20	0	96.8	66 - 130	18.53	4.42	20	
Bromomethane	16.13	1.0	20	0	80.7	53 - 141	13.53	17.6	20	

Revision: 2

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061157-02MSD** Units: **UG/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146439** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.41	2.0	40	0	86.0	64 - 133	34.31	0.298	20	
Carbon tetrachloride	18.94	1.0	20	0	94.7	72 - 136	19.13	0.978	20	
Chlorobenzene	17.62	1.0	20	0	88.1	82 - 118	17.61	0.0136	20	
Chloroethane	18.76	1.0	20	0	93.8	60 - 138	20.41	8.41	20	
Chloroform	18.25	1.0	20	0	91.3	79 - 124	18.1	0.822	20	
Chloromethane	23.96	1.0	20	0	120	50 - 139	29.09	19.4	20	
cis-1,2-Dichloroethene	18.61	1.0	20	0	93.1	78 - 123	19.95	6.93	20	
cis-1,3-Dichloropropene	17.39	1.0	20	0	87.0	75 - 124	17.23	0.946	20	
Dibromochloromethane	18.07	1.0	20	0	90.3	74 - 126	17.55	2.93	20	
Dibromomethane	18.25	1.0	20	0	91.3	79 - 123	17.65	3.33	20	
Dichlorodifluoromethane	17.78	1.0	20	0	88.9	32 - 152	18.02	1.36	20	
Ethylbenzene	18.25	1.0	20	0	91.3	79 - 121	18.28	0.178	20	
Hexachlorobutadiene	23.8	1.0	20	0	119	66 - 134	23.73	0.3	20	
Isopropylbenzene	18.76	1.0	20	0	93.8	72 - 131	18.91	0.782	20	
m,p-Xylene	36.69	2.0	40	0	91.7	80 - 121	37.07	1.03	20	
Methylene chloride	20.47	2.0	20	0	102	74 - 124	25.8	23.1	20	R
Naphthalene	24.28	1.0	20	0	121	61 - 128	23.22	4.46	20	
n-Butylbenzene	20.17	1.0	20	0	101	75 - 128	19.75	2.1	20	
n-Propylbenzene	20.11	1.0	20	0	101	76 - 126	20.08	0.148	20	
o-Xylene	17.67	1.0	20	0	88.4	78 - 122	17.73	0.292	20	
sec-Butylbenzene	20.54	1.0	20	0	103	77 - 126	20.67	0.606	20	
Styrene	18.44	1.0	20	0	92.2	78 - 123	18.57	0.717	20	
tert-Butylbenzene	20.01	1.0	20	0	100	78 - 124	20.06	0.251	20	
Tetrachloroethene	18.05	1.0	20	0	90.2	74 - 129	18.08	0.156	20	
Toluene	17.82	1.0	20	0	89.1	80 - 121	17.83	0.055	20	
trans-1,2-Dichloroethene	18.18	1.0	20	0	90.9	75 - 124	18.21	0.146	20	
trans-1,3-Dichloropropene	18	1.0	20	0	90.0	73 - 127	17.88	0.68	20	
Trichloroethene	17.66	1.0	20	0	88.3	79 - 123	17.77	0.648	20	
Trichlorofluoromethane	19.72	1.0	20	0	98.6	65 - 141	20.23	2.53	20	
Vinyl chloride	17.84	1.0	20	0	89.2	58 - 137	18.22	2.1	20	
Surr: 1,2-Dichloroethane-d4	*51.79*	*1.0*	*50*	*0*	*104*	*81 - 118*	*50.38*	*2.77*	*20*	
Surr: 4-Bromofluorobenzene	*50.7*	*1.0*	*50*	*0*	*101*	*85 - 114*	*50.99*	*0.571*	*20*	
Surr: Dibromofluoromethane	*49.25*	*1.0*	*50*	*0*	*98.5*	*80 - 119*	*49.29*	*0.0914*	*20*	
Surr: Toluene-d8	*47.25*	*1.0*	*50*	*0*	*94.5*	*89 - 112*	*48.04*	*1.66*	*20*	

Revision: 2

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ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341546 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS19061083-01	HS19061083-02	HS19061083-03	HS19061083-04
HS19061083-05	HS19061083-06	HS19061083-07	HS19061083-08

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190701** Units: **UG/L** Analysis Date: **01-Jul-2019 13:13**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149141** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*50.46*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.58*	*1.0*	*50*	*0*	*95.2*	*85 - 114*				
Surr: Dibromofluoromethane	*47*	*1.0*	*50*	*0*	*94.0*	*80 - 119*				
Surr: Toluene-d8	*50.26*	*1.0*	*50*	*0*	*101*	*89 - 112*				

LCS Sample ID: **VLCSW-190701** Units: **UG/L** Analysis Date: **01-Jul-2019 12:25**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149140** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	19.73	1.0	20	0	98.7	79 - 123				
Surr: 1,2-Dichloroethane-d4	*56.59*	*1.0*	*50*	*0*	*113*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*54.46*	*1.0*	*50*	*0*	*109*	*85 - 114*				
Surr: Dibromofluoromethane	*54.8*	*1.0*	*50*	*0*	*110*	*80 - 119*				
Surr: Toluene-d8	*53.87*	*1.0*	*50*	*0*	*108*	*89 - 112*				

MS Sample ID: **HS19061210-04MS** Units: **UG/L** Analysis Date: **01-Jul-2019 15:13**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149146** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	17.51	1.0	20	0	87.5	79 - 123				
Surr: 1,2-Dichloroethane-d4	*49.83*	*1.0*	*50*	*0*	*99.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.6*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*47.78*	*1.0*	*50*	*0*	*95.6*	*80 - 119*				
Surr: Toluene-d8	*50.33*	*1.0*	*50*	*0*	*101*	*89 - 112*				

ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061083

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061210-04MSD** Units: **UG/L** Analysis Date: **01-Jul-2019 15:37**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149147** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Trichloroethene	17.2	1.0	20	0	86.0	79 - 123	17.51	1.78	20	
Surr: 1,2-Dichloroethane-d4	*50.94*	*1.0*	*50*	*0*	*102*	*81 - 118*	*49.83*	*2.21*	*20*	
Surr: 4-Bromofluorobenzene	*50.71*	*1.0*	*50*	*0*	*101*	*85 - 114*	*50.6*	*0.217*	*20*	
Surr: Dibromofluoromethane	*49.23*	*1.0*	*50*	*0*	*98.5*	*80 - 119*	*47.78*	*2.99*	*20*	
Surr: Toluene-d8	*50.46*	*1.0*	*50*	*0*	*101*	*89 - 112*	*50.33*	*0.265*	*20*	

The following samples were analyzed in this batch: HS19061083-06 HS19061083-07

Revision: 2

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ALS Houston, US Date: 11-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19061083**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

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ALS Houston, US Date: 11-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19061083
Date/Time Received: **20-Jun-2019 08:30**
Received by: **NDR**

Checklist completed by: *Paresh M. Giga* eSignature 20-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature 21-Jun-2019 Date

Matrices: **Groundwater/Water**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.0c U/C	IR11
Cooler(s)/Kit(s):	25093	
Date/Time sample(s) sent to storage:	6/20/19 17:05	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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bhate ENVIRONMENTAL CONSULTANTS ENGINEERS

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NW01312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE						Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
								Sample Analysis Requested (5)										Quality Assurance Samples (6)			
MW2_061919		19 Jun 2019	0855	-	N		WG	5	X	X		X									
MW2_061919_a		19 Jun 2019	0855	-	FD		WG	5	X	X		X									
18CPTMW01PW_061919		19 Jun 2019	0950	-	N		WG	6	X	X	X	X									
18CPTMW01SW_061919		19 Jun 2019	1040		N		WG	6	X	X	X	X									
18CPTMW04SW_061919		19 Jun 2019	1135		N		WG	6	X	X	X	X									
18CPTMW04_061919		19 Jun 2019	1225	-	N		WG	5	X	X		X									
MW1_061919		19 Jun 2019	1315	-	N		WG	5	X	X	X										
TRIP BLANK		19 Jun 2019		-	TB		W	2	X												
				-																	
				-																	
				-																	

HS19061083
Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS: ____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	6/19/19	1430	1. NA	6-2019	08:30
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill Number: ____

Analytical Lab: ALS 10450 Stancliff Rd, Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

Cooler # 25093

Temp 4°C
2.0

IR # 11 4/4 O

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00940662

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax: +1 281 530 5887

— 5093

CUSTODY SEAL

Date: 6/19/19 Time: 1430
Name: Scott Beesinger
Company: Bhate

Seal Broken By: SNJ
Date: 06/20/19

25093 JUN 20 2019

Must Deliver Next Business Day
Time and Tempature Sensitive!

25093

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202

MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 24MAY19
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656

REF: LHAAP/18/24 & SURFACE WATER - RJ

RMA:

FedEx Express

FedEx
TRK# 0221 4809 7834 3170

THU - 20 JUN 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US IAH

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1917698, 1917856, 1918052

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2266 (242597)

General Set Information: There were seventeen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 661480) was less than 1/2 the CRDL. The recovery for the LCS (661481) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on samples 1917698005/06 (Client ID: MW5_061819). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The parent sample and the MS/MSD were analyzed and reported from 1:1,000 dilutions. The effective spike target was 4,000.µg/L. The MS/MSD percent recoveries and relative percent difference were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 661478) is reported from the analysis of the Laboratory Control Sample (LCS – 661481) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafile 01JULD15.

Thomas Bosch July 5, 2019
Analyst Date

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ANALYTICAL REPORT
Amended-20190711

Report Date: July 11, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1917856**
Project ID: HS19061083
Purchase Order: HS19061083
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
MW2_061919	1917856001	06/19/19	06/21/19	
MW2_061919_a	1917856002	06/19/19	06/21/19	
18CPTMW01DW_061919	1917856003	06/19/19	06/21/19	
18CPTMW01SW_061919	1917856004	06/19/19	06/21/19	
18CPTMW04SW_061919	1917856005	06/19/19	06/21/19	
18CPTMW04_061919	1917856006	06/19/19	06/21/19	
MW1_061919	1917856007	06/19/19	06/21/19	

ANALYTICAL REPORT
Amended-20190711

Workorder: 34-1917856
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **MW2_061919** | Sampling Site: NA | Collected: 06/19/2019
Lab ID: 1917856001 | Media: 125 mL Nalgene | Received: 06/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 14:39 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **MW2_061919_a** | Sampling Site: NA | Collected: 06/19/2019
Lab ID: 1917856002 | Media: 125 mL Nalgene | Received: 06/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 15:07 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18CPTMW01DW_061919** | Sampling Site: NA | Collected: 06/19/2019
Lab ID: 1917856003 | Media: 125 mL Nalgene | Received: 06/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 11:52 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18CPTMW01SW_061919** | Sampling Site: NA | Collected: 06/19/2019
Lab ID: 1917856004 | Media: 125 mL Nalgene | Received: 06/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 12:06 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

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ANALYTICAL REPORT
Amended-20190711

Workorder: 34-1917856
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW04SW_061919** | Sampling Site: NA | Collected: 06/19/2019
Lab ID: 1917856005 | Media: 125 mL Nalgene | Received: 06/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 12:34 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18CPTMW04_061919** | Sampling Site: NA | Collected: 06/19/2019
Lab ID: 1917856006 | Media: 125 mL Nalgene | Received: 06/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 12:48 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**620**	100	200	400	100	

Sample ID: **MW1_061919** | Sampling Site: NA | Collected: 06/19/2019
Lab ID: 1917856007 | Media: 125 mL Nalgene | Received: 06/21/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 13:02 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**590**	100	200	400	100	

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 242597)**

The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/03/2019 09:40	/S/ Stephen Brose 07/05/2019 11:57

ANALYTICAL REPORT
Amended-20190711

Workorder: 34-1917856
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

ANALYTICAL REPORT
Amended-20190711

Workorder: 34-1917856
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1917856

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2266 (HBN: 242597)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 661480
Analyzed: 07/01/2019 09:16
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 661481
Analyzed: 07/01/2019 08:48
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.28	4.00	107	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1917698004	**MS:**	1917698005	**MSD:**	1917698006
Analyzed:	07/01/2019 10:12	**Analyzed:**	07/01/2019 10:28	**Analyzed:**	07/01/2019 10:43
Dilution:	1000	**Dilution:**	1000	**Dilution:**	1000
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	4400	8910	4000	113	78.8	123.8	8810	110	1.19	0.0	20.0

Comments

The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/03/2019 12:16	07/05/2019 11:57

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◓ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19061083	Split:	Workorder ID: 1917856	Level: ENV_LVL4
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly
Comments:			Preservatives: COOL

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	06/19/2019 08:55	MW2_061919	1917856001		Water	A	1	A
2	06/19/2019 08:55	MW2_061919_a	1917856002		Water	A	1	A
3	06/19/2019 09:50	18CPTMW01DW_061919	1917856003		Water	A	1	A
4	06/19/2019 10:40	18CPTMW015W_061919	1917856004		Water	A	1	A
5	06/19/2019 11:35	18CPTMW045W_061919	1917856005		Water	A	1	A
6	06/19/2019 12:25	18CPTMW04_061919	1917856006		Water	A	1	A
7	06/19/2019 13:15	MW1_061919	1917856007		Water	A	1	A
8								
9								
10								

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Werath, Julie	06/21/2019 09:45	ALS Sample Receiving	Sample Login
R-33.1	6/21/19 1430 6-27-16/12:20	EB T. Bush	Storage 6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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00940672

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **11643**

1917856

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19061083
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19061083-01**	**MW2_061919**	**Groundwater**	**19 Jun 2019 08:55**
	SUB_Perch-6850			28 Jun 2019
2.	**HS19061083-02**	**MW2_061919_a**	**Groundwater**	**19 Jun 2019 08:55**
	SUB_Perch-6850			28 Jun 2019
3.	**HS19061083-03**	**18CPTMW01DW_061919**	**Groundwater**	**19 Jun 2019 09:50**
	SUB_Perch-6850			28 Jun 2019
4.	**HS19061083-04**	**18CPTMW015W_061919**	**Groundwater**	**19 Jun 2019 10:40**
	SUB_Perch-6850			28 Jun 2019
5.	**HS19061083-05**	**18CPTMW045W_061919**	**Groundwater**	**19 Jun 2019 11:35**
	SUB_Perch-6850			28 Jun 2019
6.	**HS19061083-06**	**18CPTMW04_061919**	**Groundwater**	**19 Jun 2019 12:25**
	SUB_Perch-6850			28 Jun 2019
7.	**HS19061083-07**	**MW1_061919**	**Groundwater**	**19 Jun 2019 13:15**
	SUB_Perch-6850			28 Jun 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

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Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11643**

QC Level: DOD IV (DoD Data Package)

Relinquished By:		Date/Time:	6/20/19 1800.
Received By:	Meredith Allen	Date/Time:	6/21/2019 945
Cooler ID(s):	07714	Temperature(s):	3°

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19061083	Split:	Workorder ID: 1917856	Level: ENV_LVL4
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly
Comments:			Preservatives: COOL

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	06/19/2019 08:55	MW2_061919	1917856001		Water	A	1	A
2	06/19/2019 08:55	MW2_061919_a	1917856002		Water	A	1	A
3	06/19/2019 09:50	18CPTMW01DW_061919	1917856003		Water	A	1	A
4	06/19/2019 10:40	18CPTMW015W_061919	1917856004		Water	A	1	A
5	06/19/2019 11:35	18CPTMW045W_061919	1917856005		Water	A	1	A
6	06/19/2019 12:25	18CPTMW04_061919	1917856006		Water	A	1	A
7	06/19/2019 13:15	MW1_061919	1917856007		Water	A	1	A
8								
9								
10								

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	06/21/2019 09:45	ALS Sample Receiving	Sample Login
R-33.1	6/21/19 1430 6-27-16/12:20	EB T. Bush	Storage 6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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00940675

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 1907856

Date/Time of Receipt: 6/21/2024 945

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 97/6	3 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Meredith Edens (Signature) Meredith Edens (Printed Name) 6/21/2024 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018

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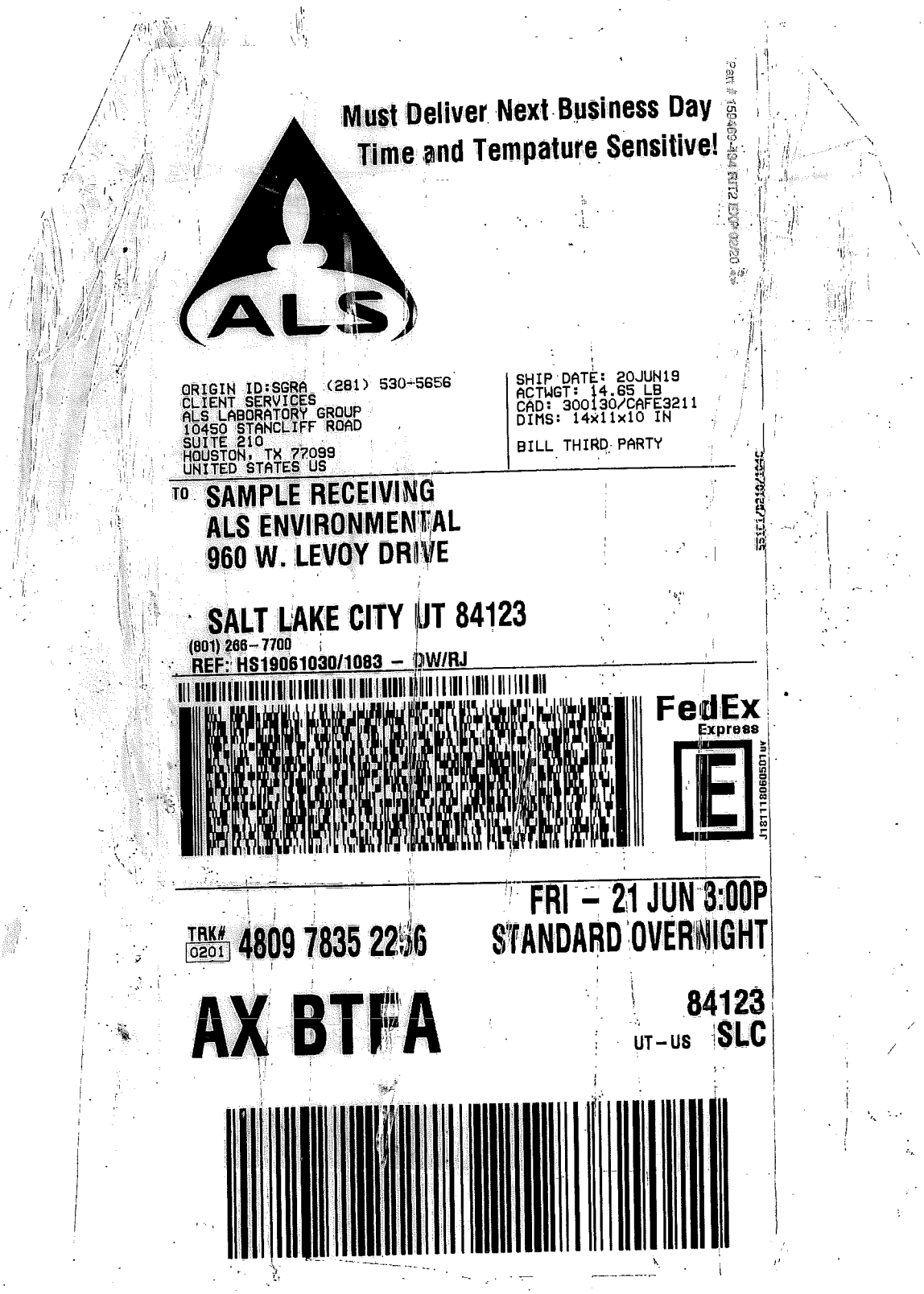

Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 20JUN19
ACTWGT: 14.65 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19061030/1083 - DW/RJ

FedEx Express

FRI - 21 JUN 3:00P
STANDARD OVERNIGHT

TRK# 0201 4809 7835 22[illegible]6

AX BTFA

84123
UT-US SLC

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Batch Worklist

Batch: ELMS/ 2266 **Created:** 7/1/2019 08:25 **Instrument:** LCMS04 **HBN:** 242597
Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1917698 [ENV_LVL4]
Workorder: 1917856 [ENV_LVL4]
Workorder: 1918052 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	661477	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019
2	661481	LCS for HBN 242597 [ELMS/2266]				LCS	3		E6850Q413Q	5311		7/3/2019	7/1/2019
3	661479	ICS for HBN 242597 [ELMS/2266]				ICS	3		E6850..D3Q	5311		7/3/2019	7/1/2019
4	661480	LMB for HBN 242597 [ELMS/2266]				LMB	3		E6850Q413Q	5311		7/3/2019	7/1/2019
5	1917698001	18CPTMW08SW_061819				SAMPLE	3	1917698001-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
6	1917698002	MW5_061819				SAMPLE	3	1917698002-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
7	1917698004	MW6_061819				SAMPLE	3	1917698004-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
8	1917698005	MW6_061819MS				MS	3	1917698005-A	E6850Q413Q	5480		7/3/2019	7/1/2019
9	1917698006	MW6_061819MSD				MSD	3	1917698006-A	E6850Q413Q	5480		7/3/2019	7/1/2019
10	1917698007	109_061819				SAMPLE	3	1917698007-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
13	1917856003	18CPTMW01DW_061919				SAMPLE	3	1917856003-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
14	1917856004	18CPTMW015W_061919				SAMPLE	3	1917856004-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
15	661482	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019
16	1917856005	18CPTMW045W_061919				SAMPLE	3	1917856005-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
17	1917856006	18CPTMW04_061919				SAMPLE	3	1917856006-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
18	1917856007	MW1_061919				SAMPLE	3	1917856007-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
19	1918052001	120_062019				SAMPLE	3	1918052001-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
20	1918052002	MW14_062019				SAMPLE	3	1918052002-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
21	1918052003	MW14_062019_a				SAMPLE	3	1918052003-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
22	1918052004	MW12_062019				SAMPLE	3	1918052004-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
23	1917698003	19CPTMW08DW_061819				SAMPLE	3	1917698003-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
24	1917698008	MW21_061819				SAMPLE	3	1917698008-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
25	1917856001	MW2_061919				SAMPLE	3	1917856001-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
26	661483	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019
27	1917856002	MW2_061919_a				SAMPLE	3	1917856002-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
28	661478	RLVS for HBN 242597 [ELMS/2266				RLVS	3		E685041C3Q	5311		7/3/2019	7/1/2019
29	661661	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019

RIGHT SOLUTIONS | RIGHT PARTNER

00940678

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Work Order #'s & Sample #( )'s: 1917698 (001-08), 1917856 (001-07), 1918052 (001-04)
ELMS Batch/HBN ID: 2266 (242597)
Prep Date: 06/27/2019 Analysis Date: 07/01/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\01JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 661481; Target = 4.0µg/L. ASTM type II water was used for LMB 661480.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on samples 1917698005/06 (Client ID: MW6_061819). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L. The parent sample and the MS/MSD were analyzed and reported from 1:1,000 dilutions. The effective spike target was 4,000.µg/L.

COMMENTS:

1) Results reported in µg/L. The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\242597-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 661478) is reported from the analysis of the Laboratory Control Sample (LCS – 661481) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 01JULD15.

RIGHT SOLUTIONS | RIGHT PARTNER

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2266 HBN: 242597 Sample Set IDs if Applicable: 1917698/1917856/1918052	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT	Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ANAB ACCREDITED

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

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Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

Page 1 of 1

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

OR-ORG/INO-001
Rev. 5/18

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Report: C:\HPCHEM\1\DATA\01JUL19D\01JUL19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	661477 CCV@25	Vial 71	1	Control	1	1.94364e6	8.502	26.12624
*	661481 QC@4.0	Vial 72	1	Control	2	3.56116e5	8.215	4.27672
*	661479 ICS@4.0	Vial 73	1	Control	3	2.74101e5	8.013	3.76269
*	661480 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917698001 1K	Vial 75	1	Sample	5	1.80575e6	8.547	2.30697e4
*	1917698002 1K	Vial 76	1	Sample	6	2.06010e6	8.593	2.58627e4
*	1917698004 1K	Vial 78	1	Sample	8	3.25841e5	8.618	4410.00331
*	1917698005 MS	Vial 79	1	Sample	9	6.67091e5	8.655	8914.28717
*	1917698006 MSD	Vial 80	1	Sample	10	6.51482e5	8.597	8808.96977
*	1917698007 1K	Vial 81	1	Sample	11	7.47888e5	8.647	1.04112e4
*	1917856001	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1917856002	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1917856003	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1917856004	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	661482 CCV@25	Vial 71	1	Control	17	1.60409e6	8.558	25.00349
*	1917856005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917856006 100	Vial 88	1	Sample	19	4.03838e5	8.639	621.06433
*	1917856007 100	Vial 89	1	Sample	20	4.34274e5	8.657	588.15812
*	1918052001 1K	Vial 90	1	Sample	21	9.58579e5	8.665	1.34755e4
*	1918052002 10K	Vial 91	1	Sample	22	1.70174e6	8.689	2.36511e5
*	1918052003 10K	Vial 92	1	Sample	23	1.68203e6	8.679	2.30798e5
*	1918052004	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	1917698003 100	Vial 94	1	Sample	25	3.02113e6	8.615	4300.62656
*	1917698008 1K	Vial 95	1	Sample	26	1.64048e6	8.691	2.37316e4
*	1917856001 RE	Vial 83	1	Sample	27	0.00000	0.000	0.00000
*	661483 CCV@25	Vial 71	1	Control	28	1.50603e6	8.597	25.41985
*	1917856002 RE	Vial 84	1	Sample	29	0.00000	0.000	0.00000
*	661661 CCV@25	Vial 71	1	Control	30	1.45949e6	8.576	25.10137

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	661477 CCV@25	Vial 71	1	Control	1	5.88479e5	8.517	26.62967
*	661481 QC@4.0	Vial 72	1	Control	2	1.16200e5	8.258	4.54646
*	661479 ICS@4.0	Vial 73	1	Control	3	8.51455e4	8.028	3.78922
*	661480 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917698001 1K	Vial 75	1	Sample	5	5.48648e5	8.553	2.35743e4
*	1917698002 1K	Vial 76	1	Sample	6	6.20226e5	8.595	2.62187e4
*	1917698004 1K	Vial 78	1	Sample	8	1.08064e5	8.621	4769.85352
*	1917698005 MS	Vial 79	1	Sample	9	2.16450e5	8.652	9609.46002
*	1917698006 MSD	Vial 80	1	Sample	10	2.06556e5	8.628	9281.28672
*	1917698007 1K	Vial 81	1	Sample	11	2.34170e5	8.675	1.08652e4
*	1917856001	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1917856002	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1917856003	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1917856004	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	661482 CCV@25	Vial 71	1	Control	17	4.85334e5	8.571	25.46167
*	1917856005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917856006 100	Vial 88	1	Sample	19	1.32726e5	8.663	672.87107
*	1917856007 100	Vial 89	1	Sample	20	1.40119e5	8.663	624.82071
*	1918052001 1K	Vial 90	1	Sample	21	2.95207e5	8.681	1.38848e4
*	1918052002 10K	Vial 91	1	Sample	22	5.16167e5	8.701	2.41334e5
*	1918052003 10K	Vial 92	1	Sample	23	5.17000e5	8.701	2.38460e5
*	1918052004	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	1917698003 100	Vial 94	1	Sample	25	8.88076e5	8.626	4275.40488
*	1917698008 1K	Vial 95	1	Sample	26	4.99687e5	8.711	2.43133e4
*	1917856001 RE	Vial 83	1	Sample	27	0.00000	0.000	0.00000
*	661483 CCV@25	Vial 71	1	Control	28	4.53099e5	8.615	25.74994
*	1917856002 RE	Vial 84	1	Sample	29	0.00000	0.000	0.00000
*	661661 CCV@25	Vial 71	1	Control	30	4.45116e5	8.600	25.75597

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Batch Report: C:\HPCHEM\1\DATA\01JUL19D\01JUL19S.B

#	*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
	*	661477 CCV@25	Vial 71	1	Control	1	2.25730e5	8.518	5.00000
	*	661481 QC@4.0	Vial 72	1	Control	2	2.73485e5	8.237	5.00000
	*	661479 ICS@4.0	Vial 73	1	Control	3	2.40789e5	8.048	5.00000
	*	661480 LMB	Vial 74	1	Control	4	2.63576e5	8.496	5.00000
	*	1917698001 1K	Vial 75	1	Sample	5	2.39255e5	8.564	5000.00000
	*	1917698002 1K	Vial 76	1	Sample	6	2.41844e5	8.612	5000.00000
	*	1917698004 1K	Vial 78	1	Sample	8	2.42320e5	8.640	5000.00000
	*	1917698005 MS	Vial 79	1	Sample	9	2.38518e5	8.669	5000.00000
	*	1917698006 MSD	Vial 80	1	Sample	10	2.35827e5	8.629	5000.00000
	*	1917698007 1K	Vial 81	1	Sample	11	2.27615e5	8.679	5000.00000
	*	1917856001	Vial 83	1	Sample	13	9.31342e4	7.613	5.00000
	*	1917856002	Vial 84	1	Sample	14	8.79498e4	7.621	5.00000
	*	1917856003	Vial 85	1	Sample	15	2.30973e5	7.860	5.00000
	*	1917856004	Vial 86	1	Sample	16	2.08544e5	7.904	5.00000
	*	661482 CCV@25	Vial 71	1	Control	17	1.95182e5	8.589	5.00000
	*	1917856005	Vial 87	1	Sample	18	2.92027e5	7.936	5.00000
	*	1917856006 100	Vial 88	1	Sample	19	2.10142e5	8.654	500.00000
	*	1917856007 100	Vial 89	1	Sample	20	2.39145e5	8.684	500.00000
	*	1918052001 1K	Vial 90	1	Sample	21	2.23102e5	8.672	5000.00000
	*	1918052002 10K	Vial 91	1	Sample	22	2.19618e5	8.709	5.00000e4
	*	1918052003 10K	Vial 92	1	Sample	23	2.22758e5	8.695	5.00000e4
	*	1918052004	Vial 93	1	Sample	24	1.88746e5	7.876	5.00000
	*	1917698003 100	Vial 94	1	Sample	25	2.05249e5	8.640	500.00000
	*	1917698008 1K	Vial 95	1	Sample	26	2.10954e5	8.695	5000.00000
	*	1917856001 RE	Vial 83	1	Sample	27	1.44962e5	7.630	5.00000
	*	661483 CCV@25	Vial 71	1	Control	28	1.80070e5	8.618	5.00000
	*	1917856002 RE	Vial 84	1	Sample	29	1.42651e5	7.637	5.00000
	*	661661 CCV@25	Vial 71	1	Control	30	1.76854e5	8.601	5.00000

*** End of Report ***

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Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	661477 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	661481 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	661479 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	661480 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1917698001 1K	CLO4-AQN	1	Sample		
6	Vial 76	1917698002 1K	CLO4-AQN	1	Sample		
7	Vial 77	1917698003 1K	CLO4-AQN	1	Sample		
8	Vial 78	1917698004 1K	CLO4-AQN	1	Sample		
9	Vial 79	1917698005 MS	CLO4-AQN	1	Sample		
10	Vial 80	1917698006 MSD	CLO4-AQN	1	Sample		
11	Vial 81	1917698007 1K	CLO4-AQN	1	Sample		
12	Vial 82	1917698008 10K	CLO4-AQN	1	Sample		
13	Vial 83	1917856001	CLO4-AQN	1	Sample		
14	Vial 84	1917856002	CLO4-AQN	1	Sample		
15	Vial 85	1917856003	CLO4-AQN	1	Sample		
16	Vial 86	1917856004	CLO4-AQN	1	Sample		
17	Vial 71	661482 CCV@25	CLO4-AQN	1	Ctrl Samp		
18	Vial 87	1917856005	CLO4-AQN	1	Sample		
19	Vial 88	1917856006 100	CLO4-AQN	1	Sample		
20	Vial 89	1917856007 100	CLO4-AQN	1	Sample		
21	Vial 90	1918052001 1K	CLO4-AQN	1	Sample		
22	Vial 91	1918052002 10K	CLO4-AQN	1	Sample		
23	Vial 92	1918052003 10K	CLO4-AQN	1	Sample		
24	Vial 93	1918052004	CLO4-AQN	1	Sample		
25	Vial 94	1917698003 100	CLO4-AQN	1	Sample		
26	Vial 95	1917698008 1K	CLO4-AQN	1	Sample		
27	Vial 83	1917856001 RE	CLO4-AQN	1	Sample		
28	Vial 71	661483 CCV@25	CLO4-AQN	1	Ctrl Samp		
29	Vial 84	1917856002 RE	CLO4-AQN	1	Sample		
30	Vial 71	661661 CCV@25	CLO4-AQN	1	Ctrl Samp		

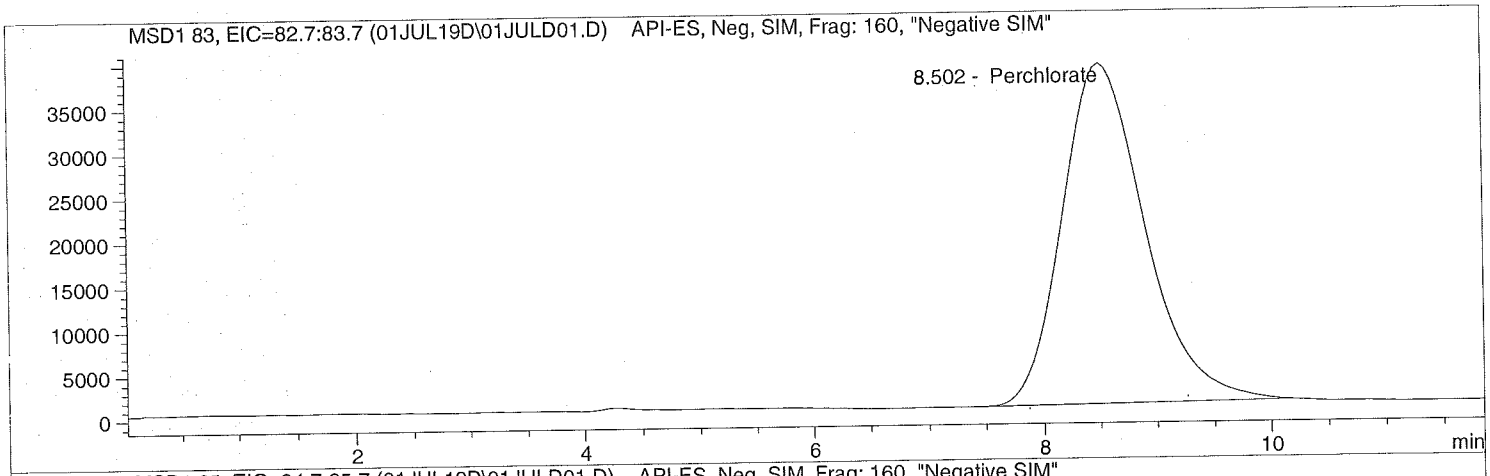
RIGHT SOLUTIONS | RIGHT PARTNER

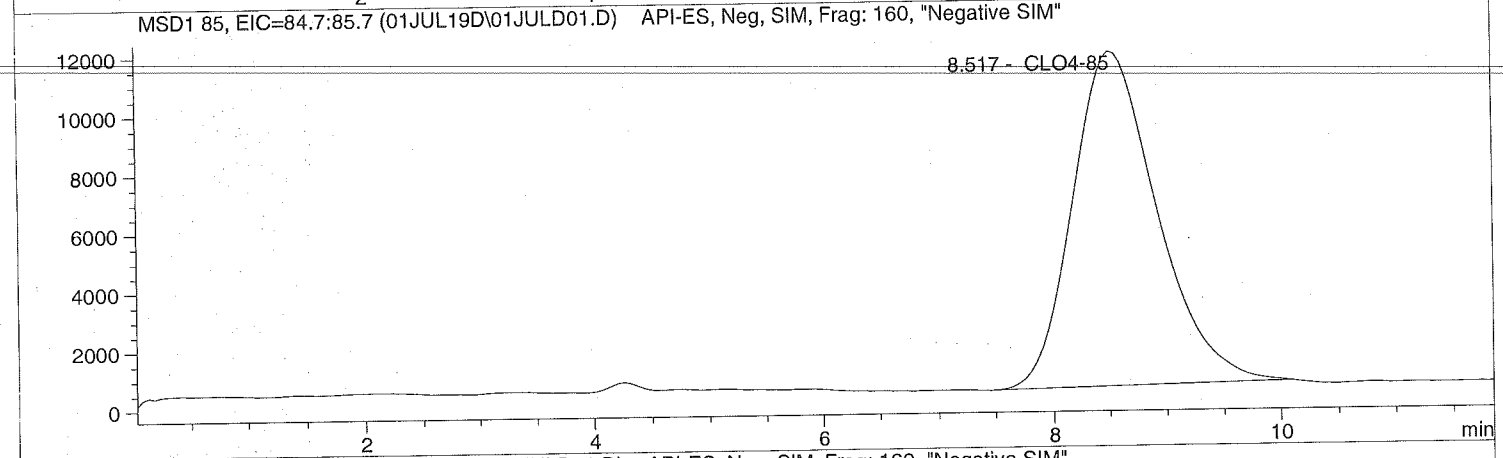
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD01.D Sample Name: 661477 CCV@25

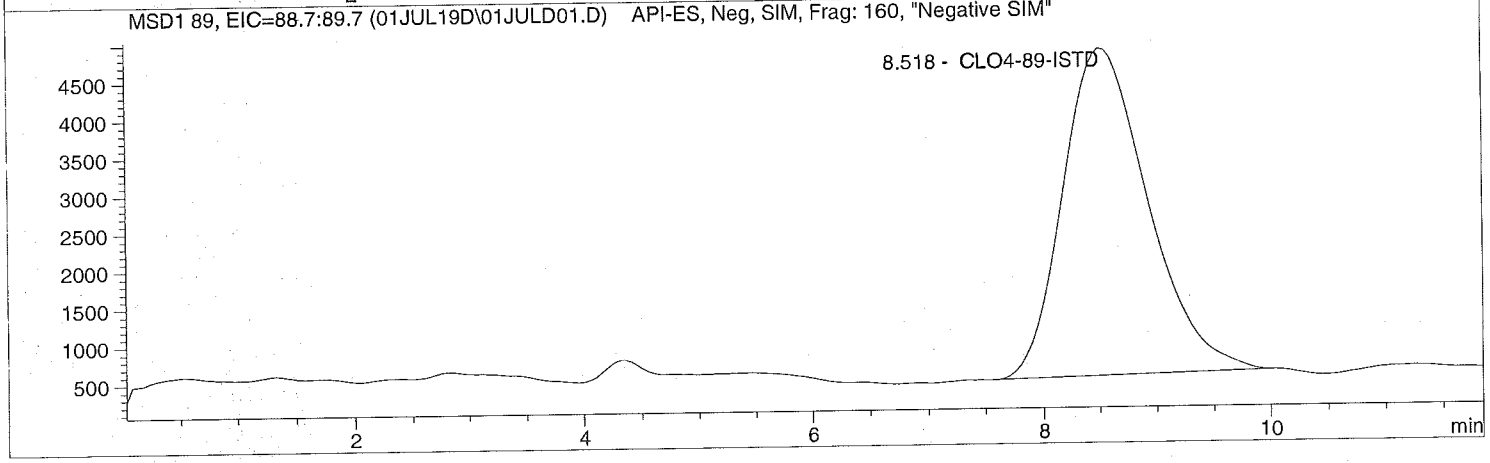
Injection Date:	7/01/2019 08:34:23	Seq Line:	1
Sample Name:	661477 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD01.D Sample Name: 661477 CCV@25

Injection Date:	7/01/2019 08:34:23	Seq Line:	1
Sample Name:	661477 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	PBA	1943636.6	26.1262	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.517	PBA	588479.1	26.6297	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.518	PBA	225730.5	5.0000	CLO4-89-ISTD

*** End of Report ***

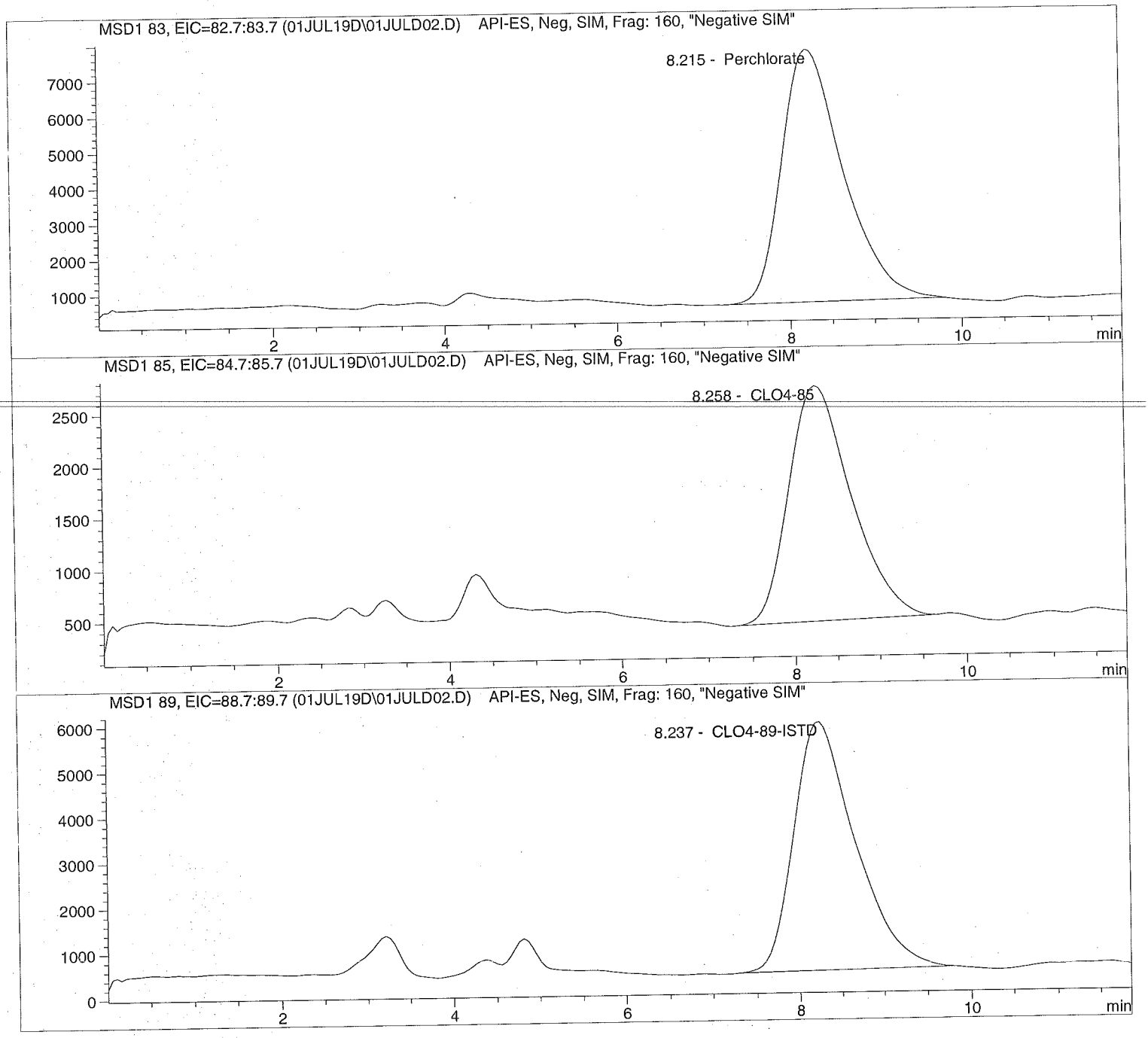
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD02.D Sample Name: 661481 QC@4.0

Injection Date:	7/01/2019 08:48:56	Seq Line:	2
Sample Name:	661481 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD02.D Sample Name: 661481 QC@4.0

Injection Date:	7/01/2019 08:48:56	Seq Line:	2
Sample Name:	661481 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.215	PBA	356116.2	4.2767	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.258	PBA	116199.5	4.5465	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.237	PBA	273484.5	5.0000	CLO4-89-ISTD

*** End of Report ***

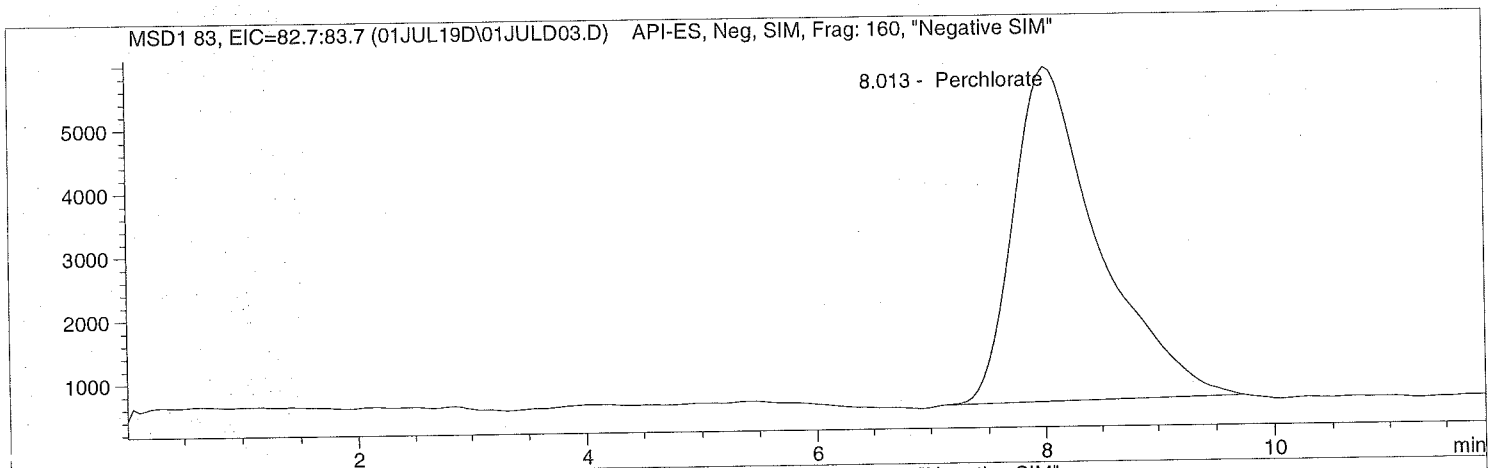
RIGHT SOLUTIONS | RIGHT PARTNER

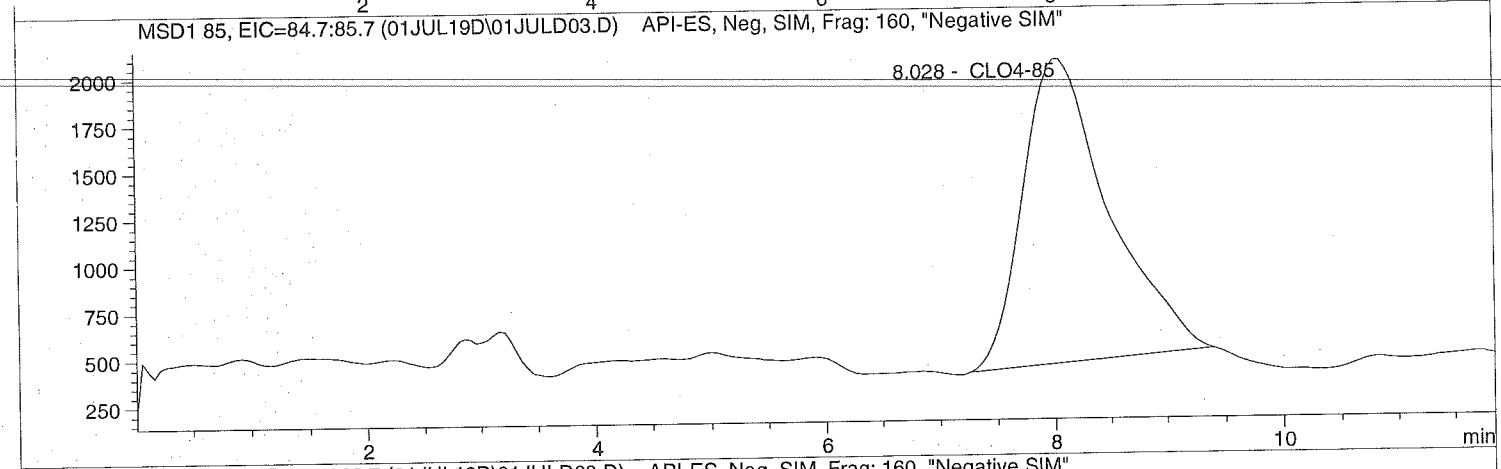
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD03.D Sample Name: 661479 ICS@4.0

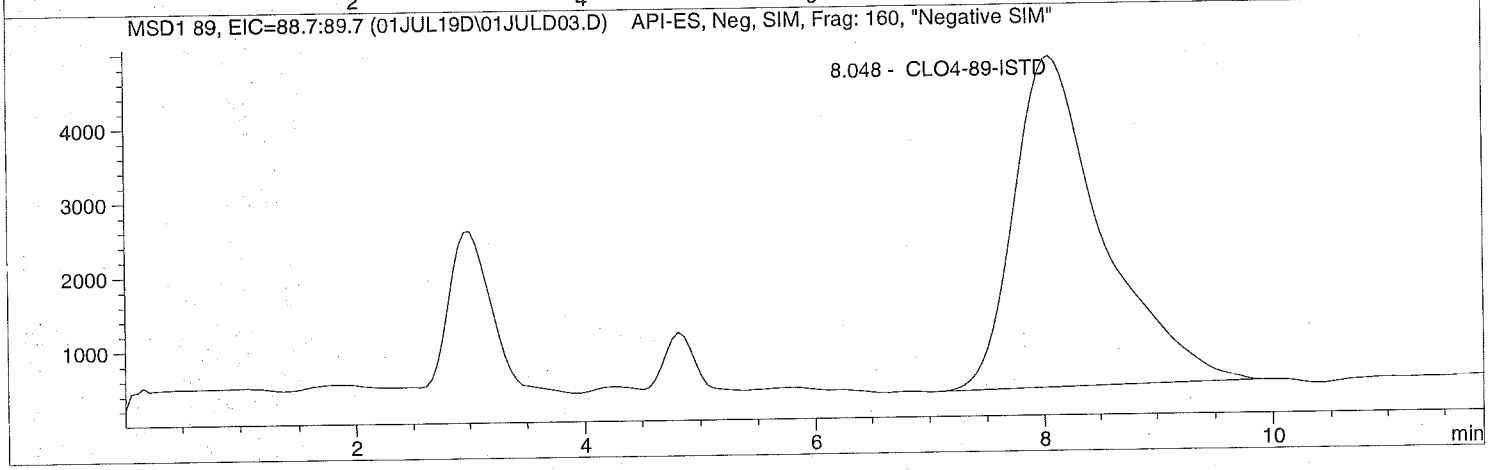
Injection Date:	7/01/2019 09:02:47	Seq Line:	3
Sample Name:	661479 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD03.D Sample Name: 661479 ICS@4.0

Injection Date:	7/01/2019 09:02:47	Seq Line:	3
Sample Name:	661479 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.013	BBA	274101.4	3.7627	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.028	PBA	85145.5	3.7892	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.048	PBA	240788.6	5.0000	CLO4-89-ISTD

*** End of Report ***

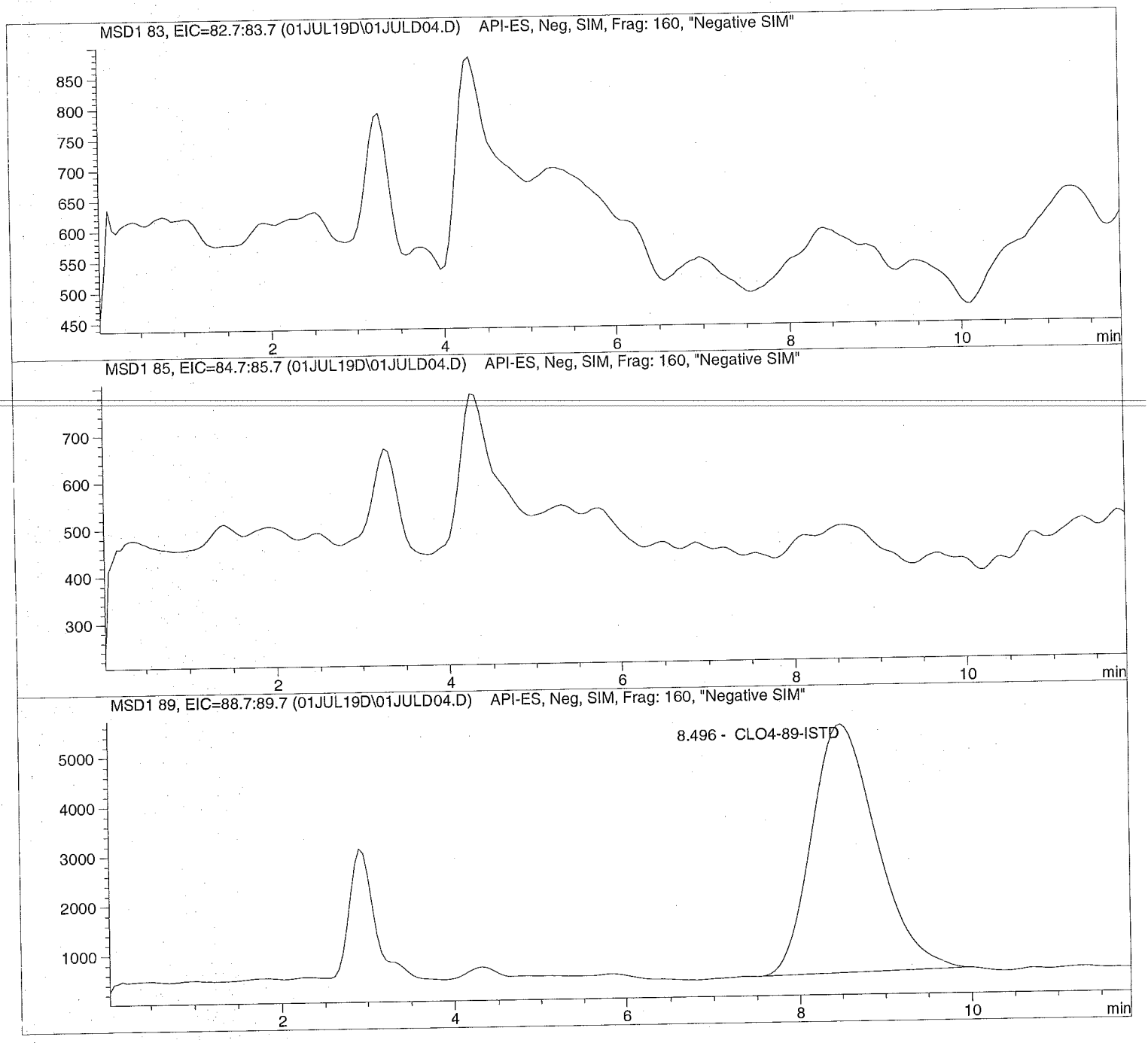
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD04.D Sample Name: 661480 LMB

Injection Date:	7/01/2019 09:16:47	Seq Line:	4
Sample Name:	661480 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD04.D Sample Name: 661480 LMB

Injection Date:	7/01/2019 09:16:47	Seq Line:	4
Sample Name:	661480 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.496	PBA	263576.3	5.0000	CLO4-89-ISTD

*** End of Report ***

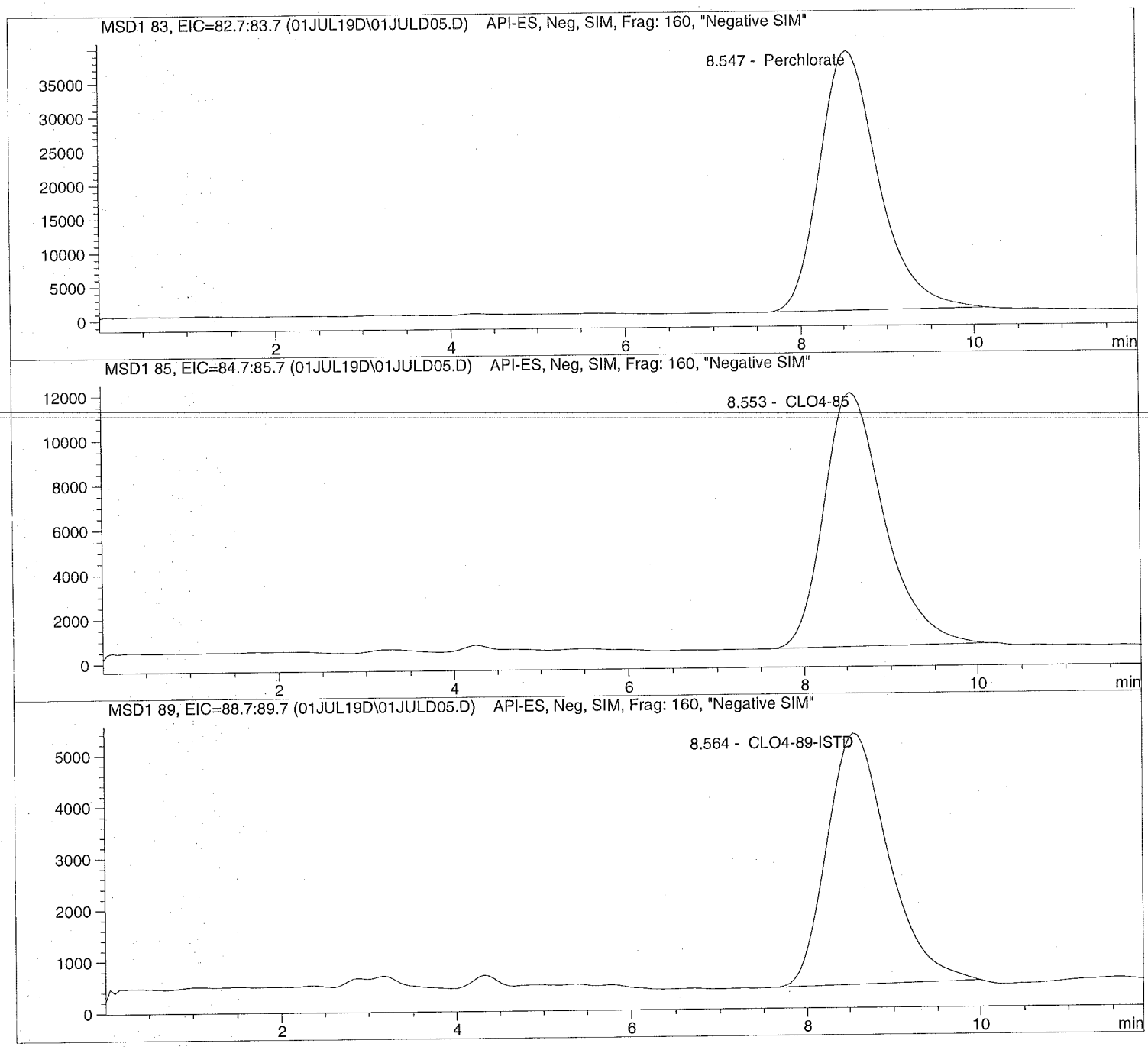
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD05.D Sample Name: 1917698001 1K

Injection Date:	7/01/2019 09:30:40	Seq Line:	5
Sample Name:	1917698001 1K	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD05.D Sample Name: 1917698001 1K

Injection Date:	7/01/2019 09:30:40	Seq Line:	5
Sample Name:	1917698001 1K	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.547	PBA	1805754.9	23069.7173	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.553	PBA	548647.9	23574.3344	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.564	PBA	239254.8	5000.0000	CLO4-89-ISTD

*** End of Report ***

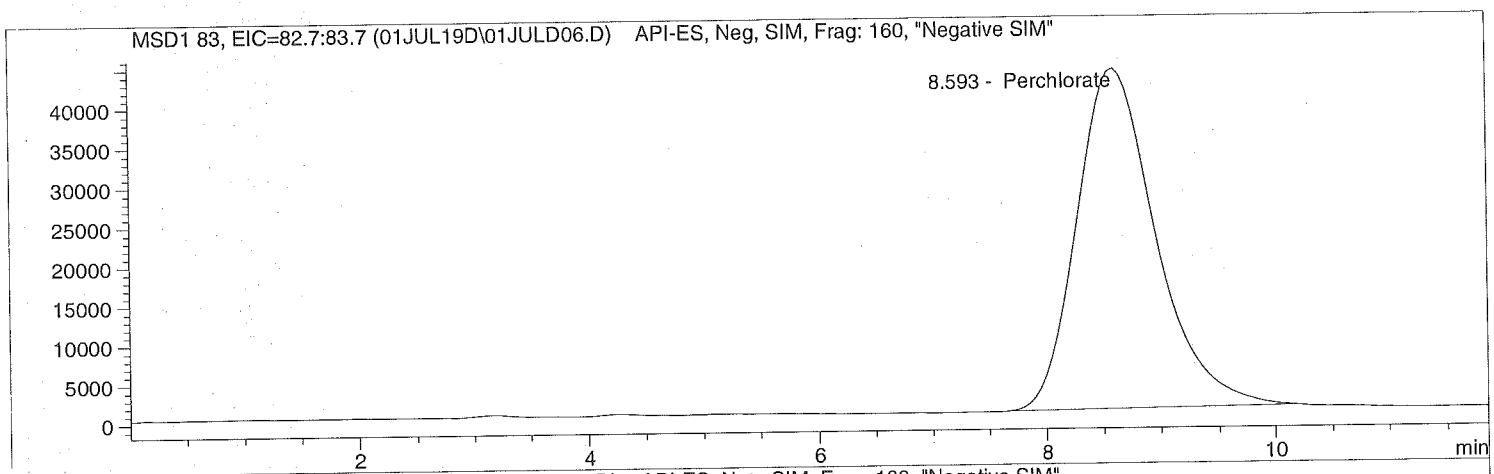
RIGHT SOLUTIONS | RIGHT PARTNER

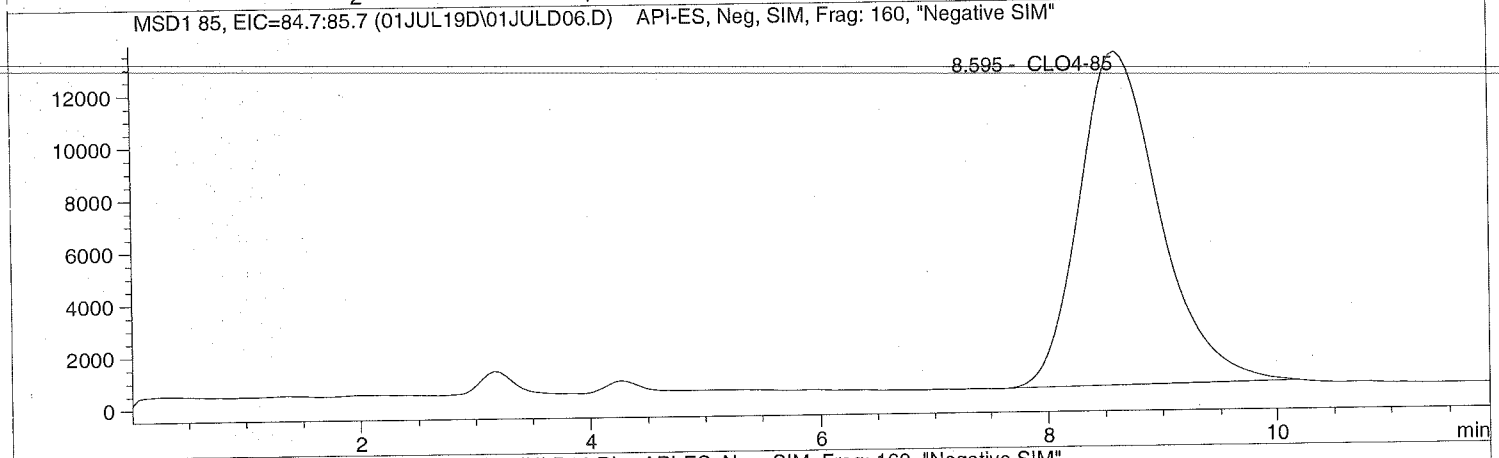
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD06.D Sample Name: 1917698002 1K

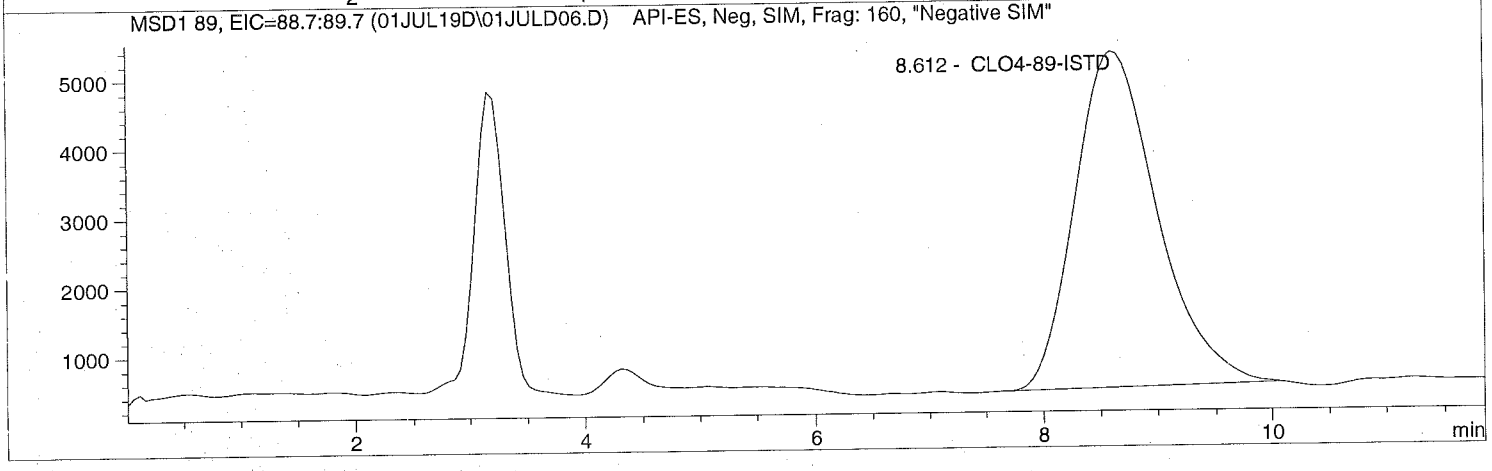
Injection Date:	7/01/2019 09:44:35	Seq Line:	6
Sample Name:	1917698002 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD06.D Sample Name: 1917698002 1K

Injection Date:	7/01/2019 09:44:35	Seq Line:	6
Sample Name:	1917698002 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.593	PBA	2060095.9	25862.7348	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.595	PBA	620225.7	26218.7320	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.612	PBA	241844.5	5000.0000	CLO4-89-ISTD

*** End of Report ***

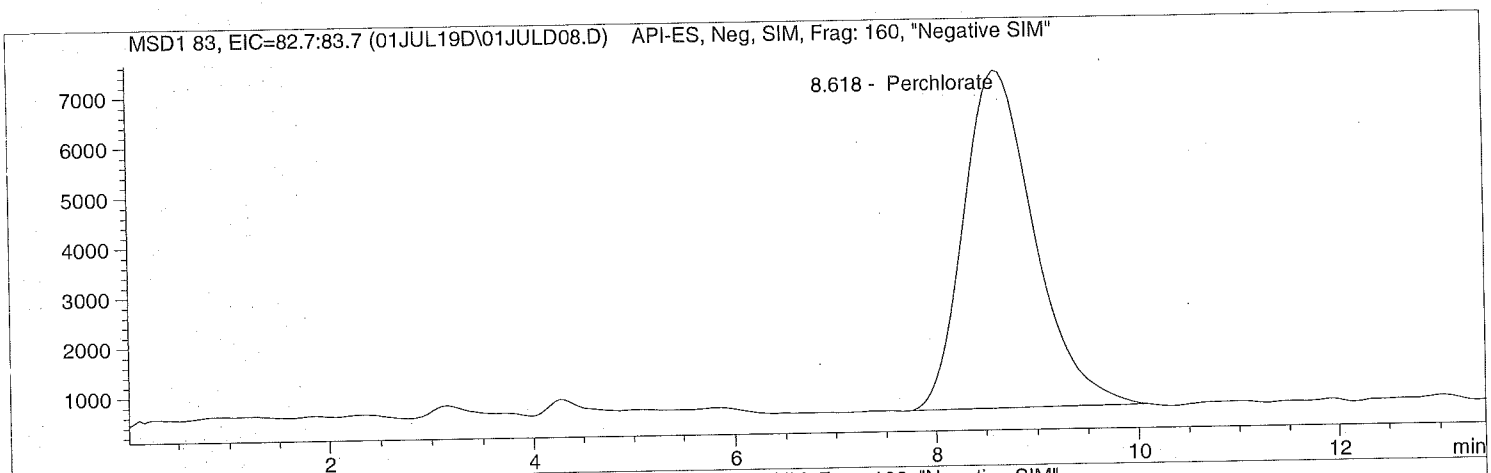
RIGHT SOLUTIONS | RIGHT PARTNER

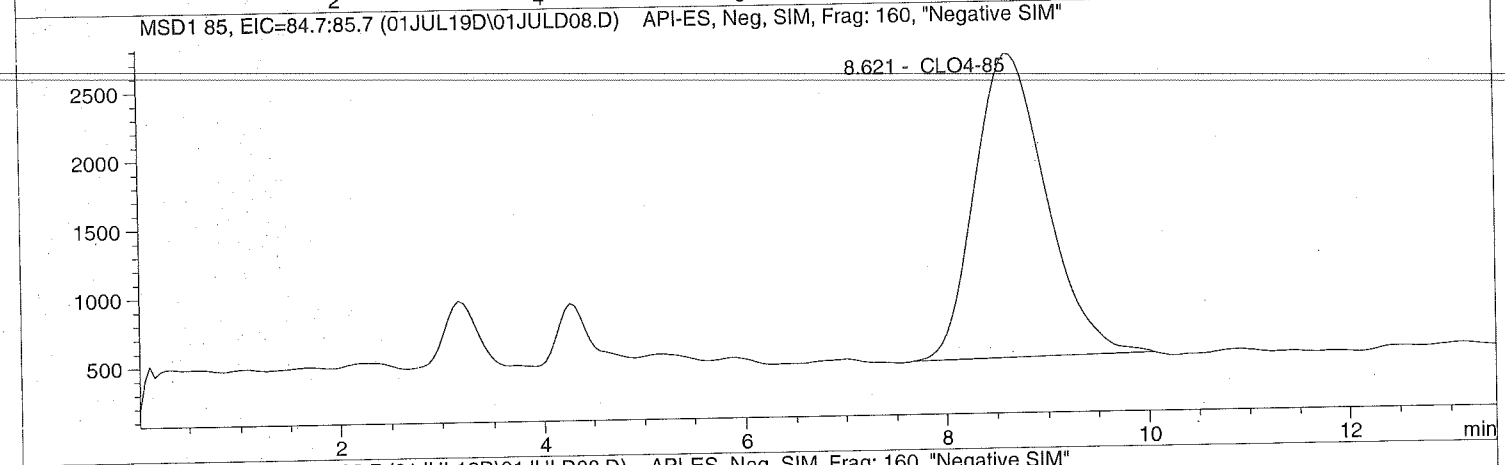
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD08.D Sample Name: 1917698004 1K

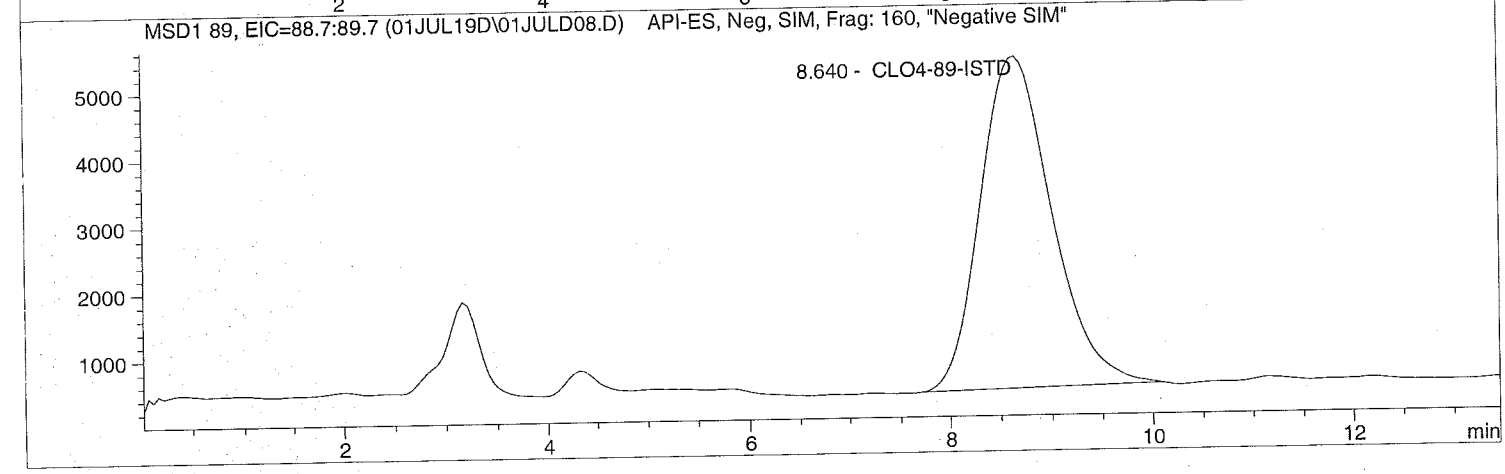
Injection Date:	7/01/2019 10:12:34	Seq Line:	8
Sample Name:	1917698004 1K	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD08.D Sample Name: 1917698004 1K

Injection Date:	7/01/2019 10:12:34	Seq Line:	8
Sample Name:	1917698004 1K	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.618	PBA	325841.4	4410.0033	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.621	PBA	108064.0	4769.8535	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.640	PBA	242319.7	5000.0000	CLO4-89-ISTD

*** End of Report ***

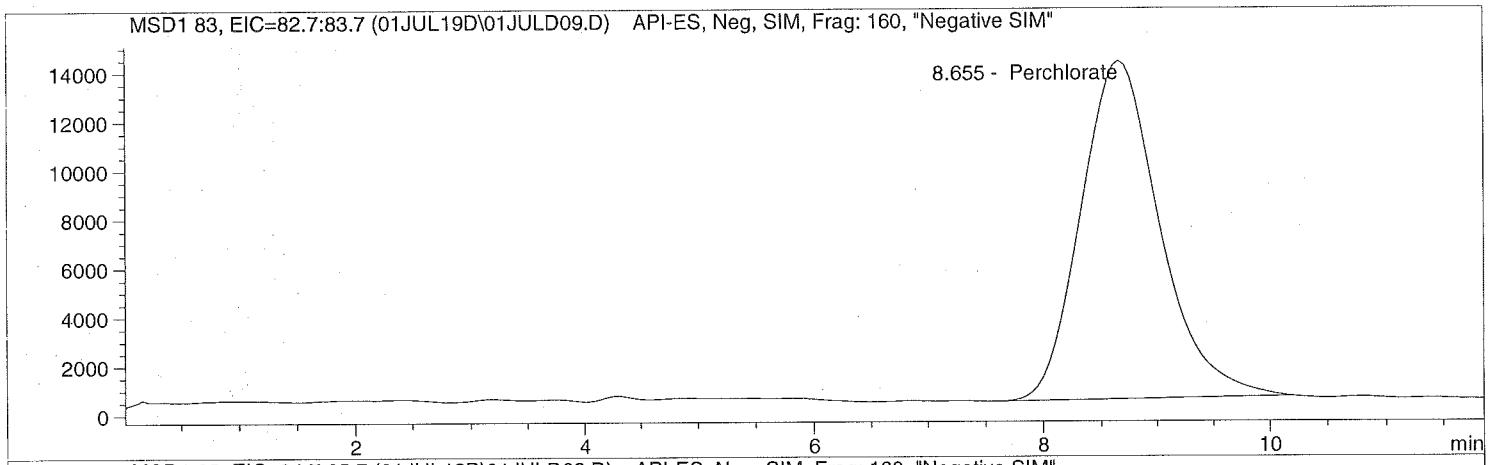
RIGHT SOLUTIONS | RIGHT PARTNER

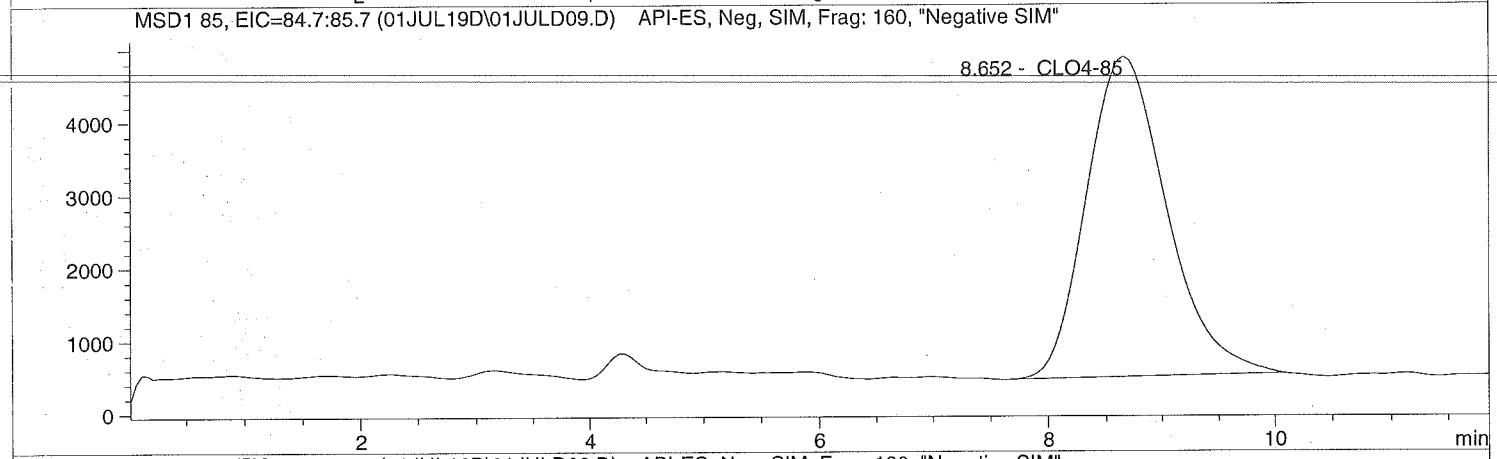
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD09.D Sample Name: 1917698005 MS

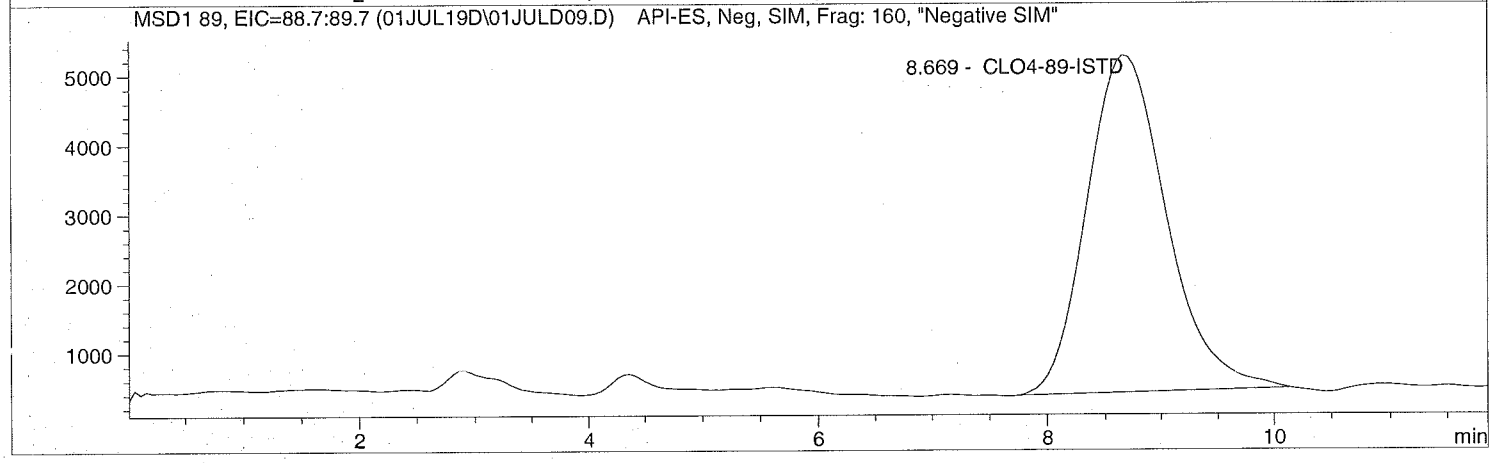
Injection Date:	7/01/2019 10:28:15	Seq Line:	9
Sample Name:	1917698005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD09.D Sample Name: 1917698005 MS

Injection Date:	7/01/2019 10:28:15	Seq Line:	9
Sample Name:	1917698005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.655	PBA	667091.1	8914.2872	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.652	PBA	216450.0	9609.4600	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.669	PBA	238517.6	5000.0000	CLO4-89-ISTD

*** End of Report ***

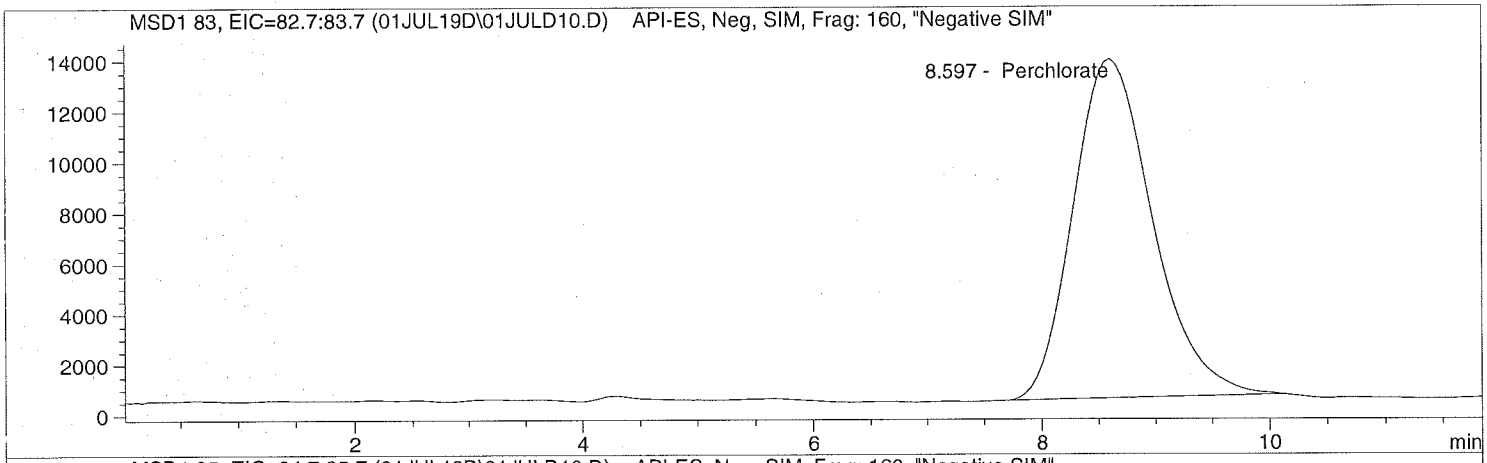
RIGHT SOLUTIONS | RIGHT PARTNER

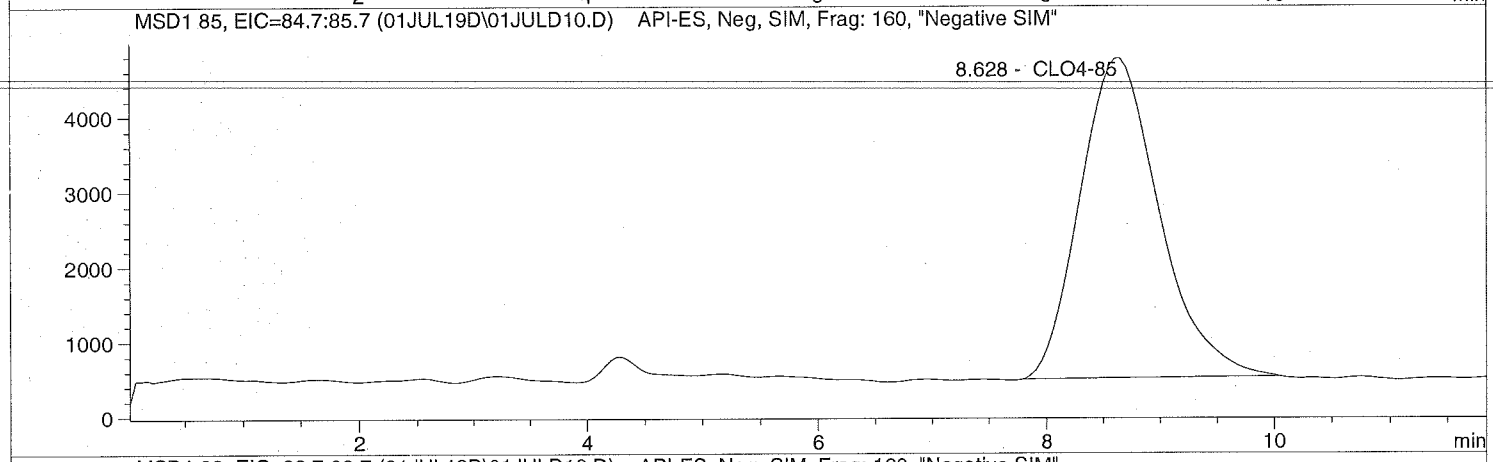
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD10.D Sample Name: 1917698006 MSD

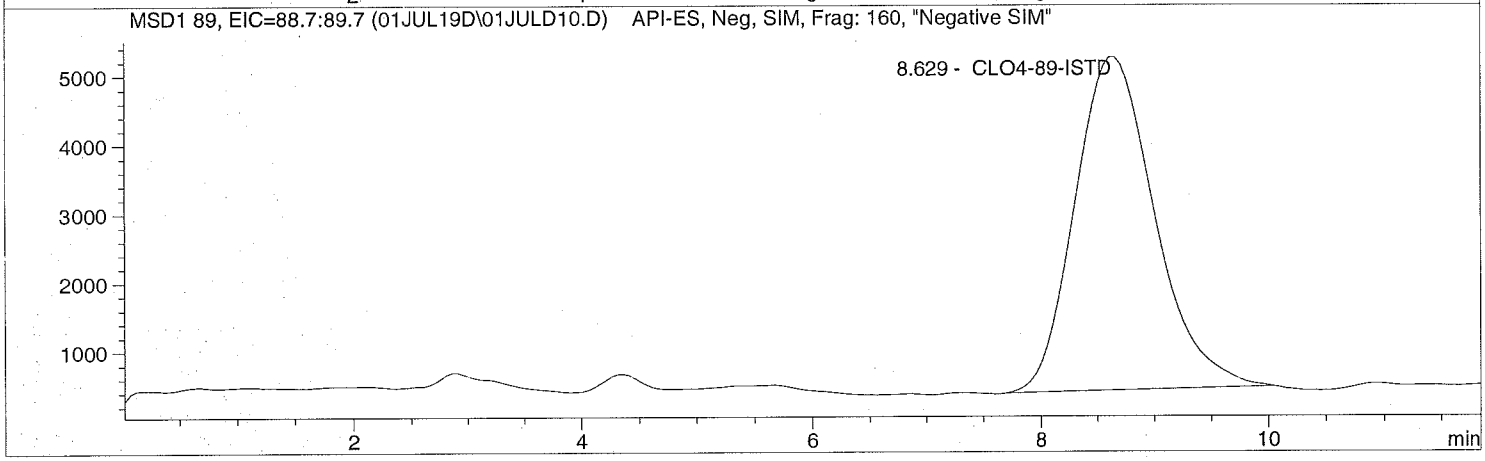
Injection Date:	7/01/2019 10:43:07	Seq Line:	10
Sample Name:	1917698006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD10.D Sample Name: 1917698006 MSD

Injection Date:	7/01/2019 10:43:07	Seq Line:	10
Sample Name:	1917698006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.597	PBA	651481.5	8808.9698	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.628	BBA	206556.3	9281.2867	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.629	PBA	235827.1	5000.0000	CLO4-89-ISTD

*** End of Report ***

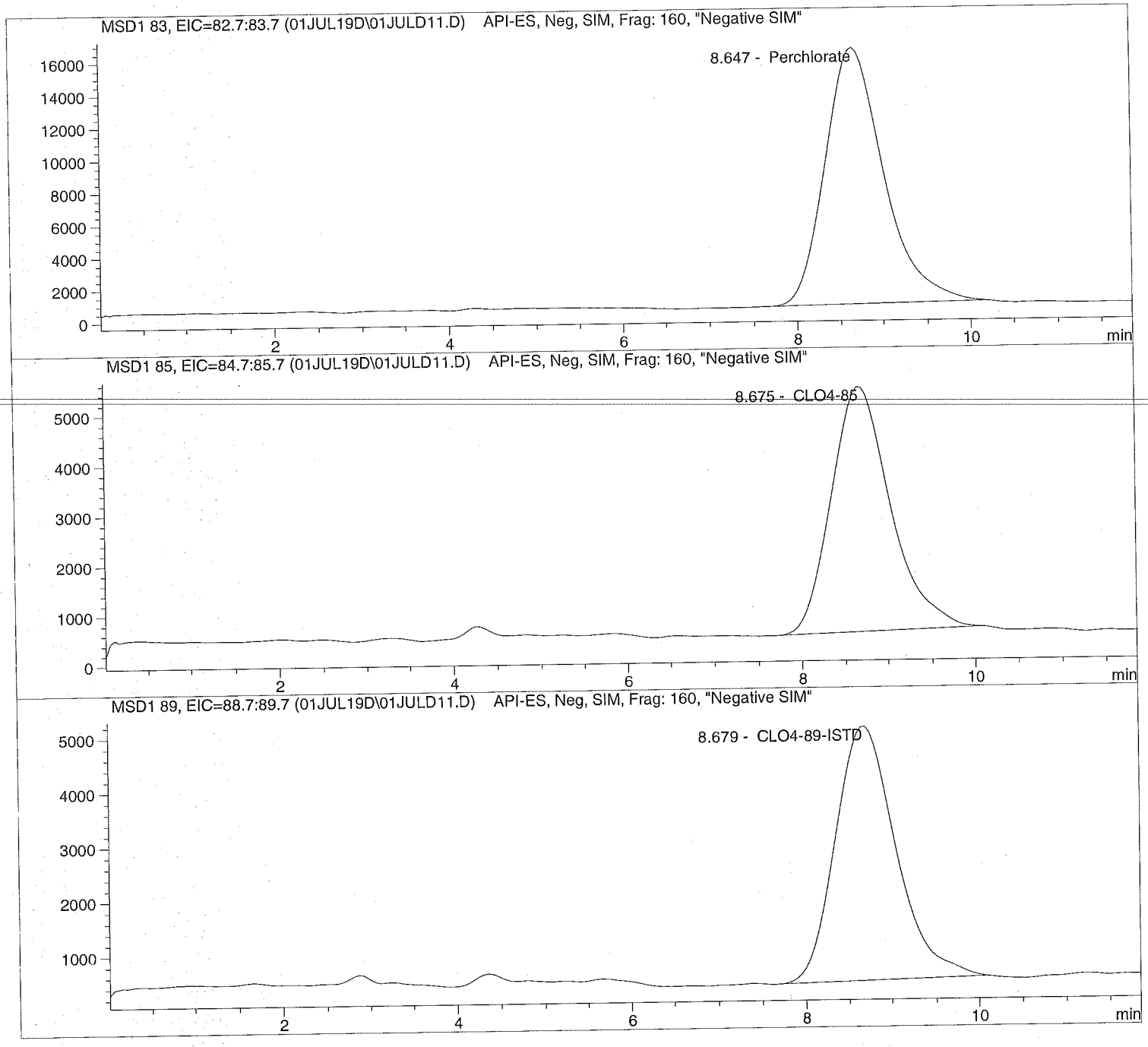
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD11.D Sample Name: 1917698007 1K

Injection Date:	7/01/2019 10:56:59	Seq Line:	11
Sample Name:	1917698007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD11.D Sample Name: 1917698007 1K

Injection Date:	7/01/2019 10:56:59	Seq Line:	11
Sample Name:	1917698007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.647	PBA	747887.6	10411.1564	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.675	PBA	234170.4	10865.1642	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.679	PBA	227614.9	5000.0000	CLO4-89-ISTD

*** End of Report ***

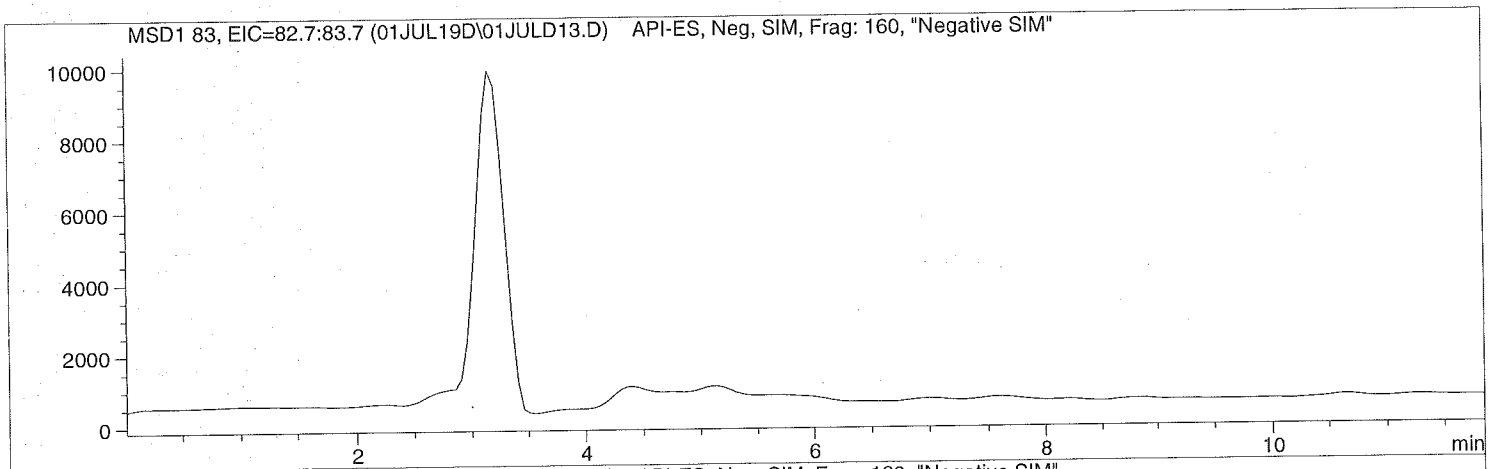
RIGHT SOLUTIONS | RIGHT PARTNER

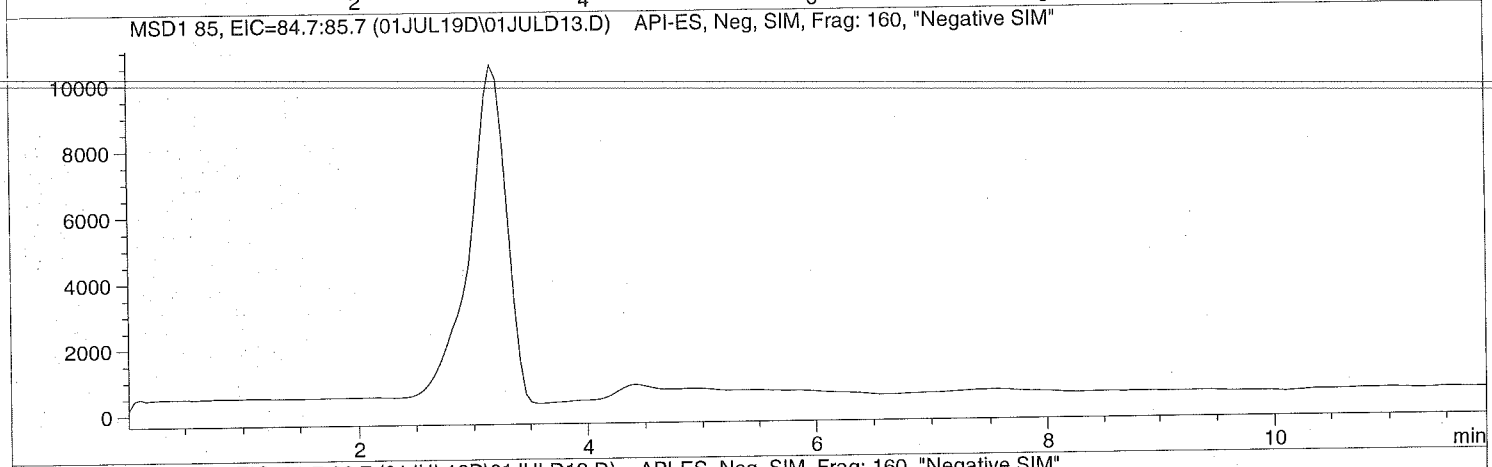
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD13.D Sample Name: 1917856001

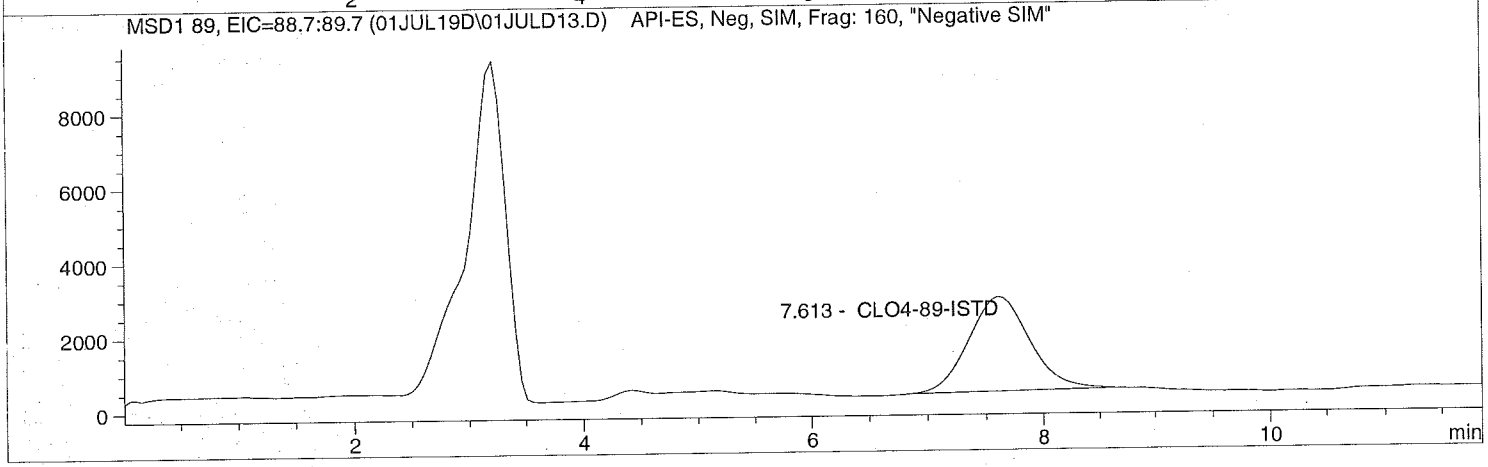
Injection Date:	7/01/2019 11:24:46	Seq Line:	13
Sample Name:	1917856001	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD13.D Sample Name: 1917856001

Injection Date:	7/01/2019 11:24:46	Seq Line:	13
Sample Name:	1917856001	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.613	PBA	93134.2	5.0000	CLO4-89-ISTD

*** End of Report ***

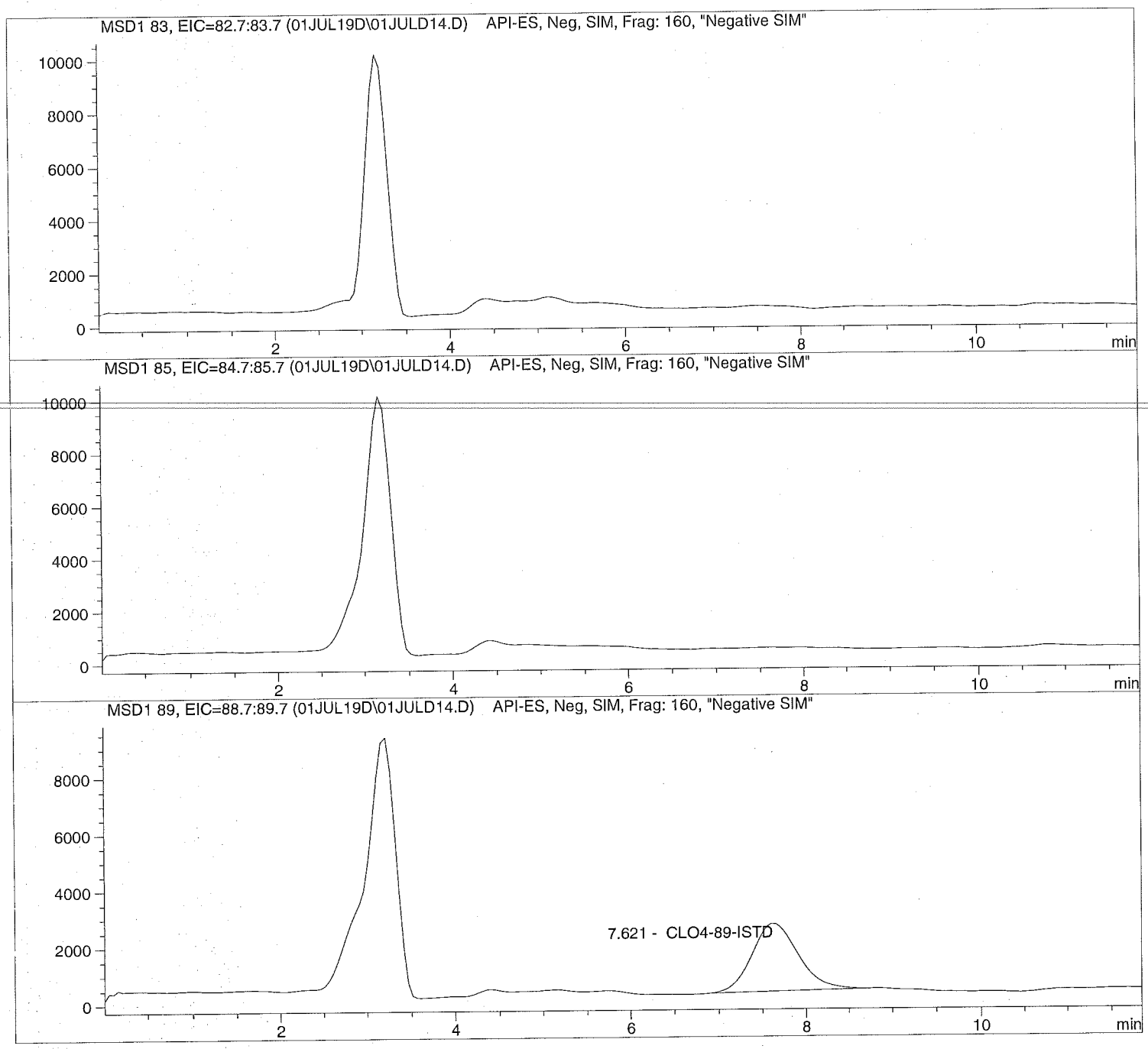
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD14.D Sample Name: 1917856002

Injection Date:	7/01/2019 11:38:38	Seq Line:	14
Sample Name:	1917856002	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD14.D Sample Name: 1917856002

Injection Date:	7/01/2019 11:38:38	Seq Line:	14
Sample Name:	1917856002	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.621	PBA	87949.8	5.0000	CLO4-89-ISTD

*** End of Report ***

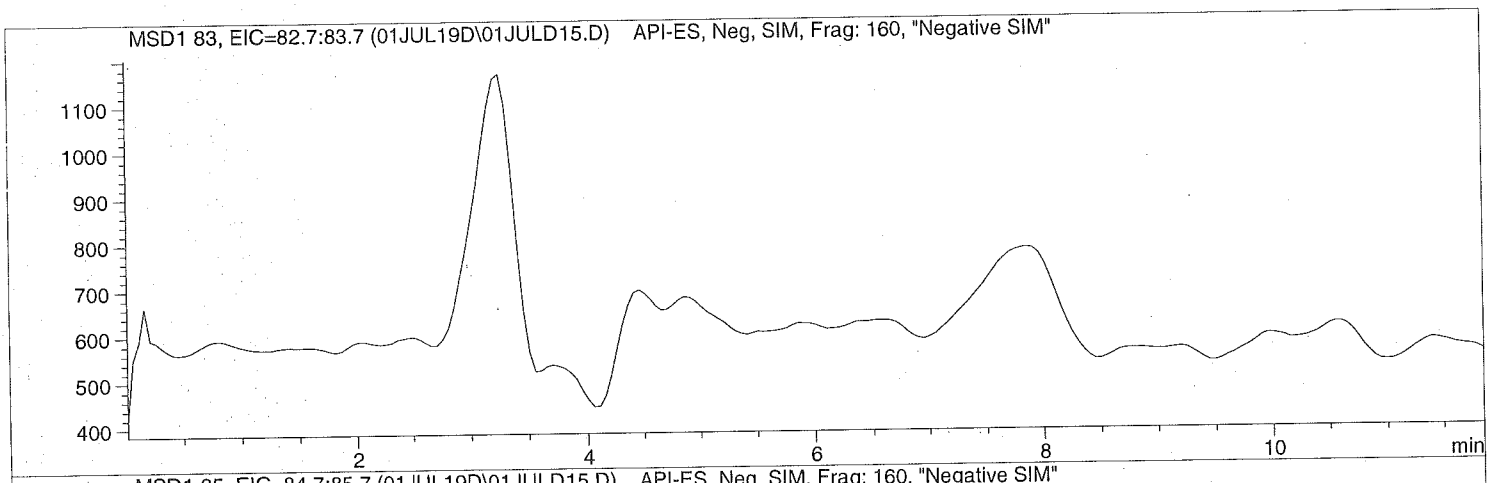
RIGHT SOLUTIONS | RIGHT PARTNER

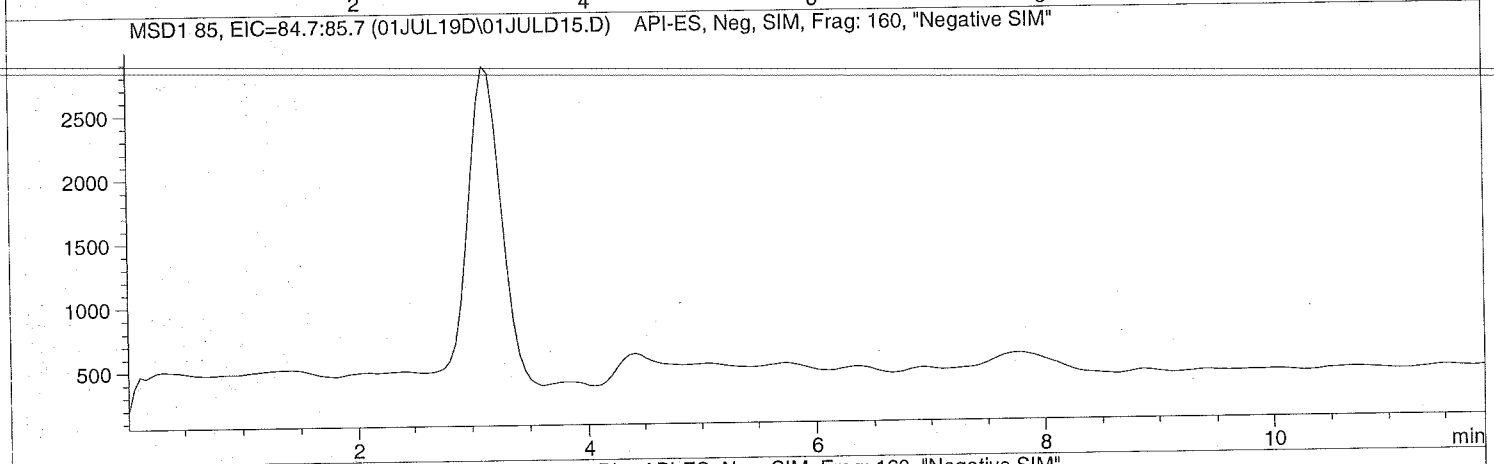
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

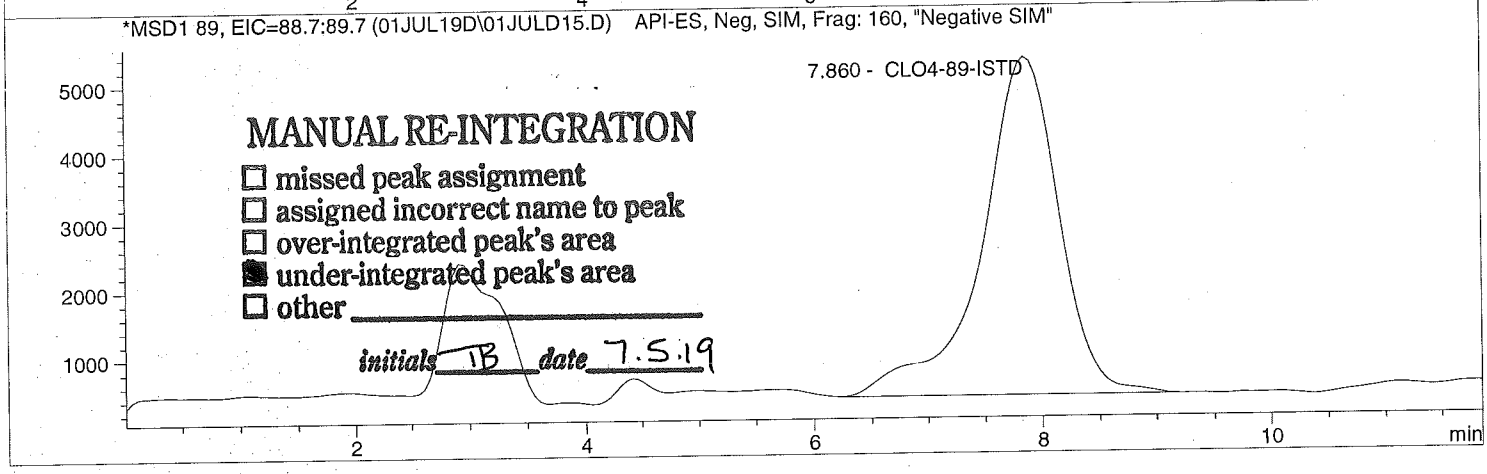
Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







MANUAL RE-INTEGRATION
- ☐ missed peak assignment
- ☐ assigned incorrect name to peak
- ☐ over-integrated peak's area
- ■ under-integrated peak's area
- ☐ other _____

initials TB date 7.5.19

RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.860	MM	230973.5	5.0000	CLO4-89-ISTD

*** End of Report ***

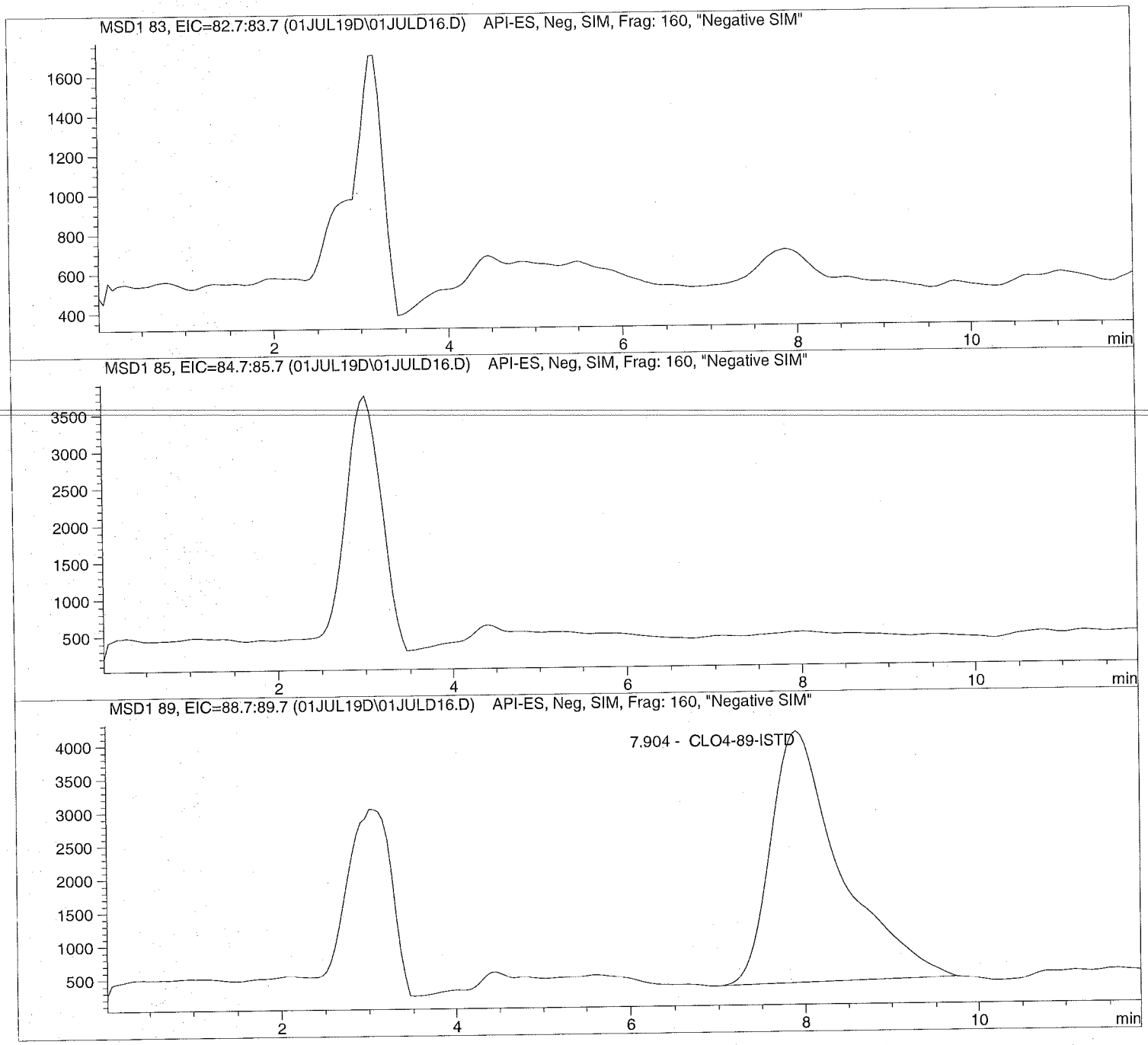
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD16.D Sample Name: 1917856004

Injection Date:	7/01/2019 12:06:28	Seq Line:	16
Sample Name:	1917856004	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD16.D Sample Name: 1917856004

Injection Date:	7/01/2019 12:06:28	Seq Line:	16
Sample Name:	1917856004	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.904	PBA	208544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

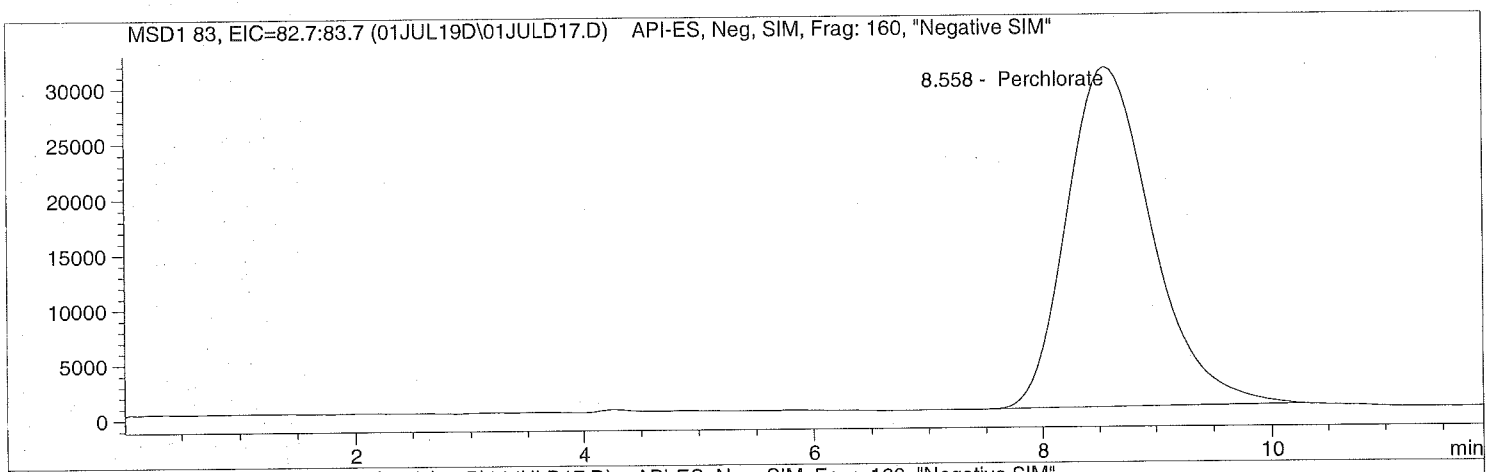
RIGHT SOLUTIONS | RIGHT PARTNER

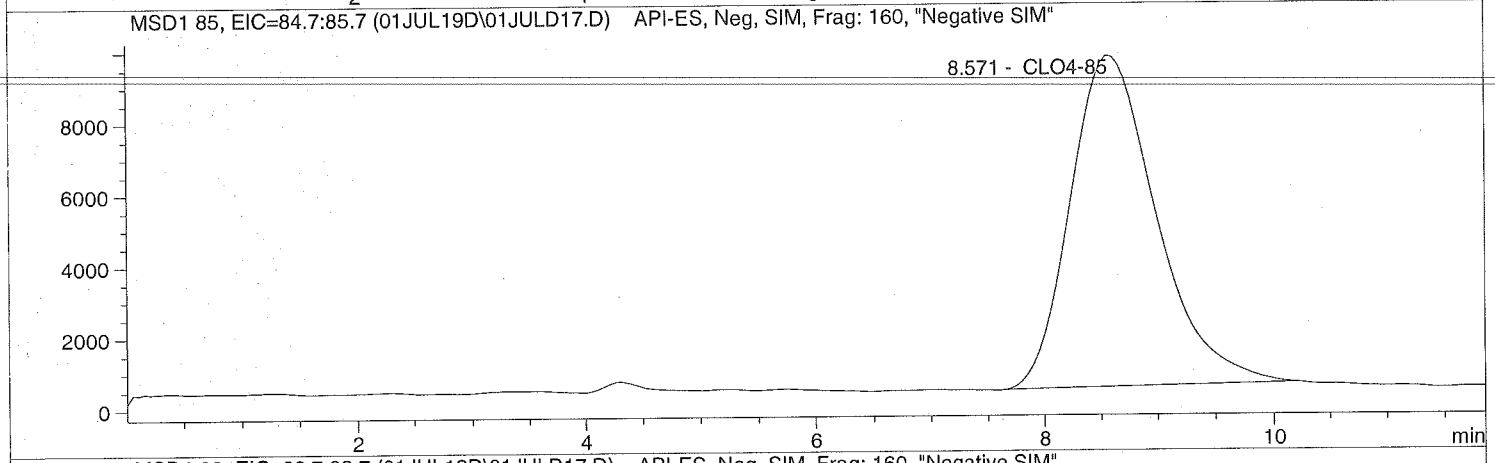
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD17.D Sample Name: 661482 CCV@25

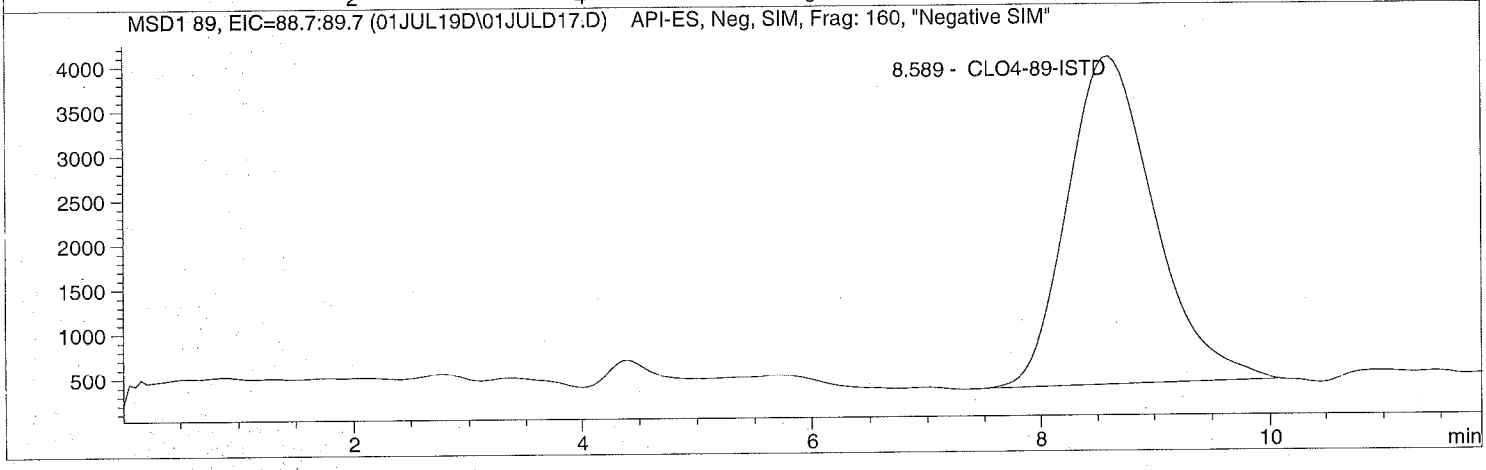
Injection Date:	7/01/2019 12:20:29	Seq Line:	17
Sample Name:	661482 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD17.D Sample Name: 661482 CCV@25

Injection Date:	7/01/2019 12:20:29	Seq Line:	17
Sample Name:	661482 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.558	PBA	1604090.1	25.0035	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.571	PBA	485334.3	25.4617	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.589	PBA	195182.3	5.0000	CLO4-89-ISTD

*** End of Report ***

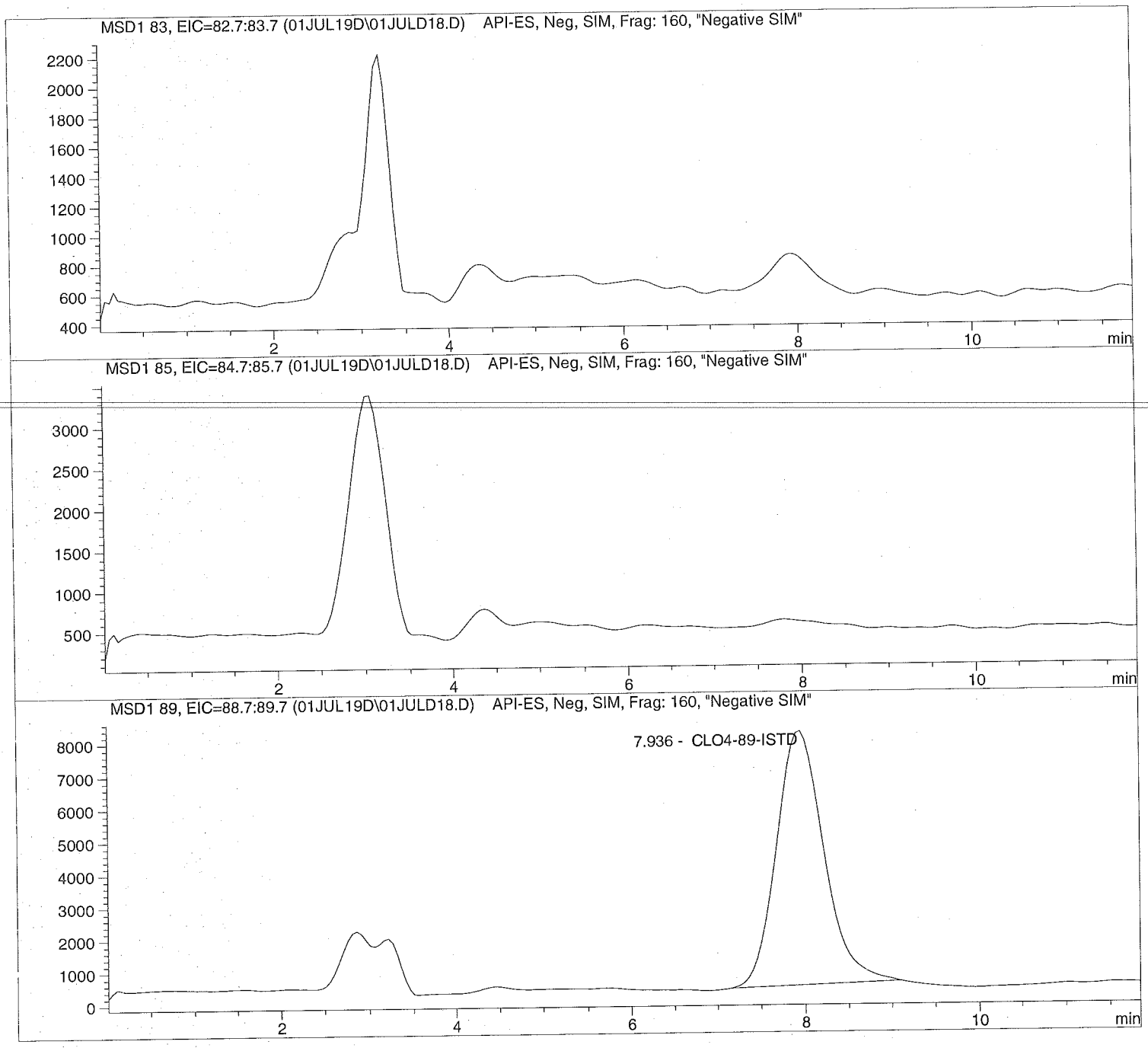
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD18.D Sample Name: 1917856005

Injection Date:	7/01/2019 12:34:22	Seq Line:	18
Sample Name:	1917856005	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD18.D Sample Name: 1917856005

Injection Date:	7/01/2019 12:34:22	Seq Line:	18
Sample Name:	1917856005	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.936	PBA	292027.4	5.0000	CLO4-89-ISTD

*** End of Report ***

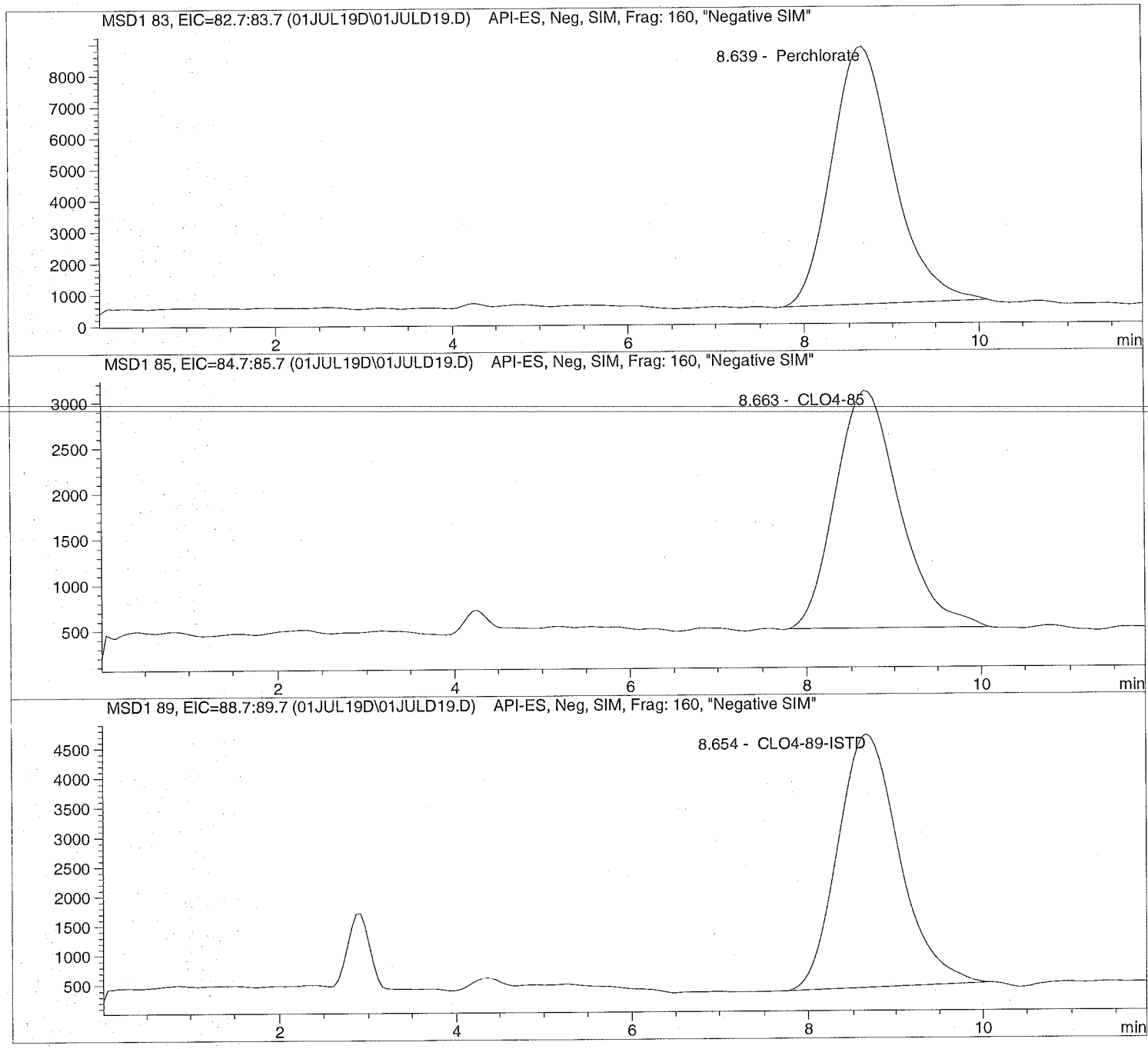
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD19.D Sample Name: 1917856006 100

Injection Date:	7/01/2019 12:48:15	Seq Line:	19
Sample Name:	1917856006 100	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD19.D Sample Name: 1917856006 100

Injection Date:	7/01/2019 12:48:15	Seq Line:	19
Sample Name:	1917856006 100	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.639	PBA	403838.0	621.0643	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.663	BBA	132725.9	672.8711	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.654	PBA	210141.8	500.0000	CLO4-89-ISTD

*** End of Report ***

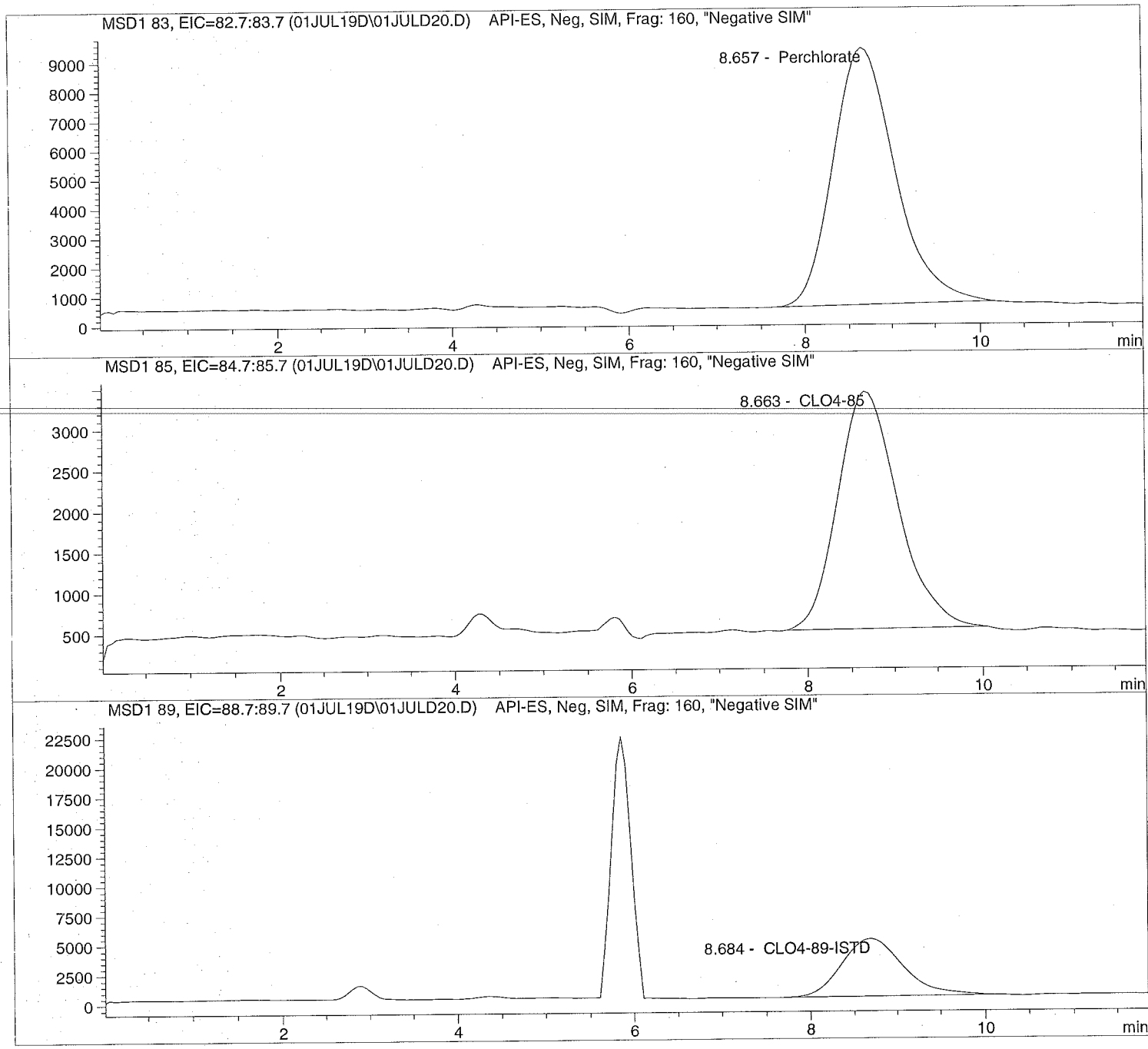
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD20.D Sample Name: 1917856007 100

Injection Date:	7/01/2019 13:02:10	Seq Line:	20
Sample Name:	1917856007 100	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD20.D Sample Name: 1917856007 100

Injection Date:	7/01/2019 13:02:10	Seq Line:	20
Sample Name:	1917856007 100	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.657	PBA	434273.7	588.1581	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.663	BBA	140119.4	624.8207	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.684	PBA	239145.3	500.0000	CLO4-89-ISTD

*** End of Report ***

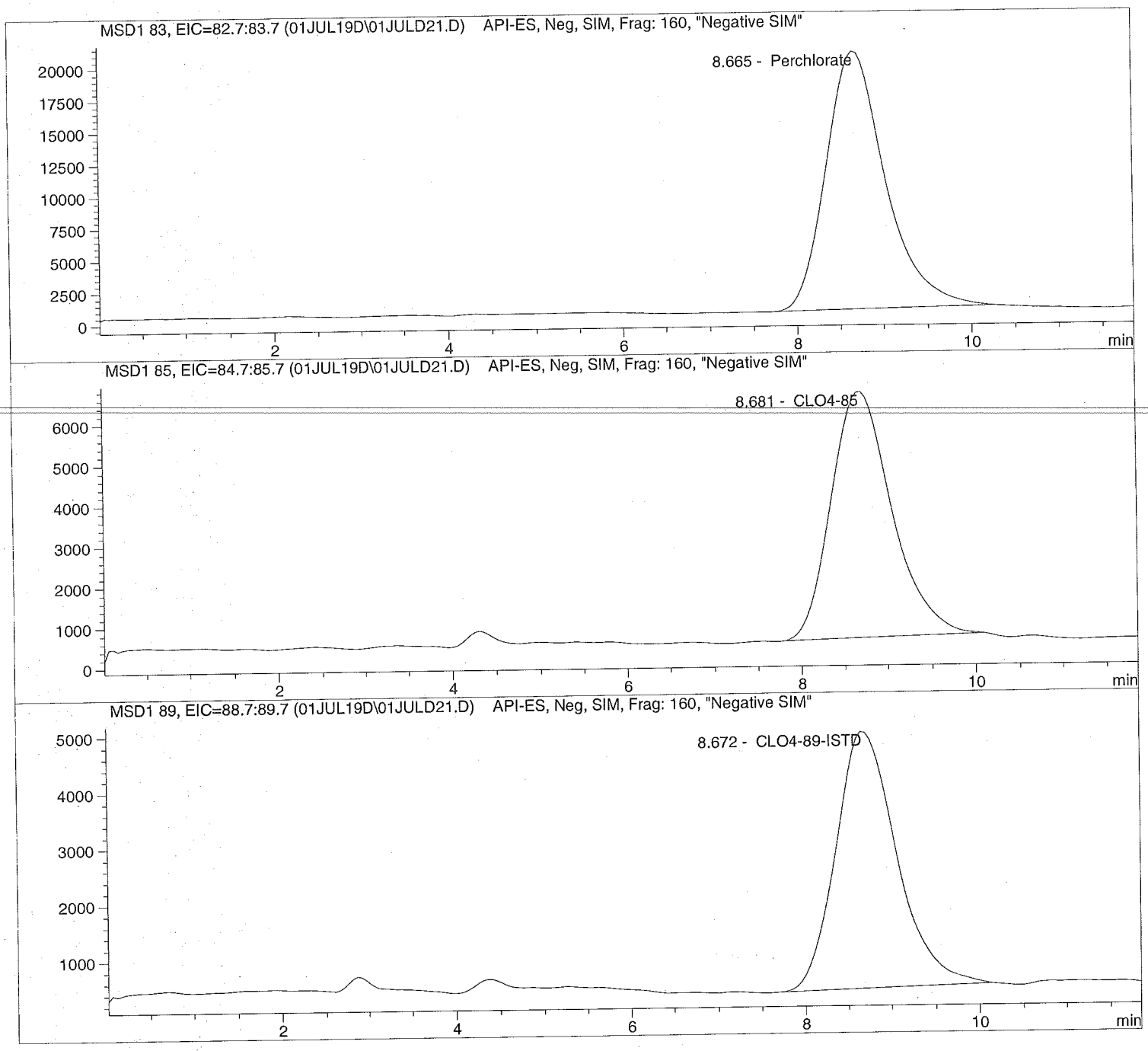
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD21.D Sample Name: 1918052001 1K

Injection Date:	7/01/2019 13:16:12	Seq Line:	21
Sample Name:	1918052001 1K	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD21.D Sample Name: 1918052001 1K

Injection Date:	7/01/2019 13:16:12	Seq Line:	21
Sample Name:	1918052001 1K	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.665	PBA	958578.9	13475.4930	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.681	PBA	295207.3	13884.7680	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.672	PBA	223102.2	5000.0000	CLO4-89-ISTD

*** End of Report ***

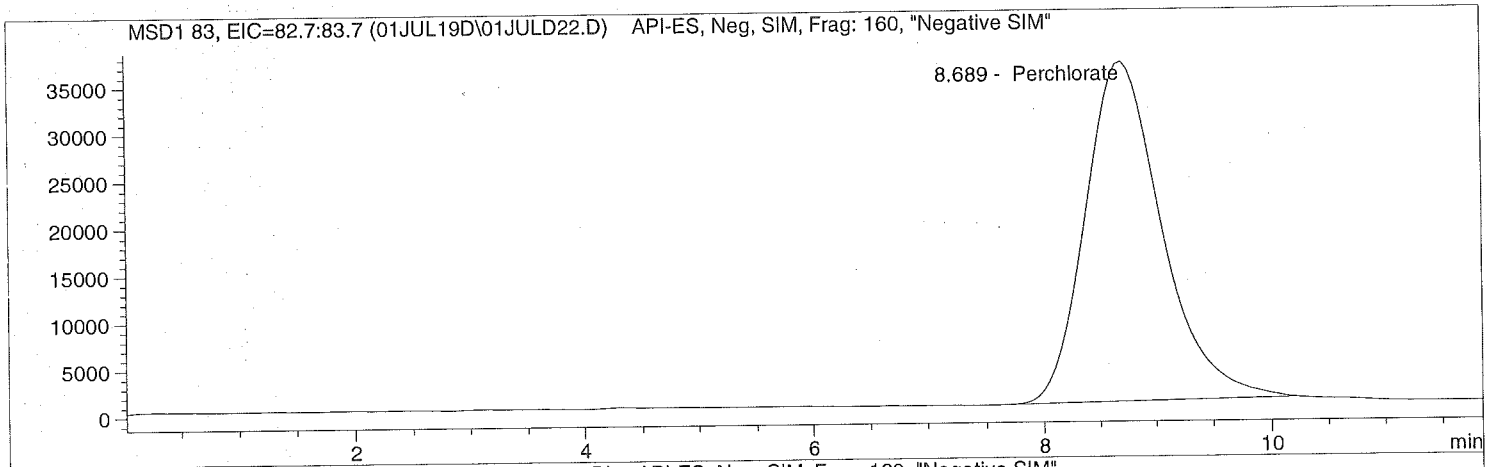
RIGHT SOLUTIONS | RIGHT PARTNER

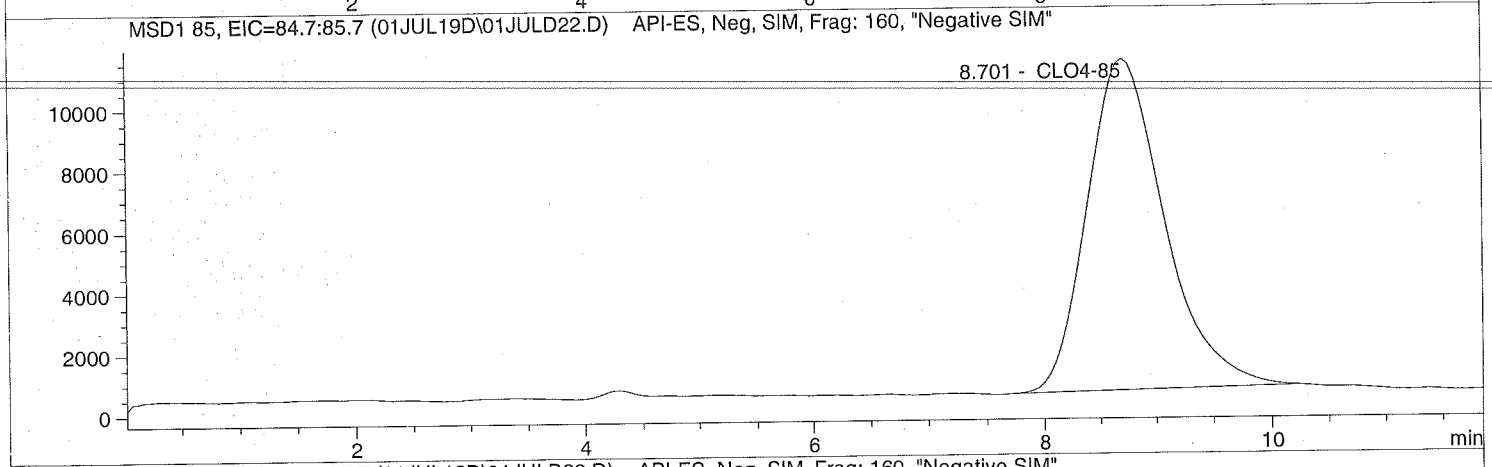
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD22.D Sample Name: 1918052002 10K

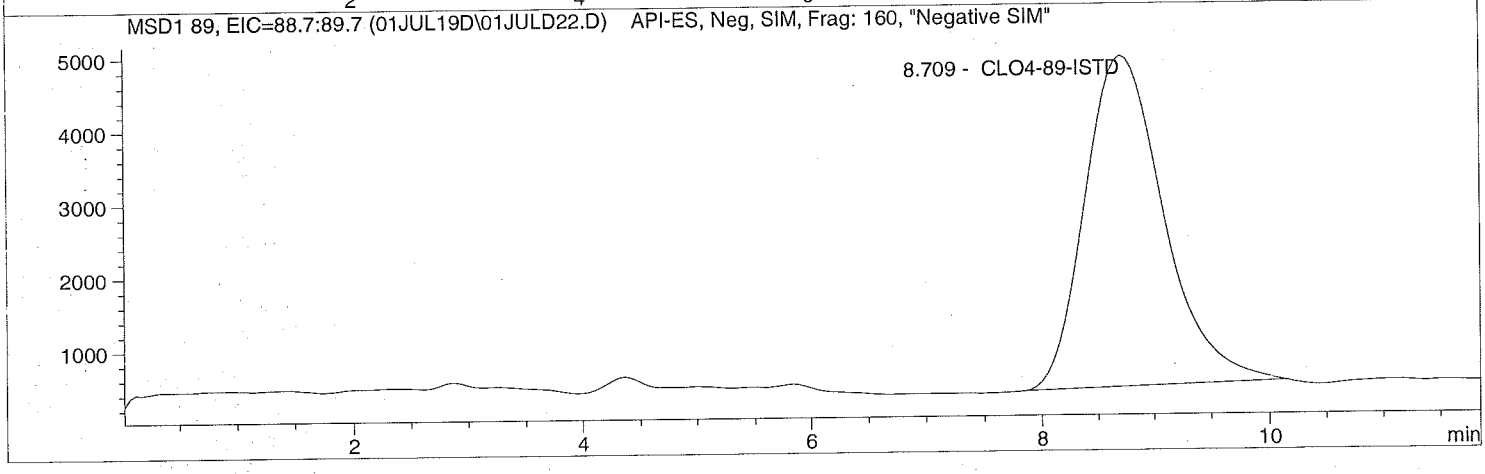
Injection Date:	7/01/2019 13:30:09	Seq Line:	22
Sample Name:	1918052002 10K	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD22.D Sample Name: 1918052002 10K

Injection Date:	7/01/2019 13:30:09	Seq Line:	22
Sample Name:	1918052002 10K	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.689	PBA	1701736.0	236511.4245	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.701	PBA	516167.1	241333.7557	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.709	PBA	219618.3	50000.0000	CLO4-89-ISTD

*** End of Report ***

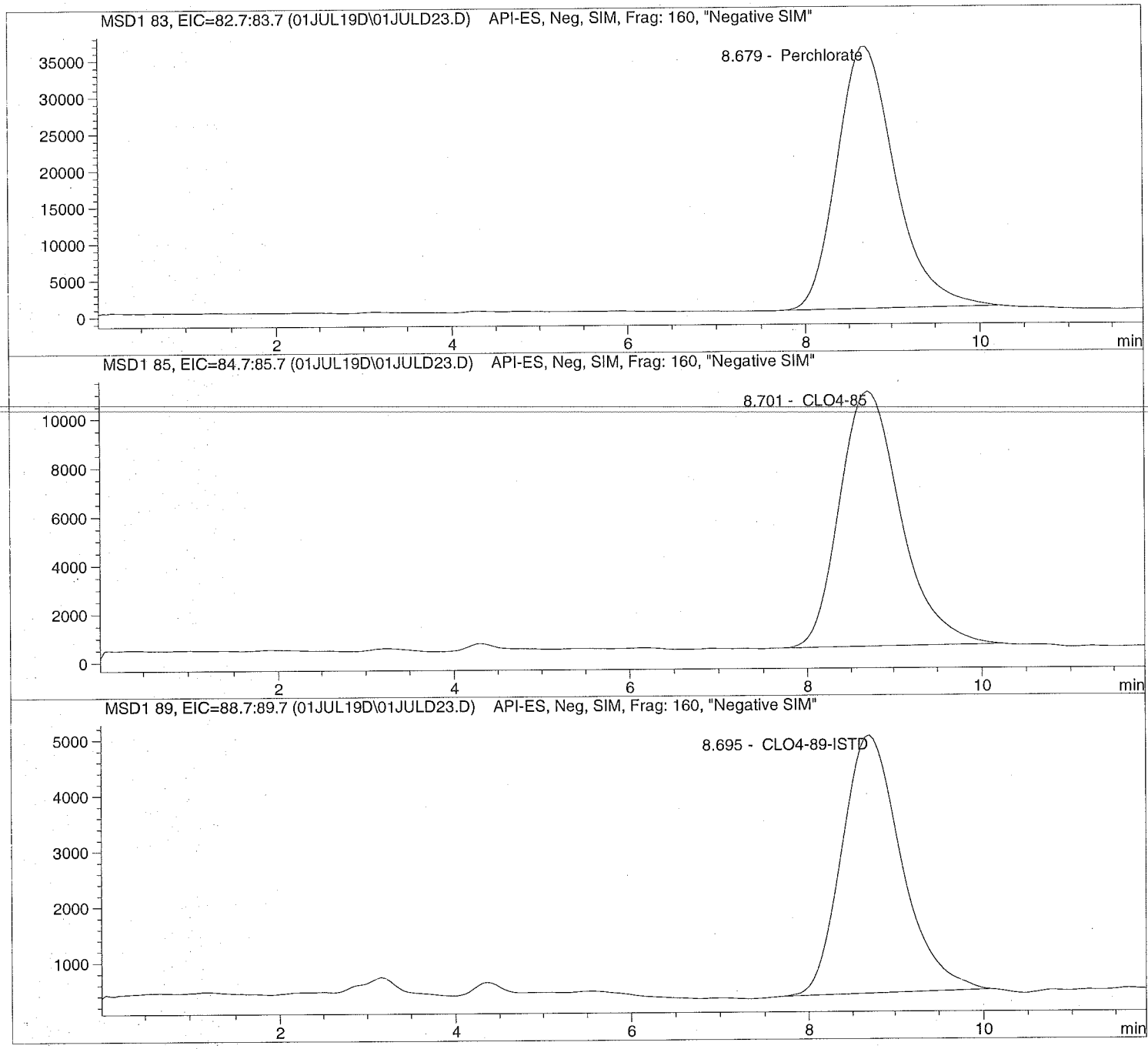
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD23.D Sample Name: 1918052003 10K

Injection Date:	7/01/2019 13:44:04	Seq Line:	23
Sample Name:	1918052003 10K	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD23.D Sample Name: 1918052003 10K

Injection Date:	7/01/2019 13:44:04	Seq Line:	23
Sample Name:	1918052003 10K	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.679	PBA	1682027.8	230798.4297	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.701	PBA	516999.9	238459.8445	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.695	PBA	222758.2	50000.0000	CLO4-89-ISTD

*** End of Report ***

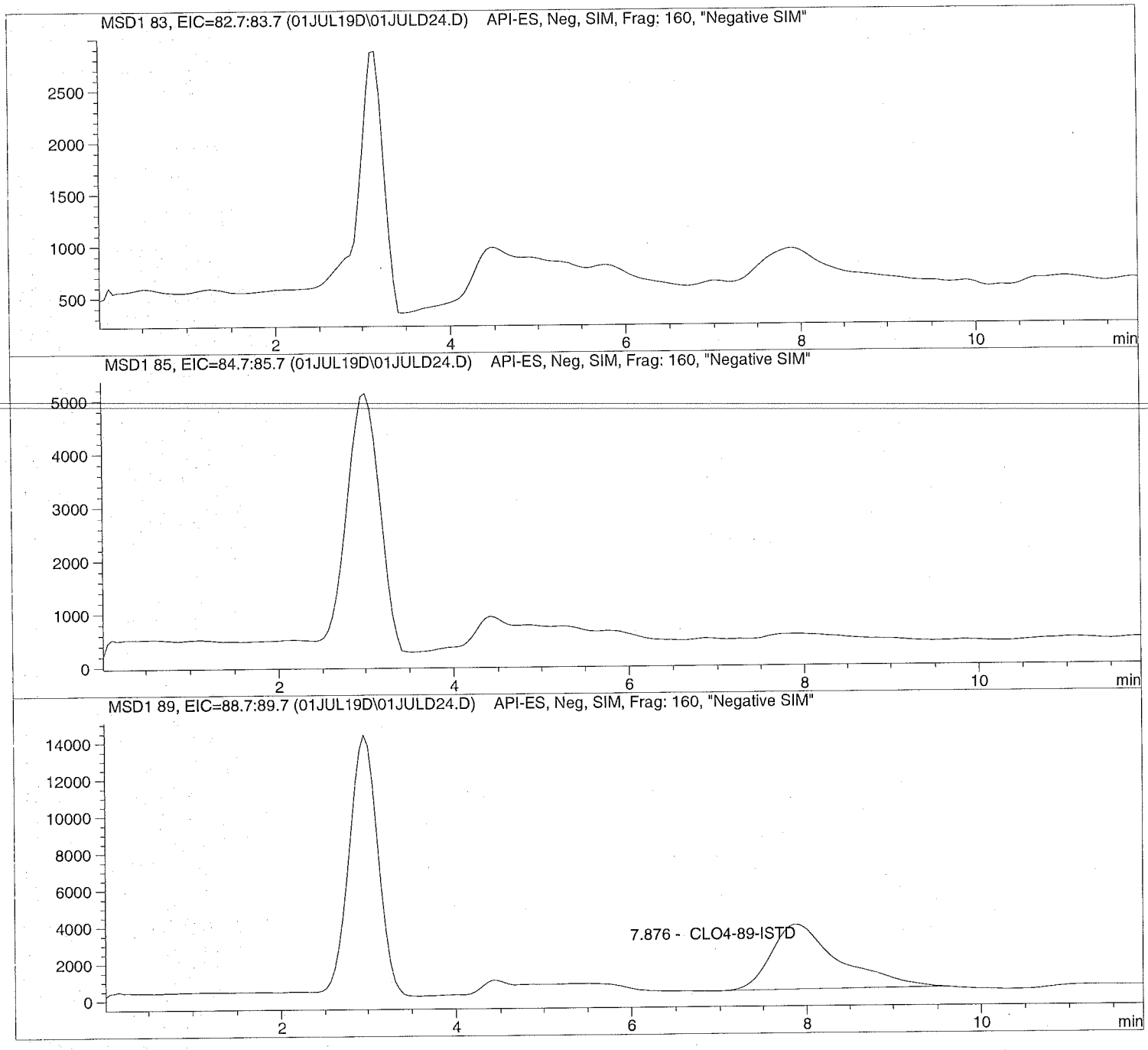
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD24.D Sample Name: 1918052004

Injection Date:	7/01/2019 13:57:58	Seq Line:	24
Sample Name:	1918052004	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD24.D Sample Name: 1918052004

Injection Date:	7/01/2019 13:57:58	Seq Line:	24
Sample Name:	1918052004	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.876	PBA	188746.5	5.0000	CLO4-89-ISTD

*** End of Report ***

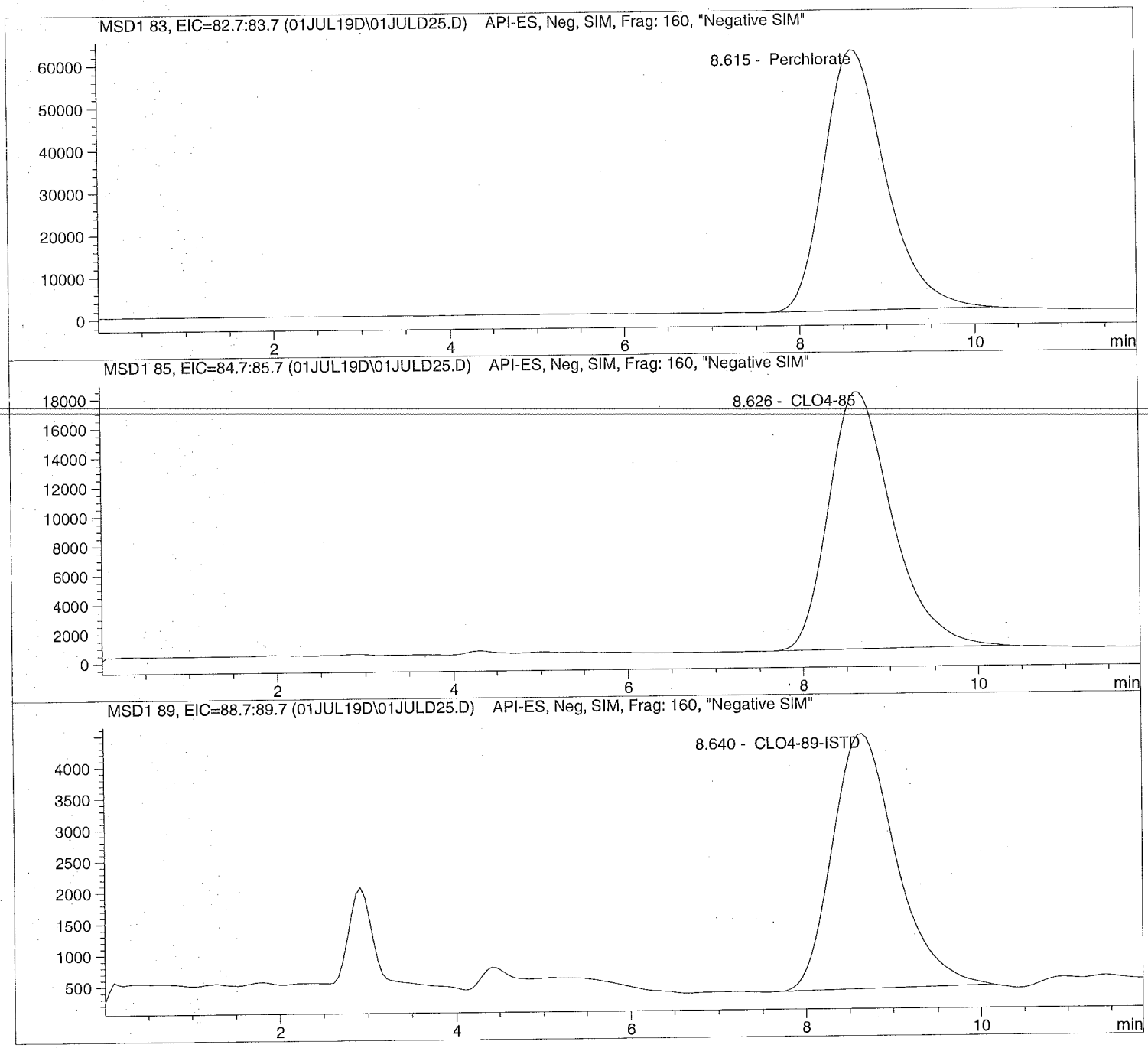
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD25.D Sample Name: 1917698003 100

Injection Date:	7/01/2019 14:11:59	Seq Line:	25
Sample Name:	1917698003 100	Location:	Vial 94
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD25.D Sample Name: 1917698003 100

Injection Date:	7/01/2019 14:11:59	Seq Line:	25
Sample Name:	1917698003 100	Location:	Vial 94
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.615	PBA	3021130.8	4300.6266	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.626	PBA	888075.5	4275.4049	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.640	PBA	205249.1	500.0000	CLO4-89-ISTD

*** End of Report ***

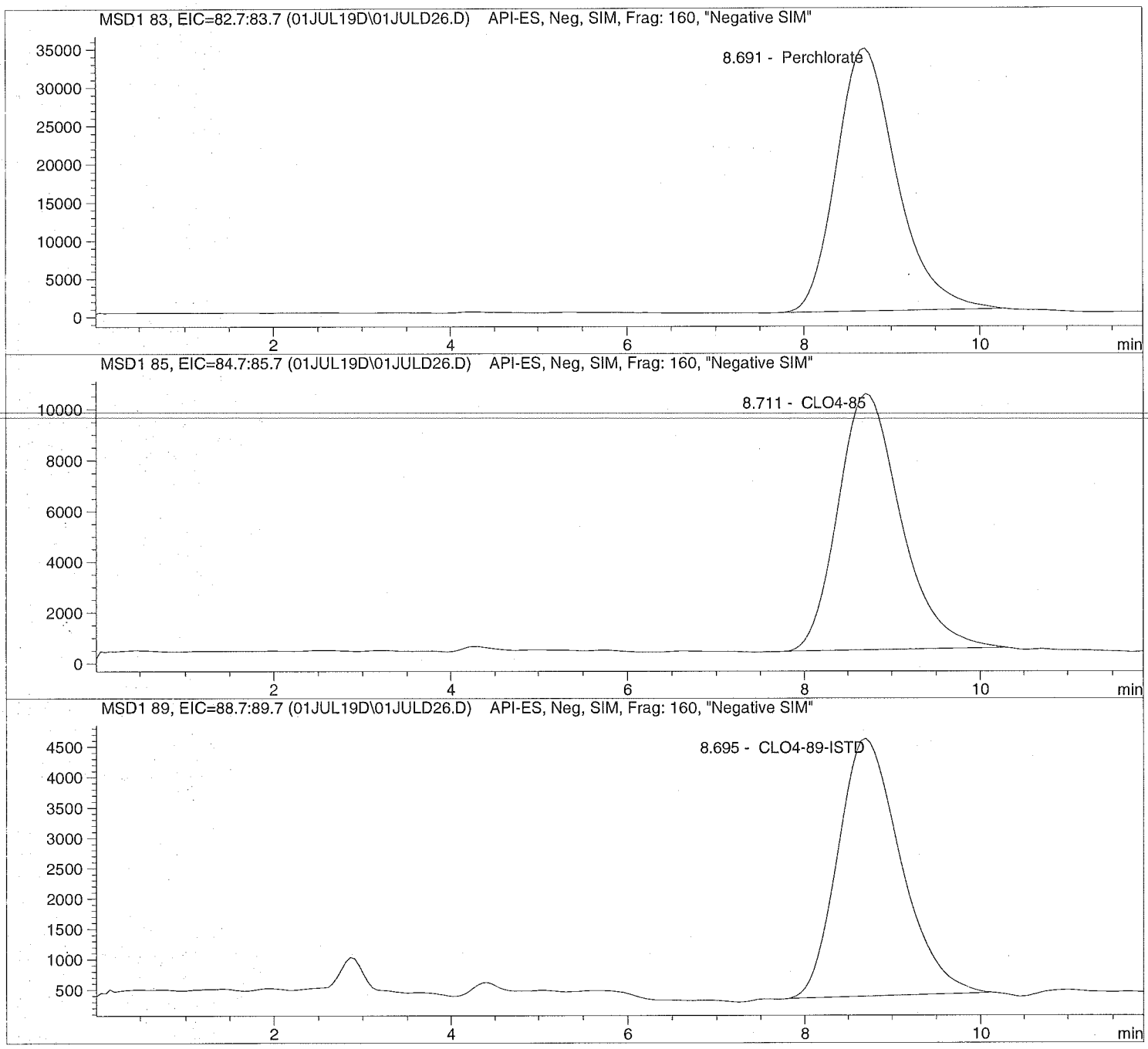
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD26.D Sample Name: 1917698008 1K

Injection Date:	7/01/2019 14:25:54	Seq Line:	26
Sample Name:	1917698008 1K	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD26.D Sample Name: 1917698008 1K

Injection Date:	7/01/2019 14:25:54	Seq Line:	26
Sample Name:	1917698008 1K	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.691	PBA	1640477.0	23731.5795	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.711	PBA	499687.1	24313.2650	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.695	PBA	210953.7	5000.0000	CLO4-89-ISTD

*** End of Report ***

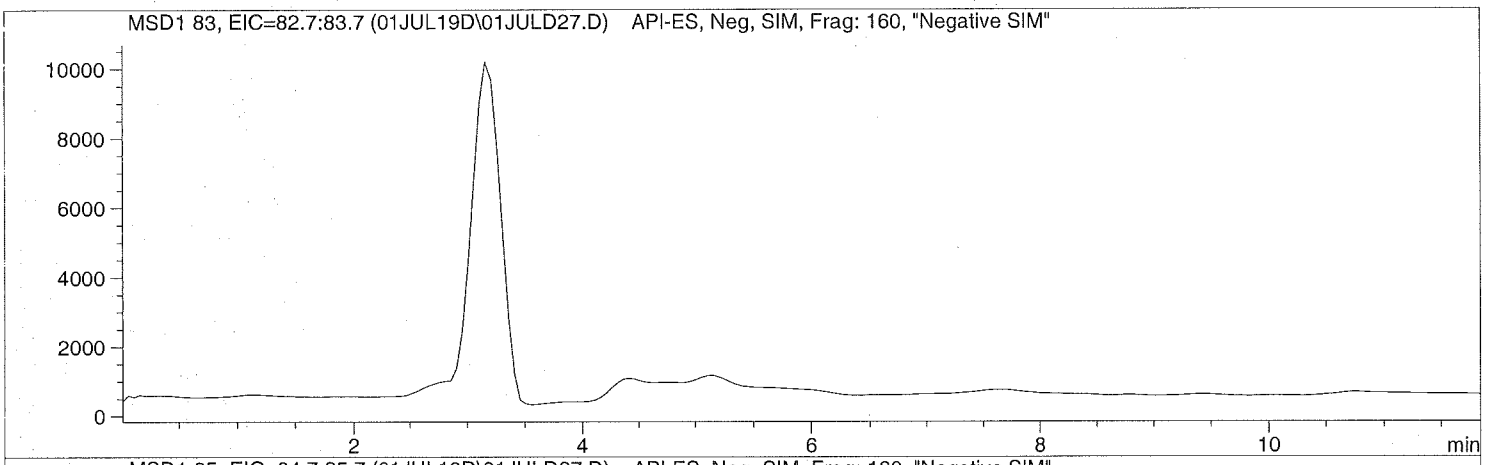
RIGHT SOLUTIONS | RIGHT PARTNER

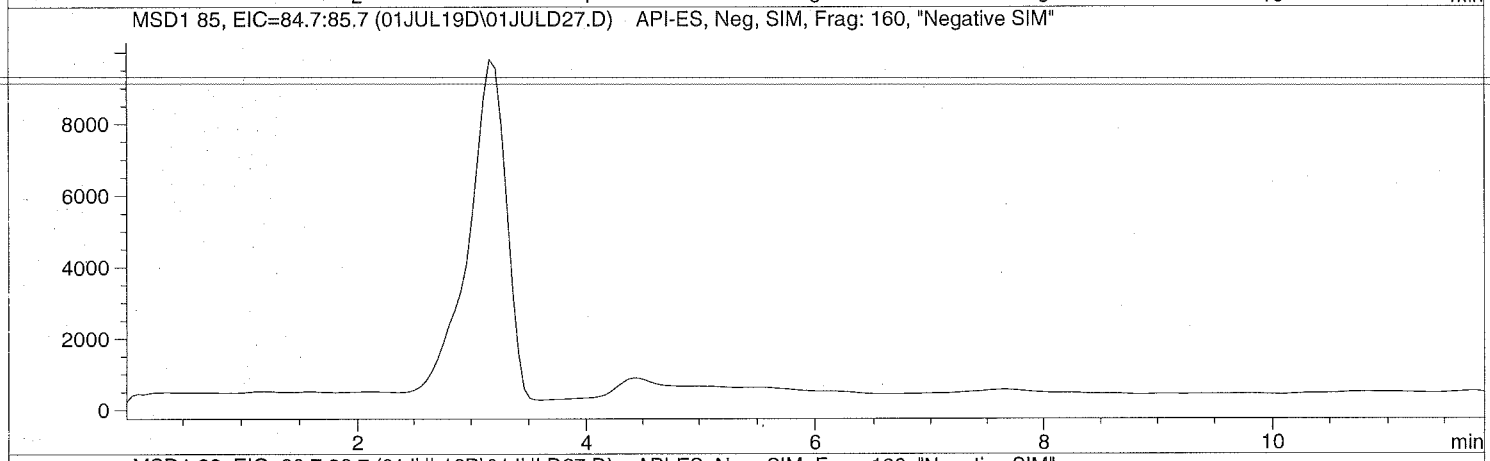
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD27.D Sample Name: 1917856001 RE

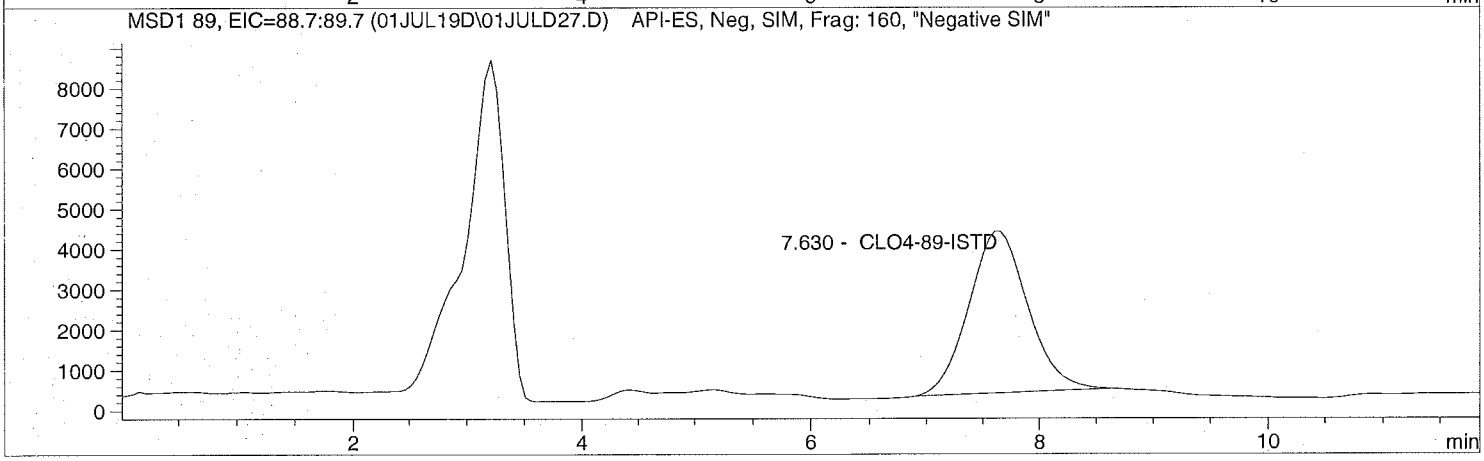
Injection Date:	7/01/2019 14:39:49	Seq Line:	27
Sample Name:	1917856001 RE	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD27.D Sample Name: 1917856001 RE

Injection Date:	7/01/2019 14:39:49	Seq Line:	27
Sample Name:	1917856001 RE	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.630	PBA	144962.0	5.0000	CLO4-89-ISTD

*** End of Report ***

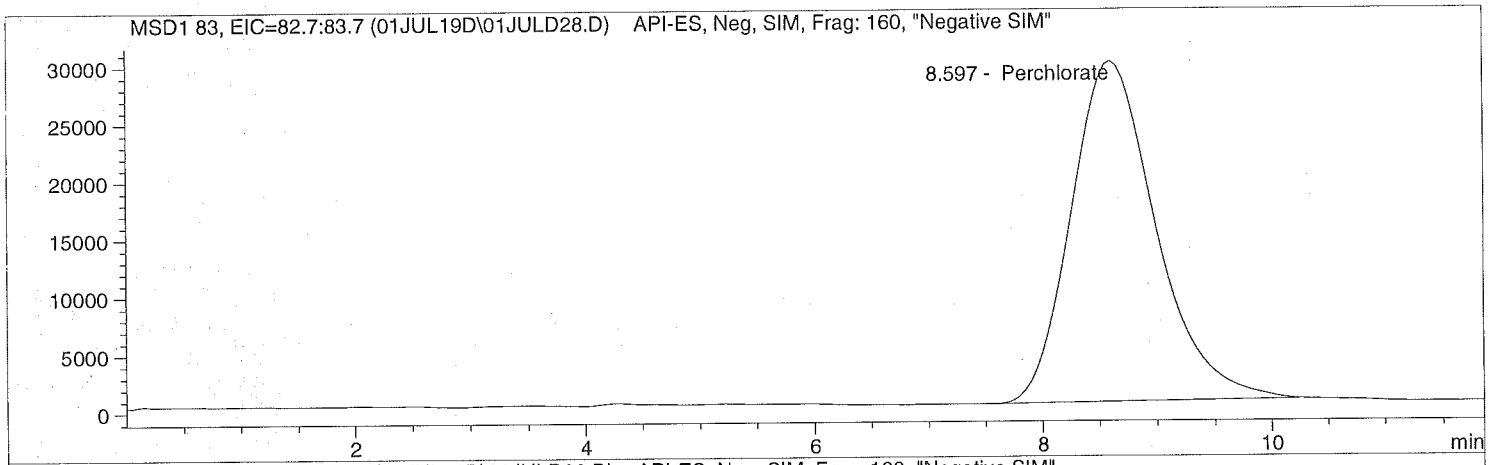
RIGHT SOLUTIONS | RIGHT PARTNER

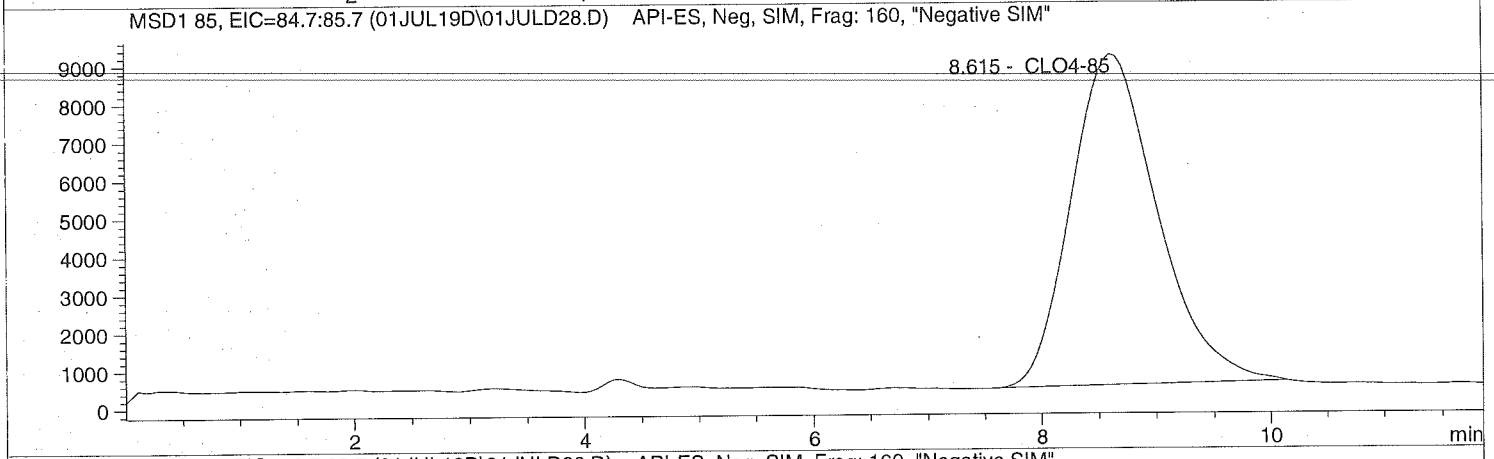
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD28.D Sample Name: 661483 CCV@25

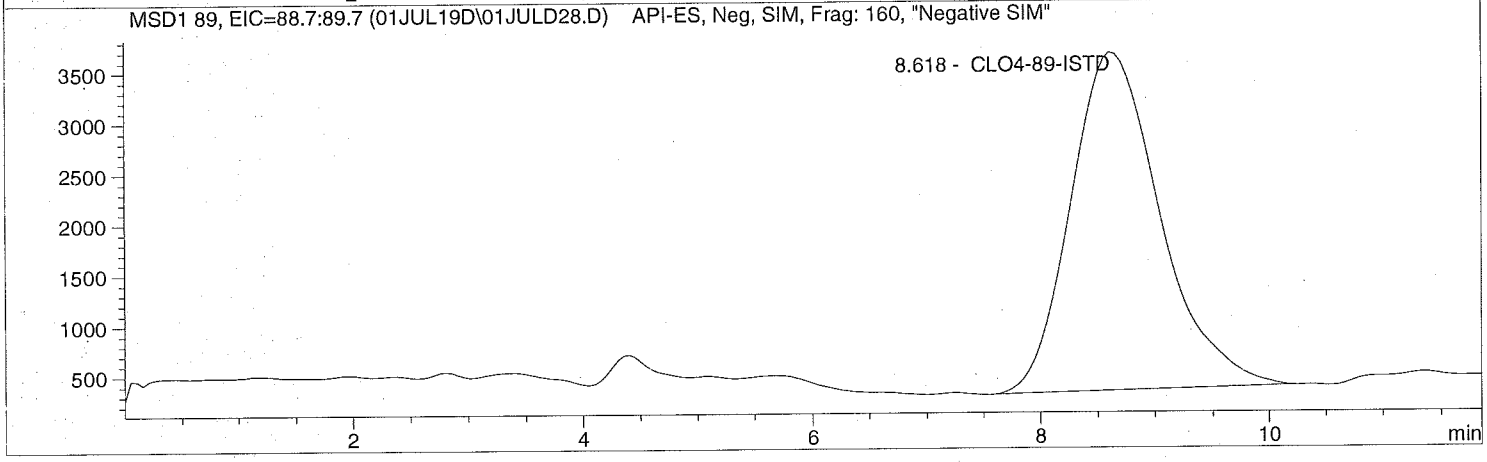
Injection Date:	7/01/2019 14:53:42	Seq Line:	28
Sample Name:	661483 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD28.D Sample Name: 661483 CCV@25

Injection Date:	7/01/2019 14:53:42	Seq Line:	28
Sample Name:	661483 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.597	PBA	1506029.6	25.4198	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.615	PBA	453099.1	25.7499	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.618	PBA	180069.9	5.0000	CLO4-89-ISTD

*** End of Report ***

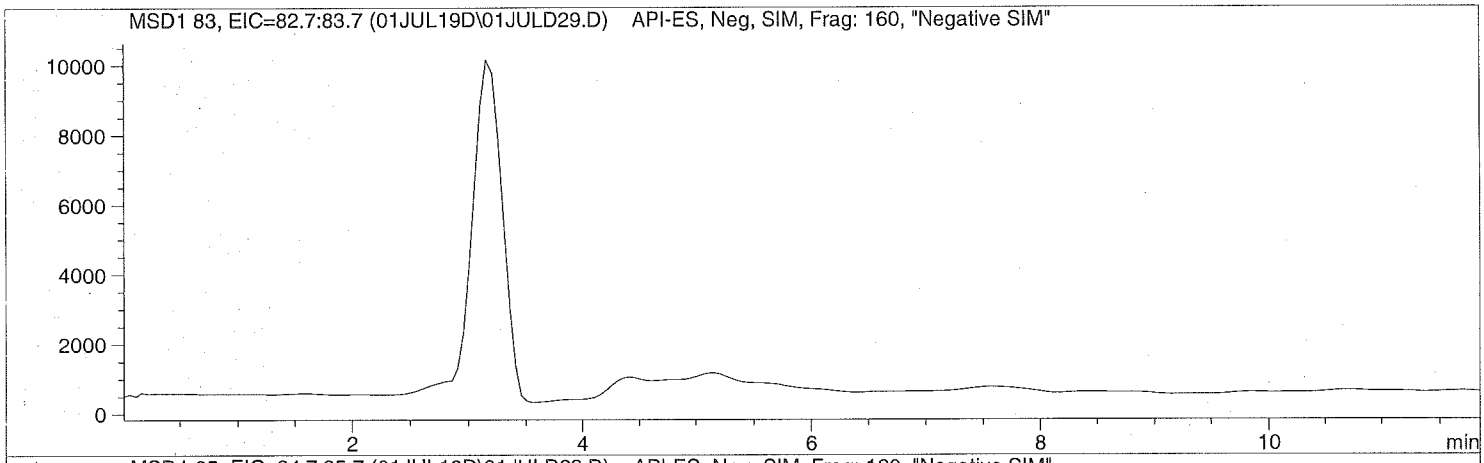
RIGHT SOLUTIONS | RIGHT PARTNER

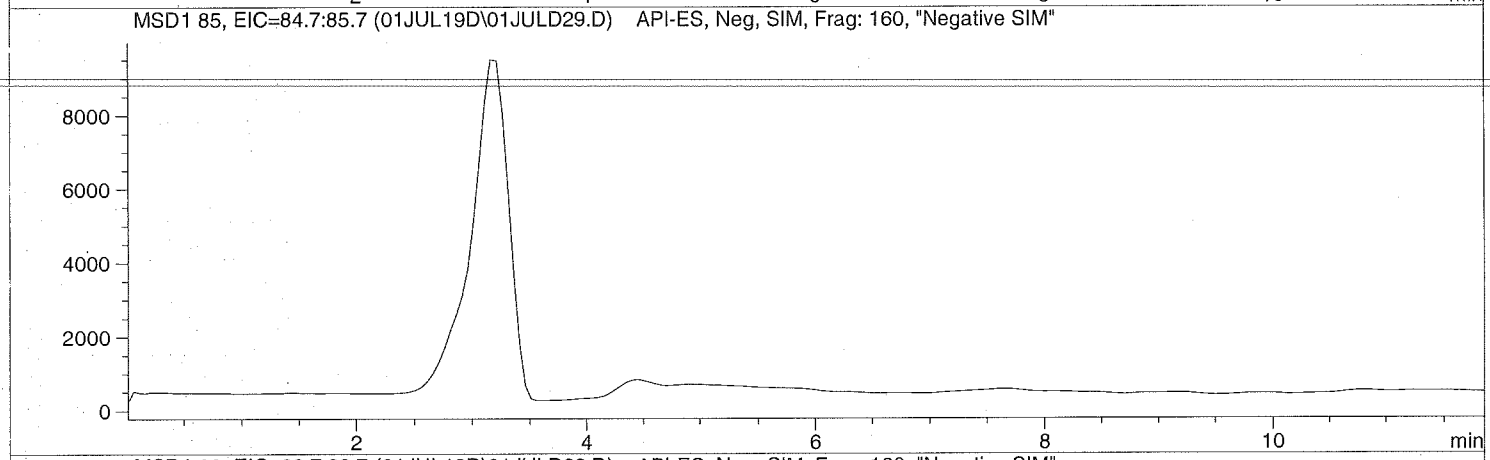
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD29.D Sample Name: 1917856002 RE

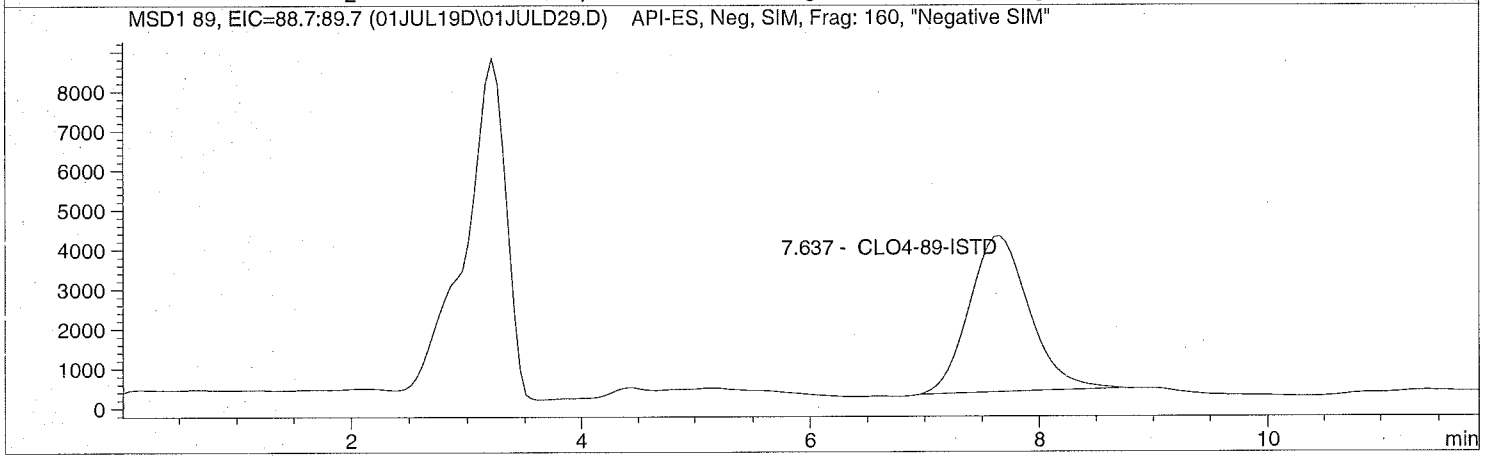
Injection Date:	7/01/2019 15:07:32	Seq Line:	29
Sample Name:	1917856002 RE	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD29.D Sample Name: 1917856002 RE

Injection Date:	7/01/2019 15:07:32	Seq Line:	29
Sample Name:	1917856002 RE	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.637	PBA	142651.0	5.0000	CLO4-89-ISTD

*** End of Report ***

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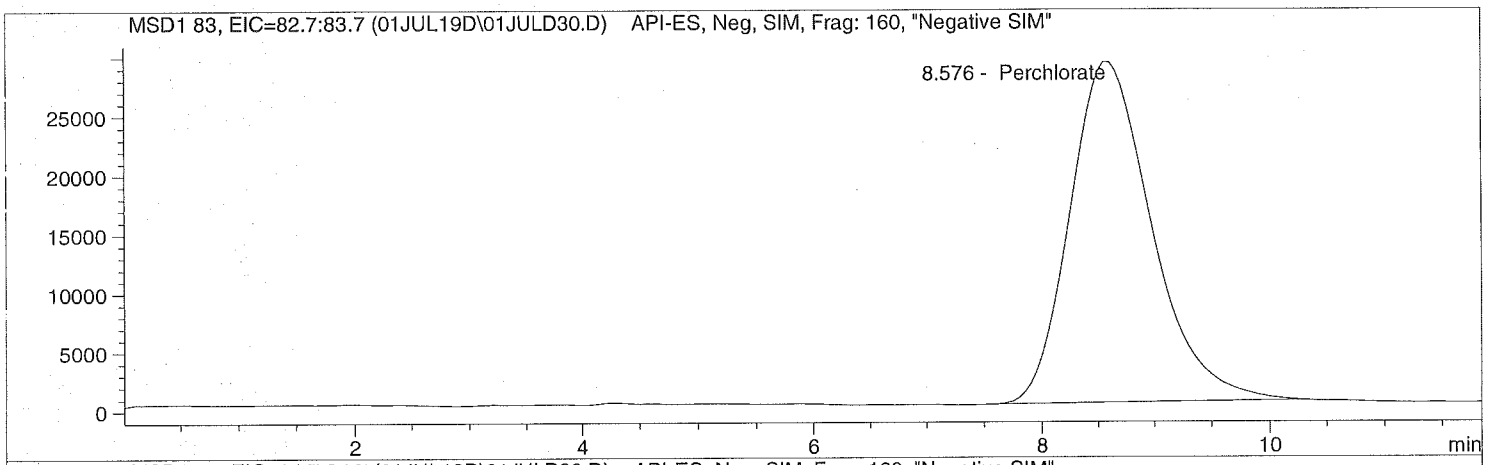
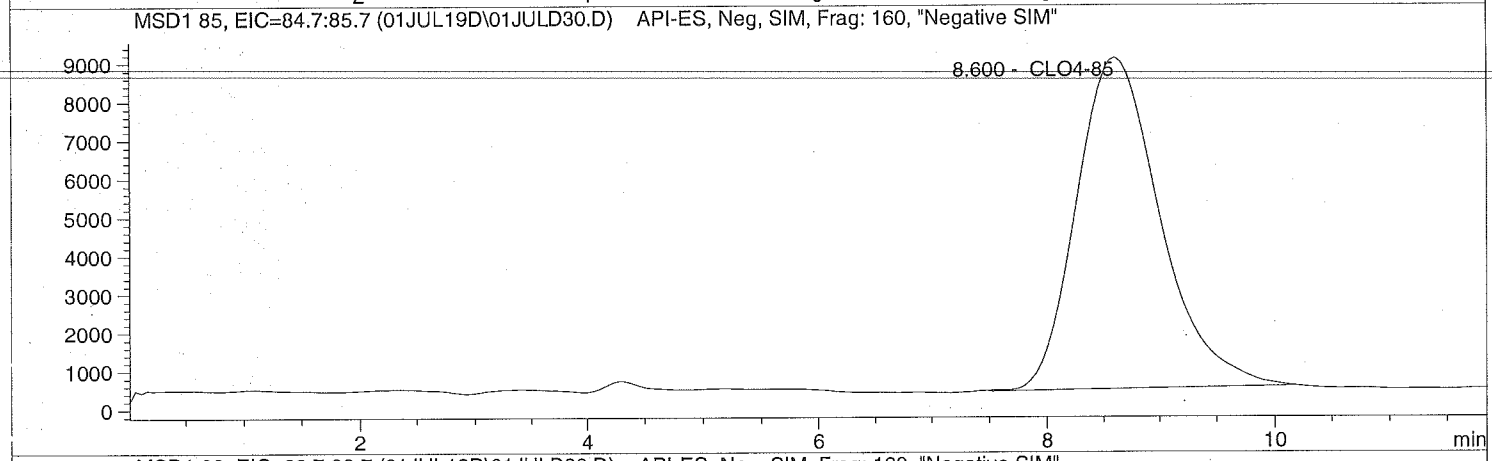
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD30.D Sample Name: 661661 CCV@25

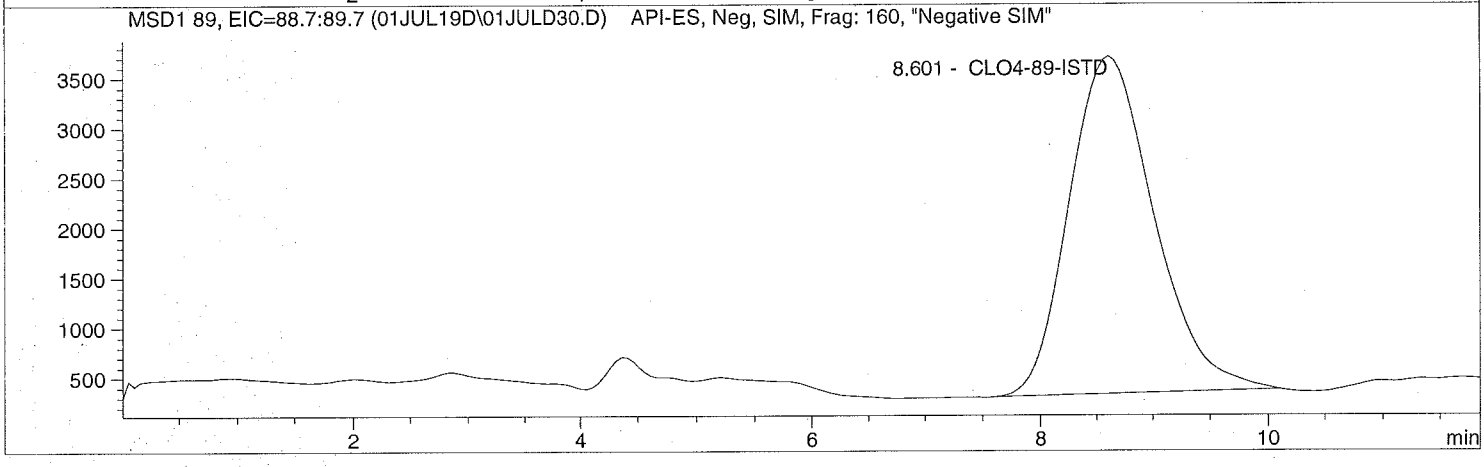
Injection Date:	7/01/2019 15:21:25	Seq Line:	30
Sample Name:	661661 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD30.D Sample Name: 661661 CCV@25

Injection Date:	7/01/2019 15:21:25	Seq Line:	30
Sample Name:	661661 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.576	PBA	1459488.9	25.1014	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.600	BBA	445116.2	25.7560	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.601	PBA	176853.7	5.0000	CLO4-89-ISTD

*** End of Report ***

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

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Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5	1		Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5	1		CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

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RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

Peak Sum Table

No Entries in table

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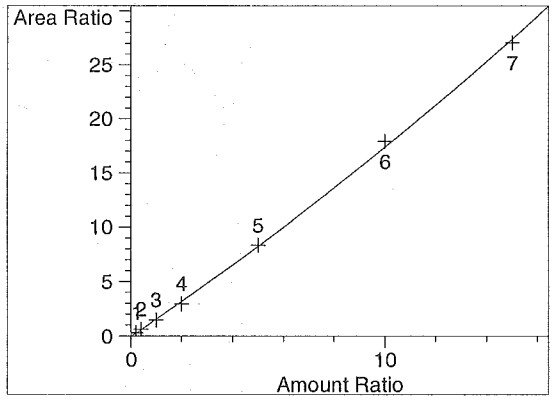
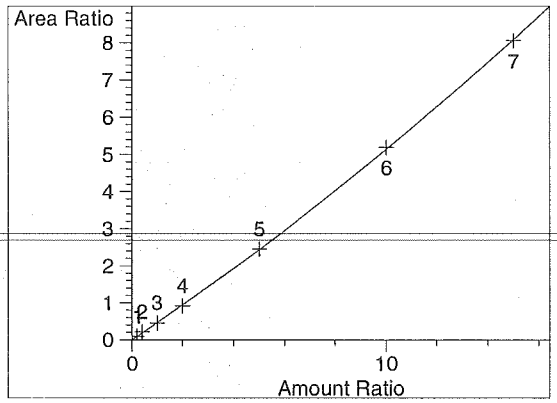
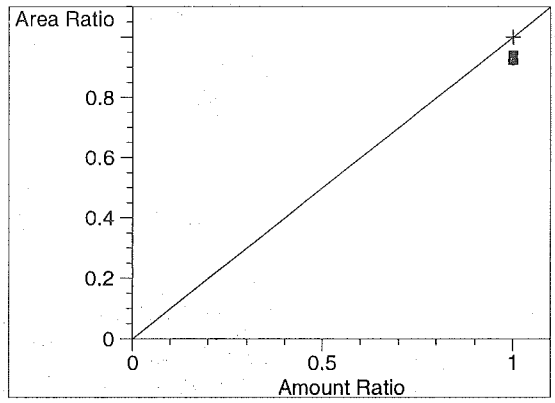
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: y = ax² + bx + c
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: y = ax² + bx + c
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: y = mx + b
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

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00940760

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

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Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

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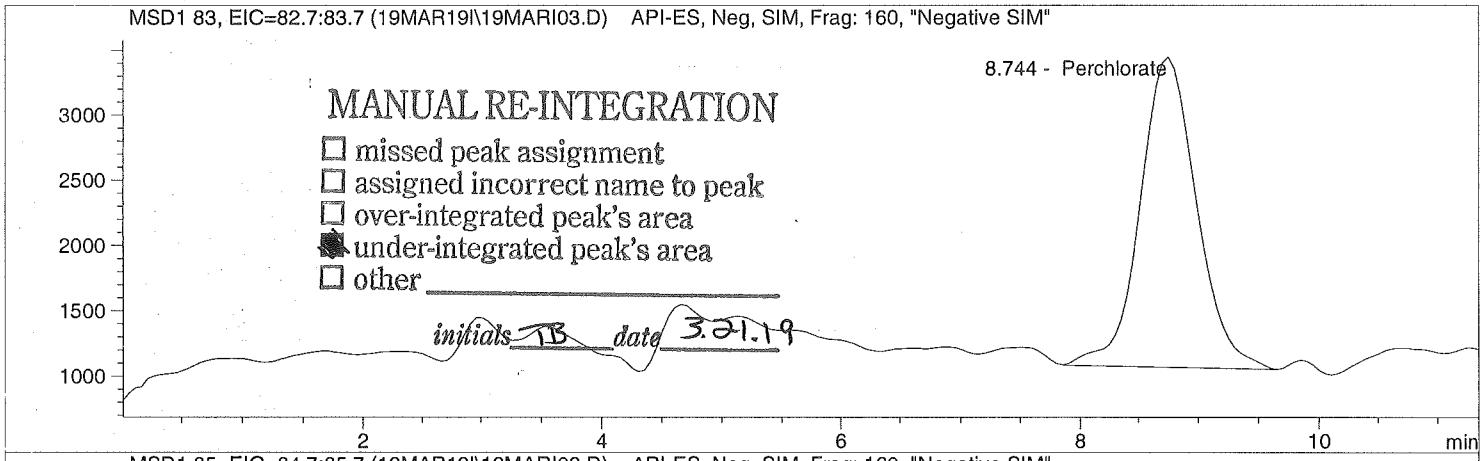
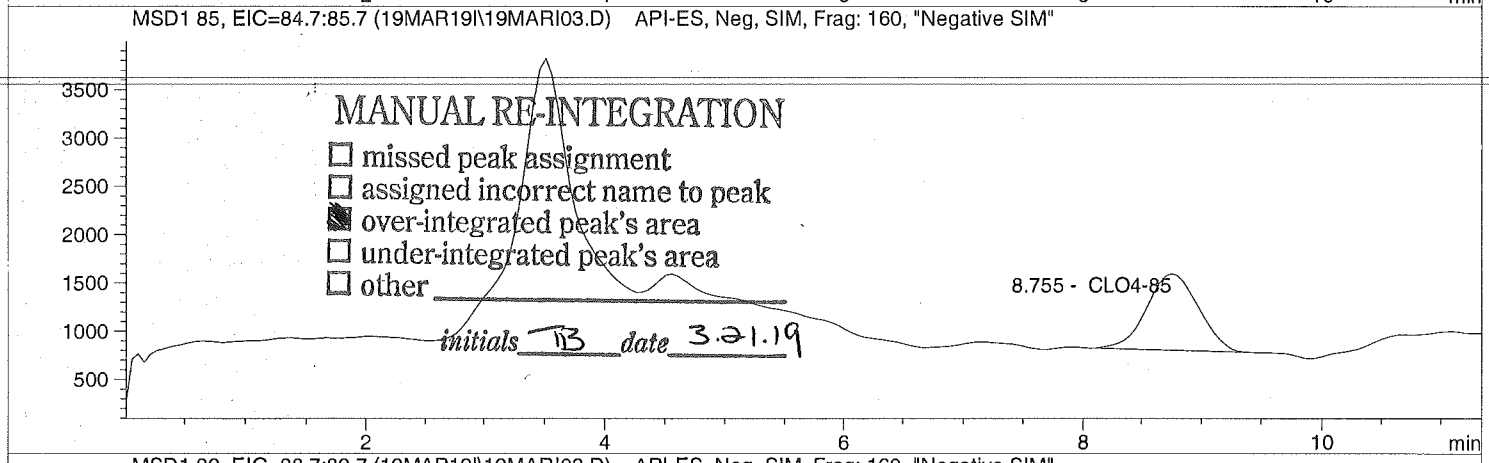
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

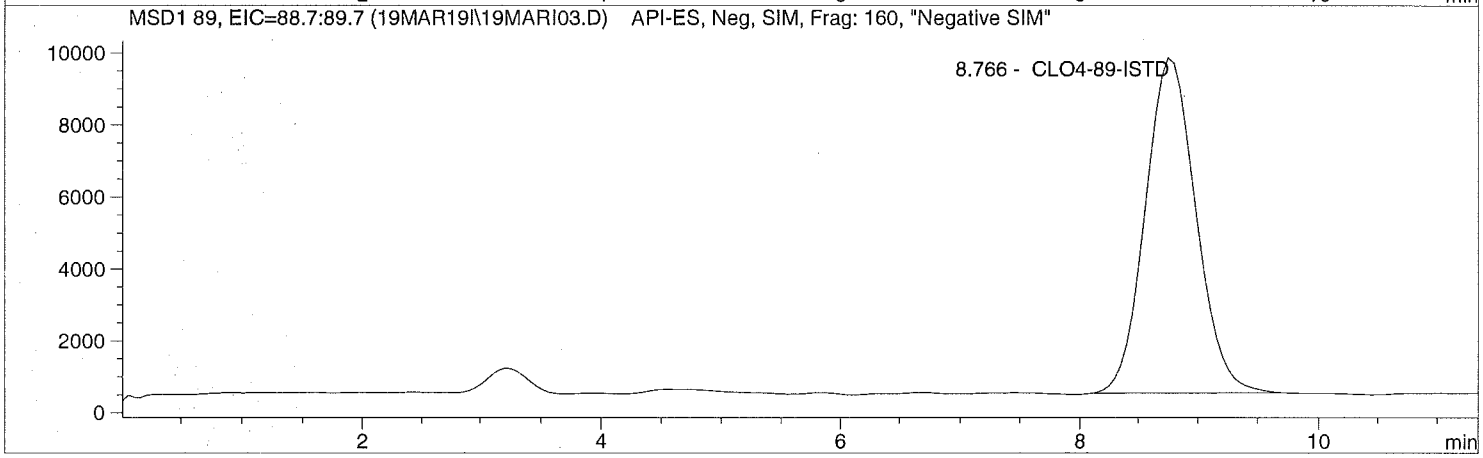
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

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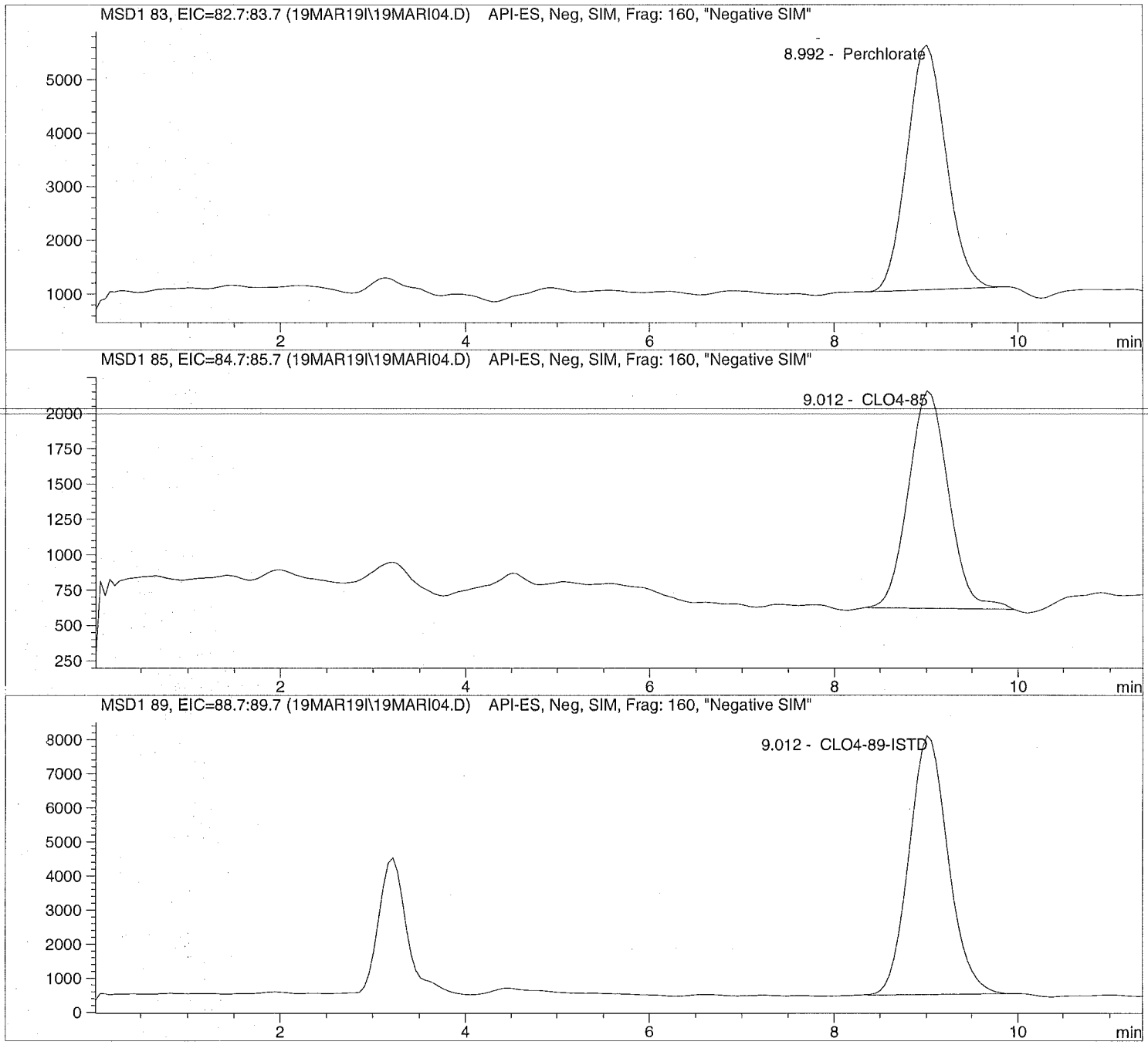
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

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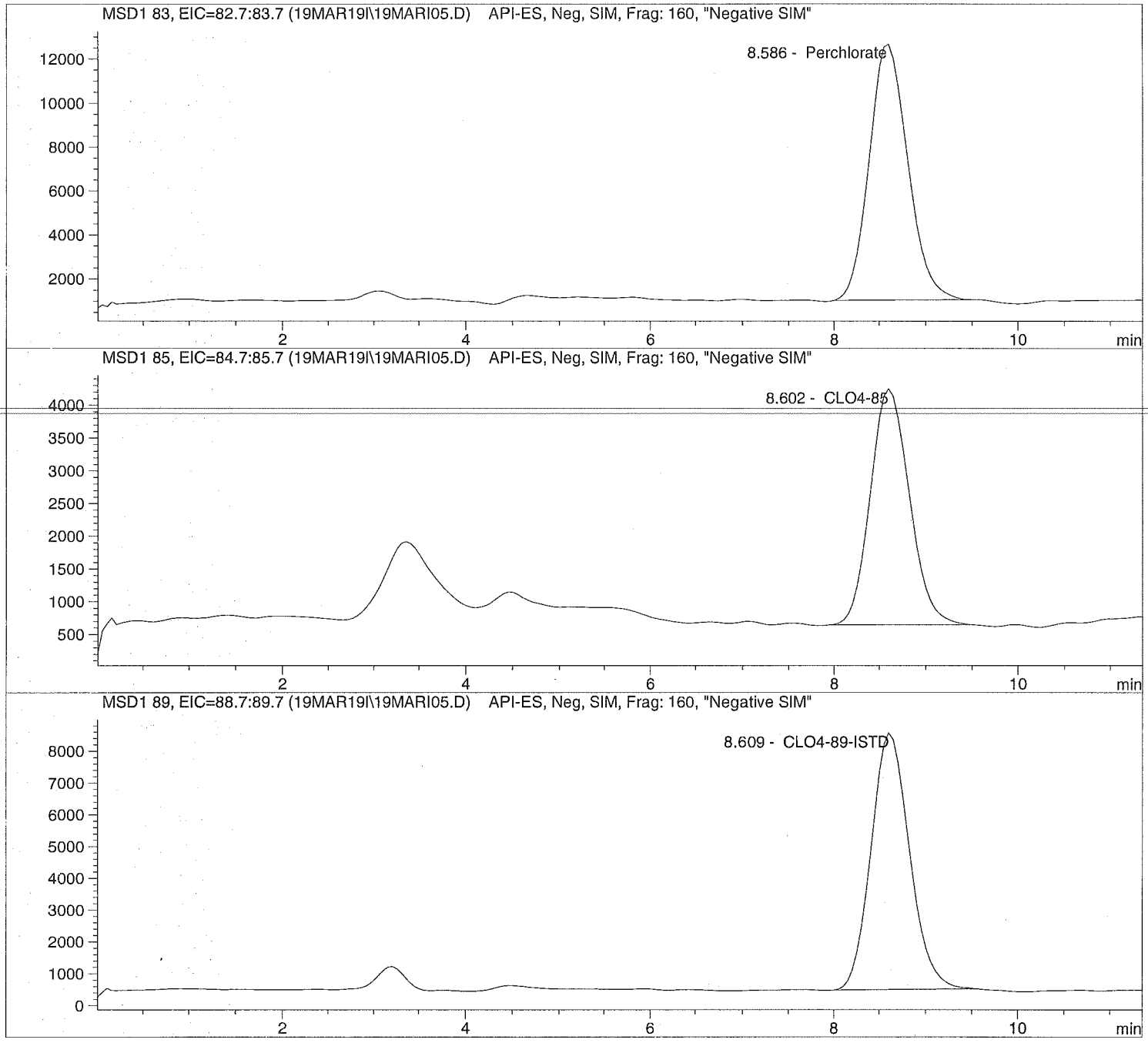
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

*** End of Report ***

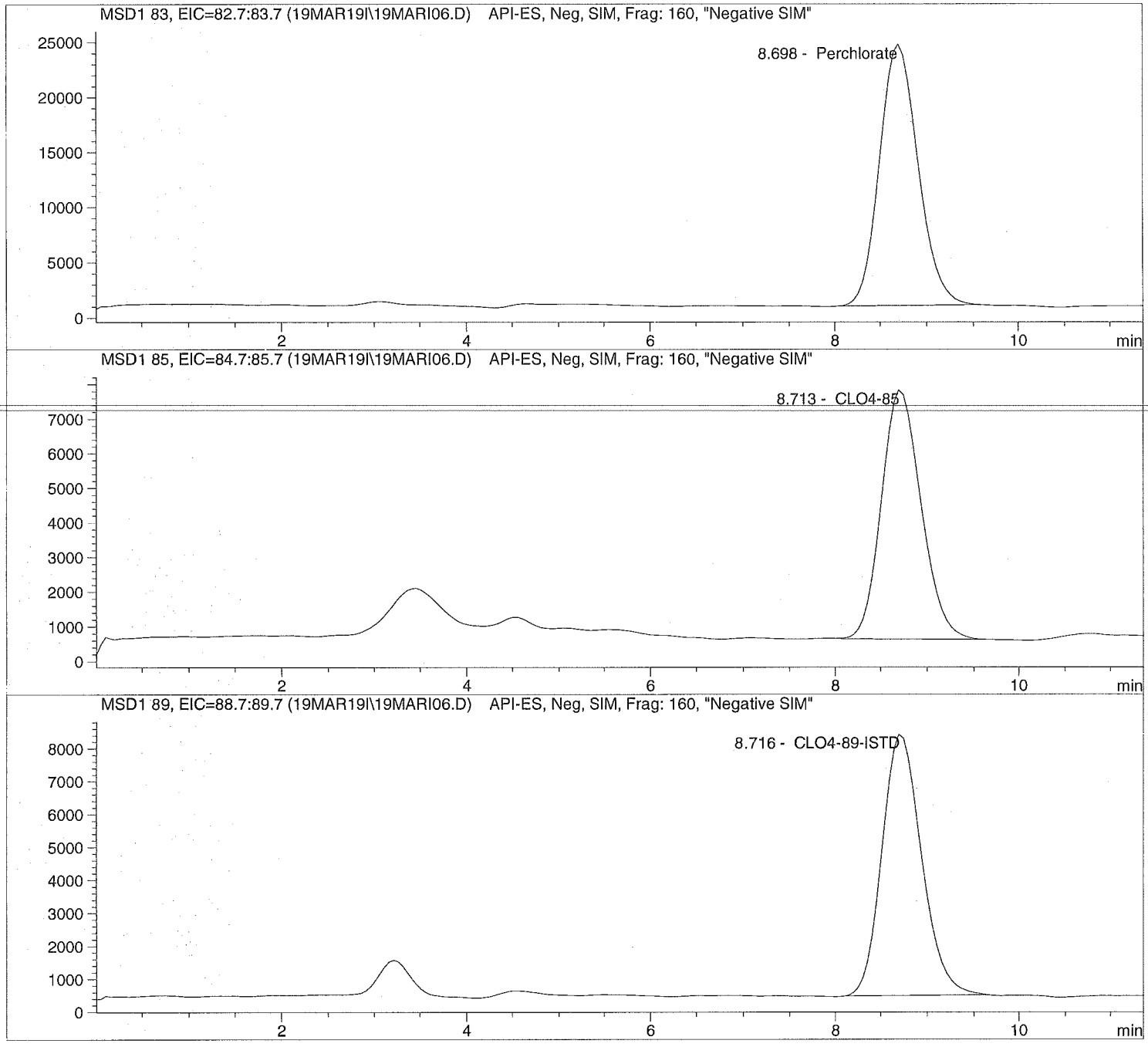
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

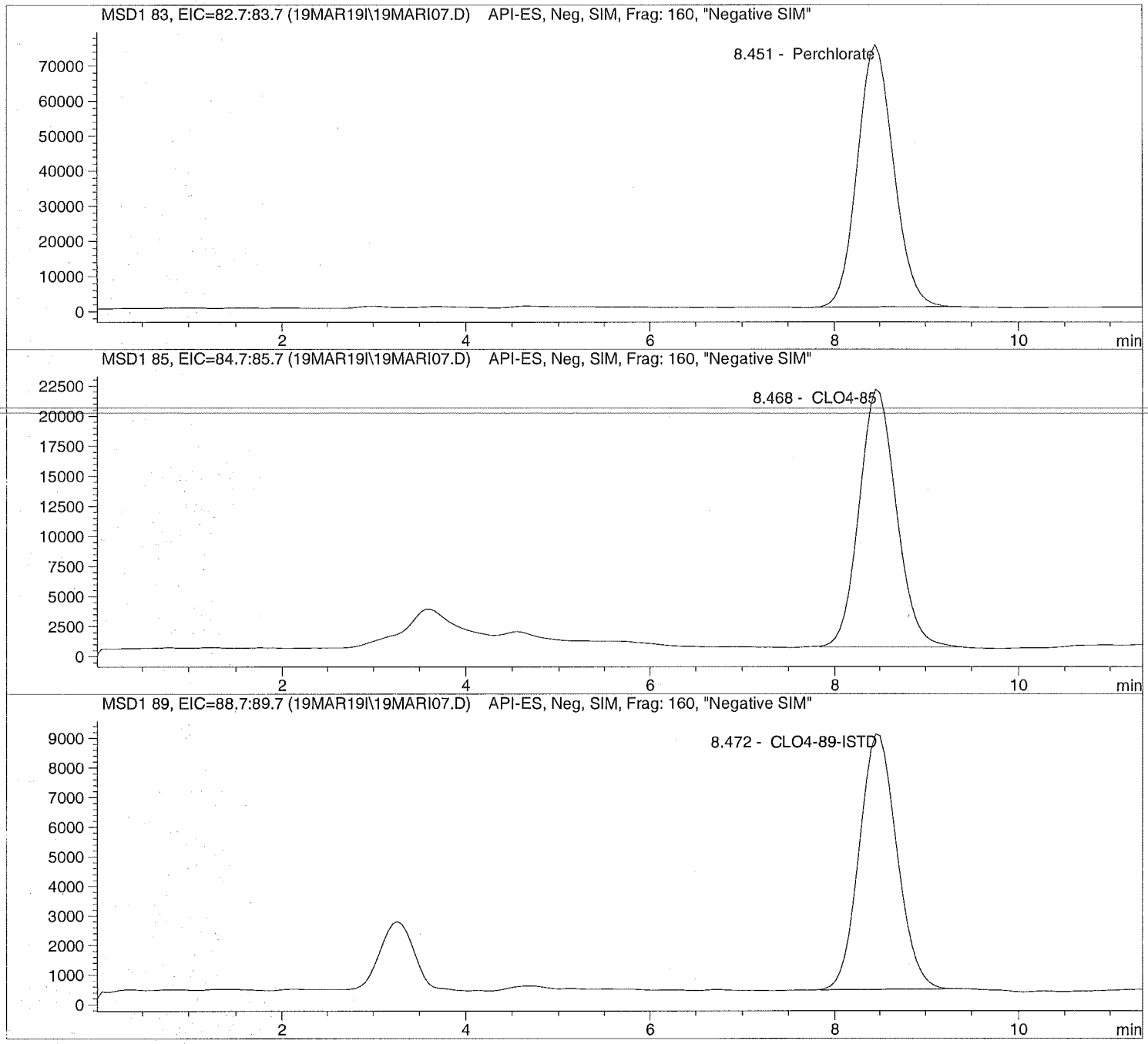
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

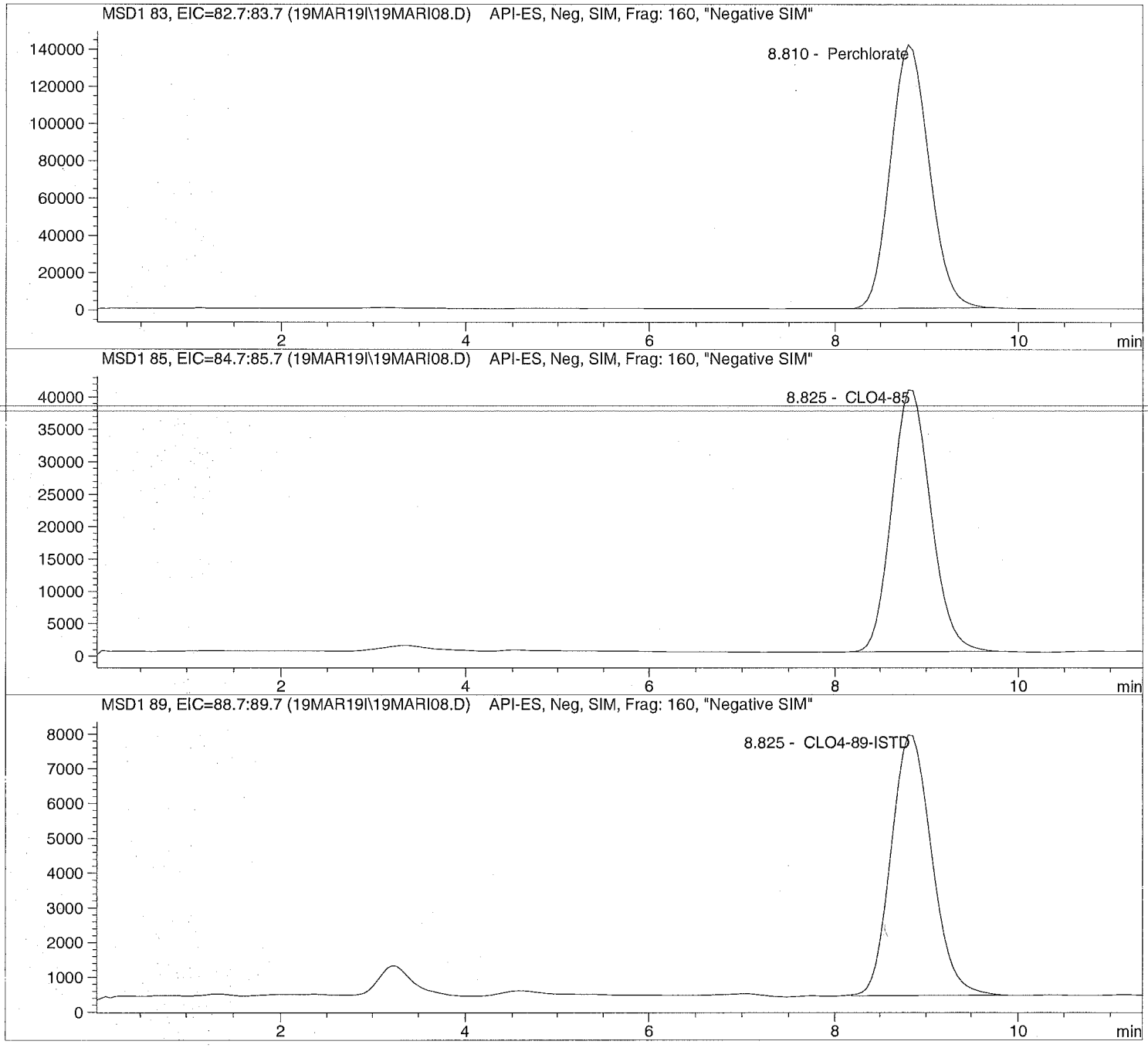
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

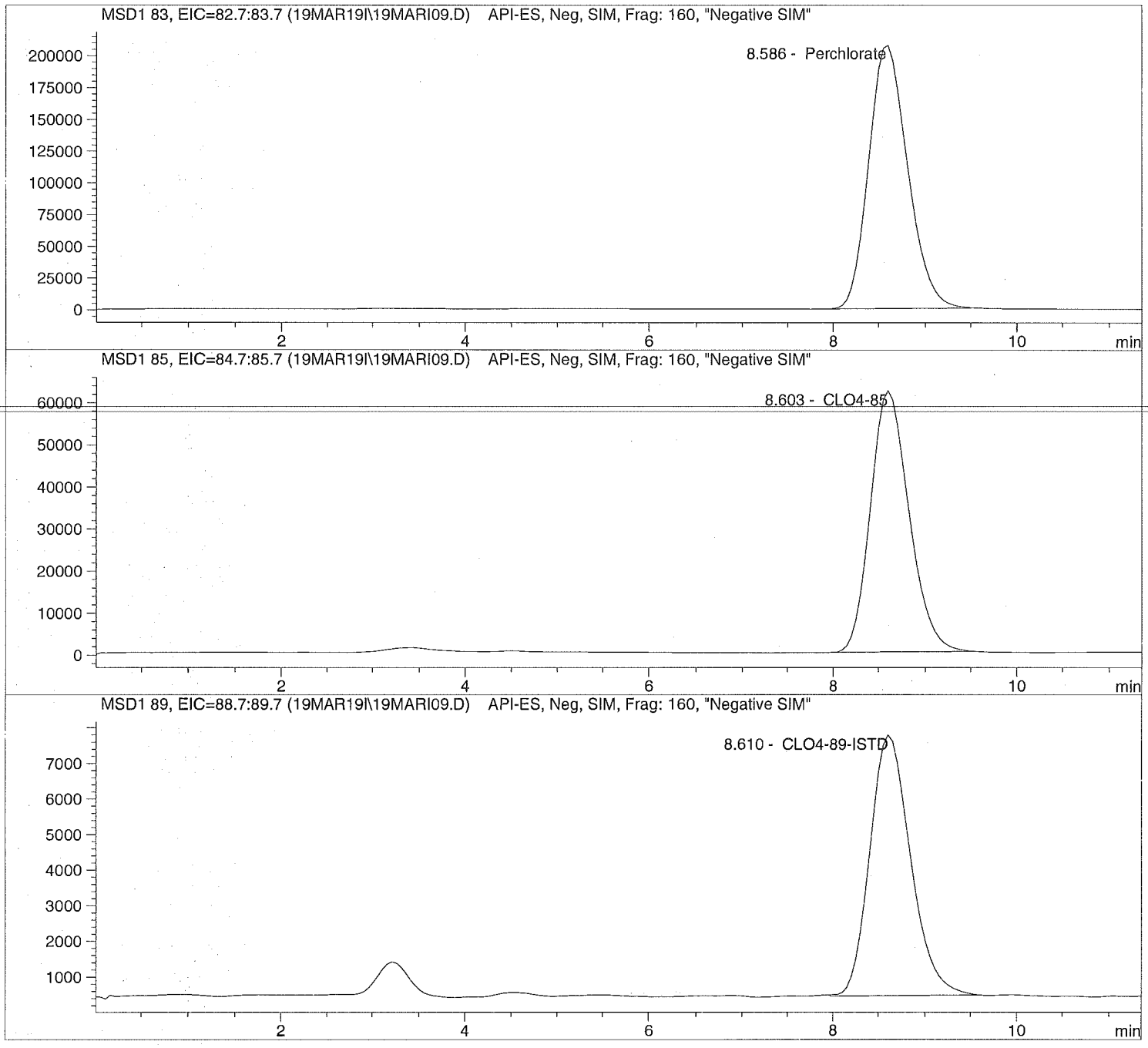
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

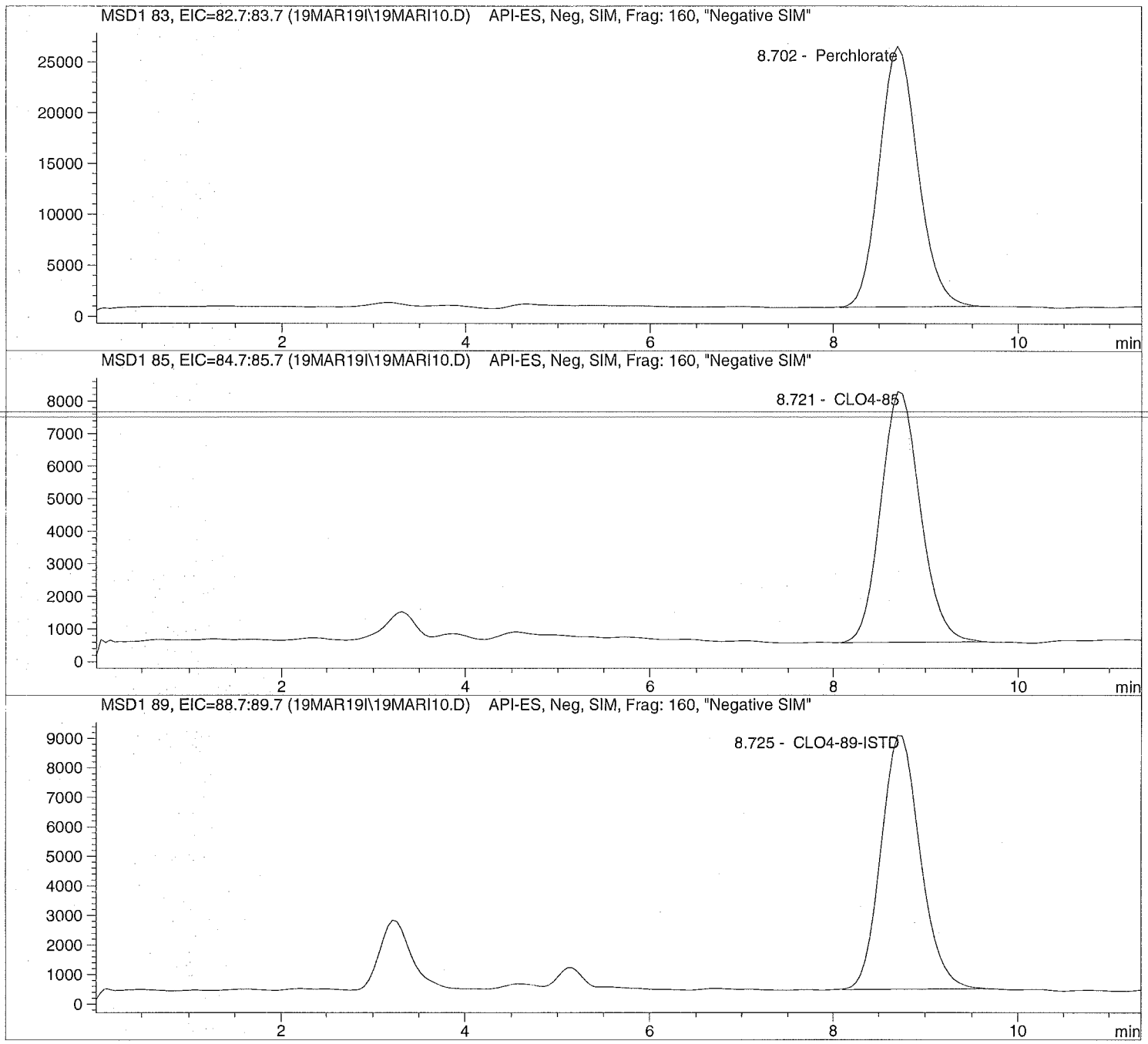
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

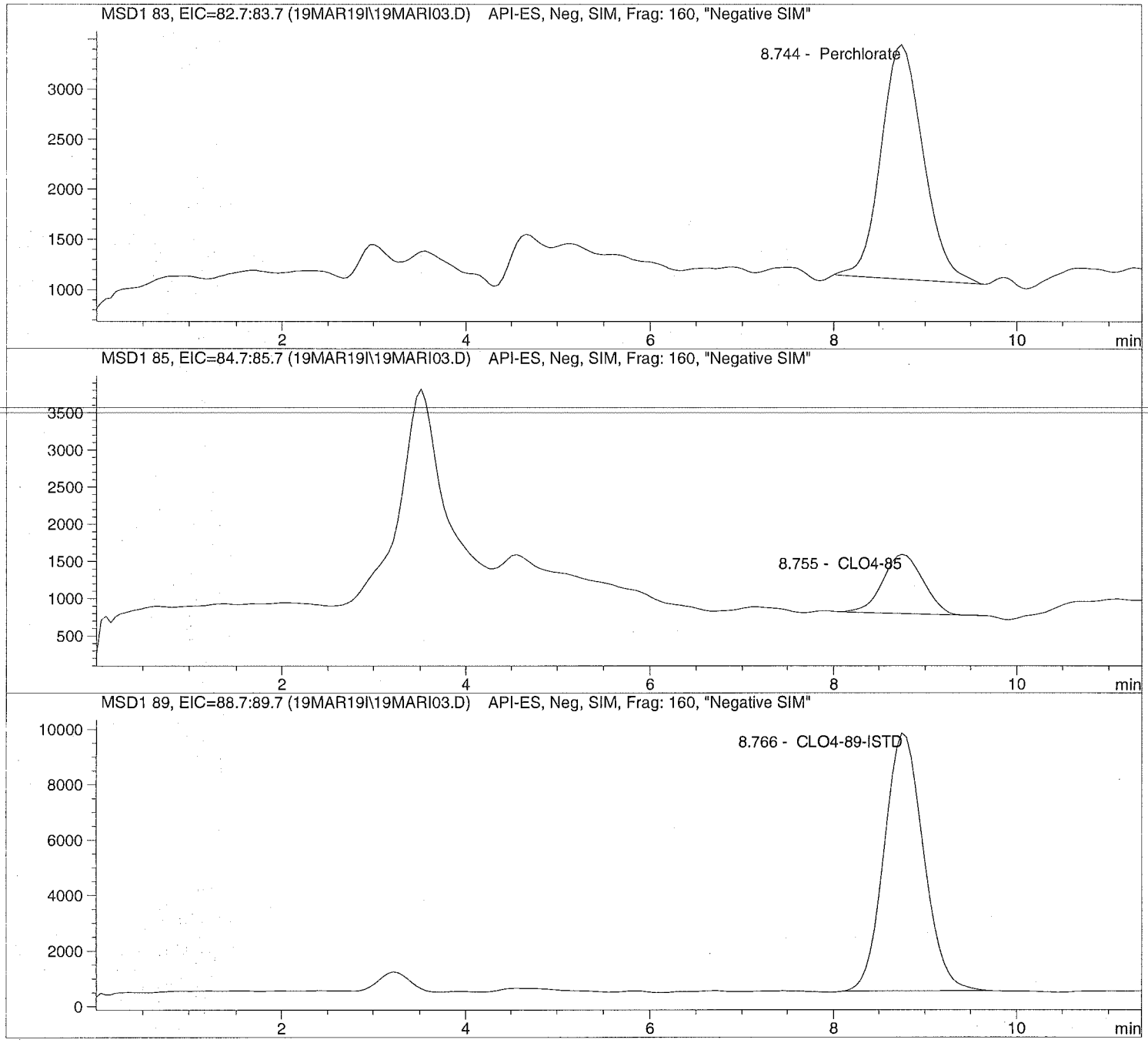
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

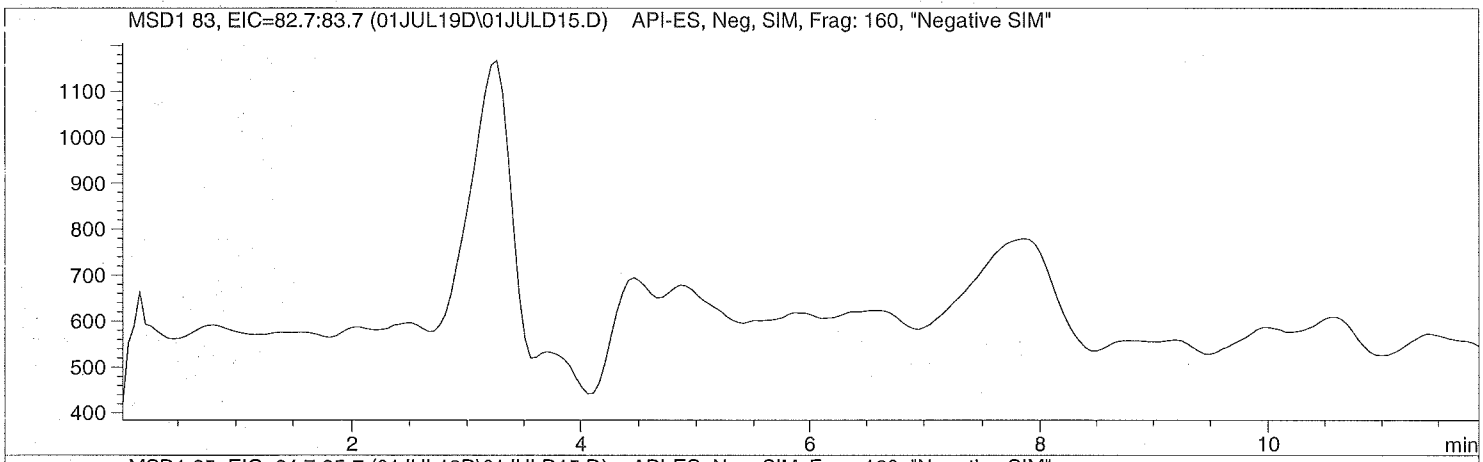
RIGHT SOLUTIONS | RIGHT PARTNER

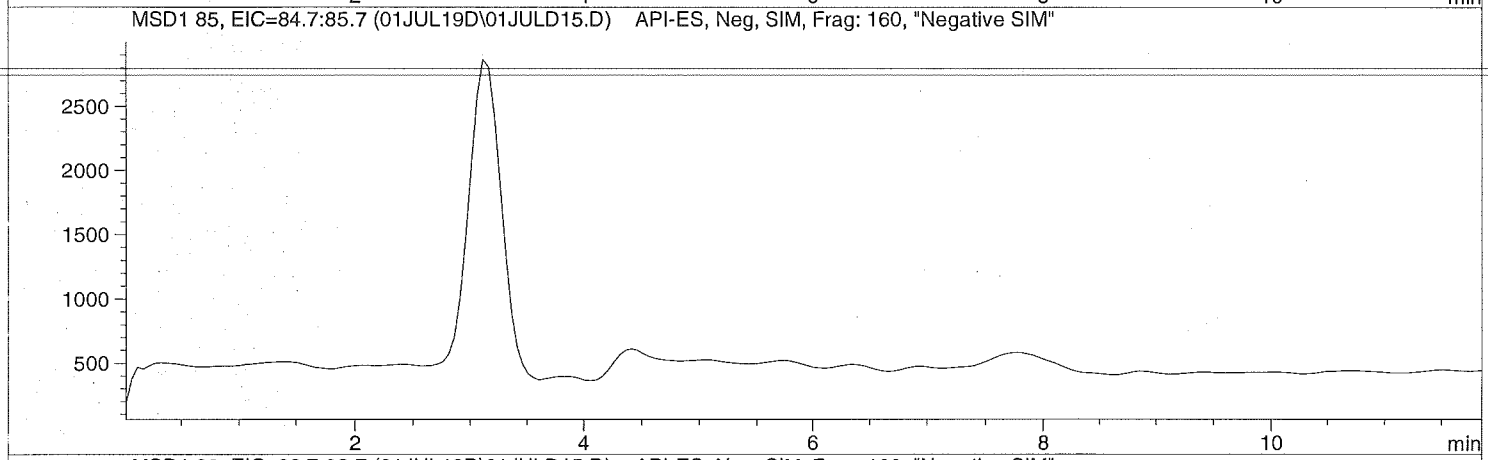
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

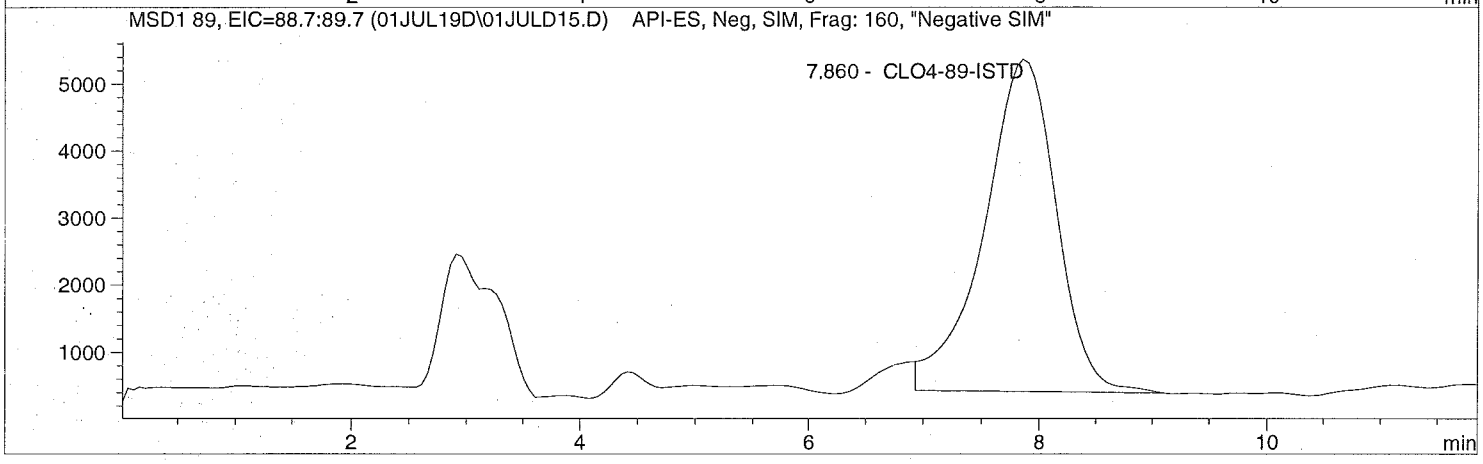
Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.860	BBA	216713.3	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

July 10, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19061157**

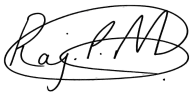
Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 9 sample(s) on Jun 21, 2019 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061157

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19061157-01	18CPTMW10DW_062019	Groundwater		20-Jun-2019 07:10	21-Jun-2019 09:00	☐
HS19061157-02	18CPTMW10SW_062019	Groundwater		20-Jun-2019 07:55	21-Jun-2019 09:00	☐
HS19061157-03	18WW06_062019	Groundwater		20-Jun-2019 08:50	21-Jun-2019 09:00	☐
HS19061157-04	18WW02_062019	Groundwater		20-Jun-2019 09:40	21-Jun-2019 09:00	☐
HS19061157-05	18CPTMW19_062019	Groundwater		20-Jun-2019 10:35	21-Jun-2019 09:00	☐
HS19061157-06	18CPTMW19SW_062019	Groundwater		20-Jun-2019 11:25	21-Jun-2019 09:00	☐
HS19061157-07	18WW22_062019	Groundwater		20-Jun-2019 12:20	21-Jun-2019 09:00	☐
HS19061157-08	C04_062019	Groundwater		20-Jun-2019 13:10	21-Jun-2019 09:00	☐
HS19061157-09	Trip Blank	Water		20-Jun-2019 00:00	21-Jun-2019 09:00	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19061157

Work Order Comments

• Revised to correct the reporting limit for Mercury

Work Order Comments

• The analyses for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final Report attached

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142429

Sample ID: LCSD-142429

• LCS/LCSD RPD recovered above the RPD limit. The individual recoveries met acceptance criteria (Surrogate 4-Terphenyl-d14)

GCMS Volatiles by Method SW8260

Batch ID: R341546

Sample ID: 18CPTMW10SW_062019 (HS19061157-02MS)

• MS/MSD /RPD failed QC limits for some few compounds

Sample ID: VLCSW-190628

• 1,2,3_Trichlorobenzene and Naphthalene exceeded QC limits for LCS. CCV is OK. Samples are ND for these compounds.

Metals by Method SW7470

Batch ID: 142560

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 142427

Sample ID: HS19060986-04MS

• MS and MSD are for an unrelated sample

Subcontracted by Method NA

Batch ID: R341930

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW10DW_062019
Collection Date: 20-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 18:24
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 18:24
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 18:24
Acetone	**3.3**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 18:24
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 18:24
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW10DW_062019
Collection Date: 20-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 18:24
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 18:24
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 18:24
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:24
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Trichloroethene	**1.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	28-Jun-2019 18:24
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:24
Surr: 1,2-Dichloroethane-d4	*99.3*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 18:24*
Surr: 4-Bromofluorobenzene	*94.7*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 18:24*
Surr: Dibromofluoromethane	*93.2*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 18:24*
Surr: Toluene-d8	*95.8*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 18:24*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW10DW_062019
Collection Date: 20-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.611**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:09
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:09
Arsenic	**0.00262**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Barium	**0.108**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:56
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:09
Calcium	**6.74**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:09
Chromium	**0.00736**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Cobalt	**0.000393**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Copper	**0.00188**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Iron	**2.80**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:09
Lead	**0.000967**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Magnesium	**5.34**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:09
Manganese	**0.0448**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Nickel	**0.00202**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Potassium	**111**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:09
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:09
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:09
Sodium	**184**		**0.0700**	**0.250**	**1.00**	**mg/L**	5	28-Jun-2019 15:58
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:09
Vanadium	**0.00163**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
Zinc	**0.0244**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:09
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 16:04
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW10SW_062019
Collection Date: 20-Jun-2019 07:55

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 13:13
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 13:13
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 13:13
Acetone	**5.4**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 13:13
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 13:13
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW10SW_062019
Collection Date: 20-Jun-2019 07:55

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 13:13
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 13:13
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 13:13
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:13
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:13
Surr: 1,2-Dichloroethane-d4	*99.7*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 13:13*
Surr: 4-Bromofluorobenzene	*93.3*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 13:13*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 13:13*
Surr: Toluene-d8	*95.4*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 13:13*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 01:44
Surr: 2-Fluorobiphenyl	*81.4*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 01:44*
Surr: 4-Terphenyl-d14	*124*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 01:44*
Surr: Nitrobenzene-d5	*106*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 01:44*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW06_062019
Collection Date: 20-Jun-2019 08:50

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 13:37
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 13:37
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 13:37
Acetone	**3.0**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 13:37
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 13:37
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW06_062019
Collection Date: 20-Jun-2019 08:50

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 13:37
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 13:37
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 13:37
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 13:37
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 13:37
Surr: 1,2-Dichloroethane-d4	*97.9*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 13:37*
Surr: 4-Bromofluorobenzene	*93.9*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 13:37*
Surr: Dibromofluoromethane	*92.4*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 13:37*
Surr: Toluene-d8	*94.7*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 13:37*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 02:05
Surr: 2-Fluorobiphenyl	*76.9*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:05*
Surr: 4-Terphenyl-d14	*124*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:05*
Surr: Nitrobenzene-d5	*111*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:05*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW02_062019
Collection Date: 20-Jun-2019 09:40

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 16:25
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 16:25
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 16:25
Acetone	**5.4**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 16:25
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 16:25
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW02_062019
Collection Date: 20-Jun-2019 09:40

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 16:25
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 16:25
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 16:25
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:25
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:25
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 16:25*
Surr: 4-Bromofluorobenzene	*96.4*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 16:25*
Surr: Dibromofluoromethane	*96.8*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 16:25*
Surr: Toluene-d8	*96.7*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 16:25*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 02:25
Surr: 2-Fluorobiphenyl	*91.5*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:25*
Surr: 4-Terphenyl-d14	*132*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:25*
Surr: Nitrobenzene-d5	*107*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:25*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW02_062019
Collection Date: 20-Jun-2019 09:40

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**1.56**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:11
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:11
Arsenic	**0.000675**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Barium	**0.0506**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:11
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:11
Calcium	**7.84**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:11
Chromium	**0.00851**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Cobalt	**0.000341**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Copper	**0.00663**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Iron	**2.46**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:11
Lead	**0.00123**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Magnesium	**1.44**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:11
Manganese	**0.0988**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Nickel	**0.00574**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Potassium	**2.12**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:11
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:11
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:11
Sodium	**25.4**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:11
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:11
Vanadium	**0.00394**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
Zinc	**0.0147**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:11
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 16:09
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW19_062019
Collection Date: 20-Jun-2019 10:35

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 16:49
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 16:49
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 16:49
Acetone	**4.8**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 16:49
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 16:49
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW19_062019
Collection Date: 20-Jun-2019 10:35

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 16:49
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 16:49
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 16:49
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 16:49
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 16:49
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 16:49*
Surr: 4-Bromofluorobenzene	*95.3*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 16:49*
Surr: Dibromofluoromethane	*96.2*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 16:49*
Surr: Toluene-d8	*95.2*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 16:49*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**0.068**		**0.010**	**0.010**	**0.010**	**ug/L**	1	28-Jun-2019 02:46
Surr: 2-Fluorobiphenyl	*87.4*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:46*
Surr: 4-Terphenyl-d14	*131*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:46*
Surr: Nitrobenzene-d5	*107*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 02:46*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW19SW_062019
Collection Date: 20-Jun-2019 11:25

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 17:12
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 17:12
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 17:12
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 17:12
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 17:12
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW19SW_062019
Collection Date: 20-Jun-2019 11:25

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 17:12
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 17:12
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 17:12
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:12
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:12
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 17:12*
Surr: 4-Bromofluorobenzene	*94.2*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 17:12*
Surr: Dibromofluoromethane	*94.2*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 17:12*
Surr: Toluene-d8	*95.1*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 17:12*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 03:07
Surr: 2-Fluorobiphenyl	*82.7*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 03:07*
Surr: 4-Terphenyl-d14	*129*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 03:07*
Surr: Nitrobenzene-d5	*107*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 03:07*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW19SW_062019
Collection Date: 20-Jun-2019 11:25

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0745**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:16
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:16
Arsenic	**0.00543**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
Barium	**0.198**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:16
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:16
Calcium	**11.2**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:16
Chromium	**0.00171**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
Cobalt	**0.0104**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 18:16
Iron	**16.1**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:16
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:16
Magnesium	**5.98**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:16
Manganese	**0.477**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
Nickel	**0.00246**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
Potassium	**1.68**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:16
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:16
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:16
Sodium	**28.1**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:16
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:16
Vanadium	**0.00184**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
Zinc	**0.0247**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:16
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 16:11
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW22_062019
Collection Date: 20-Jun-2019 12:20

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 17:36
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 17:36
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 17:36
Acetone	**9.1**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 17:36
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 17:36
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW22_062019
Collection Date: 20-Jun-2019 12:20

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 17:36
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 17:36
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 17:36
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 17:36
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 17:36
Surr: 1,2-Dichloroethane-d4	*98.4*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 17:36*
Surr: 4-Bromofluorobenzene	*93.8*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 17:36*
Surr: Dibromofluoromethane	*91.6*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 17:36*
Surr: Toluene-d8	*94.8*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 17:36*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**0.017**		**0.010**	**0.010**	**0.010**	**ug/L**	1	28-Jun-2019 03:27
Surr: 2-Fluorobiphenyl	*117*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 03:27*
Surr: 4-Terphenyl-d14	*137*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 03:27*
Surr: Nitrobenzene-d5	*126*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 03:27*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW22_062019
Collection Date: 20-Jun-2019 12:20

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.213**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:18
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:18
Arsenic	**0.00175**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:18
Barium	**0.145**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:18
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	28-Jun-2019 15:18
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:18
Calcium	**15.2**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:18
Chromium	**0.0245**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:18
Cobalt	**0.000243**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:18
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	27-Jun-2019 18:18
Iron	**0.0577**	J	**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:18
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:18
Magnesium	**3.50**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:18
Manganese	**0.00169**	J	**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:18
Nickel	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:18
Potassium	**4.81**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:18
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:18
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:18
Sodium	**39.1**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:18
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:18
Vanadium	**0.0148**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:18
Zinc	**0.0168**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:18
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 16:13
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: C04_062019
Collection Date: 20-Jun-2019 13:10

ANALYTICAL REPORT
WorkOrder:HS19061157
Lab ID:HS19061157-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 18:00
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 18:00
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 18:00
Acetone	**4.8**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 18:00
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 18:00
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19061157
Sample ID: C04_062019
Lab ID:HS19061157-08
Collection Date: 20-Jun-2019 13:10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 18:00
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 18:00
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 18:00
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 18:00
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 18:00
Surr: 1,2-Dichloroethane-d4	*99.2*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 18:00*
Surr: 4-Bromofluorobenzene	*92.5*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 18:00*
Surr: Dibromofluoromethane	*93.0*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 18:00*
Surr: Toluene-d8	*93.3*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 18:00*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19061157
Sample ID: Trip Blank
Lab ID:HS19061157-09
Collection Date: 20-Jun-2019 00:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 12:49
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	28-Jun-2019 12:49
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	28-Jun-2019 12:49
Acetone	**21**		**0.40**	**1.0**	**2.0**	**UG/L**	1	28-Jun-2019 12:49
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	28-Jun-2019 12:49
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24 WorkOrder:HS19061157
Sample ID: Trip Blank Lab ID:HS19061157-09
Collection Date: 20-Jun-2019 00:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	28-Jun-2019 12:49
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	28-Jun-2019 12:49
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	28-Jun-2019 12:49
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	28-Jun-2019 12:49
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	28-Jun-2019 12:49
Surr: 1,2-Dichloroethane-d4	*97.5*			**0**	*81-118*	*%REC*	*1*	*28-Jun-2019 12:49*
Surr: 4-Bromofluorobenzene	*93.2*			**0**	*85-114*	*%REC*	*1*	*28-Jun-2019 12:49*
Surr: Dibromofluoromethane	*91.4*			**0**	*80-119*	*%REC*	*1*	*28-Jun-2019 12:49*
Surr: Toluene-d8	*93.3*			**0**	*89-112*	*%REC*	*1*	*28-Jun-2019 12:49*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

Batch ID: 142427 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061157-01	1	10	10 (mL)	1
HS19061157-04	1	10	10 (mL)	1
HS19061157-06	1	10	10 (mL)	1
HS19061157-07	1	10	10 (mL)	1

Batch ID: 142429 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061157-02	1	1000	1 (mL)	0.001
HS19061157-03	1	1000	1 (mL)	0.001
HS19061157-04	1	1000	1 (mL)	0.001
HS19061157-05	1	1000	1 (mL)	0.001
HS19061157-06	1	1000	1 (mL)	0.001
HS19061157-07	1	1000	1 (mL)	0.001

Batch ID: 142560 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061157-01	1	10 (mL)	10 (mL)	1
HS19061157-04	1	10 (mL)	10 (mL)	1
HS19061157-06	1	10 (mL)	10 (mL)	1
HS19061157-07	1	10 (mL)	10 (mL)	1

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142427 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19061157-01	18CPTMW10DW_062019	20 Jun 2019 07:10		25 Jun 2019 11:30	28 Jun 2019 15:58	5
HS19061157-01	18CPTMW10DW_062019	20 Jun 2019 07:10		25 Jun 2019 11:30	28 Jun 2019 15:56	1
HS19061157-01	18CPTMW10DW_062019	20 Jun 2019 07:10		25 Jun 2019 11:30	27 Jun 2019 18:09	1
HS19061157-04	18WW02_062019	20 Jun 2019 09:40		25 Jun 2019 11:30	27 Jun 2019 18:11	1
HS19061157-06	18CPTMW19SW_062019	20 Jun 2019 11:25		25 Jun 2019 11:30	28 Jun 2019 15:16	1
HS19061157-06	18CPTMW19SW_062019	20 Jun 2019 11:25		25 Jun 2019 11:30	27 Jun 2019 18:16	1
HS19061157-07	18WW22_062019	20 Jun 2019 12:20		25 Jun 2019 11:30	28 Jun 2019 15:18	1
HS19061157-07	18WW22_062019	20 Jun 2019 12:20		25 Jun 2019 11:30	27 Jun 2019 18:18	1
Batch ID: 142429 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Groundwater	
HS19061157-02	18CPTMW10SW_062019	20 Jun 2019 07:55		25 Jun 2019 16:16	28 Jun 2019 01:44	1
HS19061157-03	18WW06_062019	20 Jun 2019 08:50		25 Jun 2019 16:16	28 Jun 2019 02:05	1
HS19061157-04	18WW02_062019	20 Jun 2019 09:40		25 Jun 2019 16:16	28 Jun 2019 02:25	1
HS19061157-05	18CPTMW19_062019	20 Jun 2019 10:35		25 Jun 2019 16:16	28 Jun 2019 02:46	1
HS19061157-06	18CPTMW19SW_062019	20 Jun 2019 11:25		25 Jun 2019 16:16	28 Jun 2019 03:07	1
HS19061157-07	18WW22_062019	20 Jun 2019 12:20		25 Jun 2019 16:16	28 Jun 2019 03:27	1
Batch ID: 142560 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19061157-01	18CPTMW10DW_062019	20 Jun 2019 07:10		28 Jun 2019 10:30	28 Jun 2019 16:04	1
HS19061157-04	18WW02_062019	20 Jun 2019 09:40		28 Jun 2019 10:30	28 Jun 2019 16:09	1
HS19061157-06	18CPTMW19SW_062019	20 Jun 2019 11:25		28 Jun 2019 10:30	28 Jun 2019 16:11	1
HS19061157-07	18WW22_062019	20 Jun 2019 12:20		28 Jun 2019 10:30	28 Jun 2019 16:13	1
Batch ID: R341546 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19061157-09	Trip Blank	20 Jun 2019 00:00			28 Jun 2019 12:49	1
Batch ID: R341546 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19061157-01	18CPTMW10DW_062019	20 Jun 2019 07:10			28 Jun 2019 18:24	1
HS19061157-02	18CPTMW10SW_062019	20 Jun 2019 07:55			28 Jun 2019 13:13	1
HS19061157-03	18WW06_062019	20 Jun 2019 08:50			28 Jun 2019 13:37	1
HS19061157-04	18WW02_062019	20 Jun 2019 09:40			28 Jun 2019 16:25	1
HS19061157-05	18CPTMW19_062019	20 Jun 2019 10:35			28 Jun 2019 16:49	1
HS19061157-06	18CPTMW19SW_062019	20 Jun 2019 11:25			28 Jun 2019 17:12	1
HS19061157-07	18WW22_062019	20 Jun 2019 12:20			28 Jun 2019 17:36	1
HS19061157-08	C04_062019	20 Jun 2019 13:10			28 Jun 2019 18:00	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R341930 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19061157-01	18CPTMW10DW_062019	20 Jun 2019 07:10			06 Jul 2019 09:58	1
HS19061157-02	18CPTMW10SW_062019	20 Jun 2019 07:55			06 Jul 2019 09:58	1
HS19061157-03	18WW06_062019	20 Jun 2019 08:50			06 Jul 2019 09:58	1
HS19061157-04	18WW02_062019	20 Jun 2019 09:40			06 Jul 2019 09:58	1
HS19061157-05	18CPTMW19_062019	20 Jun 2019 10:35			06 Jul 2019 09:58	1
HS19061157-06	18CPTMW19SW_062019	20 Jun 2019 11:25			06 Jul 2019 09:58	1
HS19061157-07	18WW22_062019	20 Jun 2019 12:20			06 Jul 2019 09:58	1
HS19061157-08	C04_062019	20 Jun 2019 13:10			06 Jul 2019 09:58	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 17:22**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145221** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002457	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.001932	0.00500								J
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.02437	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.001051	0.00500								J
Zinc	0.00200	0.00500								U

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 16:58**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145214** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1091	0.0100	0.1	0	109	84 - 117				
Antimony	0.0559	0.00500	0.05	0	112	85 - 117				
Arsenic	0.05618	0.00500	0.05	0	112	84 - 116				
Barium	0.05364	0.00500	0.05	0	107	86 - 114				
Beryllium	0.05694	0.00200	0.05	0	114	83 - 121				
Cadmium	0.05632	0.00200	0.05	0	113	87 - 115				
Calcium	5.323	0.500	5	0	106	87 - 118				
Chromium	0.05591	0.00500	0.05	0	112	85 - 116				
Cobalt	0.05561	0.00500	0.05	0	111	86 - 115				
Copper	0.05732	0.00500	0.05	0	115	85 - 118				
Iron	5.504	0.200	5	0	110	87 - 118				
Lead	0.05401	0.00500	0.05	0	108	88 - 115				
Magnesium	5.42	0.200	5	0	108	83 - 118				
Manganese	0.05651	0.00500	0.05	0	113	87 - 115				
Nickel	0.05699	0.00500	0.05	0	114	85 - 117				
Potassium	5.366	0.200	5	0	107	87 - 115				
Selenium	0.05781	0.00500	0.05	0	116	80 - 120				
Silver	0.05393	0.00500	0.05	0	108	85 - 116				
Sodium	5.418	0.200	5	0	108	85 - 117				
Thallium	0.05098	0.00200	0.05	0	102	82 - 116				
Vanadium	0.05441	0.00500	0.05	0	109	86 - 115				
Zinc	0.05821	0.00500	0.05	0	116	83 - 119				

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19060986-04MS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:03**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145217** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.116	0.0100	0.1	0.01515	101	84 - 117				
Antimony	0.05308	0.00500	0.05	0.000258	106	85 - 117				
Arsenic	0.05627	0.00500	0.05	0.002036	108	84 - 116				
Barium	0.8428	0.00500	0.05	0.8565	-27.4	86 - 114				SO
Beryllium	0.05294	0.00200	0.05	0.000048	106	83 - 121				
Cadmium	0.05116	0.00200	0.05	0.000205	102	87 - 115				
Calcium	35.9	0.500	5	33.03	57.3	87 - 118				SO
Chromium	0.3735	0.00500	0.05	0.2809	185	85 - 116				SO
Cobalt	0.0563	0.00500	0.05	0.005607	101	86 - 115				
Copper	0.058	0.00500	0.05	0.005199	106	85 - 118				
Iron	7.669	0.200	5	2.556	102	87 - 118				
Lead	0.05089	0.00500	0.05	0.000094	102	88 - 115				
Magnesium	31.26	0.200	5	27.76	69.9	83 - 118				SO
Manganese	0.2154	0.00500	0.05	0.164	103	87 - 115				
Nickel	0.2401	0.00500	0.05	0.2011	78.0	85 - 117				SO
Potassium	7.654	0.200	5	2.639	100	87 - 115				
Selenium	0.05384	0.00500	0.05	0.000343	107	80 - 120				
Silver	0.04654	0.00500	0.05	0.000013	93.1	85 - 116				
Sodium	233.3	0.200	5	245	-233	85 - 117				SEO
Thallium	0.04975	0.00200	0.05	0.000043	99.4	82 - 116				
Vanadium	0.0572	0.00500	0.05	0.003781	107	86 - 115				
Zinc	0.07874	0.00500	0.05	0.03582	85.8	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:05**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145218** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1062	0.0100	0.1	0.01515	91.1	84 - 117	0.116	8.82	20	
Antimony	0.04965	0.00500	0.05	0.000258	98.8	85 - 117	0.05308	6.66	20	
Arsenic	0.05281	0.00500	0.05	0.002036	102	84 - 116	0.05627	6.34	20	
Barium	0.8139	0.00500	0.05	0.8565	-85.2	86 - 114	0.8428	3.49	20	SO
Beryllium	0.05024	0.00200	0.05	0.000048	100	83 - 121	0.05294	5.24	20	
Cadmium	0.04833	0.00200	0.05	0.000205	96.2	87 - 115	0.05116	5.7	20	
Calcium	33.36	0.500	5	33.03	6.56	87 - 118	35.9	7.33	20	SO
Cobalt	0.0531	0.00500	0.05	0.005607	95.0	86 - 115	0.0563	5.85	20	
Copper	0.05342	0.00500	0.05	0.005199	96.4	85 - 118	0.058	8.23	20	
Iron	7.023	0.200	5	2.556	89.3	87 - 118	7.669	8.8	20	
Lead	0.04808	0.00500	0.05	0.000094	96.0	88 - 115	0.05089	5.67	20	
Magnesium	28.94	0.200	5	27.76	23.5	83 - 118	31.26	7.71	20	SO
Manganese	0.1904	0.00500	0.05	0.164	52.8	87 - 115	0.2154	12.4	20	S
Nickel	0.2255	0.00500	0.05	0.2011	48.7	85 - 117	0.2401	6.29	20	SO
Potassium	7.309	0.200	5	2.639	93.4	87 - 115	7.654	4.62	20	
Selenium	0.05051	0.00500	0.05	0.000343	100	80 - 120	0.05384	6.37	20	
Silver	0.04575	0.00500	0.05	0.000013	91.5	85 - 116	0.04654	1.71	20	
Sodium	224.6	0.200	5	245	-407	85 - 117	233.3	3.8	20	SEO
Thallium	0.04905	0.00200	0.05	0.000043	98.0	82 - 116	0.04975	1.42	20	
Vanadium	0.05284	0.00500	0.05	0.003781	98.1	86 - 115	0.0572	7.93	20	
Zinc	0.08005	0.00500	0.05	0.03582	88.5	83 - 119	0.07874	1.66	20	

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:07**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145651** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium	0.343	0.00500	0.05	0.2809	124	85 - 116	0.3735	8.51	20	SO

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:07**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145219** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1008	0.0100	0.1	0.01515	85.7	80 - 120				
Antimony	0.08752	0.00500	0.1	0.000258	87.3	80 - 120				
Arsenic	0.09313	0.00500	0.1	0.002036	91.1	80 - 120				
Beryllium	0.09784	0.00200	0.1	0.000048	97.8	80 - 120				
Cadmium	0.09096	0.00200	0.1	0.000205	90.8	80 - 120				
Cobalt	0.09093	0.00500	0.1	0.005607	85.3	80 - 120				
Copper	0.09101	0.00500	0.1	0.005199	85.8	80 - 120				
Iron	10.93	0.200	10	2.556	83.8	80 - 120				
Lead	0.09017	0.00500	0.1	0.000094	90.1	80 - 120				
Potassium	11.36	0.200	10	2.639	87.2	80 - 120				
Selenium	0.09025	0.00500	0.1	0.000343	89.9	80 - 120				
Silver	0.08464	0.00500	0.1	0.000013	84.6	80 - 120				
Thallium	0.08892	0.00200	0.1	0.000043	88.9	80 - 120				
Vanadium	0.09309	0.00500	0.1	0.003781	89.3	80 - 120				
Zinc	0.1183	0.00500	0.1	0.03582	82.5	80 - 120				

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **28-Jun-2019 15:14**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145655** PrepDate: **25-Jun-2019** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	1.703	0.0500	1	0.7	100	80 - 120				
Calcium	129.7	5.00	100	26.89	103	80 - 120				
Chromium	1.283	0.0500	1	0.2283	105	80 - 120				
Iron	107.4	2.00	100	2.151	105	80 - 120				
Magnesium	125.2	2.00	100	22.92	102	80 - 120				
Manganese	1.175	0.0500	1	0.1367	104	80 - 120				
Nickel	1.217	0.0500	1	0.1678	105	80 - 120				
Potassium	106.9	2.00	100	2.16	105	80 - 120				
Sodium	299.8	2.00	100	202.9	96.9	80 - 120				

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:02**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145216** PrepDate: **25-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.01988	0.0500					0.01515	0	10	J
Antimony	0.00250	0.0250					0.000258	0	10	U
Arsenic	0.002183	0.0250					0.002036	0	10	J
Beryllium	0.00250	0.0100					0.000048	0	10	U
Cadmium	0.00250	0.0100					0.000205	0	10	U
Cobalt	0.004619	0.0250					0.005607	0	10	J
Copper	0.00500	0.0250					0.005199	0	10	U
Lead	0.00500	0.0250					0.000094	0	10	U
Selenium	0.0125	0.0250					0.000343	0	10	U
Silver	0.00250	0.0250					0.000013	0	10	U
Thallium	0.00250	0.0100					0.000043	0	10	U
Vanadium	0.01164	0.0250					0.003781	0	10	J
Zinc	0.038	0.0250					0.03582	6.07	10	

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145654** PrepDate: **25-Jun-2019** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.6998	0.250					0.7	0.0306	10	
Calcium	27.1	25.0					26.89	0.761	10	
Chromium	0.234	0.250					0.2283	0	10	J
Iron	2.19	10.0					2.151	0	10	J
Magnesium	22.74	10.0					22.92	0.776	10	
Manganese	0.1567	0.250					0.1367	0	10	J
Nickel	0.1736	0.250					0.1678	0	10	J
Potassium	2.068	10.0					2.16	0	10	J
Sodium	207.1	10.0					202.9	2.06	10	

The following samples were analyzed in this batch: HS19061157-01 HS19061157-04 HS19061157-06 HS19061157-07

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142560 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142560** Units: **mg/L** Analysis Date: **28-Jun-2019 15:56**
Client ID: Run ID: **HG03_341562** SeqNo: **5147053** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142560** Units: **mg/L** Analysis Date: **28-Jun-2019 15:57**
Client ID: Run ID: **HG03_341562** SeqNo: **5147054** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00509	0.000200	0.005	0	102	80 - 120				

MS Sample ID: **HS19061486-01MS** Units: **mg/L** Analysis Date: **28-Jun-2019 16:01**
Client ID: Run ID: **HG03_341562** SeqNo: **5147056** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000513	0.000000200	5e-006	-0.0000000010	103	75 - 125				

MSD Sample ID: **HS19061486-01MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 16:03**
Client ID: Run ID: **HG03_341562** SeqNo: **5147057** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000509	0.000000200	5e-006	-0.0000000010	102	75 - 125	0.000005130	0.783	20	

The following samples were analyzed in this batch: HS19061157-01 HS19061157-04 HS19061157-06 HS19061157-07

Revision: 1

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ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: 142429 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142429** Units: **ug/L** Analysis Date: **27-Jun-2019 21:35**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146405** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.0702*	*0*	*0.08*	*0*	*87.7*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.0811*	*0*	*0.08*	*0*	*101*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07172*	*0*	*0.08*	*0*	*89.6*	*40 - 140*				

LCS Sample ID: **LCS-142429** Units: **ug/L** Analysis Date: **27-Jun-2019 21:56**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146406** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.0905	0.010	0.08	0	113	40 - 140				
Surr: 2-Fluorobiphenyl	*0.07767*	*0*	*0.08*	*0*	*97.1*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.08433*	*0*	*0.08*	*0*	*105*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08991*	*0*	*0.08*	*0*	*112*	*40 - 140*				

LCSD Sample ID: **LCSD-142429** Units: **ug/L** Analysis Date: **27-Jun-2019 22:17**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146407** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.09101	0.010	0.08	0	114	40 - 140	0.0905	0.564	20	
Surr: 2-Fluorobiphenyl	*0.09652*	*0*	*0.08*	*0*	*121*	*40 - 140*	*0.07767*	*21.6*	*20*	R
Surr: 4-Terphenyl-d14	*0.09713*	*0*	*0.08*	*0*	*121*	*40 - 140*	*0.08433*	*14.1*	*20*	
Surr: Nitrobenzene-d5	*0.1084*	*0*	*0.08*	*0*	*135*	*40 - 140*	*0.08991*	*18.6*	*20*	

The following samples were analyzed in this batch: HS19061157-02 HS19061157-03 HS19061157-04 HS19061157-05 HS19061157-06 HS19061157-07

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 11:38**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146430** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 11:38**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146430** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.64*	*1.0*	*50*	*0*	*93.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*45.03*	*1.0*	*50*	*0*	*90.1*	*85 - 114*				
Surr: Dibromofluoromethane	*44.27*	*1.0*	*50*	*0*	*88.5*	*80 - 119*				
Surr: Toluene-d8	*45.03*	*1.0*	*50*	*0*	*90.1*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 10:50**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.71	1.0	20	0	93.5	78 - 124				
1,1,1-Trichloroethane	18.86	1.0	20	0	94.3	74 - 131				
1,1,2,2-Tetrachloroethane	21.83	1.0	20	0	109	71 - 121				
1,1,2-Trichloroethane	20.31	1.0	20	0	102	80 - 119				
1,1-Dichloroethane	19.37	1.0	20	0	96.9	77 - 125				
1,1-Dichloroethene	19.49	1.0	20	0	97.5	71 - 131				
1,1-Dichloropropene	18.57	1.0	20	0	92.9	78 - 125				
1,2,3-Trichlorobenzene	27.19	1.0	20	0	136	69 - 129				S
1,2,3-Trichloropropane	22.5	1.0	20	0	113	73 - 122				
1,2,4-Trichlorobenzene	23.25	1.0	20	0	116	69 - 130				
1,2,4-Trimethylbenzene	18.63	1.0	20	0	93.2	76 - 124				
1,2-Dibromo-3-chloropropane	23.82	1.0	20	0	119	62 - 128				
1,2-Dibromoethane	20.03	1.0	20	0	100	77 - 121				
1,2-Dichlorobenzene	19.12	1.0	20	0	95.6	80 - 119				
1,2-Dichloroethane	18.81	1.0	20	0	94.1	73 - 128				
1,2-Dichloropropane	18.83	1.0	20	0	94.2	78 - 122				
1,3,5-Trimethylbenzene	17.9	1.0	20	0	89.5	75 - 124				
1,3-Dichlorobenzene	18.42	1.0	20	0	92.1	80 - 119				
1,3-Dichloropropane	20.28	1.0	20	0	101	80 - 119				
1,4-Dichlorobenzene	19.67	1.0	20	0	98.3	79 - 118				
2,2-Dichloropropane	19.99	1.0	20	0	99.9	60 - 139				
2-Butanone	49.3	2.0	40	0	123	56 - 143				
2-Chlorotoluene	19.48	1.0	20	0	97.4	79 - 122				
2-Hexanone	43.05	2.0	40	0	108	57 - 139				
4-Chlorotoluene	19.99	1.0	20	0	99.9	78 - 122				
4-Isopropyltoluene	17.77	1.0	20	0	88.9	77 - 127				
4-Methyl-2-pentanone	41.38	2.0	40	0	103	67 - 130				
Acetone	54.41	2.0	40	0	136	39 - 160				
Benzene	19.29	1.0	20	0	96.4	79 - 120				
Bromobenzene	18.42	1.0	20	0	92.1	80 - 120				
Bromochloromethane	18.67	1.0	20	0	93.3	78 - 123				
Bromodichloromethane	19.53	1.0	20	0	97.6	79 - 125				
Bromoform	20.73	1.0	20	0	104	66 - 130				
Bromomethane	22.75	1.0	20	0	114	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-190628** Units: **UG/L** Analysis Date: **28-Jun-2019 10:50**
Client ID: Run ID: **VOA6_341546** SeqNo: **5146429** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	37.03	2.0	40	0	92.6	64 - 133				
Carbon tetrachloride	18.08	1.0	20	0	90.4	72 - 136				
Chlorobenzene	18.69	1.0	20	0	93.5	82 - 118				
Chloroethane	20.86	1.0	20	0	104	60 - 138				
Chloroform	20.01	1.0	20	0	100	79 - 124				
Chloromethane	18.7	1.0	20	0	93.5	50 - 139				
cis-1,2-Dichloroethene	19.38	1.0	20	0	96.9	78 - 123				
cis-1,3-Dichloropropene	18.8	1.0	20	0	94.0	75 - 124				
Dibromochloromethane	19.26	1.0	20	0	96.3	74 - 126				
Dibromomethane	19.49	1.0	20	0	97.4	79 - 123				
Dichlorodifluoromethane	17.68	1.0	20	0	88.4	32 - 152				
Ethylbenzene	18.26	1.0	20	0	91.3	79 - 121				
Hexachlorobutadiene	21.78	1.0	20	0	109	66 - 134				
Isopropylbenzene	17.76	1.0	20	0	88.8	72 - 131				
m,p-Xylene	36.78	2.0	40	0	92.0	80 - 121				
Methylene chloride	19.74	2.0	20	0	98.7	74 - 124				
Naphthalene	25.7	1.0	20	0	128	61 - 128				S
n-Butylbenzene	17.78	1.0	20	0	88.9	75 - 128				
n-Propylbenzene	19.05	1.0	20	0	95.3	76 - 126				
o-Xylene	18.37	1.0	20	0	91.8	78 - 122				
sec-Butylbenzene	18.27	1.0	20	0	91.4	77 - 126				
Styrene	19.37	1.0	20	0	96.9	78 - 123				
tert-Butylbenzene	18.73	1.0	20	0	93.7	78 - 124				
Tetrachloroethene	17.11	1.0	20	0	85.5	74 - 129				
Toluene	18.5	1.0	20	0	92.5	80 - 121				
trans-1,2-Dichloroethene	19.5	1.0	20	0	97.5	75 - 124				
trans-1,3-Dichloropropene	19.19	1.0	20	0	96.0	73 - 127				
Trichloroethene	18.25	1.0	20	0	91.2	79 - 123				
Trichlorofluoromethane	18.83	1.0	20	0	94.1	65 - 141				
Vinyl chloride	18.93	1.0	20	0	94.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*52.6*	*1.0*	*50*	*0*	*105*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.75*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*51.89*	*1.0*	*50*	*0*	*104*	*80 - 119*				
Surr: Toluene-d8	*47.75*	*1.0*	*50*	*0*	*95.5*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19061157-02MS** Units: **UG/L** Analysis Date: **28-Jun-2019 14:49**
Client ID: **18CPTMW10SW_062019** Run ID: **VOA6_341546** SeqNo: **5146438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.73	1.0	20	0	88.6	78 - 124				
1,1,1-Trichloroethane	19.03	1.0	20	0	95.2	74 - 131				
1,1,2,2-Tetrachloroethane	20.66	1.0	20	0	103	71 - 121				
1,1,2-Trichloroethane	18.94	1.0	20	0	94.7	80 - 119				
1,1-Dichloroethane	17.57	1.0	20	0	87.9	77 - 125				
1,1-Dichloroethene	19.66	1.0	20	0	98.3	71 - 131				
1,1-Dichloropropene	19.33	1.0	20	0	96.6	78 - 125				
1,2,3-Trichlorobenzene	24.14	1.0	20	0	121	69 - 129				
1,2,3-Trichloropropane	20.5	1.0	20	0	102	73 - 122				
1,2,4-Trichlorobenzene	21.59	1.0	20	0	108	69 - 130				
1,2,4-Trimethylbenzene	18.47	1.0	20	0	92.3	76 - 124				
1,2-Dibromo-3-chloropropane	21.81	1.0	20	0	109	62 - 128				
1,2-Dibromoethane	17.9	1.0	20	0	89.5	77 - 121				
1,2-Dichlorobenzene	18.33	1.0	20	0	91.7	80 - 119				
1,2-Dichloroethane	17.43	1.0	20	0	87.1	73 - 128				
1,2-Dichloropropane	17.55	1.0	20	0	87.7	78 - 122				
1,3,5-Trimethylbenzene	18.27	1.0	20	0	91.4	75 - 124				
1,3-Dichlorobenzene	17.46	1.0	20	0	87.3	80 - 119				
1,3-Dichloropropane	18.65	1.0	20	0	93.2	80 - 119				
1,4-Dichlorobenzene	18.88	1.0	20	0	94.4	79 - 118				
2,2-Dichloropropane	18.91	1.0	20	0	94.5	60 - 139				
2-Butanone	42.59	2.0	40	0	106	56 - 143				
2-Chlorotoluene	19.4	1.0	20	0	97.0	79 - 122				
2-Hexanone	38.42	2.0	40	0	96.0	57 - 139				
4-Chlorotoluene	19.35	1.0	20	0	96.7	78 - 122				
4-Isopropyltoluene	19.33	1.0	20	0	96.6	77 - 127				
4-Methyl-2-pentanone	38.74	2.0	40	0	96.9	67 - 130				
Acetone	46.92	2.0	40	5.359	104	39 - 160				
Benzene	18.35	1.0	20	0	91.7	79 - 120				
Bromobenzene	16.8	1.0	20	0	84.0	80 - 120				
Bromochloromethane	16.09	1.0	20	0	80.4	78 - 123				
Bromodichloromethane	18.04	1.0	20	0	90.2	79 - 125				
Bromoform	18.53	1.0	20	0	92.6	66 - 130				
Bromomethane	13.53	1.0	20	0	67.6	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19061157-02MS** Units: **UG/L** Analysis Date: **28-Jun-2019 14:49**
Client ID: **18CPTMW10SW_062019** Run ID: **VOA6_341546** SeqNo: **5146438** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	34.31	2.0	40	0	85.8	64 - 133				
Carbon tetrachloride	19.13	1.0	20	0	95.6	72 - 136				
Chlorobenzene	17.61	1.0	20	0	88.1	82 - 118				
Chloroethane	20.41	1.0	20	0	102	60 - 138				
Chloroform	18.1	1.0	20	0	90.5	79 - 124				
Chloromethane	29.09	1.0	20	0	145	50 - 139				S
cis-1,2-Dichloroethene	19.95	1.0	20	0	99.8	78 - 123				
cis-1,3-Dichloropropene	17.23	1.0	20	0	86.1	75 - 124				
Dibromochloromethane	17.55	1.0	20	0	87.7	74 - 126				
Dibromomethane	17.65	1.0	20	0	88.3	79 - 123				
Dichlorodifluoromethane	18.02	1.0	20	0	90.1	32 - 152				
Ethylbenzene	18.28	1.0	20	0	91.4	79 - 121				
Hexachlorobutadiene	23.73	1.0	20	0	119	66 - 134				
Isopropylbenzene	18.91	1.0	20	0	94.5	72 - 131				
m,p-Xylene	37.07	2.0	40	0	92.7	80 - 121				
Methylene chloride	25.8	2.0	20	0	129	74 - 124				S
Naphthalene	23.22	1.0	20	0	116	61 - 128				
n-Butylbenzene	19.75	1.0	20	0	98.7	75 - 128				
n-Propylbenzene	20.08	1.0	20	0	100	76 - 126				
o-Xylene	17.73	1.0	20	0	88.6	78 - 122				
sec-Butylbenzene	20.67	1.0	20	0	103	77 - 126				
Styrene	18.57	1.0	20	0	92.9	78 - 123				
tert-Butylbenzene	20.06	1.0	20	0	100	78 - 124				
Tetrachloroethene	18.08	1.0	20	0	90.4	74 - 129				
Toluene	17.83	1.0	20	0	89.2	80 - 121				
trans-1,2-Dichloroethene	18.21	1.0	20	0	91.0	75 - 124				
trans-1,3-Dichloropropene	17.88	1.0	20	0	89.4	73 - 127				
Trichloroethene	17.77	1.0	20	0	88.9	79 - 123				
Trichlorofluoromethane	20.23	1.0	20	0	101	65 - 141				
Vinyl chloride	18.22	1.0	20	0	91.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.38*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.99*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*49.29*	*1.0*	*50*	*0*	*98.6*	*80 - 119*				
Surr: Toluene-d8	*48.04*	*1.0*	*50*	*0*	*96.1*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061157-02MSD** Units: **UG/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: **18CPTMW10SW_062019** Run ID: **VOA6_341546** SeqNo: **5146439** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.53	1.0	20	0	87.7	78 - 124	17.73	1.11	20	
1,1,1-Trichloroethane	18.55	1.0	20	0	92.7	74 - 131	19.03	2.57	20	
1,1,2,2-Tetrachloroethane	21.38	1.0	20	0	107	71 - 121	20.66	3.41	20	
1,1,2-Trichloroethane	19.17	1.0	20	0	95.9	80 - 119	18.94	1.26	20	
1,1-Dichloroethane	17.86	1.0	20	0	89.3	77 - 125	17.57	1.63	20	
1,1-Dichloroethene	19.11	1.0	20	0	95.5	71 - 131	19.66	2.85	20	
1,1-Dichloropropene	19.03	1.0	20	0	95.1	78 - 125	19.33	1.56	20	
1,2,3-Trichlorobenzene	25.23	1.0	20	0	126	69 - 129	24.14	4.4	20	
1,2,3-Trichloropropane	20.93	1.0	20	0	105	73 - 122	20.5	2.06	20	
1,2,4-Trichlorobenzene	21.92	1.0	20	0	110	69 - 130	21.59	1.52	20	
1,2,4-Trimethylbenzene	18.33	1.0	20	0	91.7	76 - 124	18.47	0.739	20	
1,2-Dibromo-3-chloropropane	22.89	1.0	20	0	114	62 - 128	21.81	4.81	20	
1,2-Dibromoethane	18.73	1.0	20	0	93.7	77 - 121	17.9	4.54	20	
1,2-Dichlorobenzene	18.43	1.0	20	0	92.1	80 - 119	18.33	0.521	20	
1,2-Dichloroethane	17.55	1.0	20	0	87.8	73 - 128	17.43	0.726	20	
1,2-Dichloropropane	17.93	1.0	20	0	89.7	78 - 122	17.55	2.16	20	
1,3,5-Trimethylbenzene	18.28	1.0	20	0	91.4	75 - 124	18.27	0.0341	20	
1,3-Dichlorobenzene	17.74	1.0	20	0	88.7	80 - 119	17.46	1.57	20	
1,3-Dichloropropane	19.01	1.0	20	0	95.1	80 - 119	18.65	1.93	20	
1,4-Dichlorobenzene	19.13	1.0	20	0	95.6	79 - 118	18.88	1.28	20	
2,2-Dichloropropane	18.53	1.0	20	0	92.6	60 - 139	18.91	2.03	20	
2-Butanone	44.5	2.0	40	0	111	56 - 143	42.59	4.39	20	
2-Chlorotoluene	19.45	1.0	20	0	97.2	79 - 122	19.4	0.245	20	
2-Hexanone	40.16	2.0	40	0	100	57 - 139	38.42	4.43	20	
4-Chlorotoluene	19.29	1.0	20	0	96.5	78 - 122	19.35	0.277	20	
4-Isopropyltoluene	19.26	1.0	20	0	96.3	77 - 127	19.33	0.313	20	
4-Methyl-2-pentanone	39.71	2.0	40	0	99.3	67 - 130	38.74	2.45	20	
Acetone	50.25	2.0	40	5.359	112	39 - 160	46.92	6.85	20	
Benzene	18.36	1.0	20	0	91.8	79 - 120	18.35	0.0865	20	
Bromobenzene	16.88	1.0	20	0	84.4	80 - 120	16.8	0.466	20	
Bromochloromethane	16.49	1.0	20	0	82.4	78 - 123	16.09	2.45	20	
Bromodichloromethane	18.36	1.0	20	0	91.8	79 - 125	18.04	1.78	20	
Bromoform	19.36	1.0	20	0	96.8	66 - 130	18.53	4.42	20	
Bromomethane	16.13	1.0	20	0	80.7	53 - 141	13.53	17.6	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061157-02MSD** Units: **UG/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: **18CPTMW10SW_062019** Run ID: **VOA6_341546** SeqNo: **5146439** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	34.41	2.0	40	0	86.0	64 - 133	34.31	0.298	20	
Carbon tetrachloride	18.94	1.0	20	0	94.7	72 - 136	19.13	0.978	20	
Chlorobenzene	17.62	1.0	20	0	88.1	82 - 118	17.61	0.0136	20	
Chloroethane	18.76	1.0	20	0	93.8	60 - 138	20.41	8.41	20	
Chloroform	18.25	1.0	20	0	91.3	79 - 124	18.1	0.822	20	
Chloromethane	23.96	1.0	20	0	120	50 - 139	29.09	19.4	20	
cis-1,2-Dichloroethene	18.61	1.0	20	0	93.1	78 - 123	19.95	6.93	20	
cis-1,3-Dichloropropene	17.39	1.0	20	0	87.0	75 - 124	17.23	0.946	20	
Dibromochloromethane	18.07	1.0	20	0	90.3	74 - 126	17.55	2.93	20	
Dibromomethane	18.25	1.0	20	0	91.3	79 - 123	17.65	3.33	20	
Dichlorodifluoromethane	17.78	1.0	20	0	88.9	32 - 152	18.02	1.36	20	
Ethylbenzene	18.25	1.0	20	0	91.3	79 - 121	18.28	0.178	20	
Hexachlorobutadiene	23.8	1.0	20	0	119	66 - 134	23.73	0.3	20	
Isopropylbenzene	18.76	1.0	20	0	93.8	72 - 131	18.91	0.782	20	
m,p-Xylene	36.69	2.0	40	0	91.7	80 - 121	37.07	1.03	20	
Methylene chloride	20.47	2.0	20	0	102	74 - 124	25.8	23.1	20	R
Naphthalene	24.28	1.0	20	0	121	61 - 128	23.22	4.46	20	
n-Butylbenzene	20.17	1.0	20	0	101	75 - 128	19.75	2.1	20	
n-Propylbenzene	20.11	1.0	20	0	101	76 - 126	20.08	0.148	20	
o-Xylene	17.67	1.0	20	0	88.4	78 - 122	17.73	0.292	20	
sec-Butylbenzene	20.54	1.0	20	0	103	77 - 126	20.67	0.606	20	
Styrene	18.44	1.0	20	0	92.2	78 - 123	18.57	0.717	20	
tert-Butylbenzene	20.01	1.0	20	0	100	78 - 124	20.06	0.251	20	
Tetrachloroethene	18.05	1.0	20	0	90.2	74 - 129	18.08	0.156	20	
Toluene	17.82	1.0	20	0	89.1	80 - 121	17.83	0.055	20	
trans-1,2-Dichloroethene	18.18	1.0	20	0	90.9	75 - 124	18.21	0.146	20	
trans-1,3-Dichloropropene	18	1.0	20	0	90.0	73 - 127	17.88	0.68	20	
Trichloroethene	17.66	1.0	20	0	88.3	79 - 123	17.77	0.648	20	
Trichlorofluoromethane	19.72	1.0	20	0	98.6	65 - 141	20.23	2.53	20	
Vinyl chloride	17.84	1.0	20	0	89.2	58 - 137	18.22	2.1	20	
Surr: 1,2-Dichloroethane-d4	*51.79*	*1.0*	*50*	*0*	*104*	*81 - 118*	*50.38*	*2.77*	*20*	
Surr: 4-Bromofluorobenzene	*50.7*	*1.0*	*50*	*0*	*101*	*85 - 114*	*50.99*	*0.571*	*20*	
Surr: Dibromofluoromethane	*49.25*	*1.0*	*50*	*0*	*98.5*	*80 - 119*	*49.29*	*0.0914*	*20*	
Surr: Toluene-d8	*47.25*	*1.0*	*50*	*0*	*94.5*	*89 - 112*	*48.04*	*1.66*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061157

QC BATCH REPORT

Batch ID: R341546 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS19061157-01	HS19061157-02	HS19061157-03	HS19061157-04
HS19061157-05	HS19061157-06	HS19061157-07	HS19061157-08
HS19061157-09			

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19061157**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061157

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19061157-01	18CPTMW10DW_062019	Login	21/06/2019 16:36:48	NDR	MET023
HS19061157-01	18CPTMW10DW_062019	Login	21/06/2019 16:36:48	NDR	Sub
HS19061157-01	18CPTMW10DW_062019	Login	21/06/2019 16:36:48	NDR	EXT177
HS19061157-01	18CPTMW10DW_062019	Login	21/06/2019 16:36:48	NDR	VOA192

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 10-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19061157
Date/Time Received: **21-Jun-2019 09:00**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 15-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature 23-Jun-2019 Date

Matrices: **Groundwater**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.3c U/c	IR25
Cooler(s)/Kit(s):	43893	
Date/Time sample(s) sent to storage:	6/14/19 18:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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bhate

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1,4 - DIOXANE								Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
18CPTMW10DW_062019		20-Jun-2019	0710	-	N		WG	5	X	X	X												
18CPTMW10SW_062019		20-Jun-2019	0755	-	N		WG	5	X	X		X											
18WW06_062019		20-Jun-2019	0850	-	N		WG	5	X	X		X											
18WW02_062019		20-Jun-2019	0940	-	N		WG	6	X	X	X	X											
18CPTMW19_062019		20-Jun-2019	1035	-	N		WG	5	X	X		X											
18CPTMW19SW_062019		20-Jun-2019	1125	-	N		WG	6	X	X	X	X											
18WW22_062019		20-Jun-2019	1220	-	N		WG	6	X	X	X	X											
CD4_062019		20-Jun-2019	1310	-	N		WG	4	X	X													
TRIP BLANK		20-Jun-2019		-	TB		W	2	X														
				-																			
				-																			

Sample Analysis Requested (5) | Quality Assurance Samples (6)

HS19061157

Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS: ____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (Signed)	Date	Time
1. Scott Beesinger	6/20/19	1430	1. JM	6/21/19	0900
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill Number: ____

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: ____ Delivery Date/Time: ____

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SD = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

44789 o/c 2.2 4 11 0900

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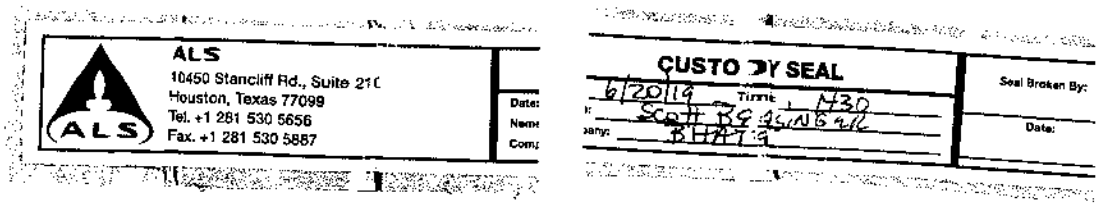
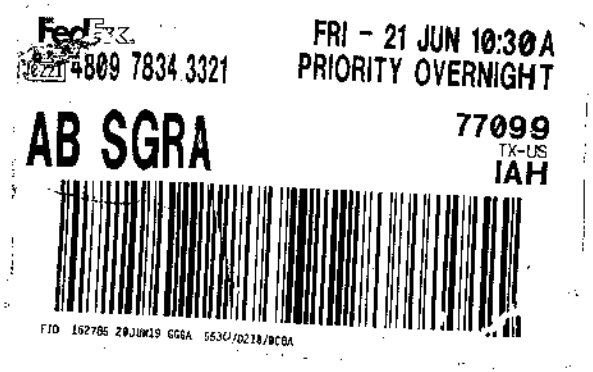
00940832





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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1918260, 1918265

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2268 (242714)

General Set Information: There were nineteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1918260003/08 were analyzed and reported from 1:10 dilutions. Field sample 1918260007 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 661792) was less than 1/2 the CRDL. The recovery for the LCS (661793) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on samples 1918260005/06 (Client ID: CO1_062119). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The MS/MSD percent recoveries and relative percent difference were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 661790) is reported from the analysis of the Laboratory Control Sample (LCS – 661793) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafile 03JULD03/06/19/23.

Thomas Bosch July 5, 2019
Analyst Date

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ANALYTICAL REPORT

Report Date: July 05, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1918265**
Project ID: HS19061157
Purchase Order: HS19061157
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
18CPTMW10DW_062019	1918265001	06/20/19	06/22/19	
18CPTMW10SW_062019	1918265002	06/20/19	06/22/19	
18WW06_062019	1918265003	06/20/19	06/22/19	
18WW02_062019	1918265004	06/20/19	06/22/19	
18CPTMW19_062019	1918265005	06/20/19	06/22/19	
18CPTMW19SW_062019	1918265006	06/20/19	06/22/19	
18WW22_062019	1918265007	06/20/19	06/22/19	
C04_062019	1918265008	06/20/19	06/22/19	

ANALYTICAL REPORT

Workorder: 34-1918265
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW10DW_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265001 | Media: 125 mL Nalgene | Received: 06/22/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 11:50 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**9.1**	1.0	2.0	4.0	1	

Sample ID: **18CPTMW10SW_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265002 | Media: 125 mL Nalgene | Received: 06/22/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 12:18 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18WW06_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265003 | Media: 125 mL Nalgene | Received: 06/22/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 12:31 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18WW02_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265004 | Media: 125 mL Nalgene | Received: 06/22/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 12:45 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

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ANALYTICAL REPORT

Workorder: 34-1918265
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW19_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265005 | Media: 125 mL Nalgene | Received: 06/22/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 12:59 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**4.1**	1.0	2.0	4.0	1	

Sample ID: **18CPTMW19SW_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265006 | Media: 125 mL Nalgene | Received: 06/22/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 13:13 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**39**	1.0	2.0	4.0	1	

Sample ID: **18WW22_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265007 | Media: 125 mL Nalgene | Received: 06/22/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 13:27 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **C04_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918265008 | Media: 125 mL Nalgene | Received: 06/22/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 13:41 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

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ANALYTICAL REPORT

Workorder: 34-1918265
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 242714)

Field samples 1918260003/08 were analyzed and reported from 1:10 dilutions. Field sample 1918260007 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/05/2019 11:10	/S/ Stephen Brose 07/05/2019 14:20

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

ANALYTICAL REPORT

Workorder: 34-1918265
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1918265

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2268 (HBN: 242714)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 661792
Analyzed: 07/03/2019 09:03
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 661793
Analyzed: 07/03/2019 08:35
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.21	4.00	105	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1918260004	**MS:**	1918260005	**MSD:**	1918260006
Analyzed:	07/03/2019 09:58	**Analyzed:**	07/03/2019 10:12	**Analyzed:**	07/03/2019 10:26
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.42	4	85.4	78.8	123.8	3.37	84.1	1.55	0.0	20.0

Comments

Field samples 1918260003/08 were analyzed and reported from 1:10 dilutions. Field sample 1918260007 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/05/2019 11:12	07/05/2019 14:20

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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W 1918265

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11648**

SUBCONTRACT TO:

1918265

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19061157
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19061157-01**	**18CPTMW10DW_062019**	**Groundwater**	**20 Jun 2019 07:10**
	SUB_Perch-6850			08 Jul 2019
2.	**HS19061157-02**	**18CPTMW10SW_062019**	**Groundwater**	**20 Jun 2019 07:55**
	SUB_Perch-6850			08 Jul 2019
3.	**HS19061157-03**	**18WW06_062019**	**Groundwater**	**20 Jun 2019 08:50** Not Rec'd
	SUB_Perch-6850			08 Jul 2019
4.	**HS19061157-04**	**18WW02_062019**	**Groundwater**	**20 Jun 2019 09:40**
	SUB_Perch-6850			08 Jul 2019
5.	**HS19061157-05**	**18CPTMW19_062019**	**Groundwater**	**20 Jun 2019 10:35**
	SUB_Perch-6850			08 Jul 2019
6.	**HS19061157-06**	**18CPTMW19SW_062019**	**Groundwater**	**20 Jun 2019 11:25**
	SUB_Perch-6850			08 Jul 2019
7.	**HS19061157-07**	**18WW22_062019**	**Groundwater**	**20 Jun 2019 12:20**
	SUB_Perch-6850			08 Jul 2019
8.	**HS19061157-08**	**C04_062019**	**Groundwater**	**20 Jun 2019 13:10**
	SUB_Perch-6850			08 Jul 2019

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Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11648**

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By:	J. Mascorro	Date/Time:	6/21/19 18:00
Received By:		Date/Time:	6/22/19 905
Cooler ID(s):	9	Temperature(s):	2°

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10450 Stancliff Rd, Ste 210
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F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11648**

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19061157
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19061157-01**	**18CPTMW10DW_062019**	**Groundwater**	**20 Jun 2019 07:10**
	SUB_Perch-6850			08 Jul 2019
2.	**HS19061157-02**	**18CPTMW10SW_062019**	**Groundwater**	**20 Jun 2019 07:55**
	SUB_Perch-6850			08 Jul 2019
3.	**HS19061157-03**	**18WW06_062019**	**Groundwater**	**20 Jun 2019 08:50**
	SUB_Perch-6850			08 Jul 2019
4.	**HS19061157-04**	**18WW02_062019**	**Groundwater**	**20 Jun 2019 09:40**
	SUB_Perch-6850			08 Jul 2019
5.	**HS19061157-05**	**18CPTMW19_062019**	**Groundwater**	**20 Jun 2019 10:35**
	SUB_Perch-6850			08 Jul 2019
6.	**HS19061157-06**	**18CPTMW19SW_062019**	**Groundwater**	**20 Jun 2019 11:25**
	SUB_Perch-6850			08 Jul 2019
7.	**HS19061157-07**	**18WW22_062019**	**Groundwater**	**20 Jun 2019 12:20**
	SUB_Perch-6850			08 Jul 2019
8.	**HS19061157-08**	**C04_062019**	**Groundwater**	**20 Jun 2019 13:10**
	SUB_Perch-6850			08 Jul 2019

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Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11648**

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: [signature] Date/Time: 6/24/19 18:00

Received By: [signature] Date/Time: 06-25-19 8:57

Cooler ID(s): Temperature(s):

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19061157 | ***Split:*** | **Workorder ID:** 1918265

Client: ALS Environmental (Houston) | **Account:** 8101

Comments:

Level: ENV_LVL4

Type: 125Poly

Preservatives: COOL

Requested Analysis: EPA 6850_DoD QSM

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis
1	06/20/2019 07:10	18CPTMW10DW_062019	1918265001		Water	A	1	A
2	06/20/2019 07:55	18CPTMW10SW_062019	1918265002		Water	A	1	A
3	06/20/2019 08:50	18WW06_062019	1918265003		Water	A	1	A
4	06/20/2019 09:40	18WW02_062019	1918265004		Water	A	1	A
5	06/20/2019 10:35	18CPTMW19_062019	1918265005		Water	A	1	A
6	06/20/2019 11:25	18CPTMW19SW_062019	1918265006		Water	A	1	A
7	06/20/2019 12:20	18WW22_062019	1918265007		Water	A	1	A
8	06/20/2019 13:10	C04_062019	1918265008		Water	A	1	A
9								
10								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Varath, Julie	06/22/2019 09:05	ALS Sample Receiving	Sample Login
	6/25/19 1400	LOC	Storage
R.33.1	7.1.19 13:20	T. Bush	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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00940846

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 19182165

Date/Time of Receipt: 6/22/19 905

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9718	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [signature] Signature — Meredith Adams Printed Name — 6/22/19 Date

Client-Related Information

☐ Missing Cooler	☑ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Did not received HSP 06157-08. 8 Bottles Listed. 7 Rcvd.

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

missing sample is being shiped for delivery tomorrow

ALS Project Manager: Kevin Griffith Printed Name — Returned to Sample Receipt by: [signature] Signature — Date: 6-24-19

CRIR.doc

Revised 01/01/2018

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ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site:

Date/Time of Receipt: 06-25-19 8157

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9784	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Jennifer Vanfossell (Signature) T. Vanfossell (Printed Name) 06-25-19 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

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Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159469-434 RUT2 EXP 02/20

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 24JUN19
ACTWGT: 19.80 LB
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 268-7700
REF: HS19061210/1157 RJ

5S1C1/02210/1010

FedEx Express

TRK# 0201 4809 7835 3035

TUE - 25 JUN 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

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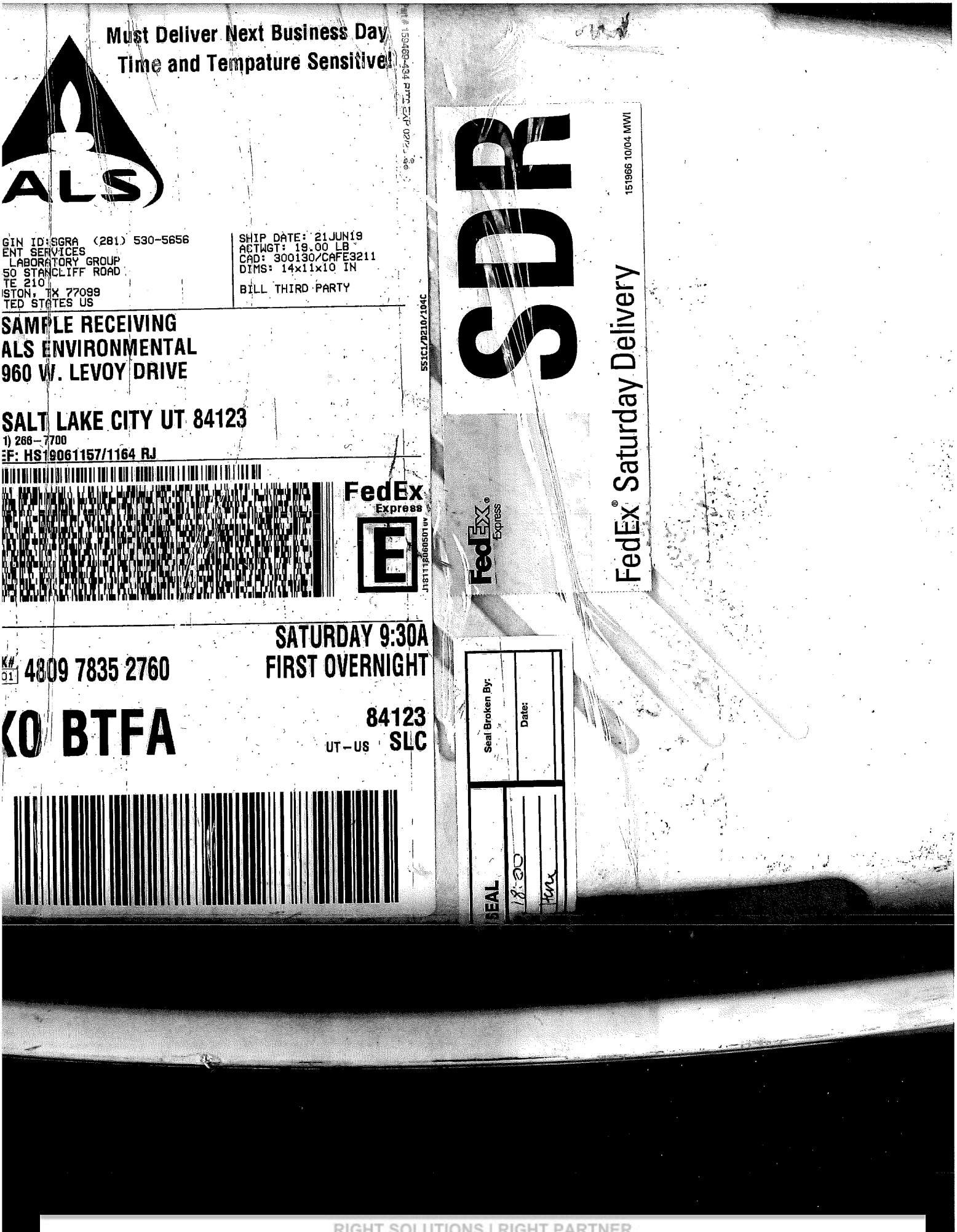
00940850



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Batch Worklist

Batch: ELMS/ 2268 Created: 7/2/2019 08:52 Instrument: HBN: 242714

Rule: EPA 6850, DoD QSM Water Analyst: T. Bosch Status: WP

Workorder: 1918260 [ENV_LVL4]

Workorder: 1918265 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	661789	CCV for HBN 242714 [ELMS/2268]				CCV	3		E685041C3Q	5311		7/5/2019	
2	661790	RLVS for HBN 242714 [ELMS/2268				RLVS	3		E685041C3Q	5311		7/5/2019	
3	661791	ICS for HBN 242714 [ELMS/2268]				ICS	3		E6850..D3Q	5311		7/5/2019	
4	661792	LMB for HBN 242714 [ELMS/2268]				LMB	3		E6850Q413Q	5311		7/5/2019	
5	661793	LCS for HBN 242714 [ELMS/2268]				LCS	3		E6850Q413Q	5311		7/5/2019	
6	1918260001	18CPTMW06_062119				SAMPLE	3	1918260001-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
7	1918260002	18CPTMW06_062119_a				SAMPLE	3	1918260002-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
8	1918260003	MW22_062119				SAMPLE	3	1918260003-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
9	1918260004	CO1_062119				SAMPLE	3	1918260004-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
10	1918260005	CO1_062119MS				MS	3	1918260005-A	E6850Q413Q	5480		7/5/2019	
11	1918260006	CO1_062119MSD				MSD	3	1918260006-A	E6850Q413Q	5480		7/5/2019	
12	1918260007	MW8_062119				SAMPLE	3	1918260007-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
13	1918260008	18CPTMW15_062119				SAMPLE	3	1918260008-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
14	1918260009	18CPTMW03SW_062119				SAMPLE	3	1918260009-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
15	1918260010	AWD3_062119				SAMPLE	3	1918260010-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
16	661794	CCV for HBN 242714 [ELMS/2268]				CCV	3		E685041C3Q	5311		7/5/2019	
17	1918260011	CO8_062119				SAMPLE	3	1918260011-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
18	1918265001	18CPTMW10DW_062019				SAMPLE	3	1918265001-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
19	1918265002	18CPTMW10SW_062019				SAMPLE	3	1918265002-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
20	1918265003	18WW06_062019				SAMPLE	3	1918265003-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
21	1918265004	18WW02_062019				SAMPLE	3	1918265004-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
22	1918265005	18CPTMW19_062019				SAMPLE	3	1918265005-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
23	1918265006	18CPTMW19SW_062019				SAMPLE	3	1918265006-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
24	1918265007	18WW22_062019				SAMPLE	3	1918265007-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
25	1918265008	C04_062019				SAMPLE	3	1918265008-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
26	661795	CCV for HBN 242714 [ELMS/2268]				CCV	3		E685041C3Q	5311		7/5/2019	

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00940851

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1918260 (001-11), 1918265 (001-08)
ELMS Batch/HBN ID: 2268 (242714)
Prep Date: 07/01/2019 Analysis Date: 07/03/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\03JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 661793; Target = 4.0µg/L. ASTM type II water was used for LMB 661792.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on samples 1918260005/06 (Client ID: CO1_062119). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1918260003/08 were analyzed and reported from 1:10 dilutions. Field sample 1918260007 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\242714-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 661790) is reported from the analysis of the Laboratory Control Sample (LCS – 661793) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 03JULD03/06/19/23.

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2268 HBN: 242714 Sample Set IDs if Applicable: 1918260/1918265	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration 1000 ug/mL
1	14797-73-0	Perchlorate	

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description - 6850 QC WKG STD 100ug/L

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK	Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ANAB

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: JCC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

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125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

Page 1 of 1

For use in routine laboratory analysis.

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	661789 CCV@25	Vial 71	1	Control	1	2.23045e6	8.436	26.59001
*	661793 QC@4.0	Vial 72	1	Control	2	3.72011e5	8.228	4.20689
*	661791 ICS@4.0	Vial 73	1	Control	3	2.92755e5	8.090	3.90370
*	661792 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1918260001	Vial 75	1	Sample	5	1.00339e5	7.926	1.72705
*	1918260002	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	1918260003 10X	Vial 77	1	Sample	7	7.28770e5	8.214	94.51960
*	1918260004	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1918260005 MS	Vial 79	1	Sample	9	1.74594e5	7.801	3.41772
*	1918260006 MSD	Vial 80	1	Sample	10	1.72844e5	7.800	3.36507
*	1918260007 1K	Vial 81	1	Sample	11	5.34661e5	8.739	7067.32278
*	1918260008 10X	Vial 82	1	Sample	12	3.53155e6	8.463	409.01406
*	1918260009	Vial 83	1	Sample	13	5.48800e5	7.917	9.89897
*	1918260010	Vial 84	1	Sample	14	1.27411e5	8.284	1.75055
*	1918260011	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1918265001	Vial 86	1	Sample	16	7.53597e5	7.981	9.07754
*	661794 CCV@25	Vial 71	1	Control	17	1.99251e6	8.576	26.33220
*	1918265002	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1918265003	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	1918265004	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	1918265005	Vial 90	1	Sample	21	2.73037e5	8.159	4.14589
*	1918265006	Vial 91	1	Sample	22	3.36289e6	8.129	39.03652
*	1918265007	Vial 92	1	Sample	23	0.00000	0.000	0.00000
*	1918265008	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	661795 CCV@25	Vial 71	1	Control	25	2.02866e6	8.520	25.81702

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	661789 CCV@25	Vial 71	1	Control	1	6.67744e5	8.470	26.81724
*	661793 QC@4.0	Vial 72	1	Control	2	1.20101e5	8.255	4.42244
*	661791 ICS@4.0	Vial 73	1	Control	3	9.57778e4	8.096	4.14544
*	661792 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1918260001	Vial 75	1	Sample	5	3.62166e4	7.941	1.91349
*	1918260002	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	1918260003 10X	Vial 77	1	Sample	7	2.32604e5	8.238	100.35898
*	1918260004	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1918260005 MS	Vial 79	1	Sample	9	6.56059e4	7.810	4.13918
*	1918260006 MSD	Vial 80	1	Sample	10	6.56232e4	7.815	4.11436
*	1918260007 1K	Vial 81	1	Sample	11	1.75075e5	8.767	7652.56480
*	1918260008 10X	Vial 82	1	Sample	12	1.06108e6	8.478	414.80020
*	1918260009	Vial 83	1	Sample	13	1.77272e5	7.934	10.64208
*	1918260010	Vial 84	1	Sample	14	4.40452e4	8.285	1.86025
*	1918260011	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1918265001	Vial 86	1	Sample	16	2.38015e5	7.999	9.53324
*	661794 CCV@25	Vial 71	1	Control	17	5.92974e5	8.599	26.40646
*	1918265002	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1918265003	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	1918265004	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	1918265005	Vial 90	1	Sample	21	8.77046e4	8.185	4.33407
*	1918265006	Vial 91	1	Sample	22	1.01421e6	8.147	39.71903
*	1918265007	Vial 92	1	Sample	23	0.00000	0.000	0.00000
*	1918265008	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	661795 CCV@25	Vial 71	1	Control	25	6.16068e5	8.540	26.38763

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	661789 CCV@25	Vial 71	1	Control	1	2.54244e5	8.447	5.00000
*	661793 QC@4.0	Vial 72	1	Control	2	2.90663e5	8.255	5.00000

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#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	661791 ICS@4.0	Vial 73	1	Control	3	2.47418e5	8.122	5.00000
*	661792 LMB	Vial 74	1	Control	4	2.69965e5	8.571	5.00000
*	1918260001	Vial 75	1	Sample	5	2.03376e5	7.947	5.00000
*	1918260002	Vial 76	1	Sample	6	2.30322e5	7.928	5.00000
*	1918260003 10X	Vial 77	1	Sample	7	2.45205e5	8.229	50.00000
*	1918260004	Vial 78	1	Sample	8	1.64595e5	7.807	5.00000
*	1918260005 MS	Vial 79	1	Sample	9	1.69734e5	7.817	5.00000
*	1918260006 MSD	Vial 80	1	Sample	10	1.70811e5	7.823	5.00000
*	1918260007 1K	Vial 81	1	Sample	11	2.43260e5	8.755	5000.00000
*	1918260008 10X	Vial 82	1	Sample	12	2.53420e5	8.502	50.00000
*	1918260009	Vial 83	1	Sample	13	1.76005e5	7.940	5.00000
*	1918260010	Vial 84	1	Sample	14	2.54426e5	8.295	5.00000
*	1918260011	Vial 85	1	Sample	15	2.32351e5	7.915	5.00000
*	1918265001	Vial 86	1	Sample	16	2.64421e5	8.007	5.00000
*	661794 CCV@25	Vial 71	1	Control	17	2.29484e5	8.599	5.00000
*	1918265002	Vial 87	1	Sample	18	2.14730e5	7.877	5.00000
*	1918265003	Vial 88	1	Sample	19	1.83014e5	7.960	5.00000
*	1918265004	Vial 89	1	Sample	20	2.99495e5	8.239	5.00000
*	1918265005	Vial 90	1	Sample	21	2.16624e5	8.179	5.00000
*	1918265006	Vial 91	1	Sample	22	2.53872e5	8.144	5.00000
*	1918265007	Vial 92	1	Sample	23	2.63295e5	8.143	5.00000
*	1918265008	Vial 93	1	Sample	24	3.21651e5	8.236	5.00000
*	661795 CCV@25	Vial 71	1	Control	25	2.38601e5	8.561	5.00000

*** End of Report ***

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Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	661789 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	661793 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	661791 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	661792 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1918260001	CLO4-AQN	1	Sample		
6	Vial 76	1918260002	CLO4-AQN	1	Sample		
7	Vial 77	1918260003 10X	CLO4-AQN	1	Sample		
8	Vial 78	1918260004	CLO4-AQN	1	Sample		
9	Vial 79	1918260005 MS	CLO4-AQN	1	Sample		
10	Vial 80	1918260006 MSD	CLO4-AQN	1	Sample		
11	Vial 81	1918260007 1K	CLO4-AQN	1	Sample		
12	Vial 82	1918260008 10X	CLO4-AQN	1	Sample		
13	Vial 83	1918260009	CLO4-AQN	1	Sample		
14	Vial 84	1918260010	CLO4-AQN	1	Sample		
15	Vial 85	1918260011	CLO4-AQN	1	Sample		
16	Vial 86	1918265001	CLO4-AQN	1	Sample		
17	Vial 71	661794 CCV@25	CLO4-AQN	1	Ctrl Samp		
18	Vial 87	1918265002	CLO4-AQN	1	Sample		
19	Vial 88	1918265003	CLO4-AQN	1	Sample		
20	Vial 89	1918265004	CLO4-AQN	1	Sample		
21	Vial 90	1918265005	CLO4-AQN	1	Sample		
22	Vial 91	1918265006	CLO4-AQN	1	Sample		
23	Vial 92	1918265007	CLO4-AQN	1	Sample		
24	Vial 93	1918265008	CLO4-AQN	1	Sample		
25	Vial 71	661795 CCV@25	CLO4-AQN	1	Ctrl Samp		

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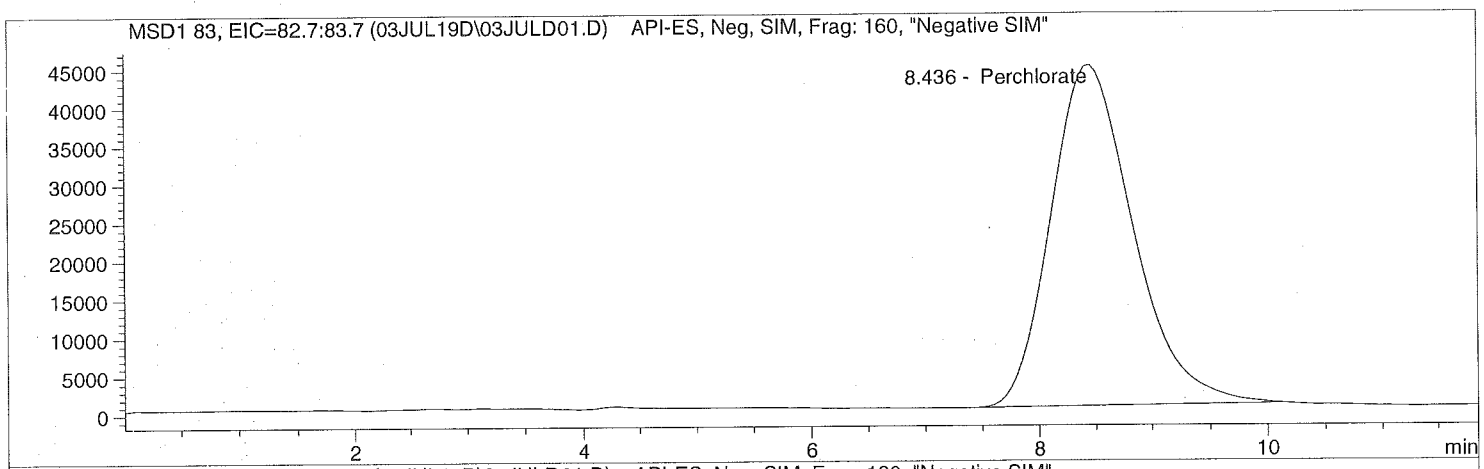
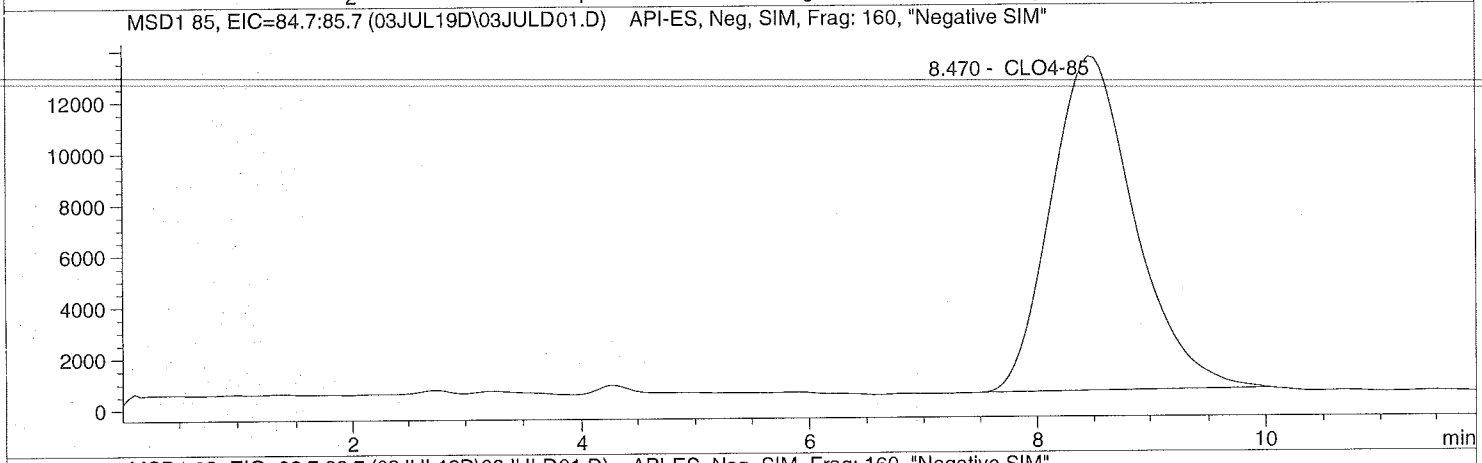
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD01.D Sample Name: 661789 CCV@25

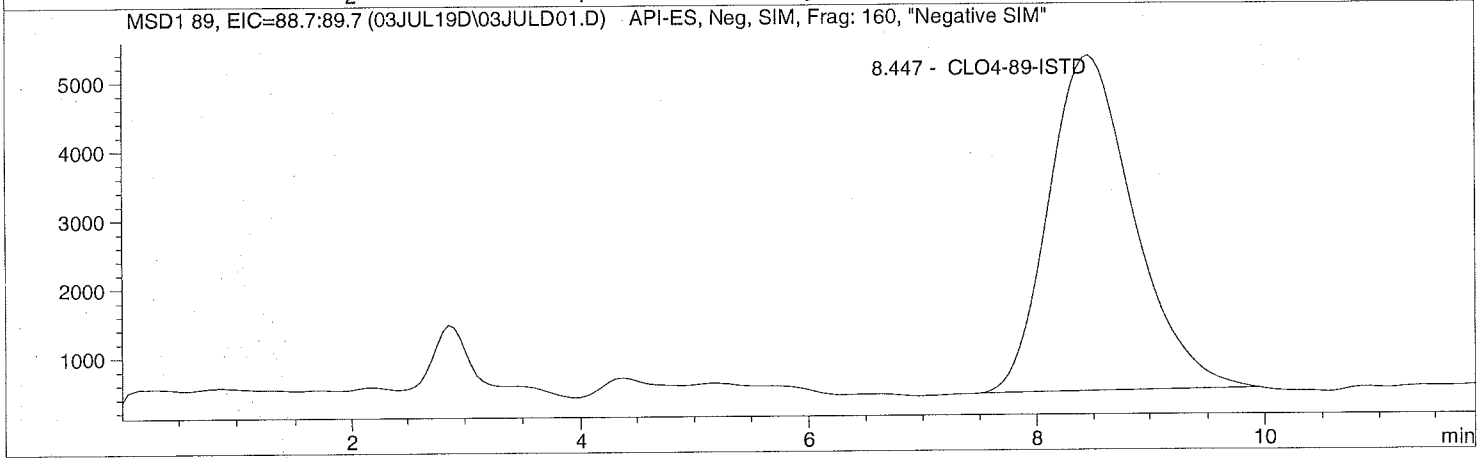
Injection Date:	7/03/2019 08:20:45	Seq Line:	1
Sample Name:	661789 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD01.D Sample Name: 661789 CCV@25

Injection Date:	7/03/2019 08:20:45	Seq Line:	1
Sample Name:	661789 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.436	PBA	2230452.0	26.5900	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.470	PBA	667744.2	26.8172	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.447	PBA	254244.0	5.0000	CLO4-89-ISTD

*** End of Report ***

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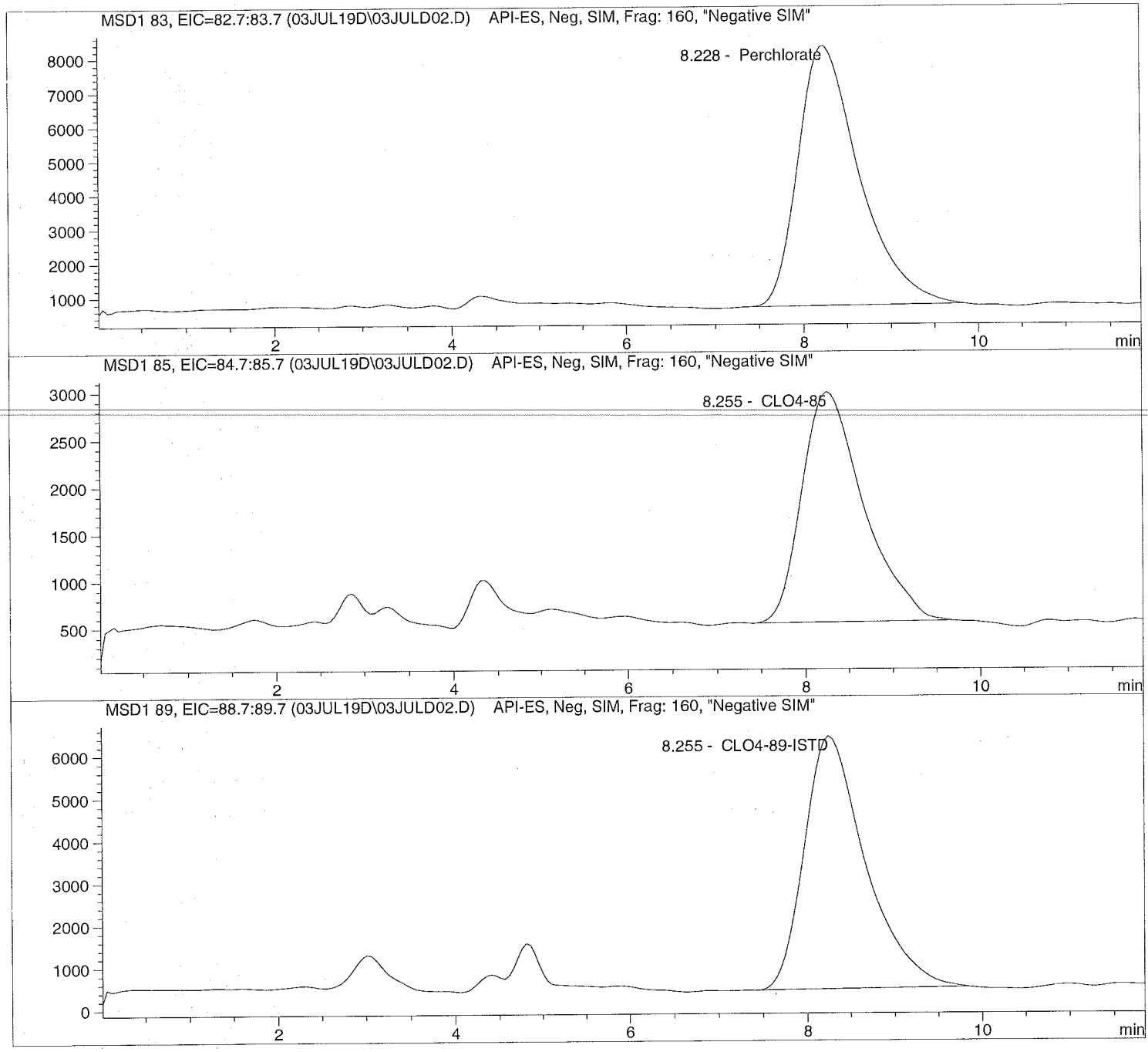
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD02.D Sample Name: 661793 QC@4.0

Injection Date:	7/03/2019 08:35:29	Seq Line:	2
Sample Name:	661793 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD02.D Sample Name: 661793 QC@4.0

Injection Date:	7/03/2019 08:35:29	Seq Line:	2
Sample Name:	661793 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.228	PBA	372011.4	4.2069	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.255	PBA	120100.8	4.4224	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.255	PBA	290663.2	5.0000	CLO4-89-ISTD

*** End of Report ***

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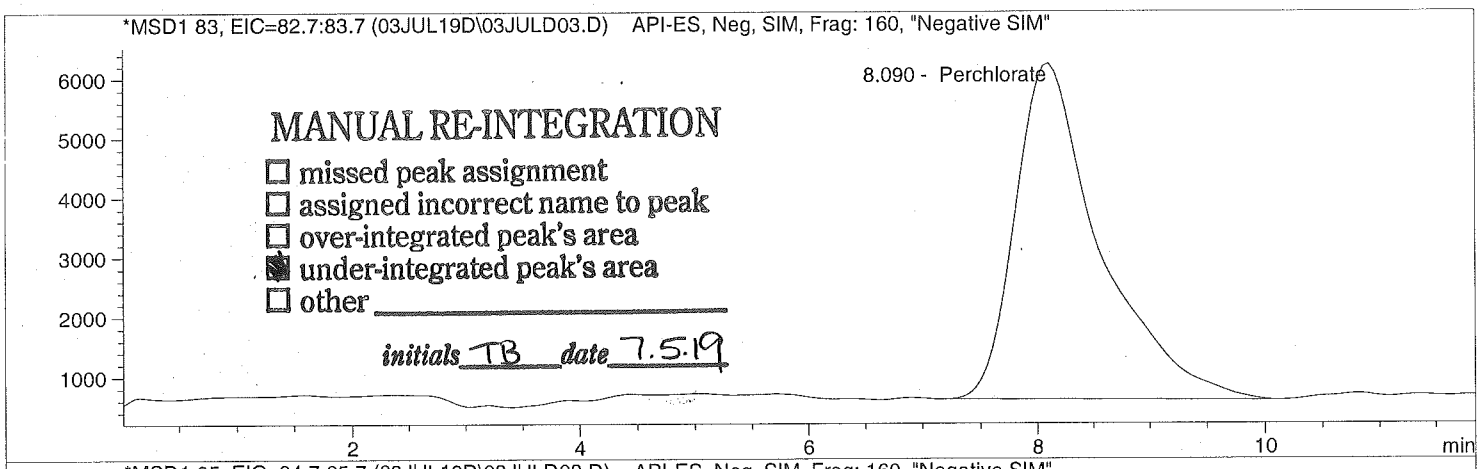
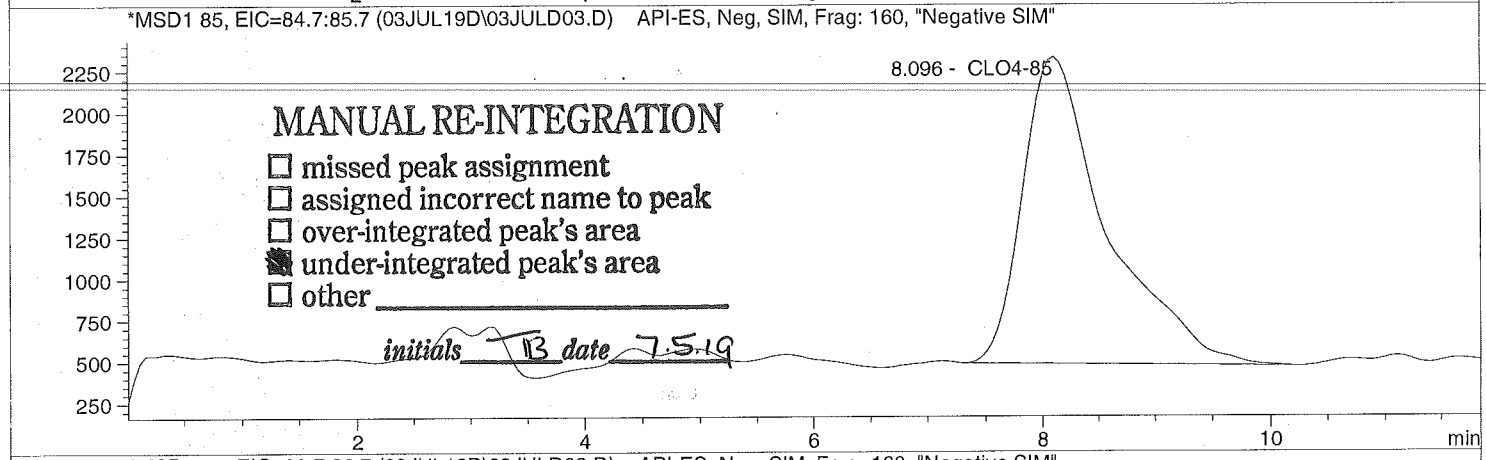
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD03.D Sample Name: 661791 ICS@4.0

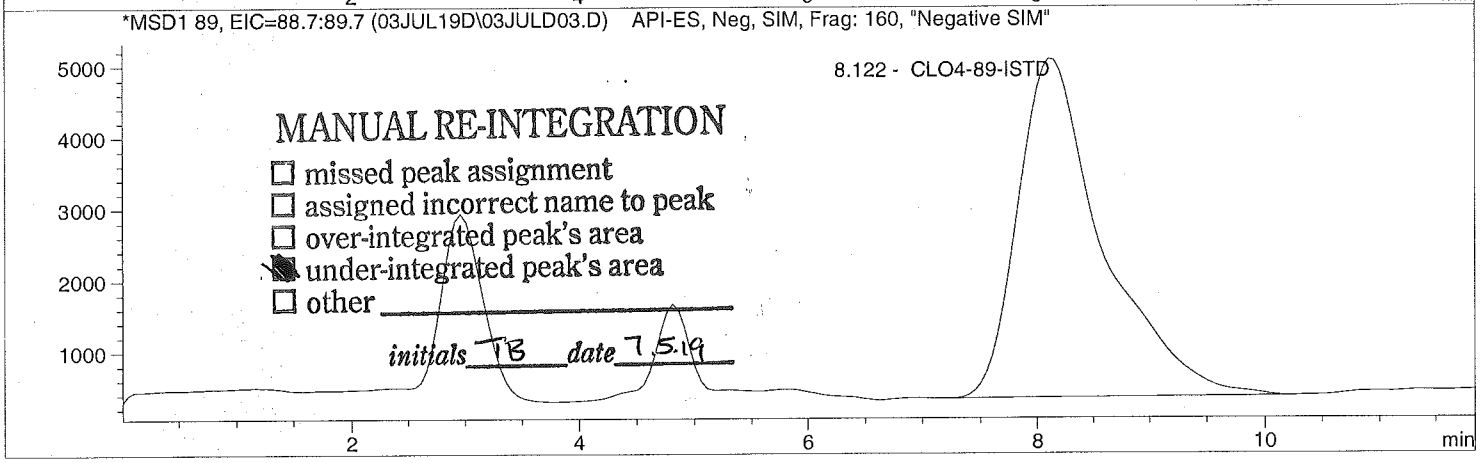
Injection Date:	7/03/2019 08:49:21	Seq Line:	3
Sample Name:	661791 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







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Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD03.D Sample Name: 661791 ICS@4.0

Injection Date:	7/03/2019 08:49:21	Seq Line:	3
Sample Name:	661791 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.090	MM	292755.3	3.9037	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.096	MM	95777.8	4.1454	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.122	MM	247417.5	5.0000	CLO4-89-ISTD

*** End of Report ***

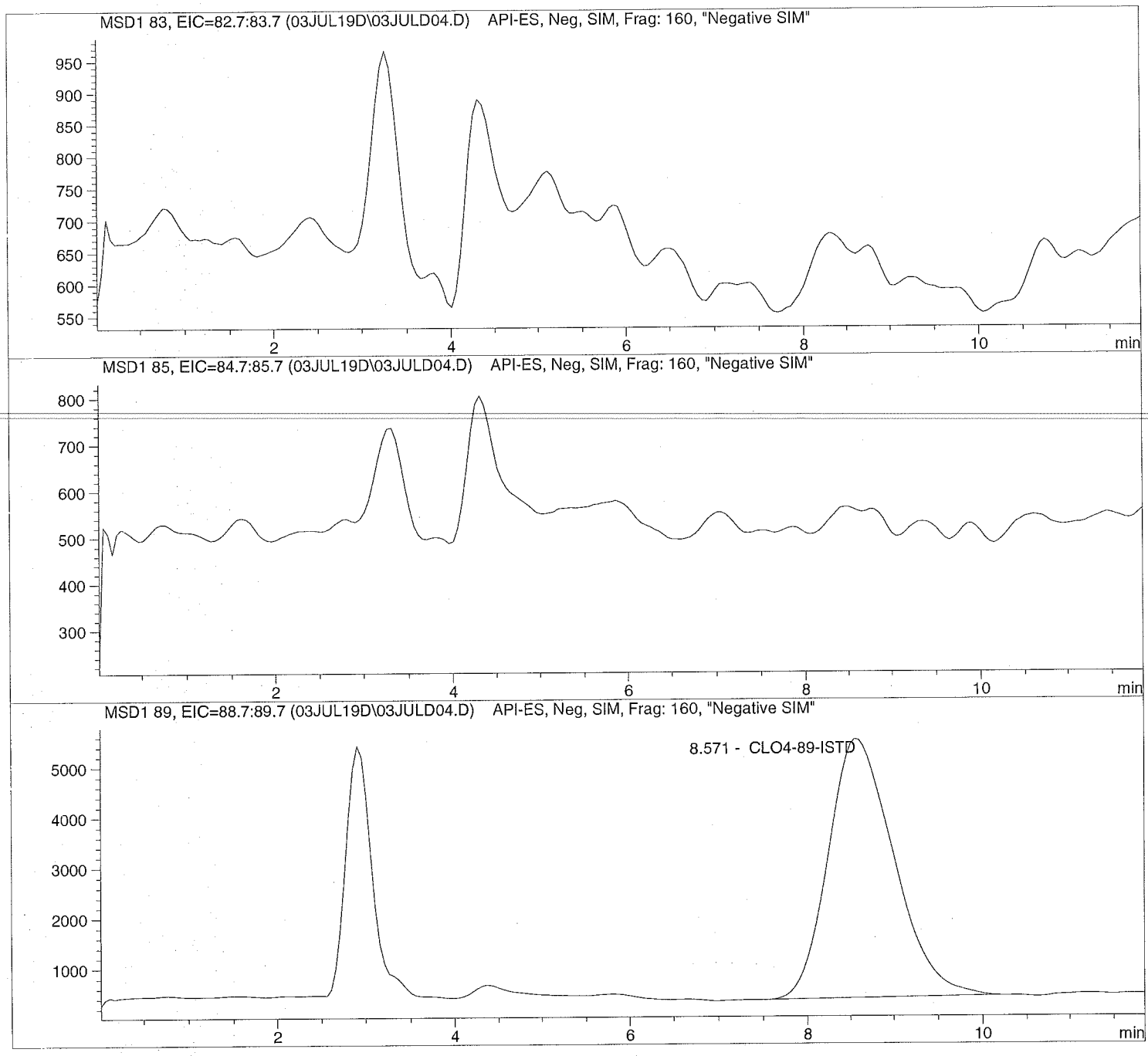
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD04.D Sample Name: 661792 LMB

Injection Date:	7/03/2019 09:03:15	Seq Line:	4
Sample Name:	661792 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD04.D Sample Name: 661792 LMB

Injection Date:	7/03/2019 09:03:15	Seq Line:	4
Sample Name:	661792 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.571	PBA	269964.7	5.0000	CLO4-89-ISTD

*** End of Report ***

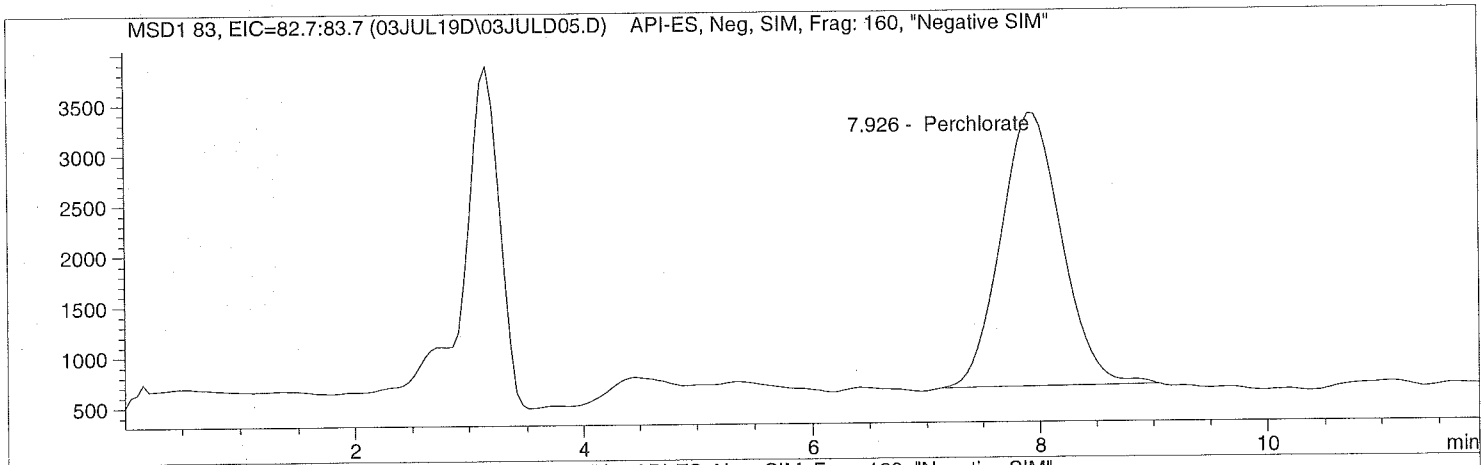
RIGHT SOLUTIONS | RIGHT PARTNER

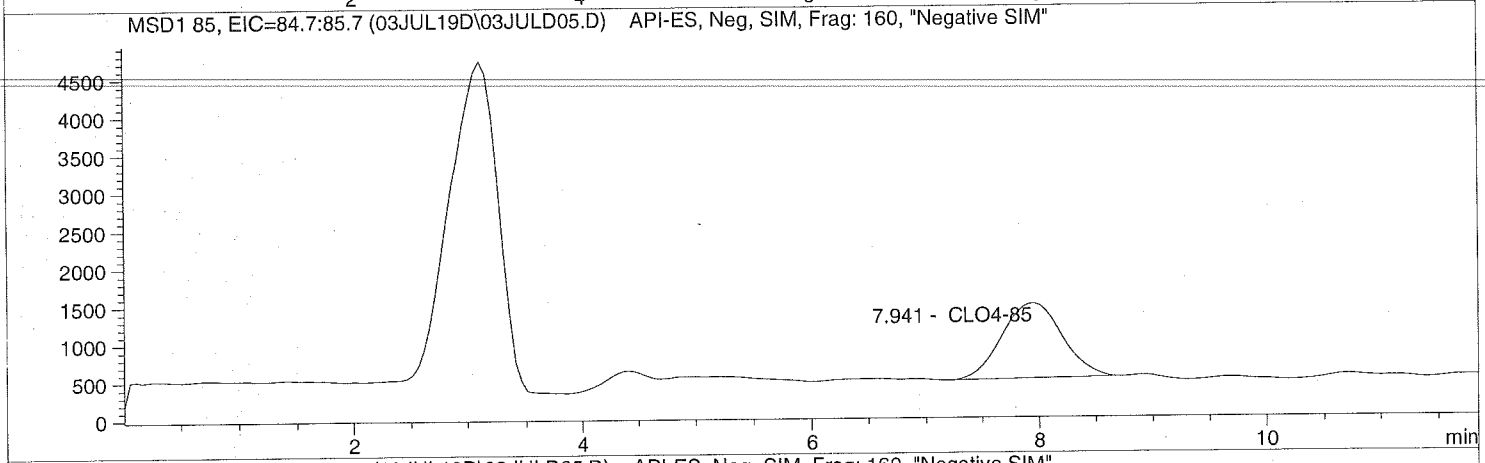
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD05.D Sample Name: 1918260001

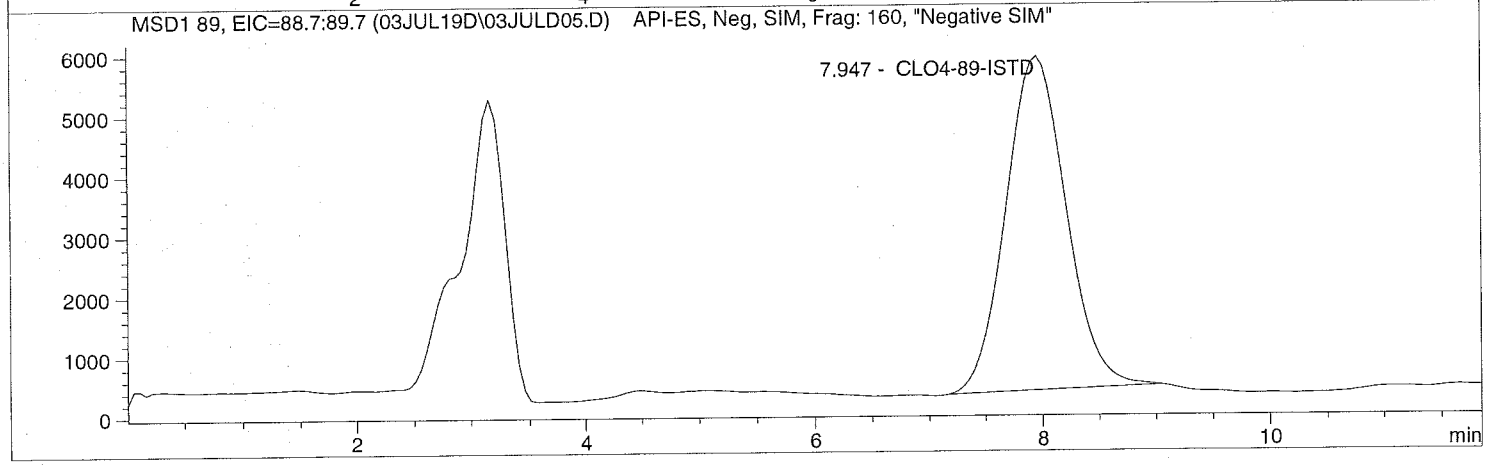
Injection Date:	7/03/2019 09:17:08	Seq Line:	5
Sample Name:	1918260001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD05.D Sample Name: 1918260001

Injection Date:	7/03/2019 09:17:08	Seq Line:	5
Sample Name:	1918260001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.926	BBA	100338.5	1.7270	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.941	PBA	36216.6	1.9135	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.947	PBA	203376.5	5.0000	CLO4-89-ISTD

*** End of Report ***

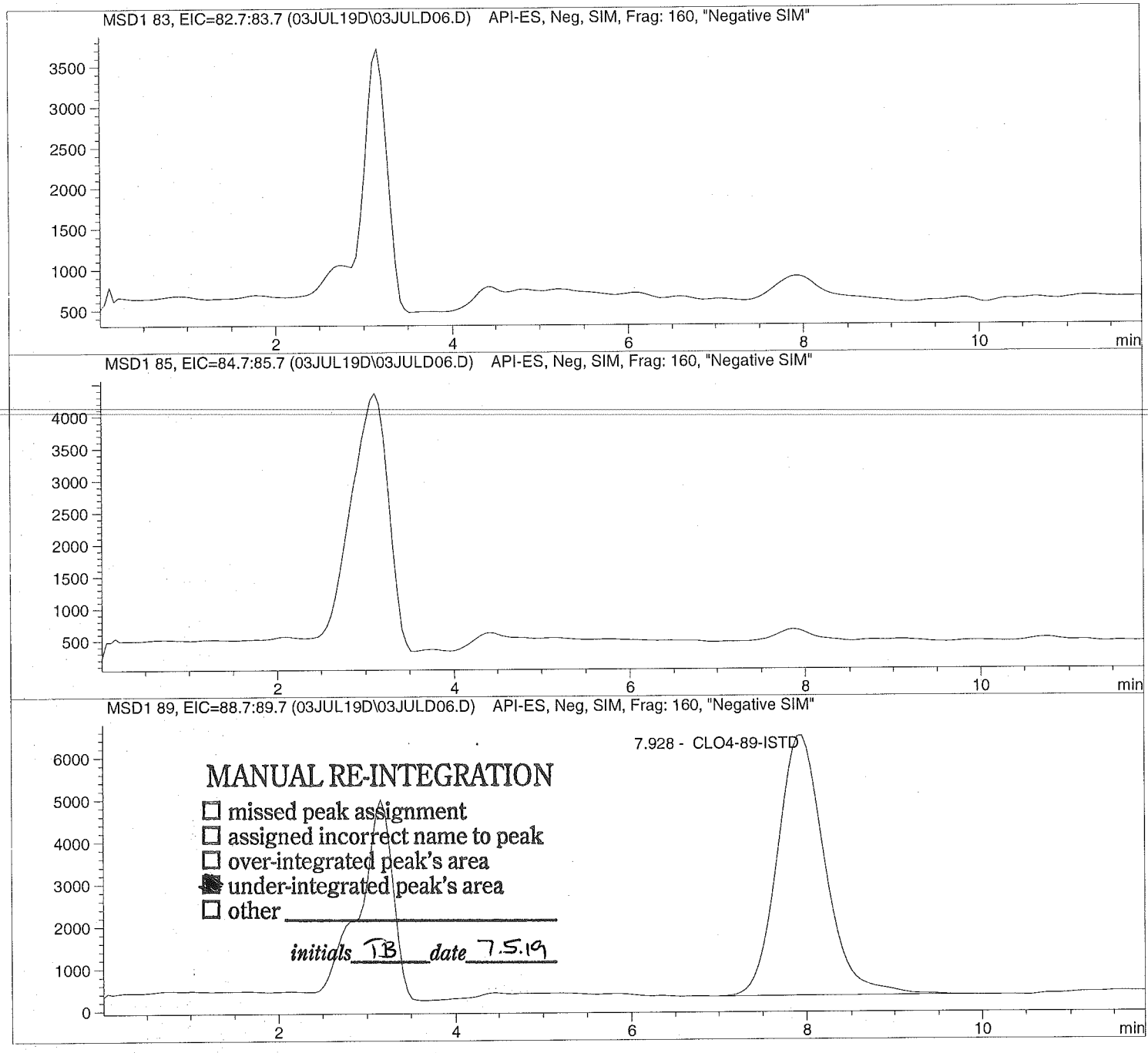
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD06.D Sample Name: 1918260002

Injection Date:	7/03/2019 09:31:06	Seq Line:	6
Sample Name:	1918260002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD06.D Sample Name: 1918260002

Injection Date:	7/03/2019 09:31:06	Seq Line:	6
Sample Name:	1918260002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.928	MM	230321.8	5.0000	CLO4-89-ISTD

*** End of Report ***

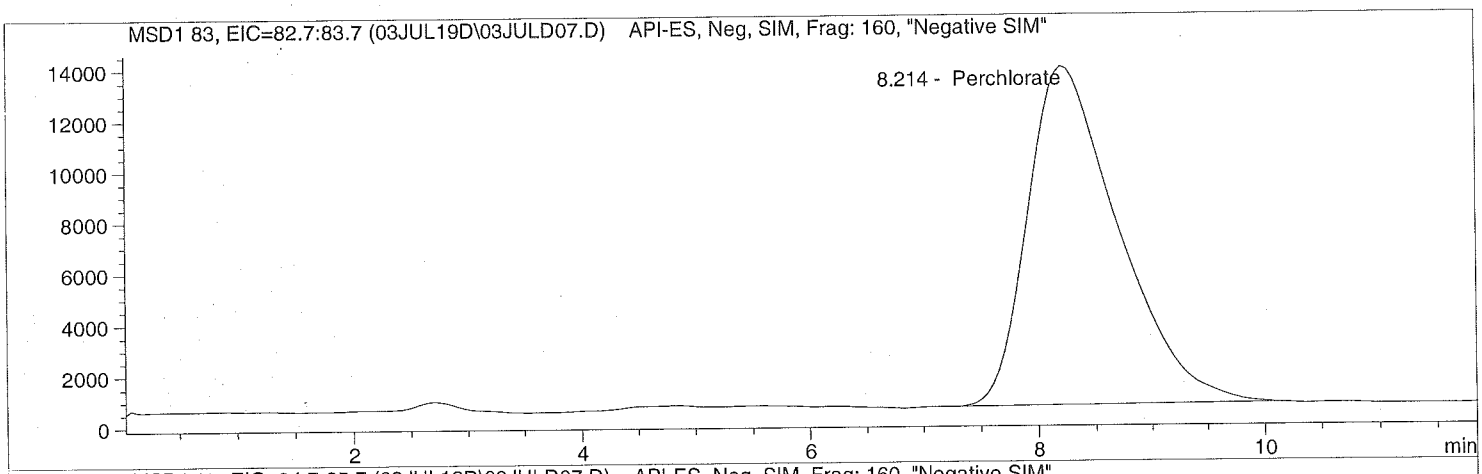
RIGHT SOLUTIONS | RIGHT PARTNER

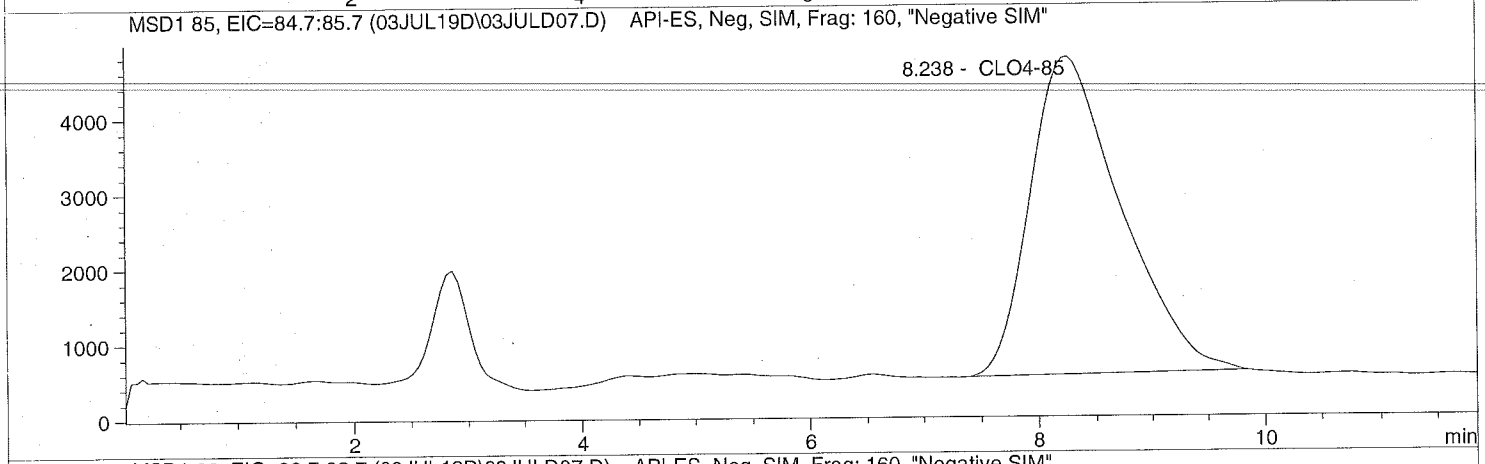
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD07.D Sample Name: 1918260003 10X 00940885

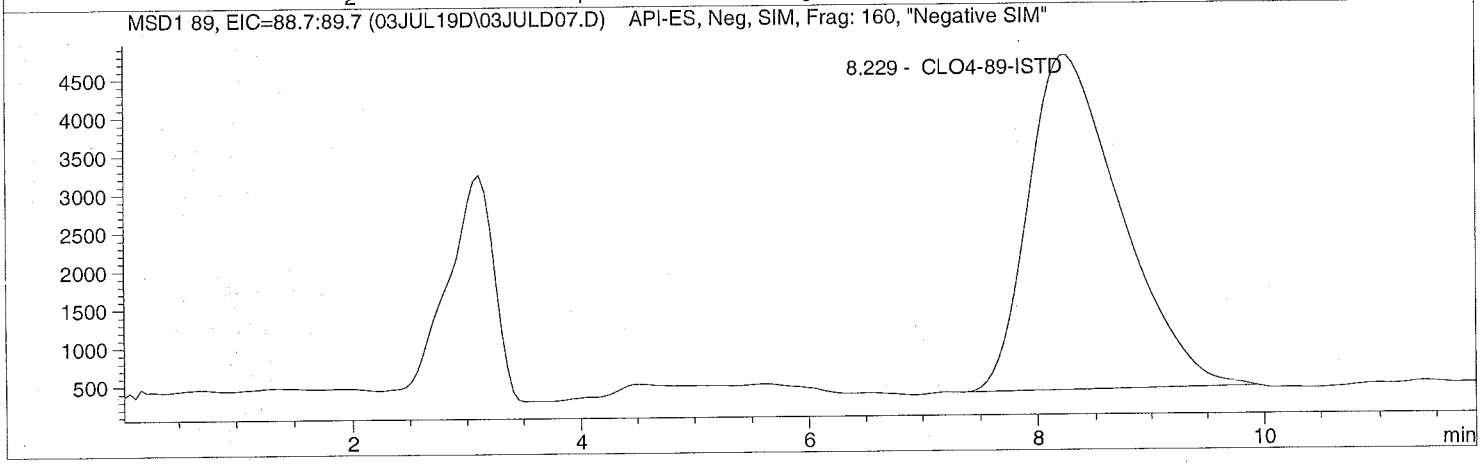
Injection Date:	7/03/2019 09:45:04	Seq Line:	7
Sample Name:	1918260003 10X	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD07.D Sample Name: 1918260003 10X

Injection Date:	7/03/2019 09:45:04	Seq Line:	7
Sample Name:	1918260003 10X	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.214	PBA	728769.6	94.5196	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.238	PBA	232603.6	100.3590	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.229	PBA	245205.1	50.0000	CLO4-89-ISTD

*** End of Report ***

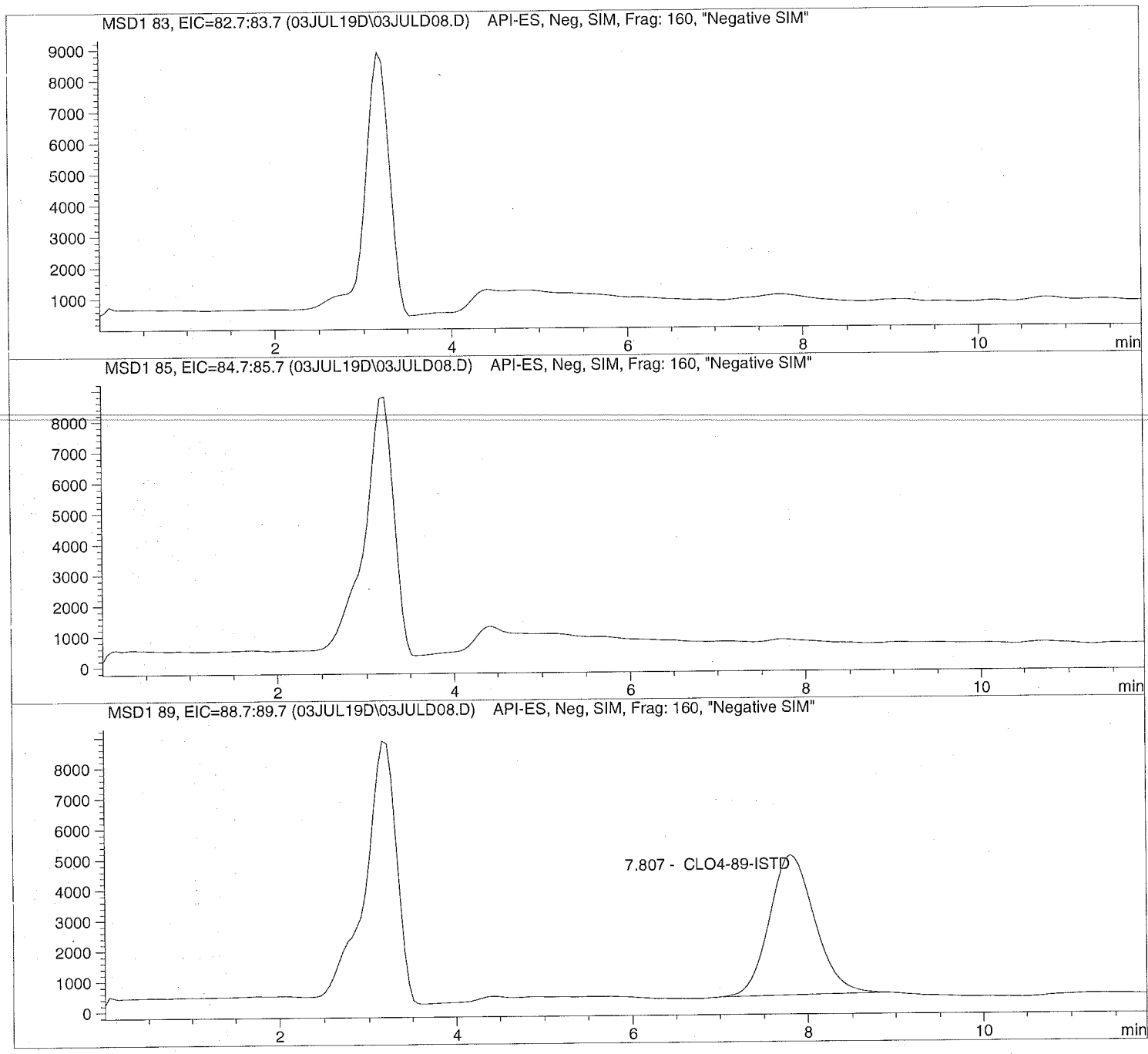
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD08.D Sample Name: 1918260004

Injection Date:	7/03/2019 09:58:59	Seq Line:	8
Sample Name:	1918260004	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD08.D Sample Name: 1918260004

Injection Date:	7/03/2019 09:58:59	Seq Line:	8
Sample Name:	1918260004	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.807	PBA	164595.2	5.0000	CLO4-89-ISTD

*** End of Report ***

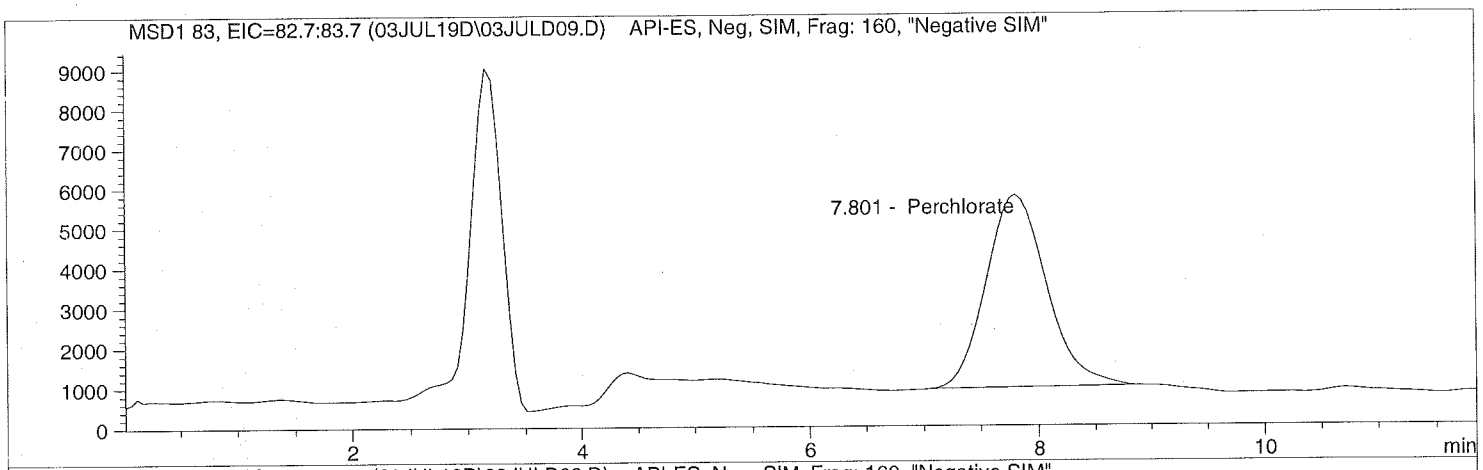
RIGHT SOLUTIONS | RIGHT PARTNER

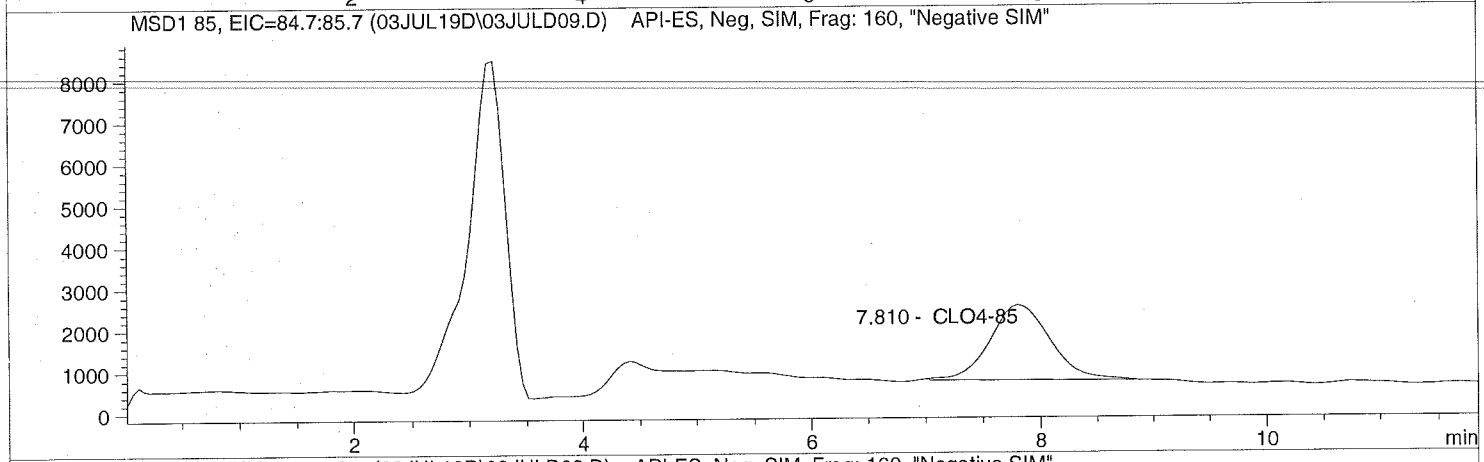
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD09.D Sample Name: 1918260005 MS

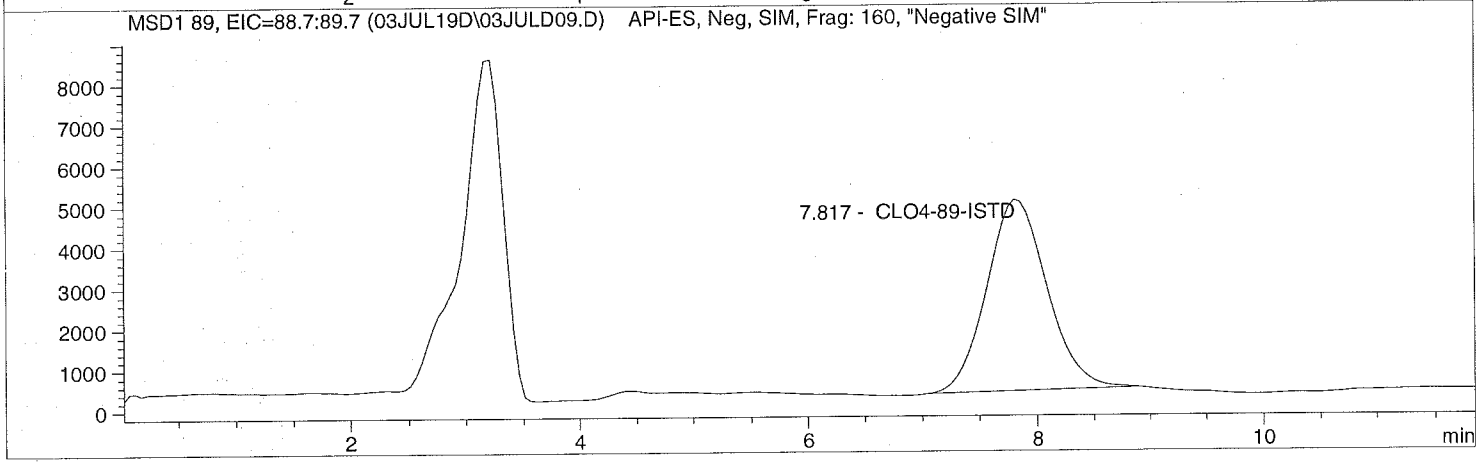
Injection Date:	7/03/2019 10:12:53	Seq Line:	9
Sample Name:	1918260005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD09.D Sample Name: 1918260005 MS

Injection Date:	7/03/2019 10:12:53	Seq Line:	9
Sample Name:	1918260005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.801	PBA	174594.0	3.4177	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.810	BBA	65605.9	4.1392	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.817	PBA	169734.3	5.0000	CLO4-89-ISTD

*** End of Report ***

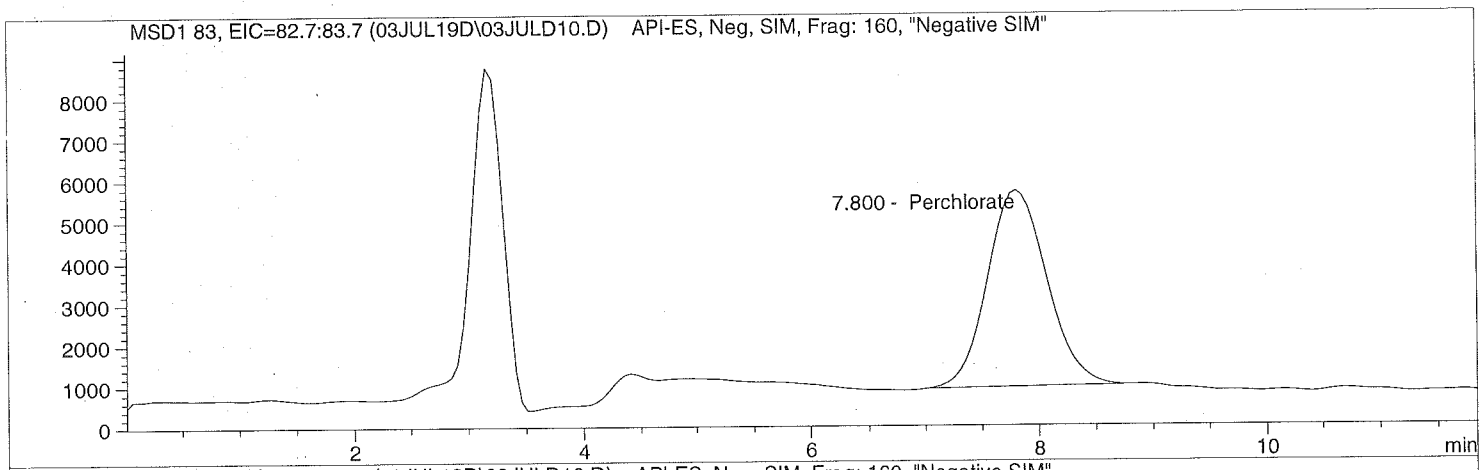
RIGHT SOLUTIONS | RIGHT PARTNER

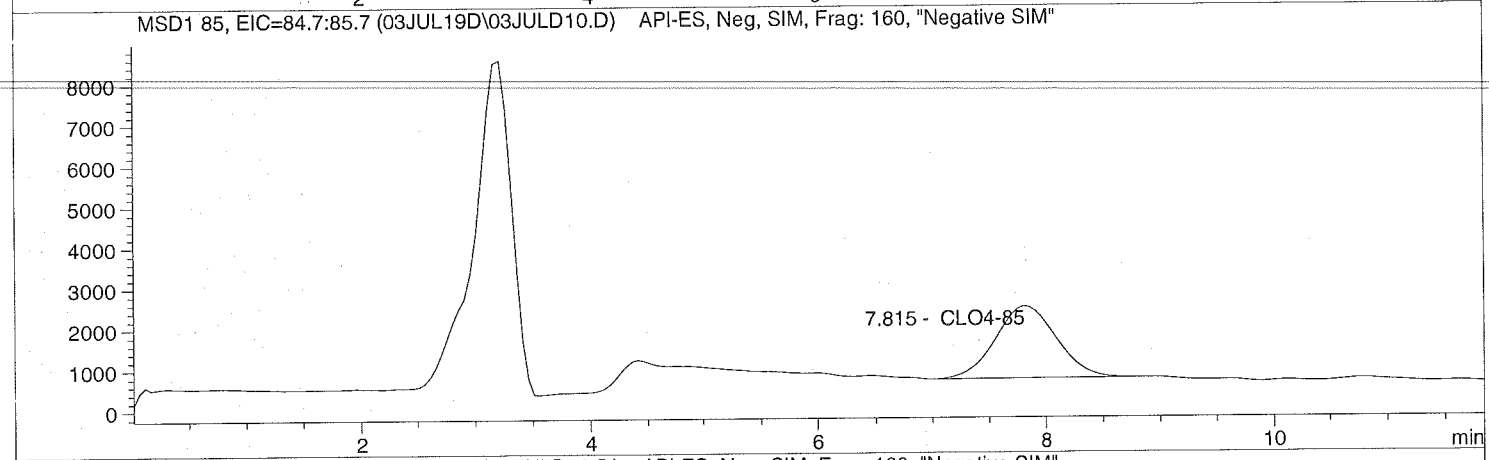
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD10.D Sample Name: 1918260006 MSD

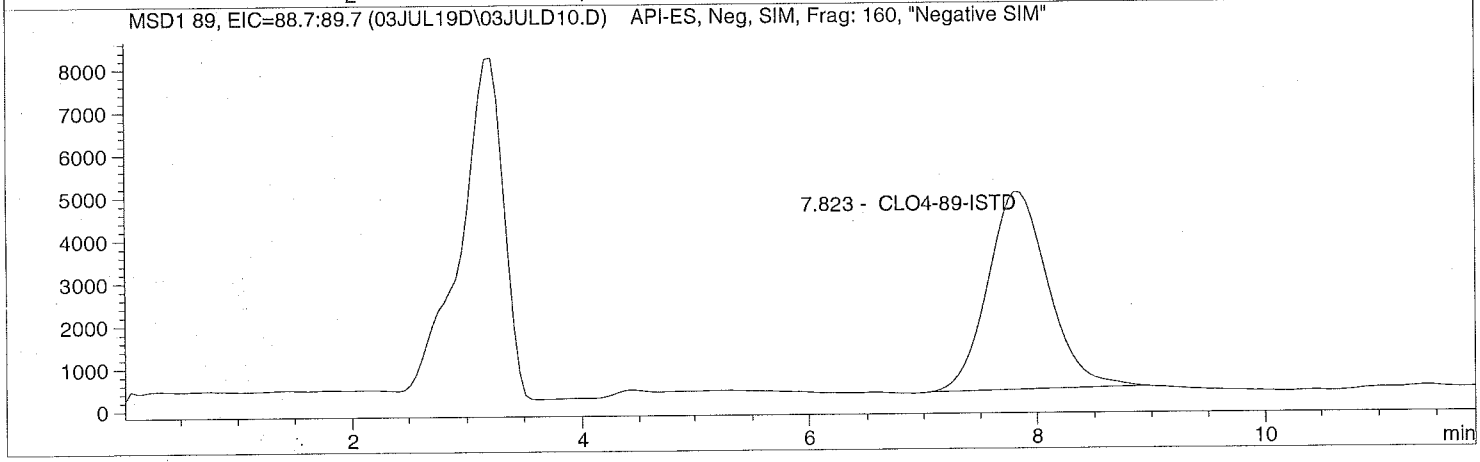
Injection Date:	7/03/2019 10:26:51	Seq Line:	10
Sample Name:	1918260006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD10.D Sample Name: 1918260006 MSD

Injection Date:	7/03/2019 10:26:51	Seq Line:	10
Sample Name:	1918260006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.800	PBA	172844.2	3.3651	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.815	PBA	65623.2	4.1144	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.823	PBA	170811.3	5.0000	CLO4-89-ISTD

*** End of Report ***

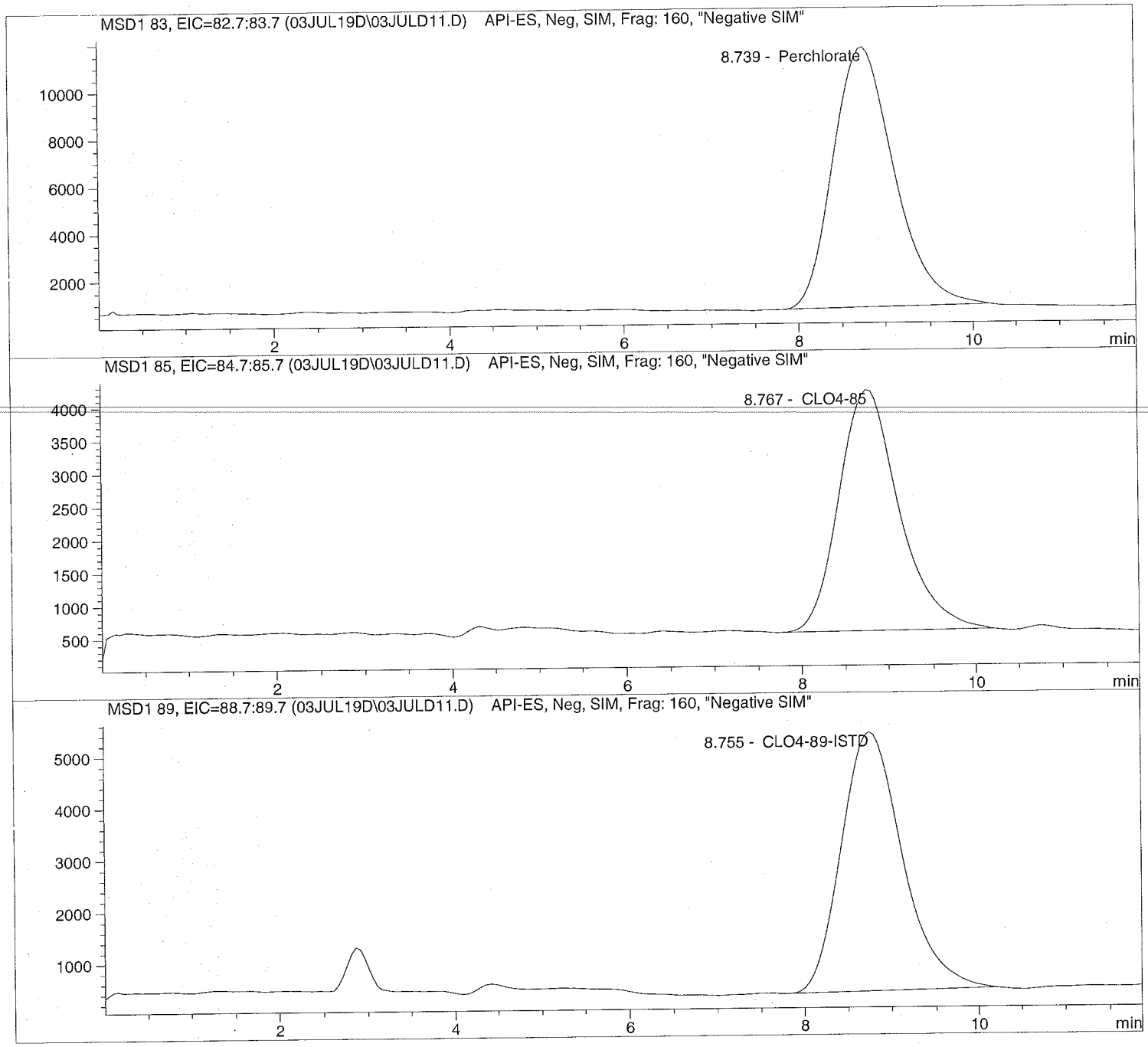
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD11.D Sample Name: 1918260007 1K

Injection Date:	7/03/2019 10:40:43	Seq Line:	11
Sample Name:	1918260007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD11.D Sample Name: 1918260007 1K

Injection Date:	7/03/2019 10:40:43	Seq Line:	11
Sample Name:	1918260007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.739	PBA	534660.9	7067.3228	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.767	PBA	175075.3	7652.5648	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	PBA	243259.9	5000.0000	CLO4-89-ISTD

*** End of Report ***

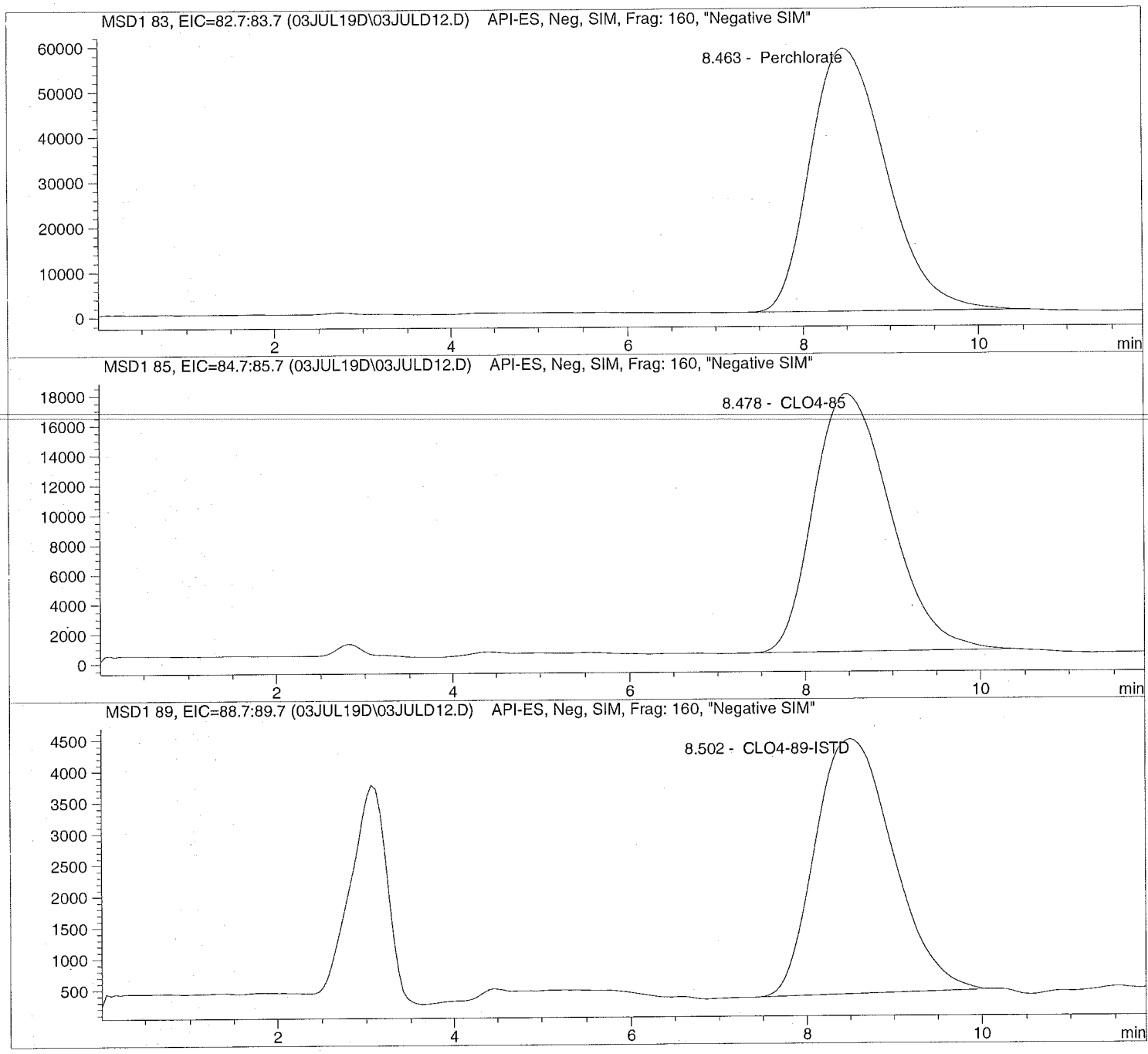
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD12.D Sample Name: 1918260008 10X

Injection Date:	7/03/2019 10:54:34	Seq Line:	12
Sample Name:	1918260008 10X	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD12.D Sample Name: 1918260008 10X

Injection Date:	7/03/2019 10:54:34	Seq Line:	12
Sample Name:	1918260008 10X	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.463	PBA	3531551.7	409.0141	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.478	PBA	1061081.0	414.8002	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	PBA	253420.0	50.0000	CLO4-89-ISTD

*** End of Report ***

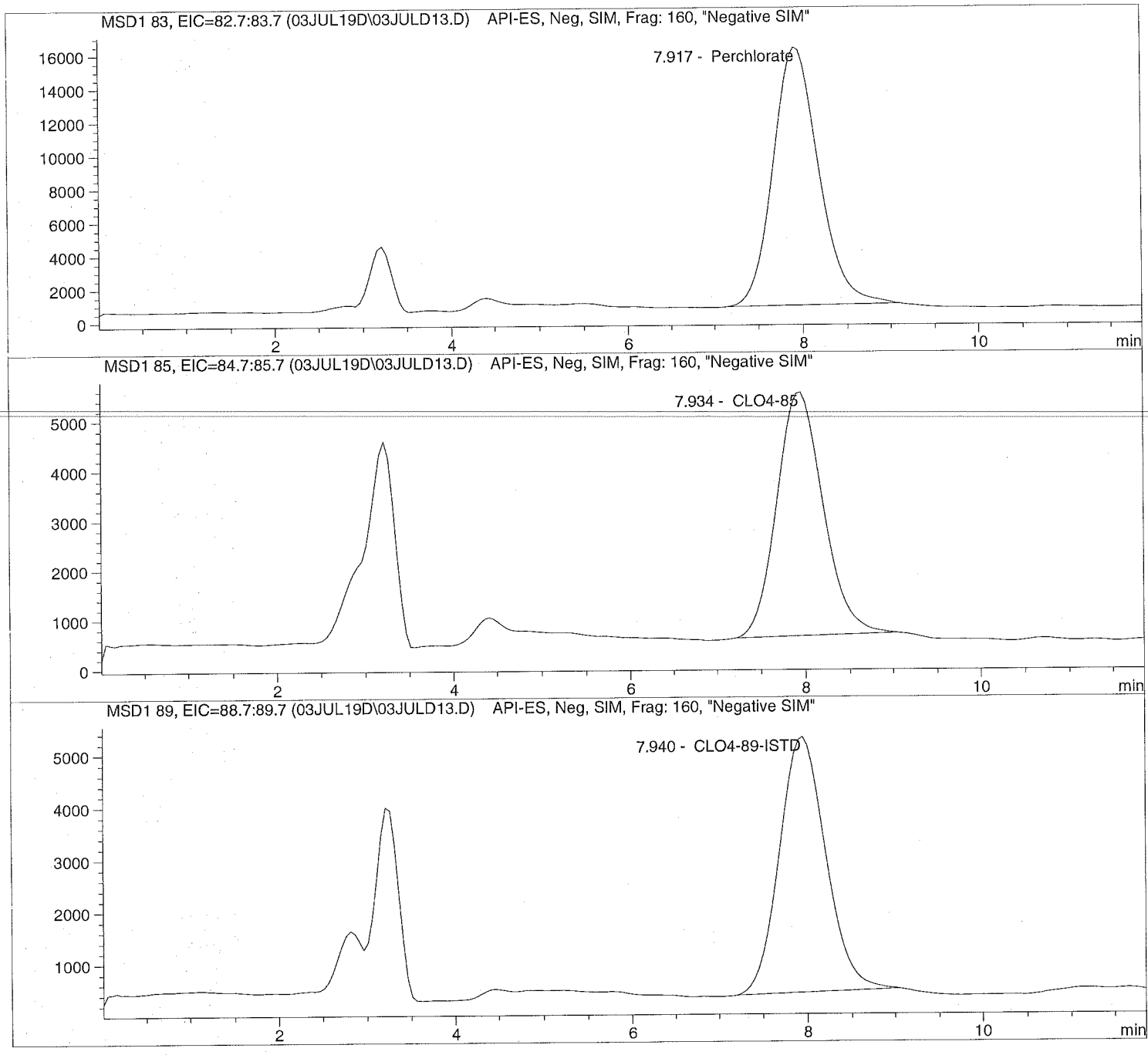
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD13.D Sample Name: 1918260009

Injection Date:	7/03/2019 11:08:30	Seq Line:	13
Sample Name:	1918260009	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD13.D Sample Name: 1918260009

Injection Date:	7/03/2019 11:08:30	Seq Line:	13
Sample Name:	1918260009	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.917	PBA	548800.2	9.8990	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.934	PBA	177271.9	10.6421	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.940	PBA	176004.6	5.0000	CLO4-89-ISTD

*** End of Report ***

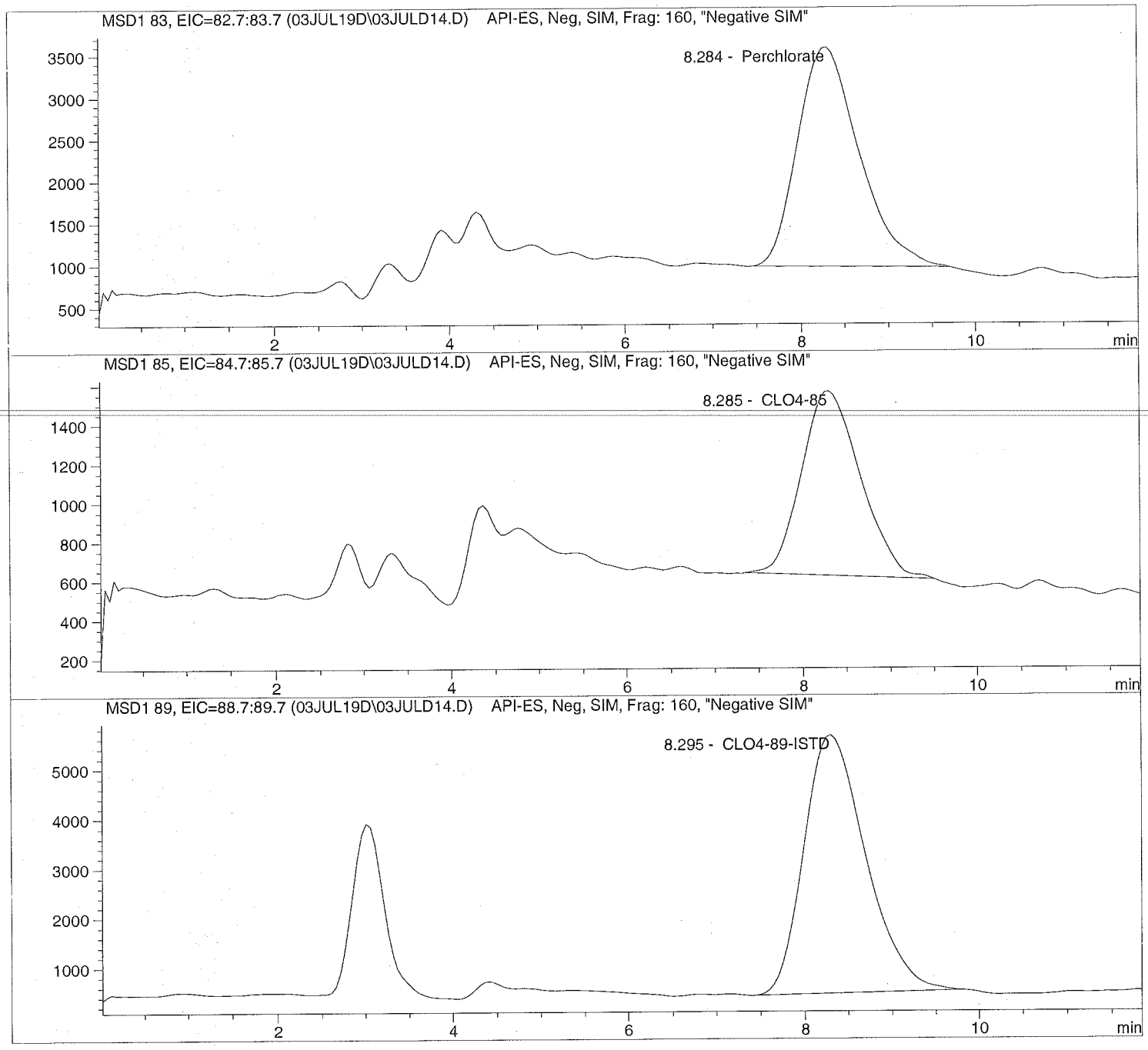
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD14.D Sample Name: 1918260010

Injection Date:	7/03/2019 11:22:22	Seq Line:	14
Sample Name:	1918260010	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD14.D Sample Name: 1918260010

Injection Date:	7/03/2019 11:22:22	Seq Line:	14
Sample Name:	1918260010	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.284	PBA	127410.9	1.7506	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.285	PBA	44045.2	1.8603	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.295	PBA	254426.4	5.0000	CLO4-89-ISTD

*** End of Report ***

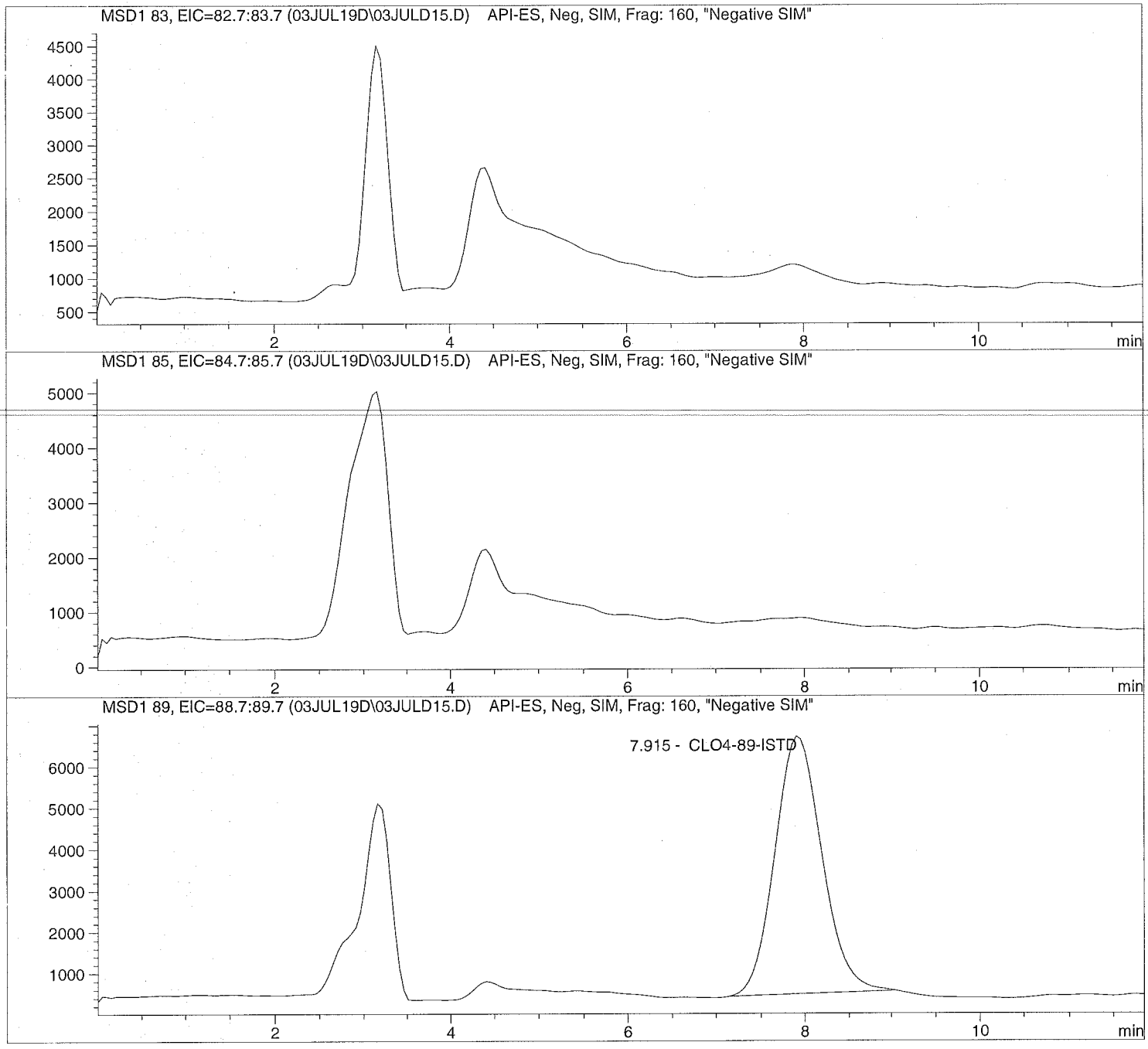
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD15.D Sample Name: 1918260011

Injection Date:	7/03/2019 11:36:14	Seq Line:	15
Sample Name:	1918260011	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD15.D Sample Name: 1918260011

Injection Date:	7/03/2019 11:36:14	Seq Line:	15
Sample Name:	1918260011	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.915	PBA	232350.5	5.0000	CLO4-89-ISTD

*** End of Report ***

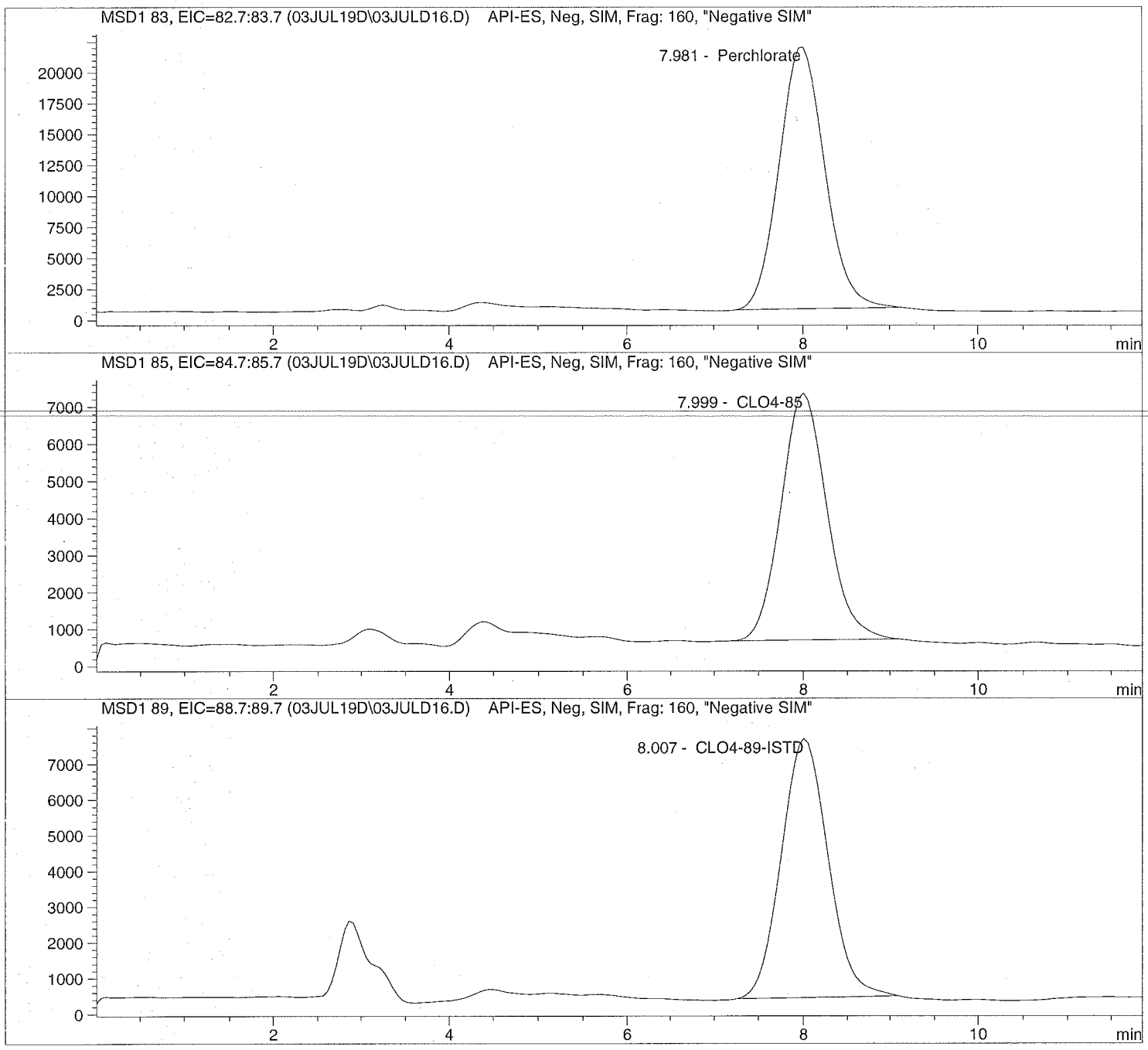
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD16.D Sample Name: 1918265001

Injection Date:	7/03/2019 11:50:13	Seq Line:	16
Sample Name:	1918265001	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD16.D Sample Name: 1918265001

Injection Date:	7/03/2019 11:50:13	Seq Line:	16
Sample Name:	1918265001	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.981	PBA	753597.0	9.0775	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.999	PBA	238015.1	9.5332	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.007	BBA	264420.9	5.0000	CLO4-89-ISTD

*** End of Report ***

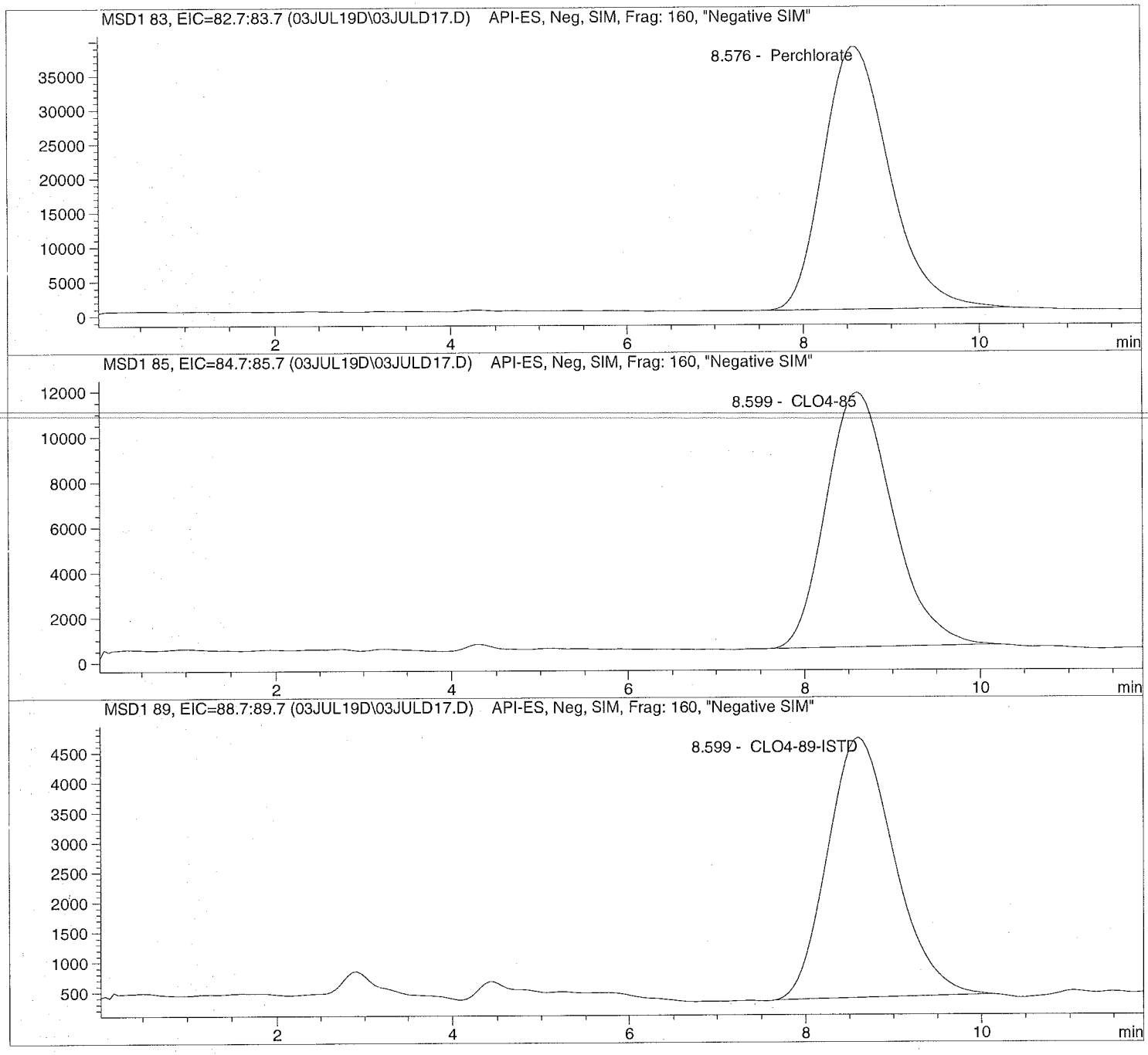
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD17.D Sample Name: 661794 CCV@25

Injection Date:	7/03/2019 12:04:07	Seq Line:	17
Sample Name:	661794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD17.D Sample Name: 661794 CCV@25

Injection Date:	7/03/2019 12:04:07	Seq Line:	17
Sample Name:	661794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.576	PBA	1992507.0	26.3322	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.599	PBA	592974.3	26.4065	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.599	PBA	229484.4	5.0000	CLO4-89-ISTD

*** End of Report ***

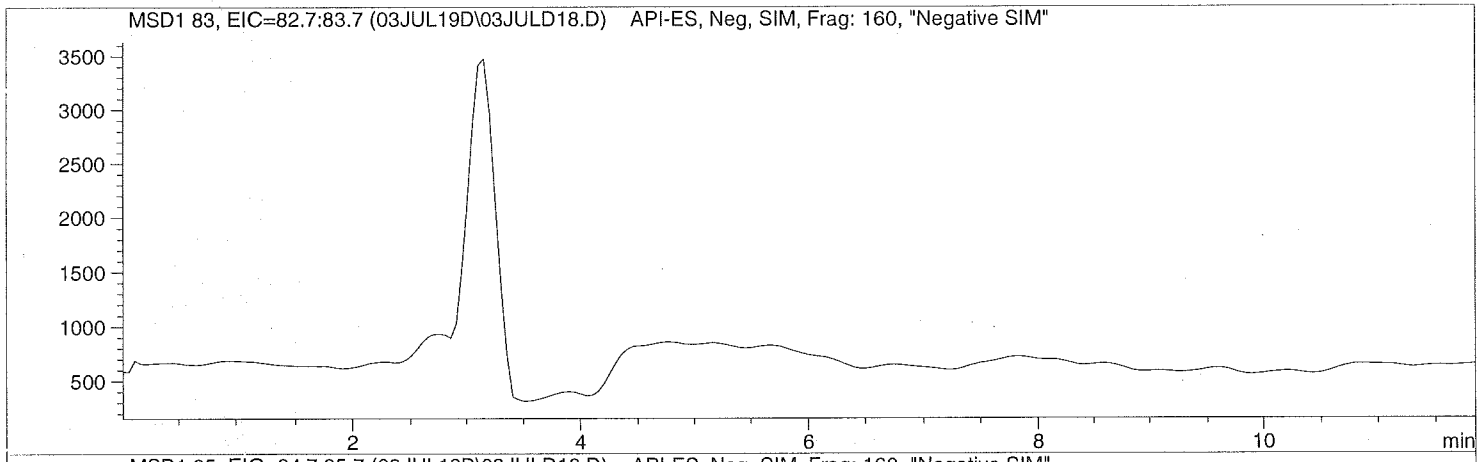
RIGHT SOLUTIONS | RIGHT PARTNER

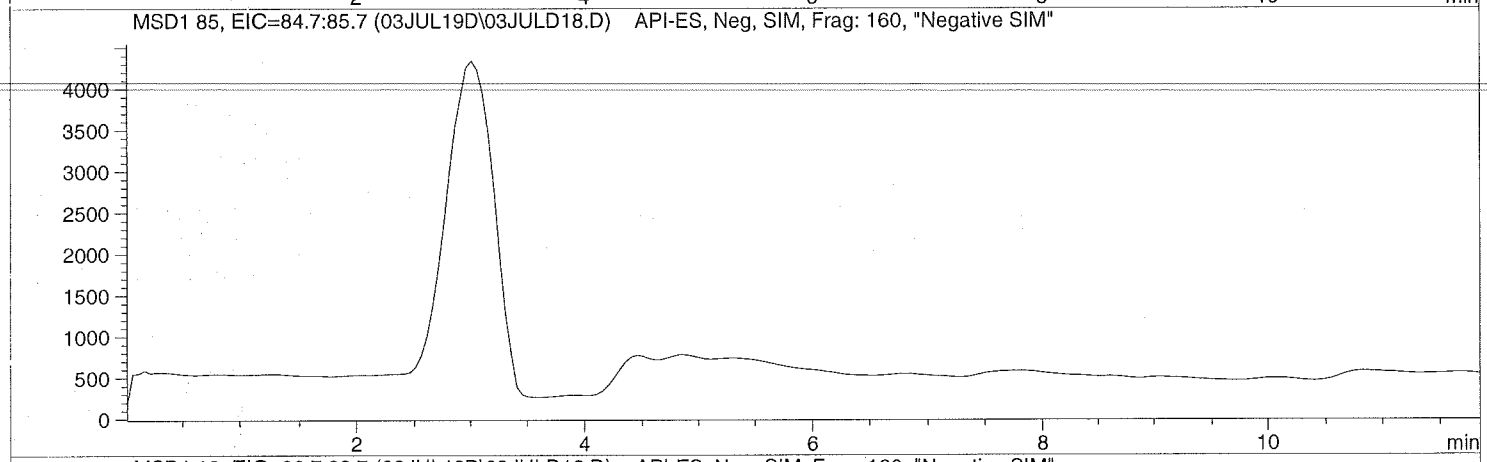
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD18.D Sample Name: 1918265002

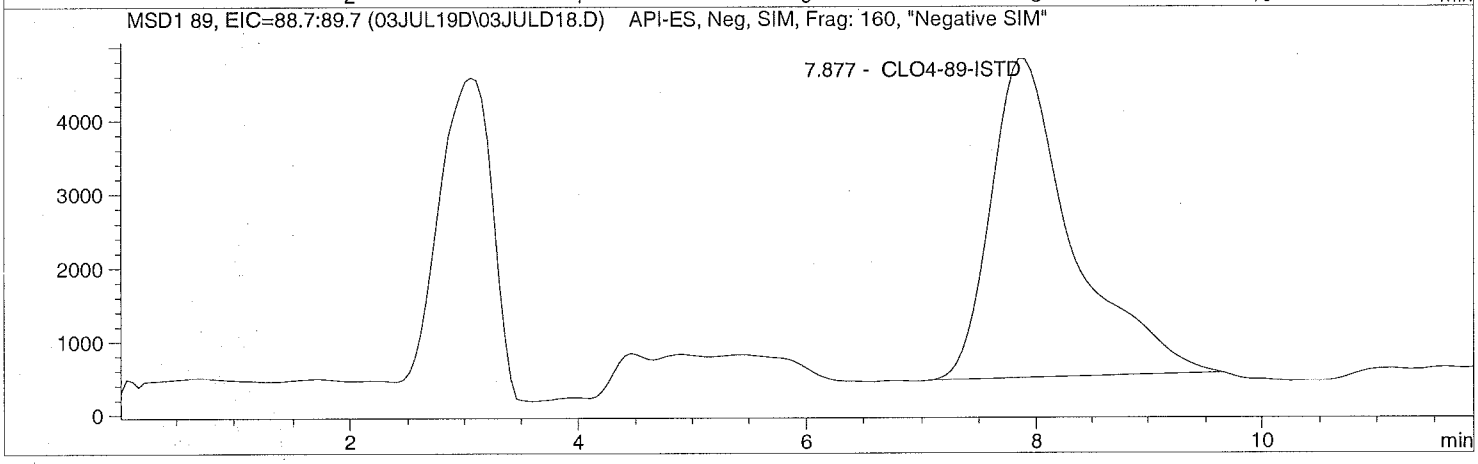
Injection Date:	7/03/2019 12:18:01	Seq Line:	18
Sample Name:	1918265002	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD18.D Sample Name: 1918265002

Injection Date:	7/03/2019 12:18:01	Seq Line:	18
Sample Name:	1918265002	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.877	PBA	214730.0	5.0000	CLO4-89-ISTD

*** End of Report ***

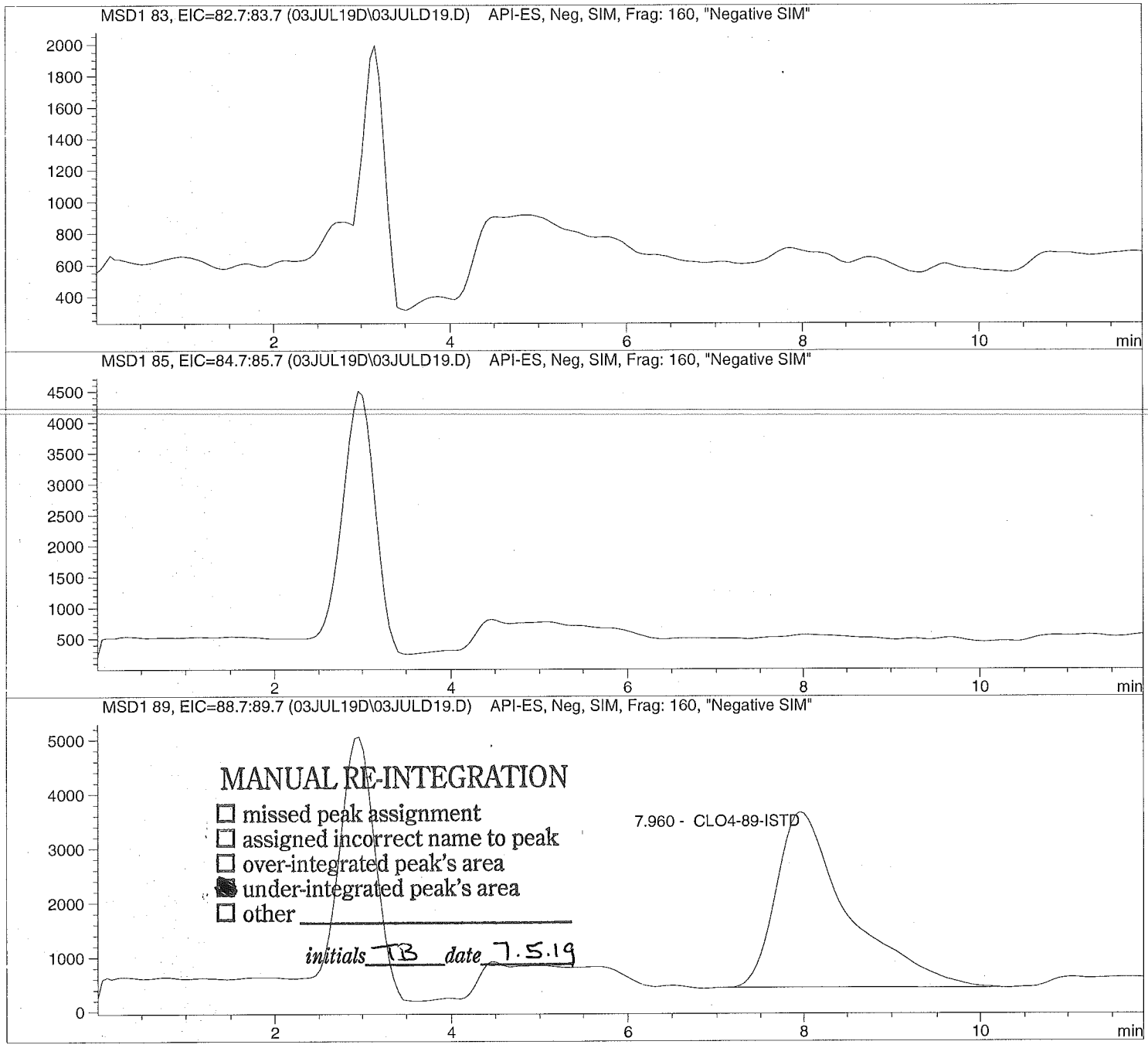
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD19.D Sample Name: 1918265003

Injection Date:	7/03/2019 12:31:53	Seq Line:	19
Sample Name:	1918265003	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD19.D Sample Name: 1918265003

Injection Date:	7/03/2019 12:31:53	Seq Line:	19
Sample Name:	1918265003	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.960	MM	183014.2	5.0000	CLO4-89-ISTD

*** End of Report ***

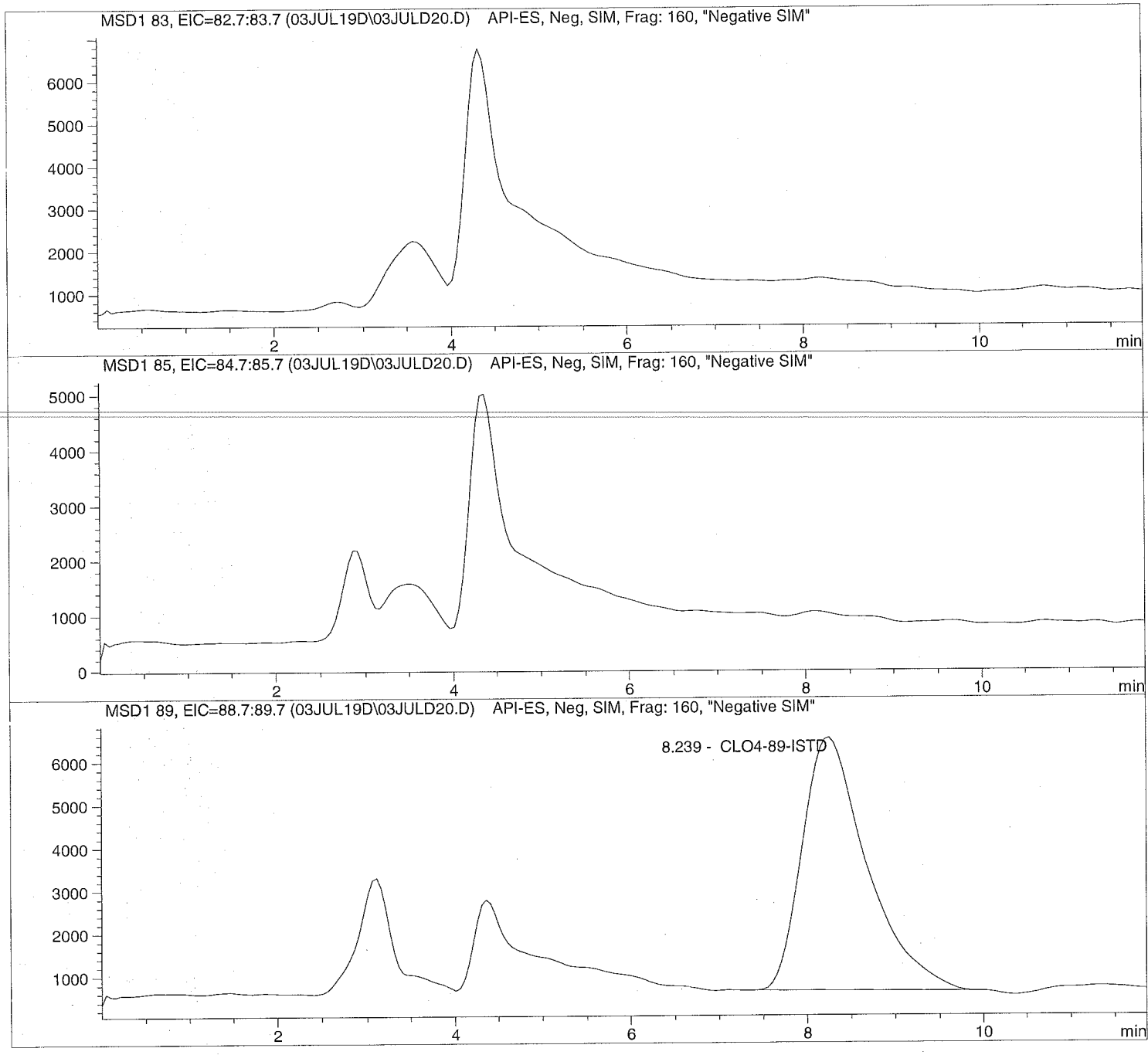
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD20.D Sample Name: 1918265004

Injection Date:	7/03/2019 12:45:47	Seq Line:	20
Sample Name:	1918265004	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD20.D Sample Name: 1918265004

Injection Date:	7/03/2019 12:45:47	Seq Line:	20
Sample Name:	1918265004	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.239	PBA	299495.5	5.0000	CLO4-89-ISTD

*** End of Report ***

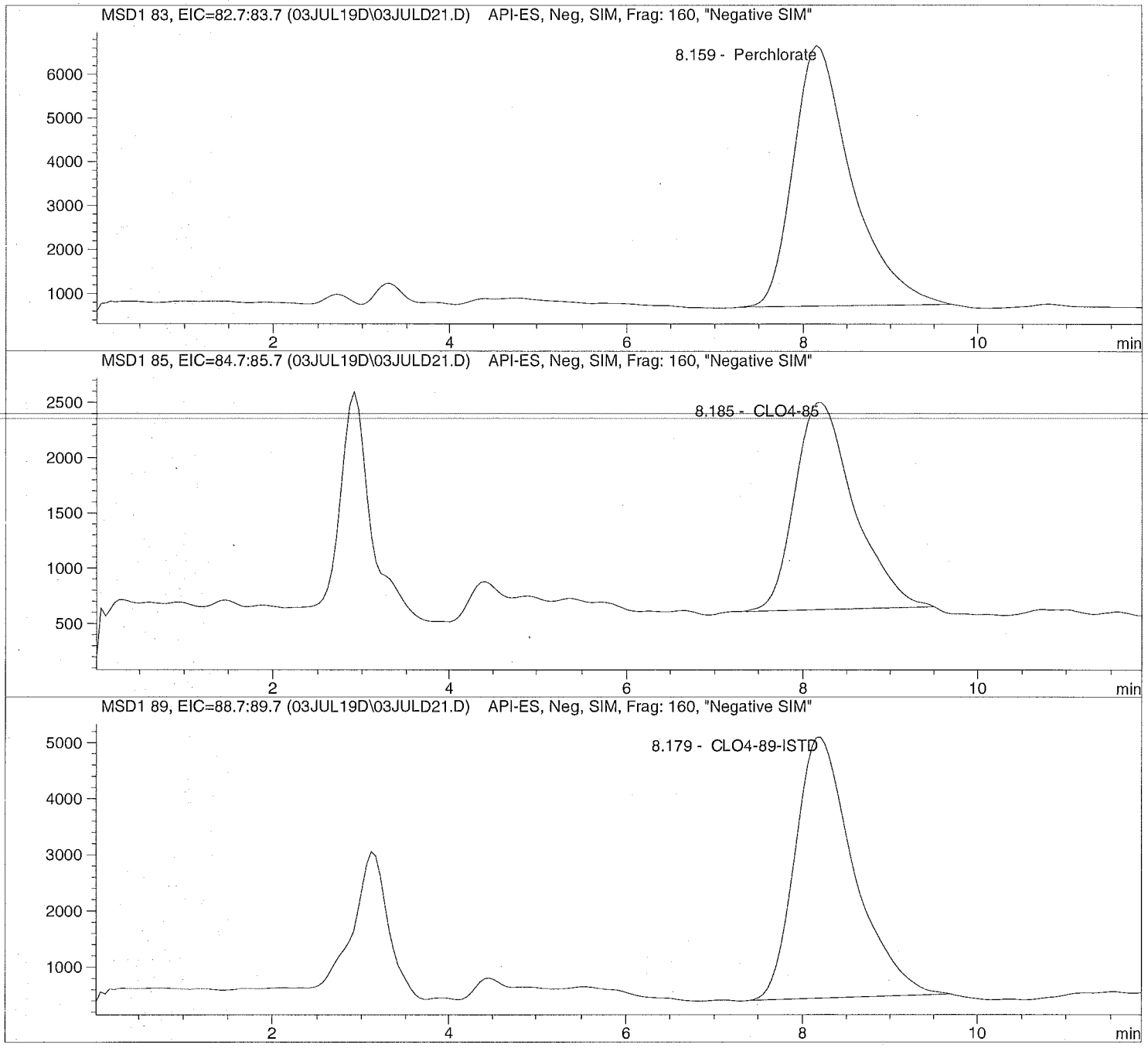
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD21.D Sample Name: 1918265005

Injection Date:	7/03/2019 12:59:40	Seq Line:	21
Sample Name:	1918265005	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD21.D Sample Name: 1918265005

Injection Date:	7/03/2019 12:59:40	Seq Line:	21
Sample Name:	1918265005	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.159	PBA	273037.3	4.1459	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.185	BBA	87704.6	4.3341	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.179	PBA	216624.0	5.0000	CLO4-89-ISTD

*** End of Report ***

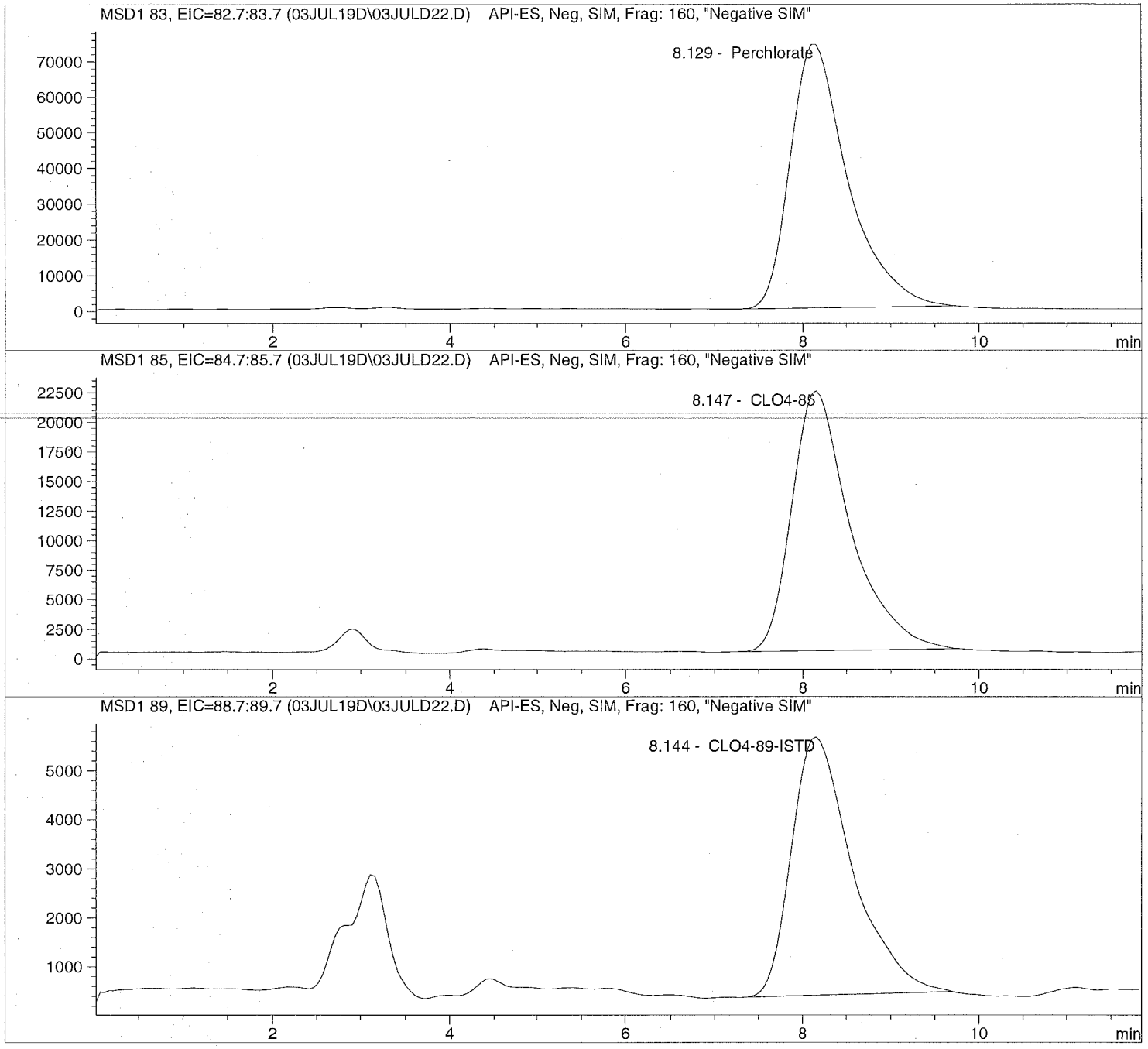
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD22.D Sample Name: 1918265006

Injection Date:	7/03/2019 13:13:42	Seq Line:	22
Sample Name:	1918265006	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD22.D Sample Name: 1918265006

Injection Date:	7/03/2019 13:13:42	Seq Line:	22
Sample Name:	1918265006	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.129	PBA	3362889.2	39.0365	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.147	PBA	1014205.1	39.7190	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.144	PBA	253872.0	5.0000	CLO4-89-ISTD

*** End of Report ***

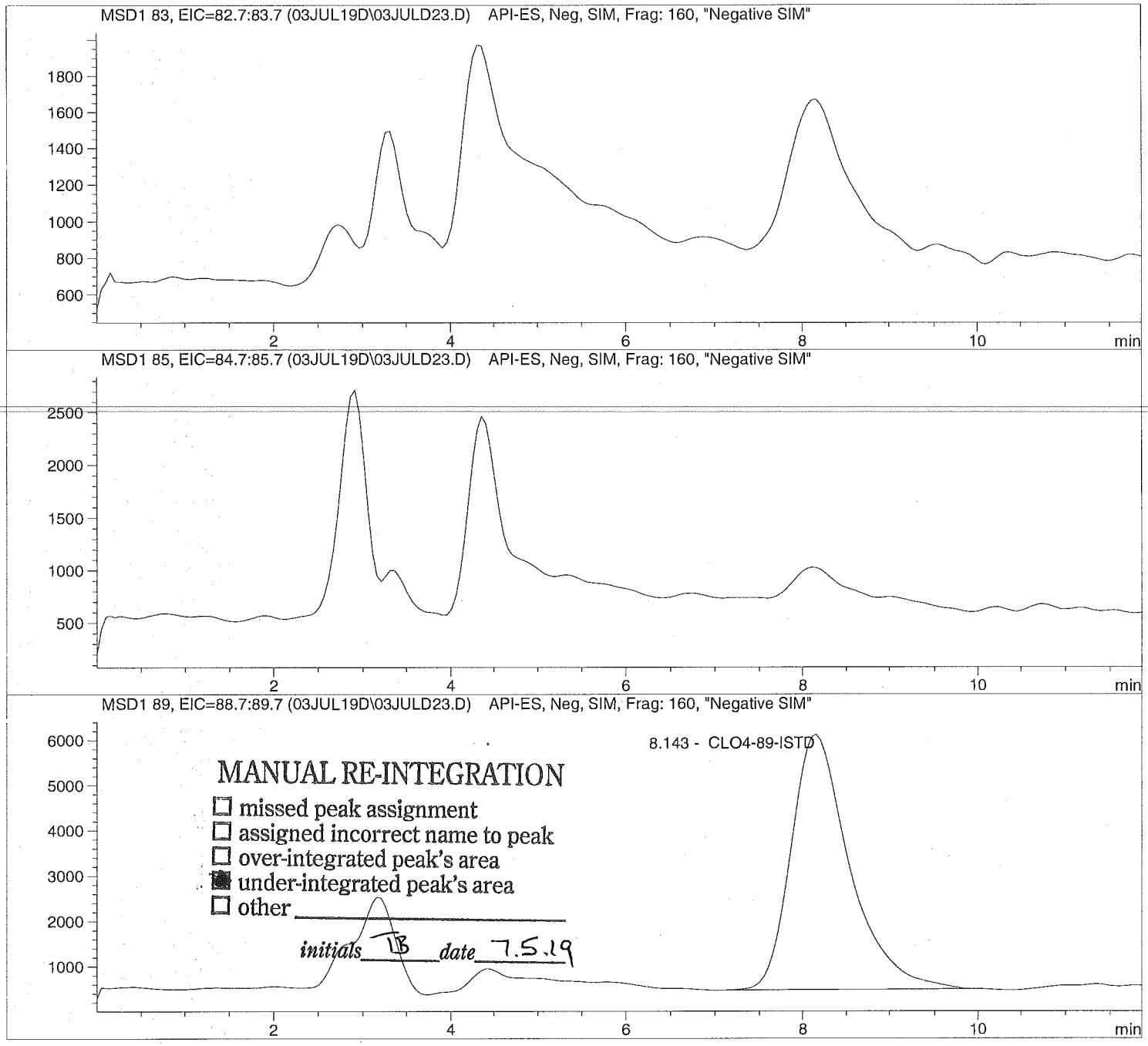
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD23.D Sample Name: 1918265007

Injection Date:	7/03/2019 13:27:36	Seq Line:	23
Sample Name:	1918265007	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD23.D Sample Name: 1918265007

Injection Date:	7/03/2019 13:27:36	Seq Line:	23
Sample Name:	1918265007	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.143	MM	263295.0	5.0000	CLO4-89-ISTD

*** End of Report ***

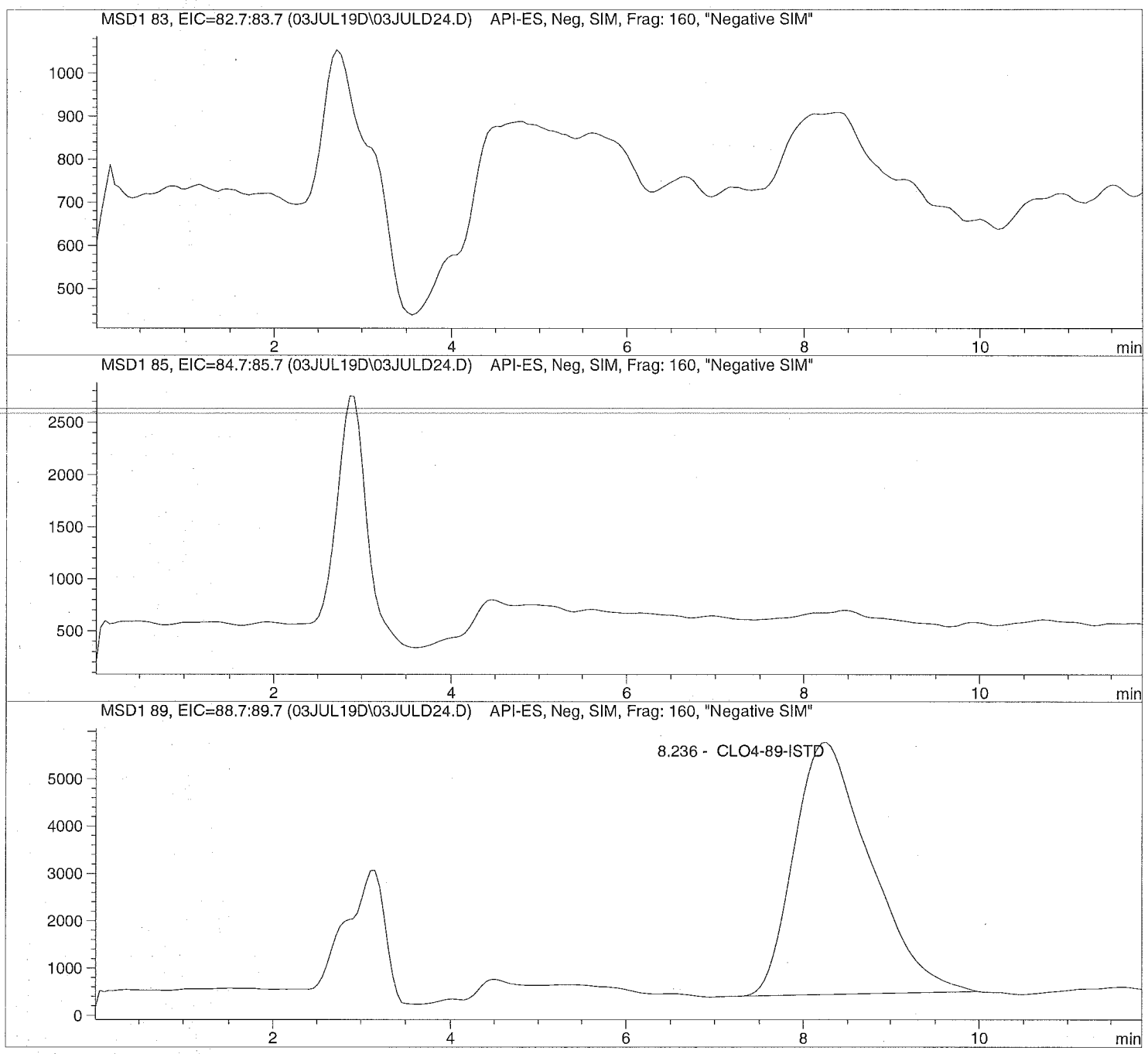
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD24.D Sample Name: 1918265008

Injection Date:	7/03/2019 13:41:31	Seq Line:	24
Sample Name:	1918265008	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD24.D Sample Name: 1918265008

Injection Date:	7/03/2019 13:41:31	Seq Line:	24
Sample Name:	1918265008	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.236	PBA	321651.0	5.0000	CLO4-89-ISTD

*** End of Report ***

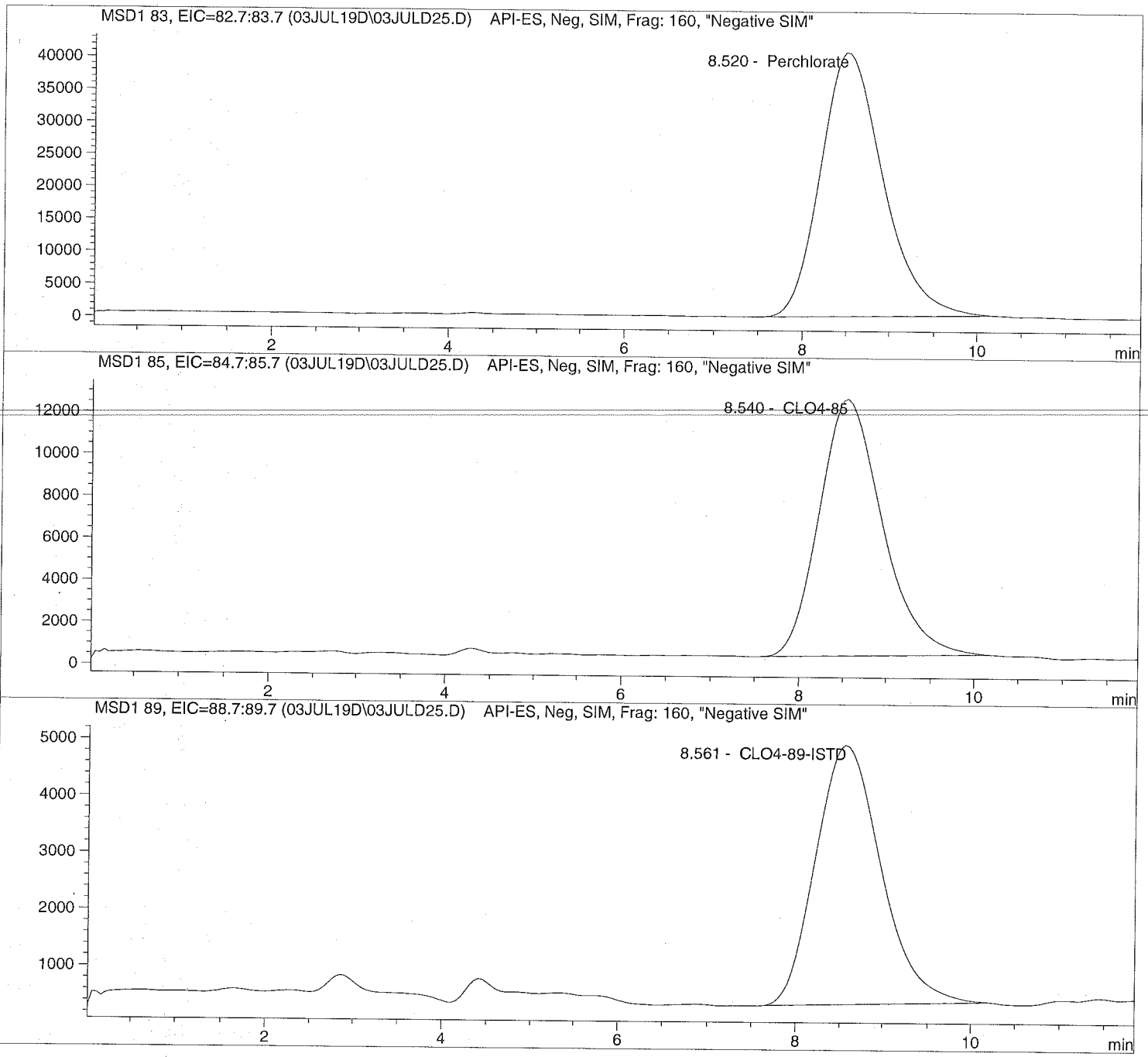
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD25.D Sample Name: 661795 CCV@25

Injection Date:	7/03/2019 13:55:26	Seq Line:	25
Sample Name:	661795 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD25.D Sample Name: 661795 CCV@25

Injection Date:	7/03/2019 13:55:26	Seq Line:	25
Sample Name:	661795 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.520	PBA	2028657.1	25.8170	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.540	PBA	616067.7	26.3876	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.561	PBA	238601.3	5.0000	CLO4-89-ISTD

*** End of Report ***

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

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Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

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RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

Peak Sum Table

No Entries in table

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Calibration Curves

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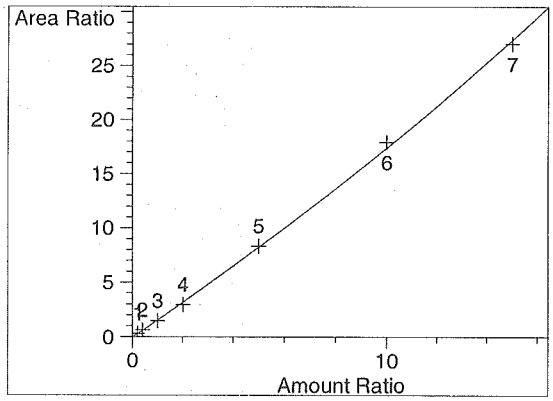
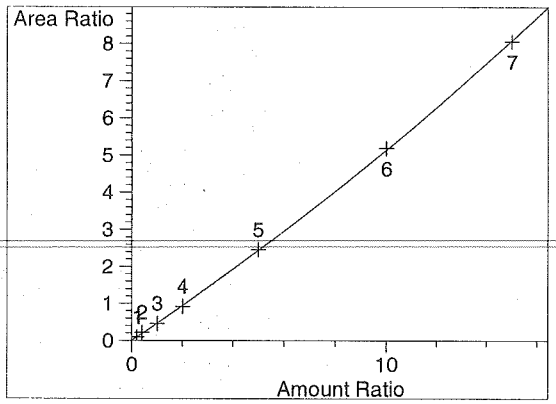
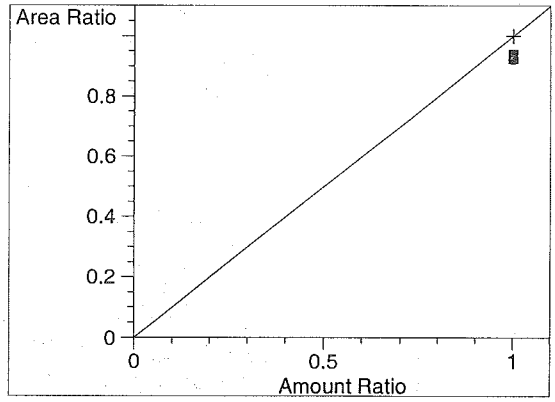


Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

==========

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Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

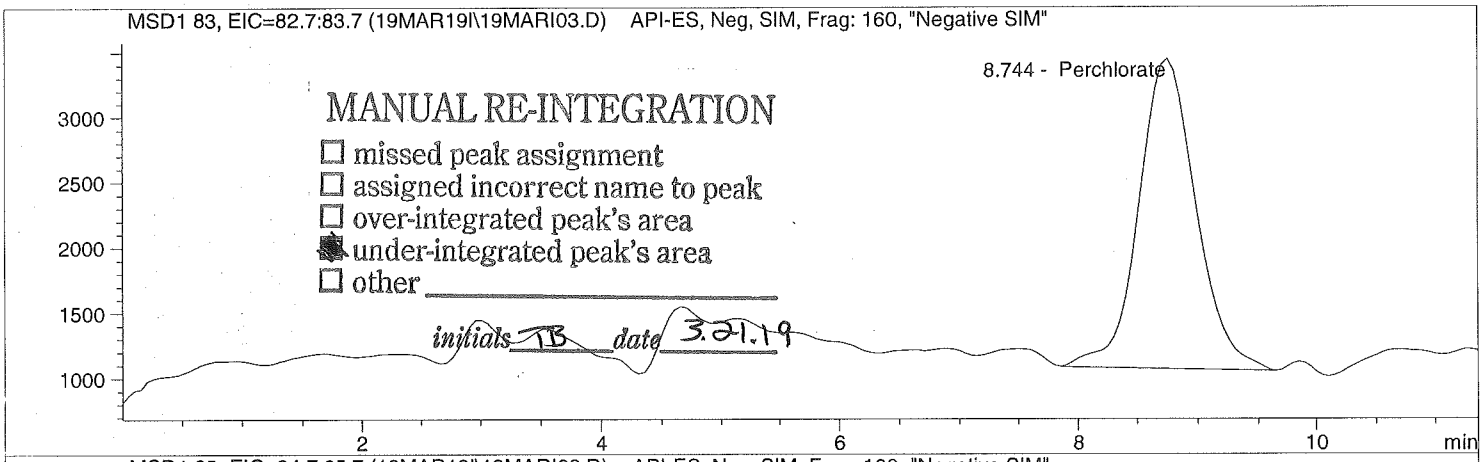
RIGHT SOLUTIONS | RIGHT PARTNER

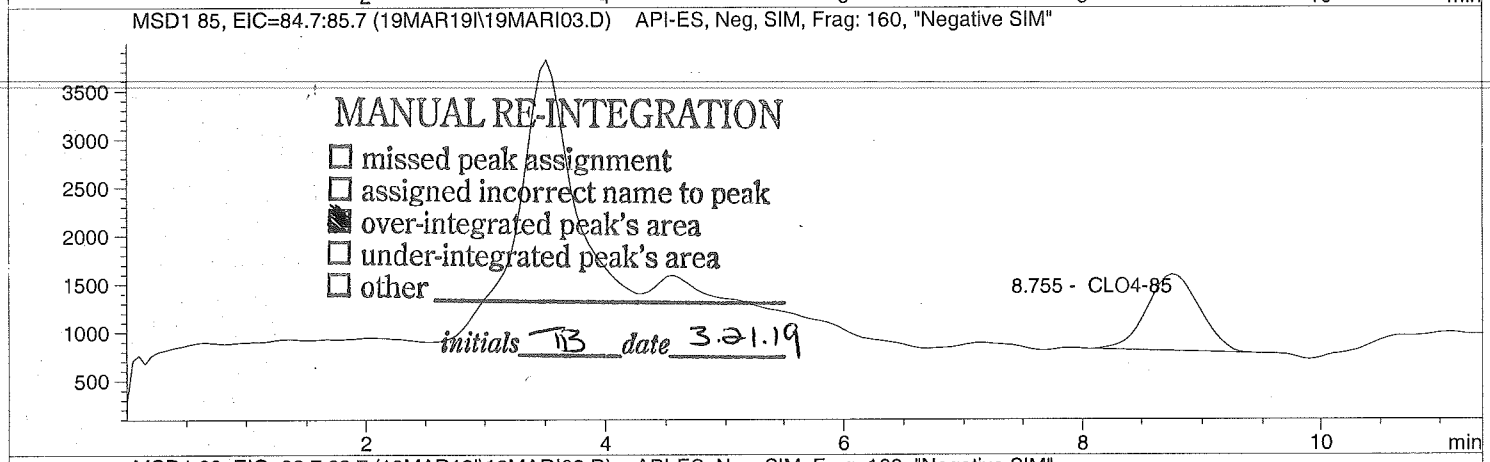
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

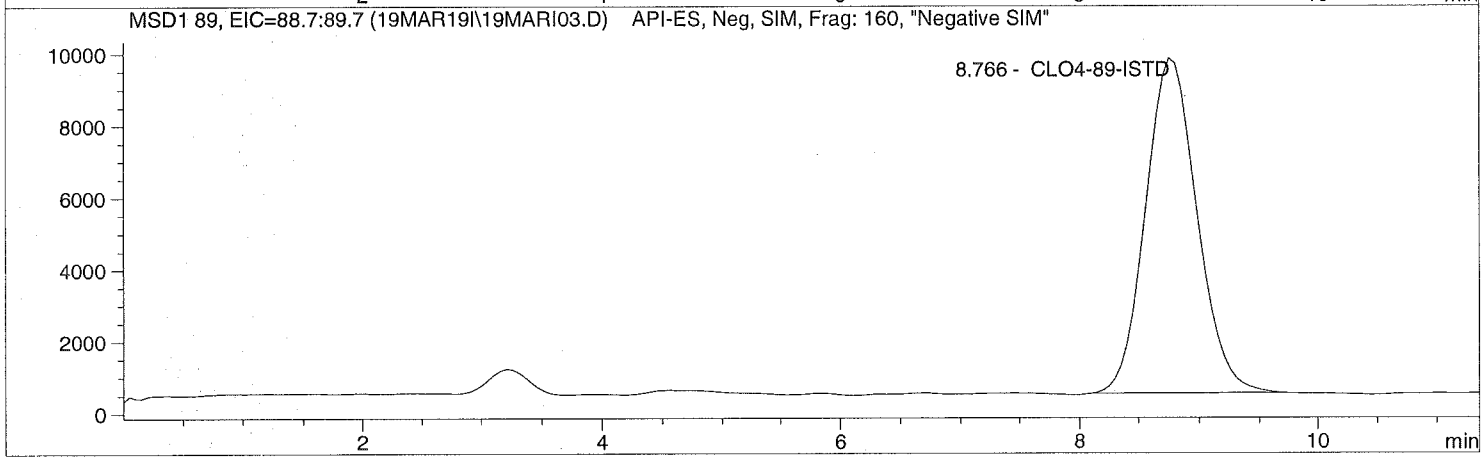
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

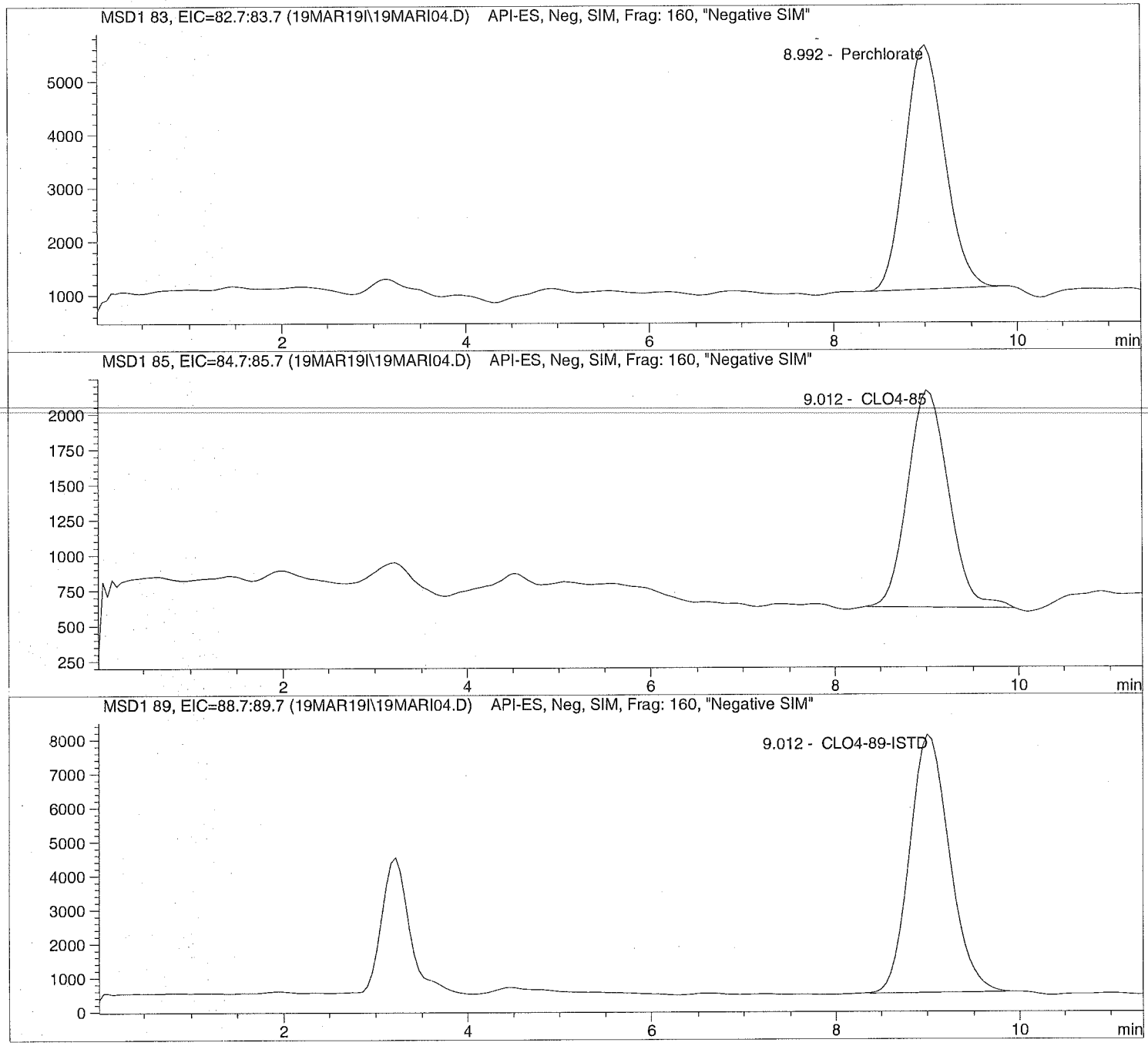
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

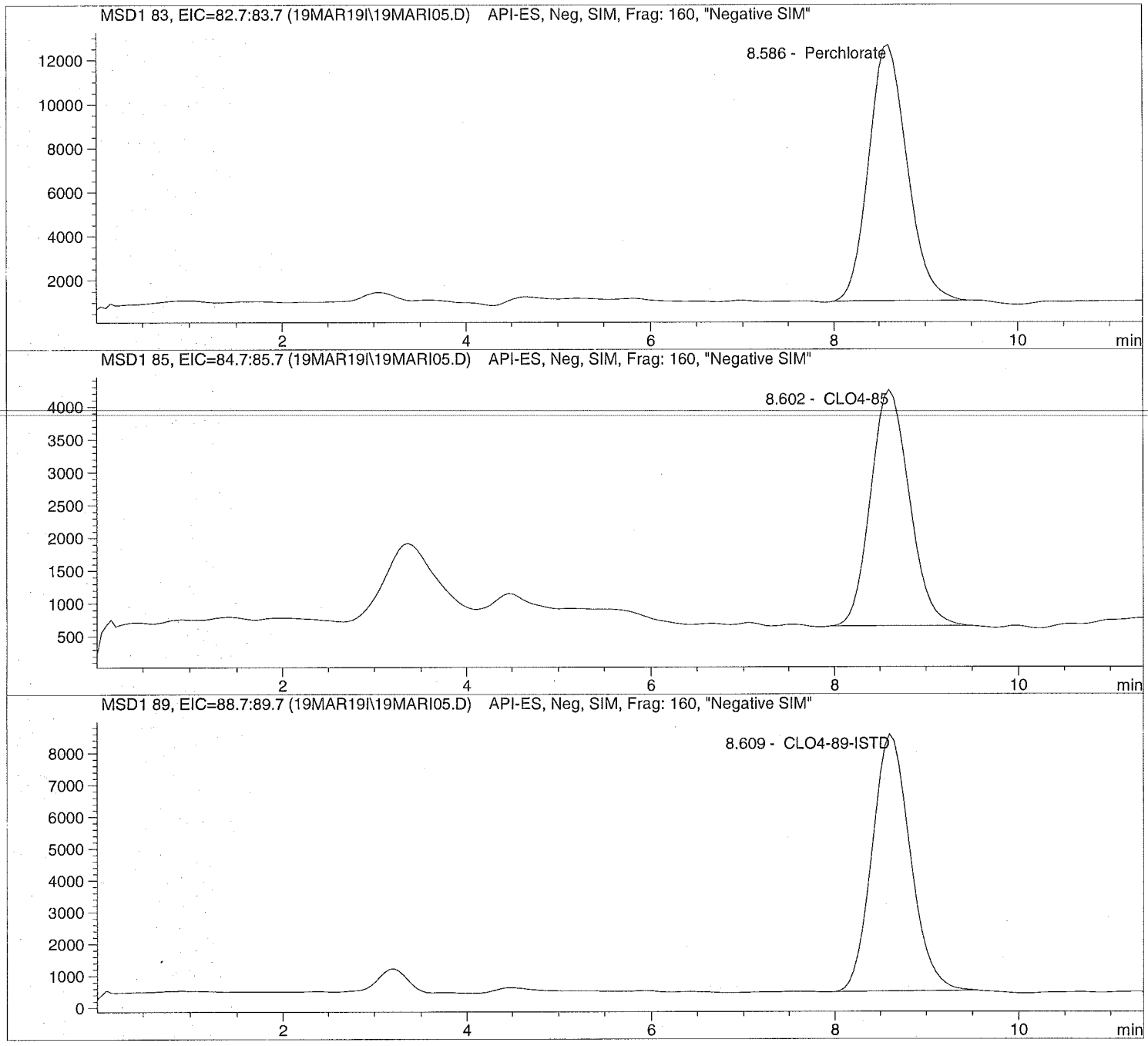
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

*** End of Report ***

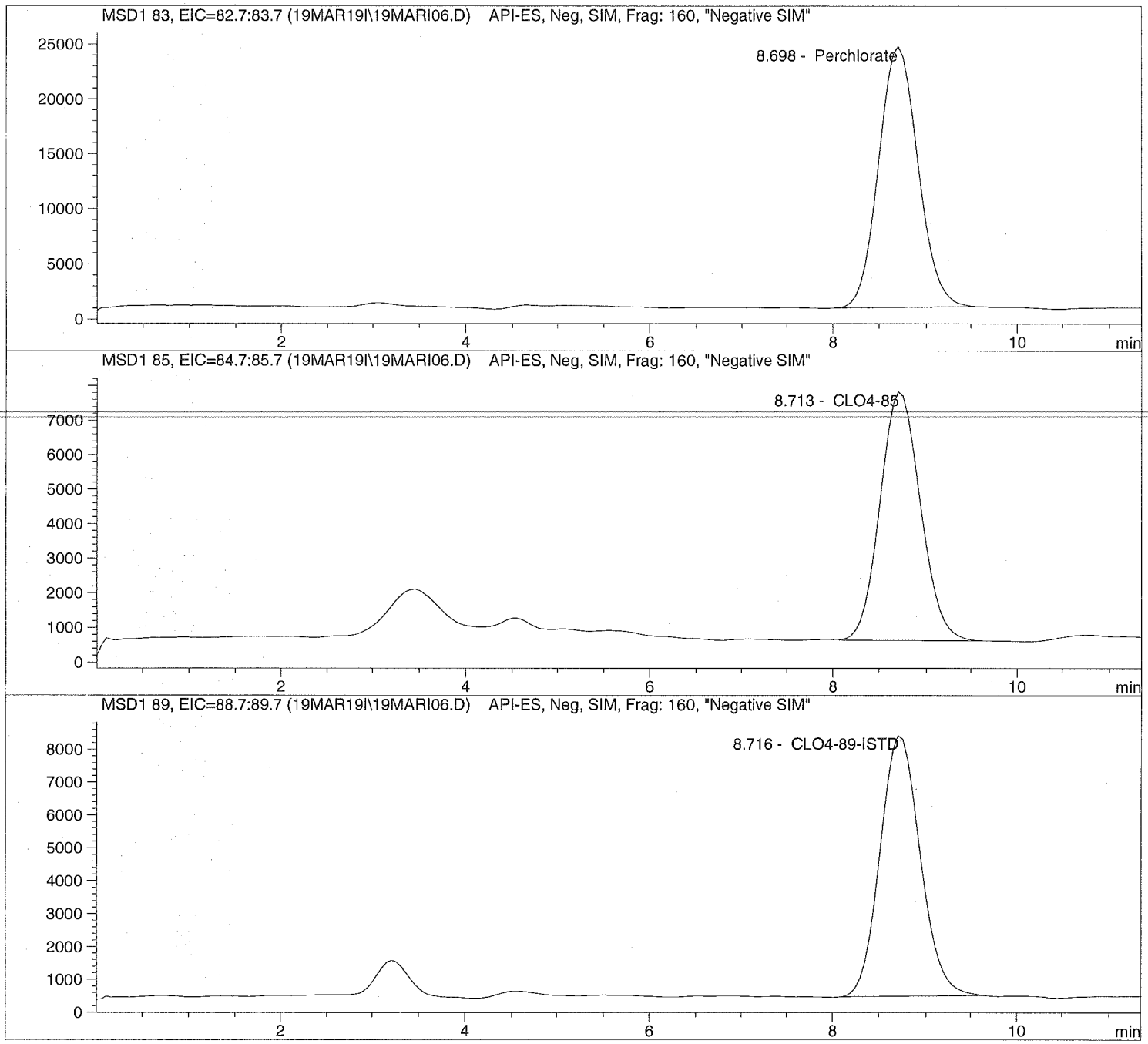
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

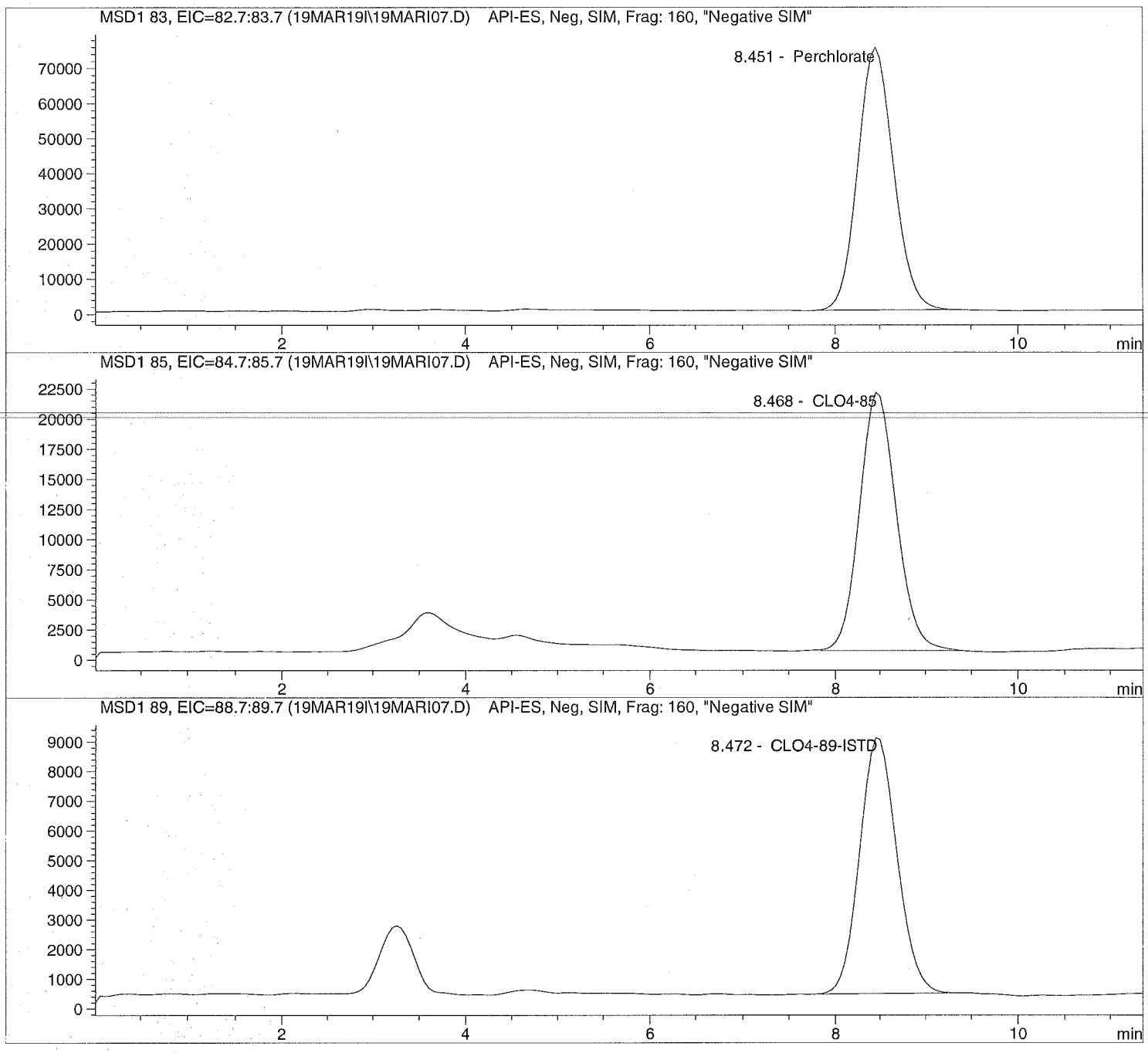
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

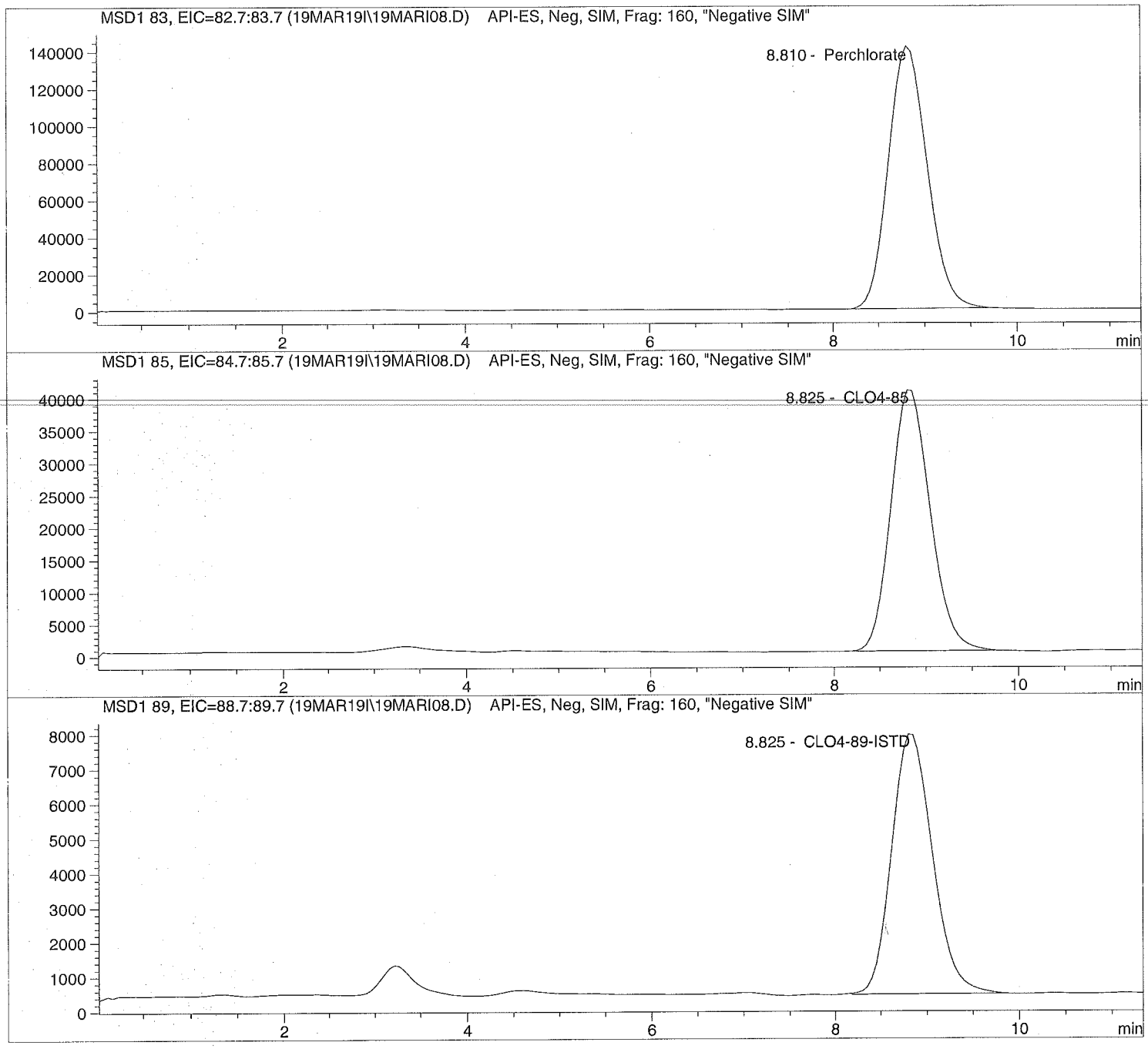
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

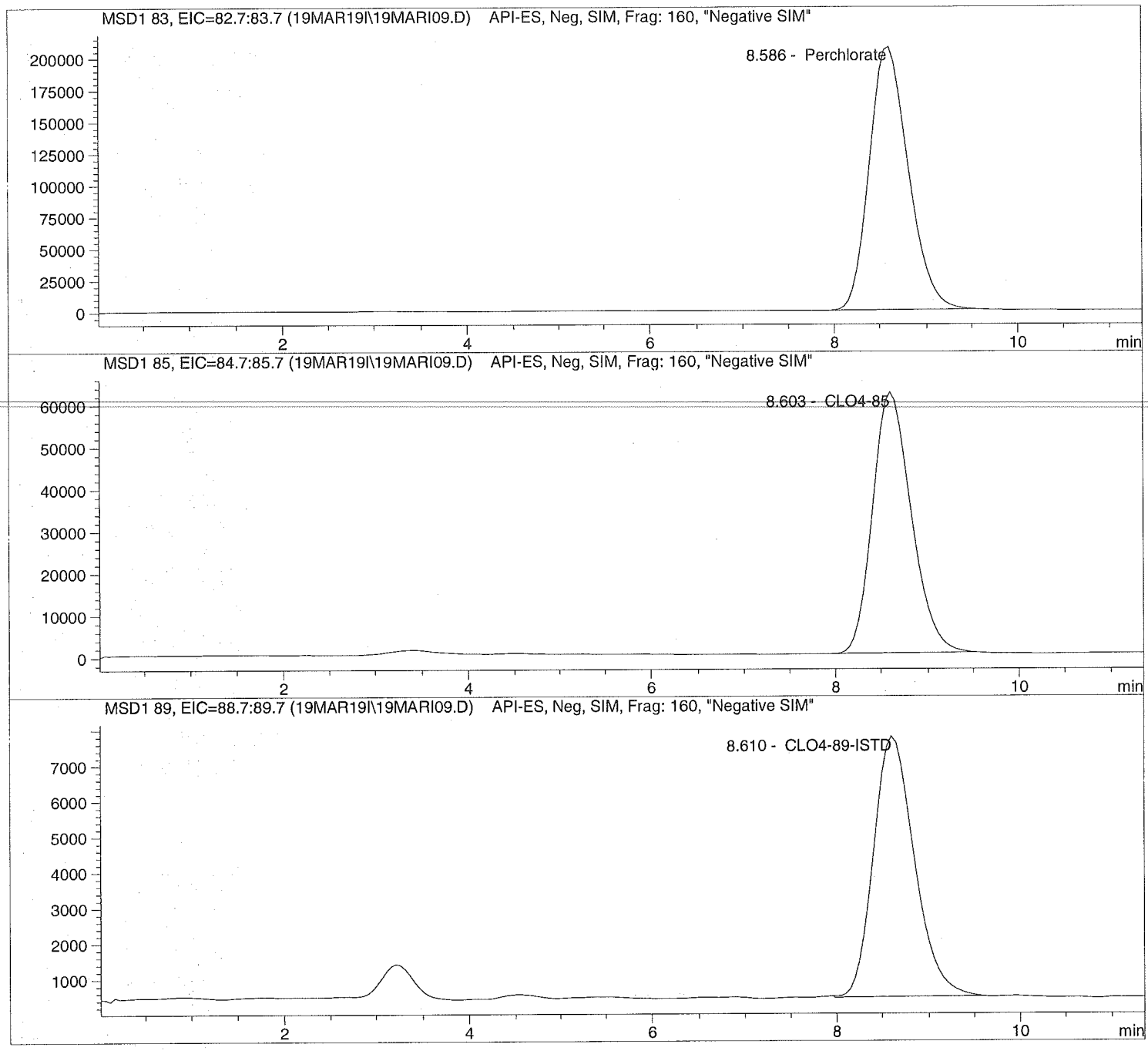
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

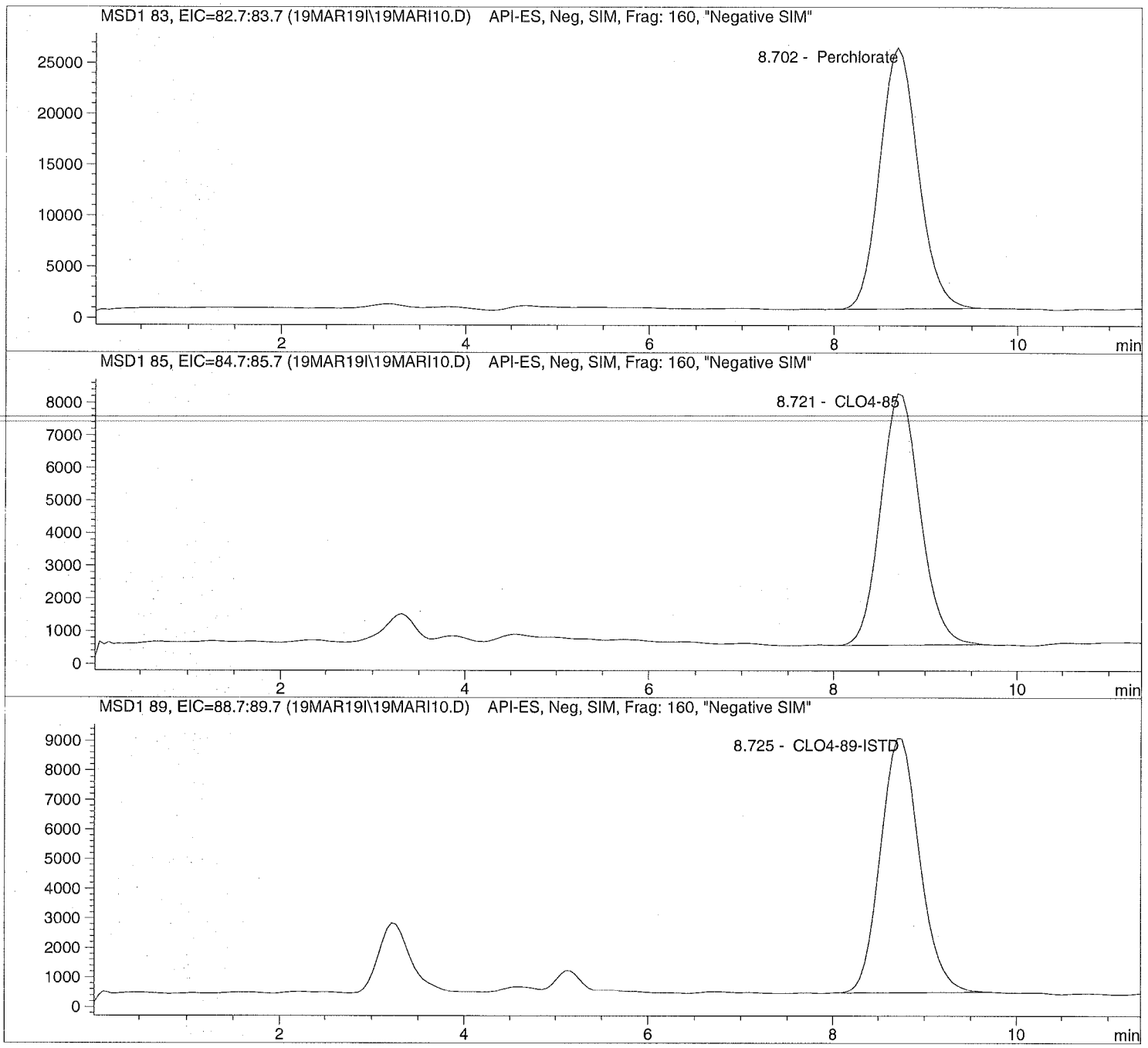
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

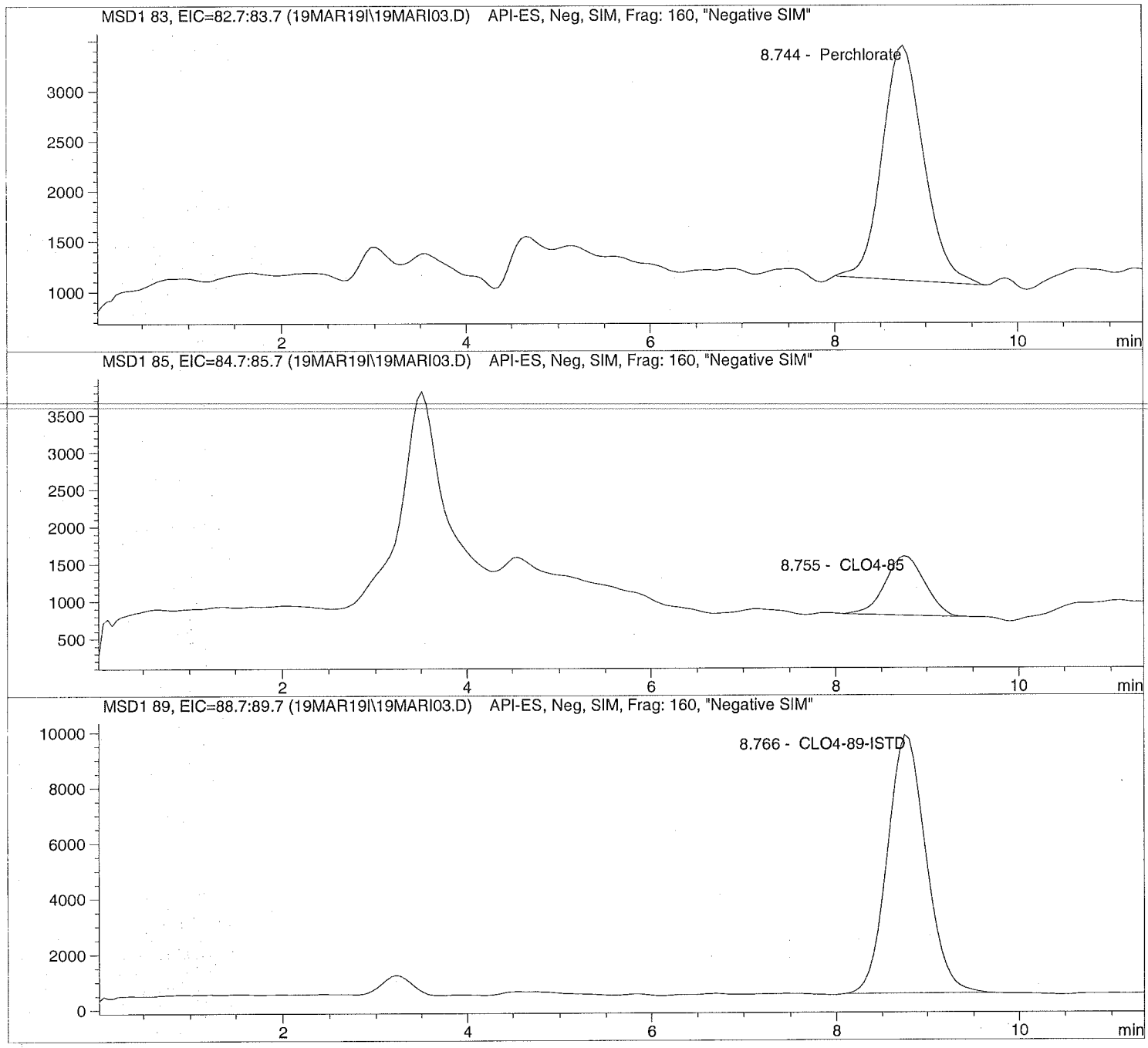
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

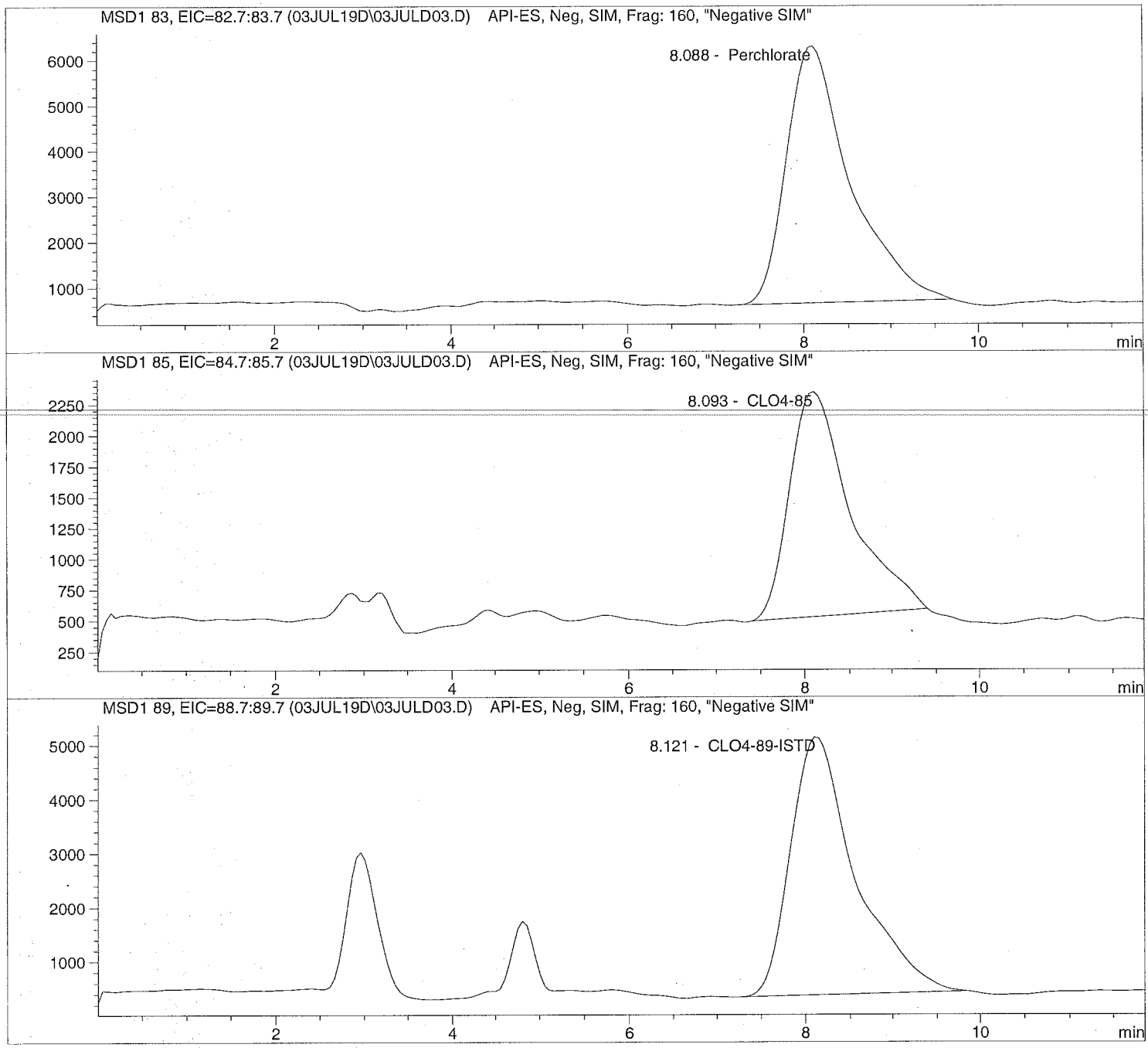
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD03.D Sample Name: 661791 ICS@4.0

Injection Date:	7/03/2019 08:49:21	Seq Line:	3
Sample Name:	661791 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD03.D Sample Name: 661791 ICS@4.0

Injection Date:	7/03/2019 08:49:21	Seq Line:	3
Sample Name:	661791 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.088	PBA	281076.3	3.8527	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.093	PBA	86599.9	3.8525	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.121	PBA	240851.1	5.0000	CLO4-89-ISTD

*** End of Report ***

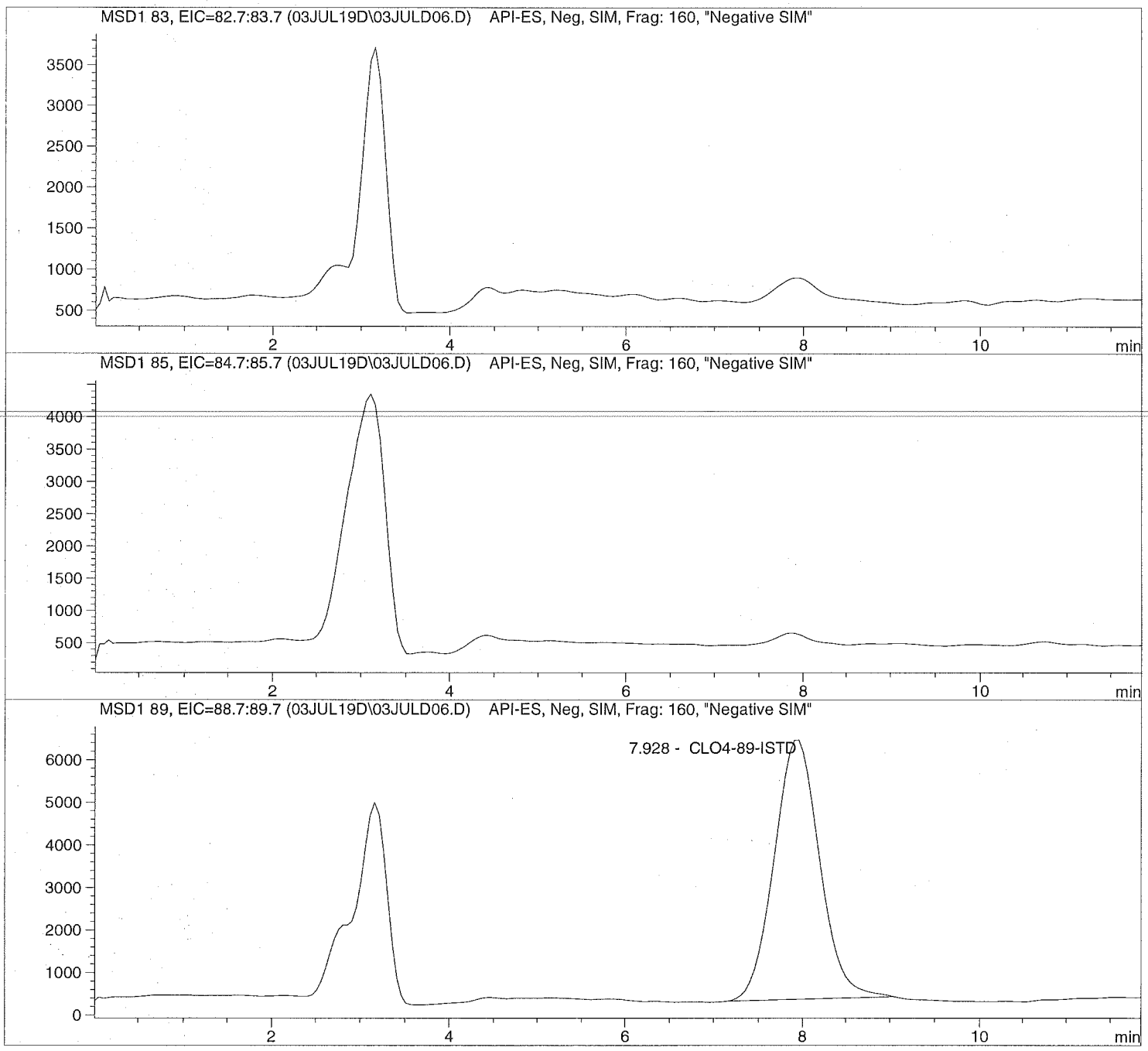
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD06.D Sample Name: 1918260002

Injection Date:	7/03/2019 09:31:06	Seq Line:	6
Sample Name:	1918260002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD06.D Sample Name: 1918260002

Injection Date:	7/03/2019 09:31:06	Seq Line:	6
Sample Name:	1918260002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.928	PBA	220839.0	5.0000	CLO4-89-ISTD

*** End of Report ***

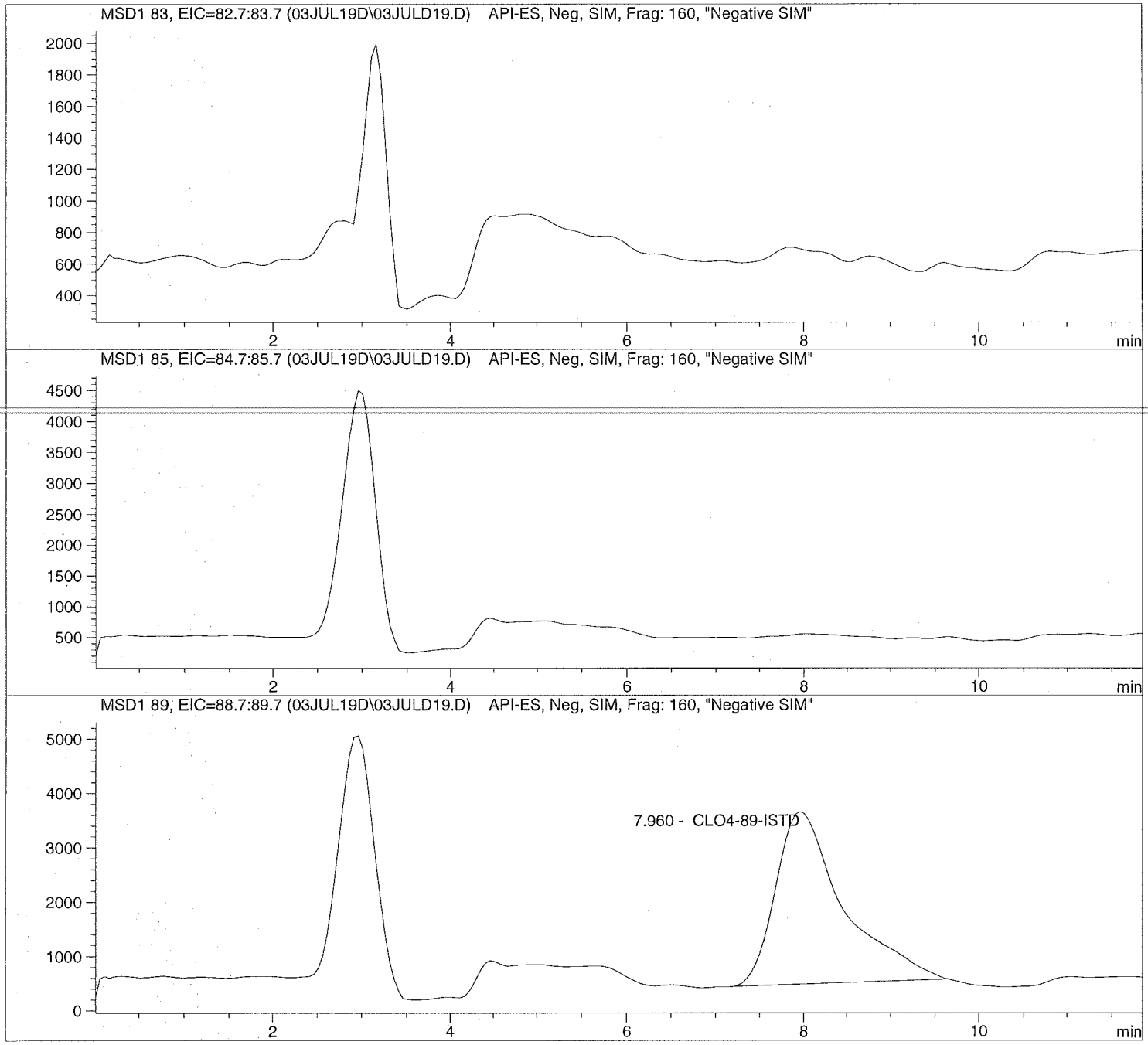
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD19.D Sample Name: 1918265003

Injection Date:	7/03/2019 12:31:53	Seq Line:	19
Sample Name:	1918265003	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD19.D Sample Name: 1918265003

Injection Date:	7/03/2019 12:31:53	Seq Line:	19
Sample Name:	1918265003	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.960	PBA	169691.9	5.0000	CLO4-89-ISTD

*** End of Report ***

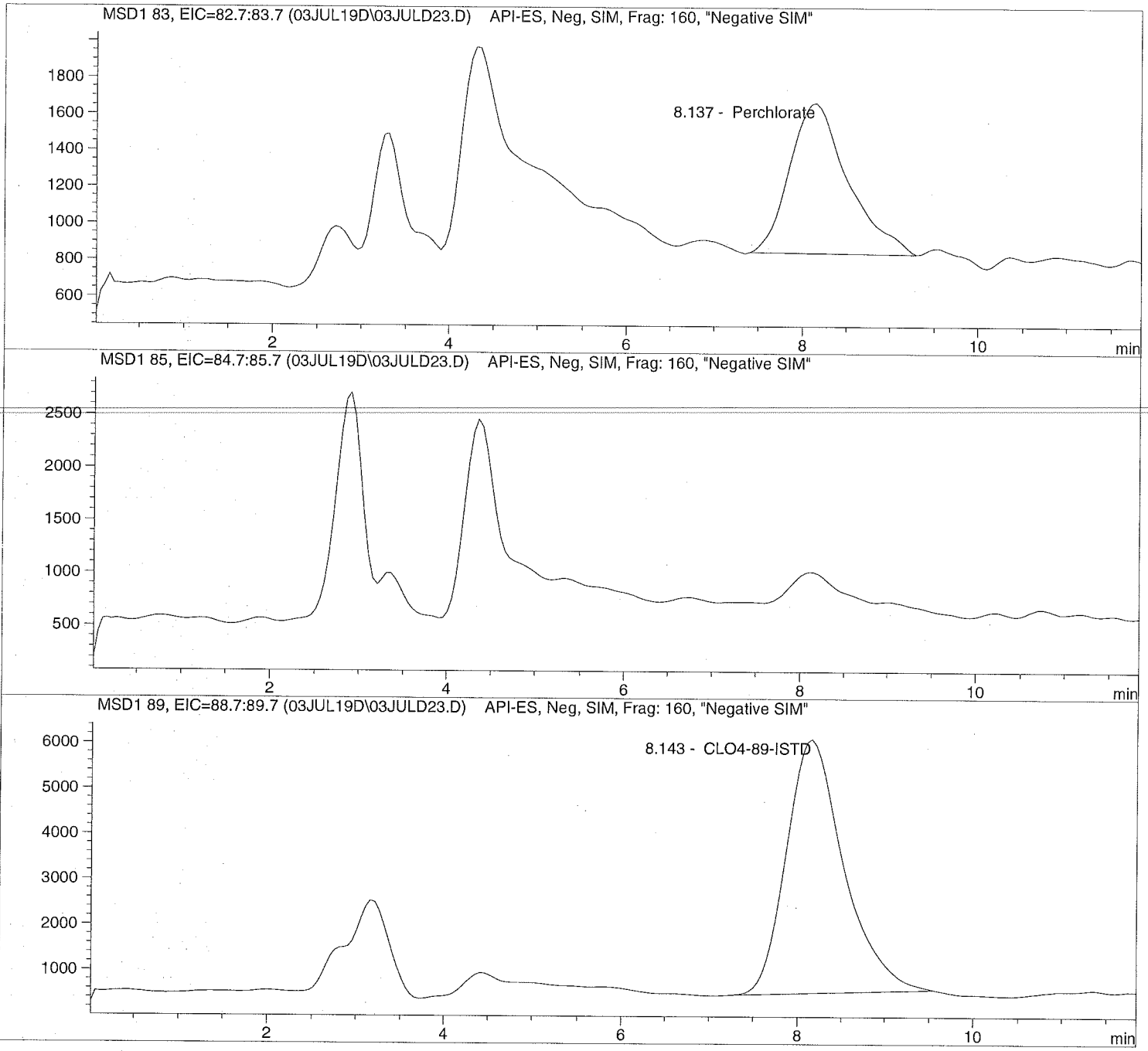
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD23.D Sample Name: 1918265007

Injection Date:	7/03/2019 13:27:36	Seq Line:	23
Sample Name:	1918265007	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD23.D Sample Name: 1918265007

Injection Date:	7/03/2019 13:27:36	Seq Line:	23
Sample Name:	1918265007	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.137	PBA	37849.4	0.6340	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.143	PBA	253241.4	5.0000	CLO4-89-ISTD

*** End of Report ***

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July 16, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19061164**

Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 6 sample(s) on Jun 21, 2019 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,

Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Houston, US Date: 16-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061164

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19061164-01	AWD-1_062019	Water		20-Jun-2019 07:45	21-Jun-2019 09:00	☐
HS19061164-02	120_062019	Water		20-Jun-2019 09:25	21-Jun-2019 09:00	☐
HS19061164-03	MW14_062019	Water		20-Jun-2019 10:45	21-Jun-2019 09:00	☐
HS19061164-04	MW14_062019_a	Water		20-Jun-2019 10:45	21-Jun-2019 09:00	☐
HS19061164-05	MW12_062019	Water		20-Jun-2019 12:30	21-Jun-2019 09:00	☐
HS19061164-06	Trip blank	Water	C&G-050119-179	20-Jun-2019 00:00	21-Jun-2019 09:00	☑

Revision:1

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ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19061164

Work Order Comments

• Revised to correct the reporting limit for Mercury.

Work Order Comments

• The analyses for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final Report attached

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142429

Sample ID: 120_062019 (HS19061164-02)

• The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: MW14_062019 (HS19061164-03)

• The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: MW14_062019_a (HS19061164-04)

• The surrogate recoveries could not be determined due to dilution below the calibration range.

Sample ID: LCSD-142429

• LCS/LCSD RPD recovered above the RPD limit. The individual recoveries met acceptance criteria (Surrogate 4-Terphenyl-d14)

GCMS Volatiles by Method SW8260

Batch ID: R341659

Sample ID: MW14_062019_a (HS19061164-04)

• 1,2-Dichloroethane-d4 (SURR) exceeded QC recovery limits due to matrix. Confirmed by re-analysis @ higher dilution.

Sample ID: CCV

• Bromoform and 1,2-Dibromo-3-Chloropropane exceeded %D limits for CCV. Samples are ND for these compounds./

Metals by Method SW6020

Batch ID: 142427

Sample ID: HS19060986-04MS

• MS and MSD are for an unrelated sample

Metals by Method SW7470

Batch ID: 142560

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: AWD-1_062019
Collection Date: 20-Jun-2019 07:45

ANALYTICAL REPORT
WorkOrder:HS19061164
Lab ID:HS19061164-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILES SIM	**Method:SW8270SIM**					Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**0.99**		**0.050**	**0.050**	**0.050**	**ug/L**	5	28-Jun-2019 17:22
Surr: 2-Fluorobiphenyl	*80.4*			**0**	*40-140*	*%REC*	*5*	*28-Jun-2019 17:22*
Surr: 4-Terphenyl-d14	*122*			**0**	*40-140*	*%REC*	*5*	*28-Jun-2019 17:22*
Surr: Nitrobenzene-d5	*114*			**0**	*40-140*	*%REC*	*5*	*28-Jun-2019 17:22*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 120_062019
Collection Date: 20-Jun-2019 09:25

ANALYTICAL REPORT
WorkOrder:HS19061164
Lab ID:HS19061164-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
1,1,1-Trichloroethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 21:12
1,1,2,2-Tetrachloroethane	10	U	10	10	20	UG/L	20	01-Jul-2019 21:12
1,1,2-Trichloroethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
1,1-Dichloroethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 21:12
1,1-Dichloroethene	**78**		**4.0**	**10**	**20**	**UG/L**	20	01-Jul-2019 21:12
1,1-Dichloropropene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
1,2,3-Trichlorobenzene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 21:12
1,2,3-Trichloropropane	10	U	10	10	20	UG/L	20	01-Jul-2019 21:12
1,2,4-Trichlorobenzene	10	U	10	10	20	UG/L	20	01-Jul-2019 21:12
1,2,4-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
1,2-Dibromo-3-chloropropane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 21:12
1,2-Dibromoethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 21:12
1,2-Dichlorobenzene	10	U	10	10	20	UG/L	20	01-Jul-2019 21:12
1,2-Dichloroethane	**17**	J	**4.0**	**10**	**20**	**UG/L**	20	01-Jul-2019 21:12
1,2-Dichloropropane	10	U	10	10	20	UG/L	20	01-Jul-2019 21:12
1,3,5-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
1,3-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 21:12
1,3-Dichloropropane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
1,4-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 21:12
2,2-Dichloropropane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 21:12
2-Butanone	20	U	10	20	40	UG/L	20	01-Jul-2019 21:12
2-Chlorotoluene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
2-Hexanone	20	U	20	20	40	UG/L	20	01-Jul-2019 21:12
4-Chlorotoluene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 21:12
4-Isopropyltoluene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
4-Methyl-2-pentanone	20	U	14	20	40	UG/L	20	01-Jul-2019 21:12
Acetone	20	U	8.0	20	40	UG/L	20	01-Jul-2019 21:12
Benzene	10	U	4.0	10	20	UG/L	20	01-Jul-2019 21:12
Bromobenzene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 21:12
Bromochloromethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 21:12
Bromodichloromethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 21:12
Bromoform	10	U	8.0	10	20	UG/L	20	01-Jul-2019 21:12
Bromomethane	10	U	8.0	10	20	UG/L	20	01-Jul-2019 21:12
Carbon disulfide	20	U	12	20	40	UG/L	20	01-Jul-2019 21:12
Carbon tetrachloride	10	U	10	10	20	UG/L	20	01-Jul-2019 21:12
Chlorobenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
Chloroethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
Chloroform	**27**		**4.0**	**10**	**20**	**UG/L**	20	01-Jul-2019 21:12

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19061164
Sample ID: 120_062019
Lab ID:HS19061164-02
Collection Date: 20-Jun-2019 09:25
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 21:12
cis-1,2-Dichloroethene	**790**		**4.0**	**10**	**20**	**UG/L**	20	01-Jul-2019 21:12
cis-1,3-Dichloropropene	10	U	2.0	10	20	UG/L	20	01-Jul-2019 21:12
Dibromochloromethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
Dibromomethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 21:12
Dichlorodifluoromethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
Ethylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
Hexachlorobutadiene	20	U	20	20	20	UG/L	20	01-Jul-2019 21:12
Isopropylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
m,p-Xylene	20	U	10	20	40	UG/L	20	01-Jul-2019 21:12
Methylene chloride	20	U	8.0	20	40	UG/L	20	01-Jul-2019 21:12
n-Butylbenzene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 21:12
n-Propylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
Naphthalene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
o-Xylene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
sec-Butylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
Styrene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
tert-Butylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
Tetrachloroethene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
Toluene	10	U	4.0	10	20	UG/L	20	01-Jul-2019 21:12
trans-1,2-Dichloroethene	10	U	4.0	10	20	UG/L	20	01-Jul-2019 21:12
trans-1,3-Dichloropropene	10	U	4.0	10	20	UG/L	20	01-Jul-2019 21:12
Trichloroethene	**7,900**		**50**	**120**	**250**	**UG/L**	250	01-Jul-2019 21:36
Trichlorofluoromethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 21:12
Vinyl chloride	10	U	4.0	10	20	UG/L	20	01-Jul-2019 21:12
Surr: 1,2-Dichloroethane-d4	*99.6*			**0**	*81-118*	*%REC*	*20*	*01-Jul-2019 21:12*
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*250*	*01-Jul-2019 21:36*
Surr: 4-Bromofluorobenzene	*93.6*			**0**	*85-114*	*%REC*	*250*	*01-Jul-2019 21:36*
Surr: 4-Bromofluorobenzene	*91.4*			**0**	*85-114*	*%REC*	*20*	*01-Jul-2019 21:12*
Surr: Dibromofluoromethane	*96.1*			**0**	*80-119*	*%REC*	*250*	*01-Jul-2019 21:36*
Surr: Dibromofluoromethane	*95.1*			**0**	*80-119*	*%REC*	*20*	*01-Jul-2019 21:12*
Surr: Toluene-d8	*98.5*			**0**	*89-112*	*%REC*	*20*	*01-Jul-2019 21:12*
Surr: Toluene-d8	*99.9*			**0**	*89-112*	*%REC*	*250*	*01-Jul-2019 21:36*
SEMIVOLATILES SIM	**Method:SW8270SIM**					Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**9.9**		**0.50**	**0.50**	**0.50**	**ug/L**	50	28-Jun-2019 17:43
Surr: 2-Fluorobiphenyl	*0*	*S*		0	*40-140*	*%REC*	*50*	*28-Jun-2019 17:43*
Surr: 4-Terphenyl-d14	*0*	*S*		0	*40-140*	*%REC*	*50*	*28-Jun-2019 17:43*
Surr: Nitrobenzene-d5	*0*	*S*		0	*40-140*	*%REC*	*50*	*28-Jun-2019 17:43*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 120_062019
Collection Date: 20-Jun-2019 09:25

ANALYTICAL REPORT
WorkOrder:HS19061164
Lab ID:HS19061164-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See attached		0	0	0	NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW14_062019
Collection Date: 20-Jun-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19061164
Lab ID:HS19061164-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
1,1,1-Trichloroethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 16:49
1,1,2,2-Tetrachloroethane	10	U	10	10	20	UG/L	20	01-Jul-2019 16:49
1,1,2-Trichloroethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
1,1-Dichloroethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 16:49
1,1-Dichloroethene	**130**		**4.0**	**10**	**20**	**UG/L**	20	01-Jul-2019 16:49
1,1-Dichloropropene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
1,2,3-Trichlorobenzene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 16:49
1,2,3-Trichloropropane	10	U	10	10	20	UG/L	20	01-Jul-2019 16:49
1,2,4-Trichlorobenzene	10	U	10	10	20	UG/L	20	01-Jul-2019 16:49
1,2,4-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
1,2-Dibromo-3-chloropropane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 16:49
1,2-Dibromoethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 16:49
1,2-Dichlorobenzene	10	U	10	10	20	UG/L	20	01-Jul-2019 16:49
1,2-Dichloroethane	**100**		**4.0**	**10**	**20**	**UG/L**	20	01-Jul-2019 16:49
1,2-Dichloropropane	10	U	10	10	20	UG/L	20	01-Jul-2019 16:49
1,3,5-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
1,3-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 16:49
1,3-Dichloropropane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
1,4-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 16:49
2,2-Dichloropropane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 16:49
2-Butanone	20	U	10	20	40	UG/L	20	01-Jul-2019 16:49
2-Chlorotoluene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
2-Hexanone	20	U	20	20	40	UG/L	20	01-Jul-2019 16:49
4-Chlorotoluene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 16:49
4-Isopropyltoluene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
4-Methyl-2-pentanone	20	U	14	20	40	UG/L	20	01-Jul-2019 16:49
Acetone	20	U	8.0	20	40	UG/L	20	01-Jul-2019 16:49
Benzene	10	U	4.0	10	20	UG/L	20	01-Jul-2019 16:49
Bromobenzene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 16:49
Bromochloromethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 16:49
Bromodichloromethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 16:49
Bromoform	10	U	8.0	10	20	UG/L	20	01-Jul-2019 16:49
Bromomethane	10	U	8.0	10	20	UG/L	20	01-Jul-2019 16:49
Carbon disulfide	20	U	12	20	40	UG/L	20	01-Jul-2019 16:49
Carbon tetrachloride	10	U	10	10	20	UG/L	20	01-Jul-2019 16:49
Chlorobenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
Chloroethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
Chloroform	10	U	4.0	10	20	UG/L	20	01-Jul-2019 16:49

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW14_062019
Collection Date: 20-Jun-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19061164
Lab ID:HS19061164-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 16:49
cis-1,2-Dichloroethene	**1,800**		**4.0**	**10**	**20**	**UG/L**	20	01-Jul-2019 16:49
cis-1,3-Dichloropropene	10	U	2.0	10	20	UG/L	20	01-Jul-2019 16:49
Dibromochloromethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
Dibromomethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 16:49
Dichlorodifluoromethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
Ethylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
Hexachlorobutadiene	20	U	20	20	20	UG/L	20	01-Jul-2019 16:49
Isopropylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
m,p-Xylene	20	U	10	20	40	UG/L	20	01-Jul-2019 16:49
Methylene chloride	20	U	8.0	20	40	UG/L	20	01-Jul-2019 16:49
n-Butylbenzene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 16:49
n-Propylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
Naphthalene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
o-Xylene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
sec-Butylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
Styrene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
tert-Butylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
Tetrachloroethene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
Toluene	10	U	4.0	10	20	UG/L	20	01-Jul-2019 16:49
trans-1,2-Dichloroethene	10	U	4.0	10	20	UG/L	20	01-Jul-2019 16:49
trans-1,3-Dichloropropene	10	U	4.0	10	20	UG/L	20	01-Jul-2019 16:49
Trichloroethene	**11,000**		**50**	**120**	**250**	**UG/L**	250	01-Jul-2019 17:12
Trichlorofluoromethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 16:49
Vinyl chloride	10	U	4.0	10	20	UG/L	20	01-Jul-2019 16:49
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*20*	*01-Jul-2019 16:49*
Surr: 1,2-Dichloroethane-d4	*107*			**0**	*81-118*	*%REC*	*250*	*01-Jul-2019 17:12*
Surr: 4-Bromofluorobenzene	*94.2*			**0**	*85-114*	*%REC*	*20*	*01-Jul-2019 16:49*
Surr: 4-Bromofluorobenzene	*93.7*			**0**	*85-114*	*%REC*	*250*	*01-Jul-2019 17:12*
Surr: Dibromofluoromethane	*95.7*			**0**	*80-119*	*%REC*	*20*	*01-Jul-2019 16:49*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*250*	*01-Jul-2019 17:12*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*20*	*01-Jul-2019 16:49*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*250*	*01-Jul-2019 17:12*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**280**		**10**	**10**	**10**	**ug/L**	1000	28-Jun-2019 18:03
Surr: 2-Fluorobiphenyl	*0*	*S*		0	*40-140*	*%REC*	*1000*	*28-Jun-2019 18:03*
Surr: 4-Terphenyl-d14	*0*	*S*		0	*40-140*	*%REC*	*1000*	*28-Jun-2019 18:03*
Surr: Nitrobenzene-d5	*0*	*S*		0	*40-140*	*%REC*	*1000*	*28-Jun-2019 18:03*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW14_062019
Collection Date: 20-Jun-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19061164
Lab ID:HS19061164-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0408**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:22
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:22
Arsenic	**0.00702**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:22
Barium	**0.311**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:22
Beryllium	**0.000305**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	28-Jun-2019 16:01
Cadmium	**0.000877**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 18:22
Calcium	**122**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:22
Chromium	**0.0974**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:22
Cobalt	**0.0252**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:22
Copper	**0.00394**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:22
Iron	**128**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:22
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:22
Magnesium	**72.8**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:22
Manganese	**4.58**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	28-Jun-2019 16:03
Nickel	**0.158**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:22
Potassium	**14.0**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:22
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:22
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:22
Sodium	**449**		**0.140**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 16:03
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:22
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:22
Zinc	**0.467**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:22
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 16:15
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See attached		0	0	0	NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW14_062019_a
Collection Date: 20-Jun-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19061164
Lab ID:HS19061164-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
1,1,1-Trichloroethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 17:36
1,1,2,2-Tetrachloroethane	10	U	10	10	20	UG/L	20	01-Jul-2019 17:36
1,1,2-Trichloroethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
1,1-Dichloroethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 17:36
1,1-Dichloroethene	**140**		**4.0**	**10**	**20**	**UG/L**	20	01-Jul-2019 17:36
1,1-Dichloropropene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
1,2,3-Trichlorobenzene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 17:36
1,2,3-Trichloropropane	10	U	10	10	20	UG/L	20	01-Jul-2019 17:36
1,2,4-Trichlorobenzene	10	U	10	10	20	UG/L	20	01-Jul-2019 17:36
1,2,4-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
1,2-Dibromo-3-chloropropane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 17:36
1,2-Dibromoethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 17:36
1,2-Dichlorobenzene	10	U	10	10	20	UG/L	20	01-Jul-2019 17:36
1,2-Dichloroethane	**110**		**4.0**	**10**	**20**	**UG/L**	20	01-Jul-2019 17:36
1,2-Dichloropropane	10	U	10	10	20	UG/L	20	01-Jul-2019 17:36
1,3,5-Trimethylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
1,3-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 17:36
1,3-Dichloropropane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
1,4-Dichlorobenzene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 17:36
2,2-Dichloropropane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 17:36
2-Butanone	20	U	10	20	40	UG/L	20	01-Jul-2019 17:36
2-Chlorotoluene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
2-Hexanone	20	U	20	20	40	UG/L	20	01-Jul-2019 17:36
4-Chlorotoluene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 17:36
4-Isopropyltoluene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
4-Methyl-2-pentanone	20	U	14	20	40	UG/L	20	01-Jul-2019 17:36
Acetone	20	U	8.0	20	40	UG/L	20	01-Jul-2019 17:36
Benzene	10	U	4.0	10	20	UG/L	20	01-Jul-2019 17:36
Bromobenzene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 17:36
Bromochloromethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 17:36
Bromodichloromethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 17:36
Bromoform	10	U	8.0	10	20	UG/L	20	01-Jul-2019 17:36
Bromomethane	10	U	8.0	10	20	UG/L	20	01-Jul-2019 17:36
Carbon disulfide	20	U	12	20	40	UG/L	20	01-Jul-2019 17:36
Carbon tetrachloride	10	U	10	10	20	UG/L	20	01-Jul-2019 17:36
Chlorobenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
Chloroethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
Chloroform	**25**		**4.0**	**10**	**20**	**UG/L**	20	01-Jul-2019 17:36

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW14_062019_a
Collection Date: 20-Jun-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19061164
Lab ID:HS19061164-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 17:36
cis-1,2-Dichloroethene	**2,000**		**4.0**	**10**	**20**	**UG/L**	20	01-Jul-2019 17:36
cis-1,3-Dichloropropene	10	U	2.0	10	20	UG/L	20	01-Jul-2019 17:36
Dibromochloromethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
Dibromomethane	10	U	4.0	10	20	UG/L	20	01-Jul-2019 17:36
Dichlorodifluoromethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
Ethylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
Hexachlorobutadiene	20	U	20	20	20	UG/L	20	01-Jul-2019 17:36
Isopropylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
m,p-Xylene	20	U	10	20	40	UG/L	20	01-Jul-2019 17:36
Methylene chloride	20	U	8.0	20	40	UG/L	20	01-Jul-2019 17:36
n-Butylbenzene	10	U	8.0	10	20	UG/L	20	01-Jul-2019 17:36
n-Propylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
Naphthalene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
o-Xylene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
sec-Butylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
Styrene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
tert-Butylbenzene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
Tetrachloroethene	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
Toluene	10	U	4.0	10	20	UG/L	20	01-Jul-2019 17:36
trans-1,2-Dichloroethene	10	U	4.0	10	20	UG/L	20	01-Jul-2019 17:36
trans-1,3-Dichloropropene	10	U	4.0	10	20	UG/L	20	01-Jul-2019 17:36
Trichloroethene	**11,000**		**50**	**120**	**250**	**UG/L**	250	01-Jul-2019 22:00
Trichlorofluoromethane	10	U	6.0	10	20	UG/L	20	01-Jul-2019 17:36
Vinyl chloride	10	U	4.0	10	20	UG/L	20	01-Jul-2019 17:36
Surr: 1,2-Dichloroethane-d4	*120*	*S*		**0**	*81-118*	*%REC*	*20*	*01-Jul-2019 17:36*
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*250*	*01-Jul-2019 22:00*
Surr: 4-Bromofluorobenzene	*93.6*			**0**	*85-114*	*%REC*	*20*	*01-Jul-2019 17:36*
Surr: 4-Bromofluorobenzene	*97.0*			**0**	*85-114*	*%REC*	*250*	*01-Jul-2019 22:00*
Surr: Dibromofluoromethane	*110*			**0**	*80-119*	*%REC*	*20*	*01-Jul-2019 17:36*
Surr: Dibromofluoromethane	*95.8*			**0**	*80-119*	*%REC*	*250*	*01-Jul-2019 22:00*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*20*	*01-Jul-2019 17:36*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*250*	*01-Jul-2019 22:00*
SEMIVOLATILES SIM	**Method:SW8270SIM**					Prep:SW3510 / 25-Jun-2019		Analyst: LG
1,4-Dioxane	**390**		**10**	**10**	**10**	**ug/L**	1000	28-Jun-2019 18:24
Surr: 2-Fluorobiphenyl	*0*	*S*		0	*40-140*	*%REC*	*1000*	*28-Jun-2019 18:24*
Surr: 4-Terphenyl-d14	*0*	*S*		0	*40-140*	*%REC*	*1000*	*28-Jun-2019 18:24*
Surr: Nitrobenzene-d5	*0*	*S*		0	*40-140*	*%REC*	*1000*	*28-Jun-2019 18:24*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW14_062019_a
Collection Date: 20-Jun-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19061164
Lab ID:HS19061164-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 25-Jun-2019		Analyst: JHD
Aluminum	**0.0353**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	27-Jun-2019 18:24
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	27-Jun-2019 18:24
Arsenic	**0.00636**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:24
Barium	**0.297**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	27-Jun-2019 18:24
Beryllium	**0.000276**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	28-Jun-2019 16:05
Cadmium	**0.000834**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	27-Jun-2019 18:24
Calcium	**116**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	27-Jun-2019 18:24
Chromium	**0.0866**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:24
Cobalt	**0.0240**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	27-Jun-2019 18:24
Copper	**0.00362**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:24
Iron	**120**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:24
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:24
Magnesium	**68.8**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:24
Manganese	**4.81**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	28-Jun-2019 16:07
Nickel	**0.150**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	27-Jun-2019 18:24
Potassium	**13.5**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	27-Jun-2019 18:24
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	27-Jun-2019 18:24
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	27-Jun-2019 18:24
Sodium	**482**		**0.140**	**0.500**	**2.00**	**mg/L**	10	28-Jun-2019 16:07
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	27-Jun-2019 18:24
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	27-Jun-2019 18:24
Zinc	**0.439**		**0.00200**	**0.00200**	**0.00500**	**mg/L**	1	27-Jun-2019 18:24
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 16:16
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See attached		0	0	0	NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW12_062019
Collection Date: 20-Jun-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19061164
Lab ID:HS19061164-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,1-Dichloroethene	**1.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	01-Jul-2019 14:25
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,2-Dichloroethane	**0.57**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	01-Jul-2019 14:25
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:25
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:25
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 14:25
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	01-Jul-2019 14:25
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:25
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	01-Jul-2019 14:25
Acetone	**3.5**		**0.40**	**1.0**	**2.0**	**UG/L**	1	01-Jul-2019 14:25
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	01-Jul-2019 14:25
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:25

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW12_062019
Collection Date: 20-Jun-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19061164
Lab ID:HS19061164-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:25
cis-1,2-Dichloroethene	**15**		**0.20**	**0.50**	**1.0**	**UG/L**	1	01-Jul-2019 14:25
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	01-Jul-2019 14:25
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 14:25
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	01-Jul-2019 14:25
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:25
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:25
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:25
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Trichloroethene	**160**		**0.20**	**0.50**	**1.0**	**UG/L**	1	01-Jul-2019 14:25
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:25
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*01-Jul-2019 14:25*
Surr: 4-Bromofluorobenzene	*96.3*			**0**	*85-114*	*%REC*	*1*	*01-Jul-2019 14:25*
Surr: Dibromofluoromethane	*94.4*			**0**	*80-119*	*%REC*	*1*	*01-Jul-2019 14:25*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*01-Jul-2019 14:25*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See attached		0	0	0	NA	1	05-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

Batch ID: 142427 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061164-03	1	10	10 (mL)	1
HS19061164-04	1	10	10 (mL)	1

Batch ID: 142429 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061164-01	1	1000	1 (mL)	0.001
HS19061164-02	1	1000	1 (mL)	0.001
HS19061164-03	1	1000	1 (mL)	0.001
HS19061164-04	1	1000	1 (mL)	0.001

Batch ID: 142560 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061164-03	1	10 (mL)	10 (mL)	1
HS19061164-04	1	10 (mL)	10 (mL)	1

ALS Houston, US Date: 16-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142427 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Water	
HS19061164-03	MW14_062019	20 Jun 2019 10:45		25 Jun 2019 11:30	28 Jun 2019 16:03	10
HS19061164-03	MW14_062019	20 Jun 2019 10:45		25 Jun 2019 11:30	28 Jun 2019 16:01	1
HS19061164-03	MW14_062019	20 Jun 2019 10:45		25 Jun 2019 11:30	27 Jun 2019 18:22	1
HS19061164-04	MW14_062019_a	20 Jun 2019 10:45		25 Jun 2019 11:30	28 Jun 2019 16:07	10
HS19061164-04	MW14_062019_a	20 Jun 2019 10:45		25 Jun 2019 11:30	28 Jun 2019 16:05	1
HS19061164-04	MW14_062019_a	20 Jun 2019 10:45		25 Jun 2019 11:30	27 Jun 2019 18:24	1
Batch ID: 142429 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Water	
HS19061164-01	AWD-1_062019	20 Jun 2019 07:45		25 Jun 2019 16:16	28 Jun 2019 17:22	5
HS19061164-02	120_062019	20 Jun 2019 09:25		25 Jun 2019 16:16	28 Jun 2019 17:43	50
HS19061164-03	MW14_062019	20 Jun 2019 10:45		25 Jun 2019 16:16	28 Jun 2019 18:03	1000
HS19061164-04	MW14_062019_a	20 Jun 2019 10:45		25 Jun 2019 16:16	28 Jun 2019 18:24	1000
Batch ID: 142560 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Water	
HS19061164-03	MW14_062019	20 Jun 2019 10:45		28 Jun 2019 10:30	28 Jun 2019 16:15	1
HS19061164-04	MW14_062019_a	20 Jun 2019 10:45		28 Jun 2019 10:30	28 Jun 2019 16:16	1
Batch ID: R341659 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19061164-02	120_062019	20 Jun 2019 09:25			01 Jul 2019 21:36	250
HS19061164-02	120_062019	20 Jun 2019 09:25			01 Jul 2019 21:12	20
HS19061164-03	MW14_062019	20 Jun 2019 10:45			01 Jul 2019 17:12	250
HS19061164-03	MW14_062019	20 Jun 2019 10:45			01 Jul 2019 16:49	20
HS19061164-04	MW14_062019_a	20 Jun 2019 10:45			01 Jul 2019 22:00	250
HS19061164-04	MW14_062019_a	20 Jun 2019 10:45			01 Jul 2019 17:36	20
HS19061164-05	MW12_062019	20 Jun 2019 12:30			01 Jul 2019 14:25	1
Batch ID: R341906 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS19061164-02	120_062019	20 Jun 2019 09:25			05 Jul 2019 14:42	1
HS19061164-03	MW14_062019	20 Jun 2019 10:45			05 Jul 2019 14:42	1
HS19061164-04	MW14_062019_a	20 Jun 2019 10:45			05 Jul 2019 14:42	1
HS19061164-05	MW12_062019	20 Jun 2019 12:30			05 Jul 2019 14:42	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 17:22**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145221** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002457	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.001932	0.00500								J
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.02437	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.001051	0.00500								J
Zinc	0.00200	0.00500								U

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142427** Units: **mg/L** Analysis Date: **27-Jun-2019 16:58**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145214** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1091	0.0100	0.1	0	109	84 - 117				
Antimony	0.0559	0.00500	0.05	0	112	85 - 117				
Arsenic	0.05618	0.00500	0.05	0	112	84 - 116				
Barium	0.05364	0.00500	0.05	0	107	86 - 114				
Beryllium	0.05694	0.00200	0.05	0	114	83 - 121				
Cadmium	0.05632	0.00200	0.05	0	113	87 - 115				
Calcium	5.323	0.500	5	0	106	87 - 118				
Chromium	0.05591	0.00500	0.05	0	112	85 - 116				
Cobalt	0.05561	0.00500	0.05	0	111	86 - 115				
Copper	0.05732	0.00500	0.05	0	115	85 - 118				
Iron	5.504	0.200	5	0	110	87 - 118				
Lead	0.05401	0.00500	0.05	0	108	88 - 115				
Magnesium	5.42	0.200	5	0	108	83 - 118				
Manganese	0.05651	0.00500	0.05	0	113	87 - 115				
Nickel	0.05699	0.00500	0.05	0	114	85 - 117				
Potassium	5.366	0.200	5	0	107	87 - 115				
Selenium	0.05781	0.00500	0.05	0	116	80 - 120				
Silver	0.05393	0.00500	0.05	0	108	85 - 116				
Sodium	5.418	0.200	5	0	108	85 - 117				
Thallium	0.05098	0.00200	0.05	0	102	82 - 116				
Vanadium	0.05441	0.00500	0.05	0	109	86 - 115				
Zinc	0.05821	0.00500	0.05	0	116	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19060986-04MS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:03**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145217** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.116	0.0100	0.1	0.01515	101	84 - 117				
Antimony	0.05308	0.00500	0.05	0.000258	106	85 - 117				
Arsenic	0.05627	0.00500	0.05	0.002036	108	84 - 116				
Barium	0.8428	0.00500	0.05	0.8565	-27.4	86 - 114				SO
Beryllium	0.05294	0.00200	0.05	0.000048	106	83 - 121				
Cadmium	0.05116	0.00200	0.05	0.000205	102	87 - 115				
Calcium	35.9	0.500	5	33.03	57.3	87 - 118				SO
Chromium	0.3735	0.00500	0.05	0.2809	185	85 - 116				SO
Cobalt	0.0563	0.00500	0.05	0.005607	101	86 - 115				
Copper	0.058	0.00500	0.05	0.005199	106	85 - 118				
Iron	7.669	0.200	5	2.556	102	87 - 118				
Lead	0.05089	0.00500	0.05	0.000094	102	88 - 115				
Magnesium	31.26	0.200	5	27.76	69.9	83 - 118				SO
Manganese	0.2154	0.00500	0.05	0.164	103	87 - 115				
Nickel	0.2401	0.00500	0.05	0.2011	78.0	85 - 117				SO
Potassium	7.654	0.200	5	2.639	100	87 - 115				
Selenium	0.05384	0.00500	0.05	0.000343	107	80 - 120				
Silver	0.04654	0.00500	0.05	0.000013	93.1	85 - 116				
Sodium	233.3	0.200	5	245	-233	85 - 117				SEO
Thallium	0.04975	0.00200	0.05	0.000043	99.4	82 - 116				
Vanadium	0.0572	0.00500	0.05	0.003781	107	86 - 115				
Zinc	0.07874	0.00500	0.05	0.03582	85.8	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:05**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145218** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1062	0.0100	0.1	0.01515	91.1	84 - 117	0.116	8.82	20	
Antimony	0.04965	0.00500	0.05	0.000258	98.8	85 - 117	0.05308	6.66	20	
Arsenic	0.05281	0.00500	0.05	0.002036	102	84 - 116	0.05627	6.34	20	
Barium	0.8139	0.00500	0.05	0.8565	-85.2	86 - 114	0.8428	3.49	20	SO
Beryllium	0.05024	0.00200	0.05	0.000048	100	83 - 121	0.05294	5.24	20	
Cadmium	0.04833	0.00200	0.05	0.000205	96.2	87 - 115	0.05116	5.7	20	
Calcium	33.36	0.500	5	33.03	6.56	87 - 118	35.9	7.33	20	SO
Cobalt	0.0531	0.00500	0.05	0.005607	95.0	86 - 115	0.0563	5.85	20	
Copper	0.05342	0.00500	0.05	0.005199	96.4	85 - 118	0.058	8.23	20	
Iron	7.023	0.200	5	2.556	89.3	87 - 118	7.669	8.8	20	
Lead	0.04808	0.00500	0.05	0.000094	96.0	88 - 115	0.05089	5.67	20	
Magnesium	28.94	0.200	5	27.76	23.5	83 - 118	31.26	7.71	20	SO
Manganese	0.1904	0.00500	0.05	0.164	52.8	87 - 115	0.2154	12.4	20	S
Nickel	0.2255	0.00500	0.05	0.2011	48.7	85 - 117	0.2401	6.29	20	SO
Potassium	7.309	0.200	5	2.639	93.4	87 - 115	7.654	4.62	20	
Selenium	0.05051	0.00500	0.05	0.000343	100	80 - 120	0.05384	6.37	20	
Silver	0.04575	0.00500	0.05	0.000013	91.5	85 - 116	0.04654	1.71	20	
Sodium	224.6	0.200	5	245	-407	85 - 117	233.3	3.8	20	SEO
Thallium	0.04905	0.00200	0.05	0.000043	98.0	82 - 116	0.04975	1.42	20	
Vanadium	0.05284	0.00500	0.05	0.003781	98.1	86 - 115	0.0572	7.93	20	
Zinc	0.08005	0.00500	0.05	0.03582	88.5	83 - 119	0.07874	1.66	20	

MSD Sample ID: **HS19060986-04MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:07**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145651** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Chromium	0.343	0.00500	0.05	0.2809	124	85 - 116	0.3735	8.51	20	SO

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **27-Jun-2019 17:07**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145219** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1008	0.0100	0.1	0.01515	85.7	80 - 120				
Antimony	0.08752	0.00500	0.1	0.000258	87.3	80 - 120				
Arsenic	0.09313	0.00500	0.1	0.002036	91.1	80 - 120				
Beryllium	0.09784	0.00200	0.1	0.000048	97.8	80 - 120				
Cadmium	0.09096	0.00200	0.1	0.000205	90.8	80 - 120				
Cobalt	0.09093	0.00500	0.1	0.005607	85.3	80 - 120				
Copper	0.09101	0.00500	0.1	0.005199	85.8	80 - 120				
Iron	10.93	0.200	10	2.556	83.8	80 - 120				
Lead	0.09017	0.00500	0.1	0.000094	90.1	80 - 120				
Potassium	11.36	0.200	10	2.639	87.2	80 - 120				
Selenium	0.09025	0.00500	0.1	0.000343	89.9	80 - 120				
Silver	0.08464	0.00500	0.1	0.000013	84.6	80 - 120				
Thallium	0.08892	0.00200	0.1	0.000043	88.9	80 - 120				
Vanadium	0.09309	0.00500	0.1	0.003781	89.3	80 - 120				
Zinc	0.1183	0.00500	0.1	0.03582	82.5	80 - 120				

PDS Sample ID: **HS19060986-04PDS** Units: **mg/L** Analysis Date: **28-Jun-2019 15:14**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145655** PrepDate: **25-Jun-2019** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Barium	1.703	0.0500	1	0.7	100	80 - 120				
Calcium	129.7	5.00	100	26.89	103	80 - 120				
Chromium	1.283	0.0500	1	0.2283	105	80 - 120				
Iron	107.4	2.00	100	2.151	105	80 - 120				
Magnesium	125.2	2.00	100	22.92	102	80 - 120				
Manganese	1.175	0.0500	1	0.1367	104	80 - 120				
Nickel	1.217	0.0500	1	0.1678	105	80 - 120				
Potassium	106.9	2.00	100	2.16	105	80 - 120				
Sodium	299.8	2.00	100	202.9	96.9	80 - 120				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: 142427 (0) **Instrument: ICPMS06** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **27-Jun-2019 17:02**
Client ID: Run ID: **ICPMS06_341376** SeqNo: **5145216** PrepDate: **25-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.01988	0.0500					0.01515	0	10	J
Antimony	0.00250	0.0250					0.000258	0	10	U
Arsenic	0.002183	0.0250					0.002036	0	10	J
Beryllium	0.00250	0.0100					0.000048	0	10	U
Cadmium	0.00250	0.0100					0.000205	0	10	U
Cobalt	0.004619	0.0250					0.005607	0	10	J
Copper	0.00500	0.0250					0.005199	0	10	U
Lead	0.00500	0.0250					0.000094	0	10	U
Selenium	0.0125	0.0250					0.000343	0	10	U
Silver	0.00250	0.0250					0.000013	0	10	U
Thallium	0.00250	0.0100					0.000043	0	10	U
Vanadium	0.01164	0.0250					0.003781	0	10	J
Zinc	0.038	0.0250					0.03582	6.07	10	

SD Sample ID: **HS19060986-04SD** Units: **mg/L** Analysis Date: **28-Jun-2019 15:13**
Client ID: Run ID: **ICPMS06_341483** SeqNo: **5145654** PrepDate: **25-Jun-2019** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Barium	0.6998	0.250					0.7	0.0306	10	
Calcium	27.1	25.0					26.89	0.761	10	
Chromium	0.234	0.250					0.2283	0	10	J
Iron	2.19	10.0					2.151	0	10	J
Magnesium	22.74	10.0					22.92	0.776	10	
Manganese	0.1567	0.250					0.1367	0	10	J
Nickel	0.1736	0.250					0.1678	0	10	J
Potassium	2.068	10.0					2.16	0	10	J
Sodium	207.1	10.0					202.9	2.06	10	

The following samples were analyzed in this batch: HS19061164-03 HS19061164-04

Revision: 1

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ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: 142560 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142560** Units: **mg/L** Analysis Date: **28-Jun-2019 15:56**
Client ID: Run ID: **HG03_341562** SeqNo: **5147053** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142560** Units: **mg/L** Analysis Date: **28-Jun-2019 15:57**
Client ID: Run ID: **HG03_341562** SeqNo: **5147054** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00509	0.000200	0.005	0	102	80 - 120				

MS Sample ID: **HS19061486-01MS** Units: **mg/L** Analysis Date: **28-Jun-2019 16:01**
Client ID: Run ID: **HG03_341562** SeqNo: **5147056** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000513	0.000000200	5e-006	-0.0000000010	103	75 - 125				

MSD Sample ID: **HS19061486-01MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 16:03**
Client ID: Run ID: **HG03_341562** SeqNo: **5147057** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000509	0.000000200	5e-006	-0.0000000010	102	75 - 125	0.000005130	0.783	20	

The following samples were analyzed in this batch: HS19061164-03 HS19061164-04

Revision: 1

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ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: 142429 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142429** Units: **ug/L** Analysis Date: **27-Jun-2019 21:35**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146405** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.0702*	*0*	*0.08*	*0*	*87.7*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.0811*	*0*	*0.08*	*0*	*101*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07172*	*0*	*0.08*	*0*	*89.6*	*40 - 140*				

LCS Sample ID: **LCS-142429** Units: **ug/L** Analysis Date: **27-Jun-2019 21:56**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146406** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.0905	0.010	0.08	0	113	40 - 140				
Surr: 2-Fluorobiphenyl	*0.07767*	*0*	*0.08*	*0*	*97.1*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.08433*	*0*	*0.08*	*0*	*105*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08991*	*0*	*0.08*	*0*	*112*	*40 - 140*				

LCSD Sample ID: **LCSD-142429** Units: **ug/L** Analysis Date: **27-Jun-2019 22:17**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146407** PrepDate: **25-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.09101	0.010	0.08	0	114	40 - 140	0.0905	0.564	20	
Surr: 2-Fluorobiphenyl	*0.09652*	*0*	*0.08*	*0*	*121*	*40 - 140*	*0.07767*	*21.6*	*20*	R
Surr: 4-Terphenyl-d14	*0.09713*	*0*	*0.08*	*0*	*121*	*40 - 140*	*0.08433*	*14.1*	*20*	
Surr: Nitrobenzene-d5	*0.1084*	*0*	*0.08*	*0*	*135*	*40 - 140*	*0.08991*	*18.6*	*20*	

The following samples were analyzed in this batch: HS19061164-01 HS19061164-02 HS19061164-03 HS19061164-04

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190701** Units: **UG/L** Analysis Date: **01-Jul-2019 13:13**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149141** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190701** Units: **UG/L** Analysis Date: **01-Jul-2019 13:13**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149141** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*50.46*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.58*	*1.0*	*50*	*0*	*95.2*	*85 - 114*				
Surr: Dibromofluoromethane	*47*	*1.0*	*50*	*0*	*94.0*	*80 - 119*				
Surr: Toluene-d8	*50.26*	*1.0*	*50*	*0*	*101*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190701** Units: **UG/L** Analysis Date: **01-Jul-2019 12:25**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149140** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.11	1.0	20	0	101	78 - 124				
1,1,1-Trichloroethane	20.63	1.0	20	0	103	74 - 131				
1,1,2,2-Tetrachloroethane	22.67	1.0	20	0	113	71 - 121				
1,1,2-Trichloroethane	21.52	1.0	20	0	108	80 - 119				
1,1-Dichloroethane	20.18	1.0	20	0	101	77 - 125				
1,1-Dichloroethene	20.08	1.0	20	0	100	71 - 131				
1,1-Dichloropropene	19.97	1.0	20	0	99.9	78 - 125				
1,2,3-Trichlorobenzene	25.38	1.0	20	0	127	69 - 129				
1,2,3-Trichloropropane	22.97	1.0	20	0	115	73 - 122				
1,2,4-Trichlorobenzene	22.39	1.0	20	0	112	69 - 130				
1,2,4-Trimethylbenzene	18.77	1.0	20	0	93.8	76 - 124				
1,2-Dibromo-3-chloropropane	24.24	1.0	20	0	121	62 - 128				
1,2-Dibromoethane	21.01	1.0	20	0	105	77 - 121				
1,2-Dichlorobenzene	20.29	1.0	20	0	101	80 - 119				
1,2-Dichloroethane	19.6	1.0	20	0	98.0	73 - 128				
1,2-Dichloropropane	20.22	1.0	20	0	101	78 - 122				
1,3,5-Trimethylbenzene	18.12	1.0	20	0	90.6	75 - 124				
1,3-Dichlorobenzene	19.14	1.0	20	0	95.7	80 - 119				
1,3-Dichloropropane	20.91	1.0	20	0	105	80 - 119				
1,4-Dichlorobenzene	20.69	1.0	20	0	103	79 - 118				
2,2-Dichloropropane	21.55	1.0	20	0	108	60 - 139				
2-Butanone	46.4	2.0	40	0	116	56 - 143				
2-Chlorotoluene	20.24	1.0	20	0	101	79 - 122				
2-Hexanone	42.95	2.0	40	0	107	57 - 139				
4-Chlorotoluene	20.21	1.0	20	0	101	78 - 122				
4-Isopropyltoluene	18.13	1.0	20	0	90.7	77 - 127				
4-Methyl-2-pentanone	42.21	2.0	40	0	106	67 - 130				
Acetone	51.9	2.0	40	0	130	39 - 160				
Benzene	20.86	1.0	20	0	104	79 - 120				
Bromobenzene	19.3	1.0	20	0	96.5	80 - 120				
Bromochloromethane	19.63	1.0	20	0	98.1	78 - 123				
Bromodichloromethane	20.78	1.0	20	0	104	79 - 125				
Bromoform	21.56	1.0	20	0	108	66 - 130				
Bromomethane	22.3	1.0	20	0	111	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-190701** Units: **UG/L** Analysis Date: **01-Jul-2019 12:25**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149140** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	38.23	2.0	40	0	95.6	64 - 133				
Carbon tetrachloride	19.74	1.0	20	0	98.7	72 - 136				
Chlorobenzene	19.92	1.0	20	0	99.6	82 - 118				
Chloroethane	20.74	1.0	20	0	104	60 - 138				
Chloroform	24.47	1.0	20	0	122	79 - 124				
Chloromethane	18.24	1.0	20	0	91.2	50 - 139				
cis-1,2-Dichloroethene	20.8	1.0	20	0	104	78 - 123				
cis-1,3-Dichloropropene	20.13	1.0	20	0	101	75 - 124				
Dibromochloromethane	20.47	1.0	20	0	102	74 - 126				
Dibromomethane	20.24	1.0	20	0	101	79 - 123				
Dichlorodifluoromethane	20.65	1.0	20	0	103	32 - 152				
Ethylbenzene	19.49	1.0	20	0	97.4	79 - 121				
Hexachlorobutadiene	24.85	1.0	20	0	124	66 - 134				
Isopropylbenzene	18.53	1.0	20	0	92.6	72 - 131				
m,p-Xylene	38.92	2.0	40	0	97.3	80 - 121				
Methylene chloride	20.4	2.0	20	0	102	74 - 124				
Naphthalene	24.33	1.0	20	0	122	61 - 128				
n-Butylbenzene	18.77	1.0	20	0	93.9	75 - 128				
n-Propylbenzene	19.53	1.0	20	0	97.6	76 - 126				
o-Xylene	19.03	1.0	20	0	95.1	78 - 122				
sec-Butylbenzene	19.27	1.0	20	0	96.4	77 - 126				
Styrene	20.47	1.0	20	0	102	78 - 123				
tert-Butylbenzene	19.27	1.0	20	0	96.4	78 - 124				
Tetrachloroethene	19.09	1.0	20	0	95.4	74 - 129				
Toluene	19.9	1.0	20	0	99.5	80 - 121				
trans-1,2-Dichloroethene	20.71	1.0	20	0	104	75 - 124				
trans-1,3-Dichloropropene	20.46	1.0	20	0	102	73 - 127				
Trichloroethene	19.73	1.0	20	0	98.7	79 - 123				
Trichlorofluoromethane	20.37	1.0	20	0	102	65 - 141				
Vinyl chloride	19.04	1.0	20	0	95.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*56.59*	*1.0*	*50*	*0*	*113*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*54.46*	*1.0*	*50*	*0*	*109*	*85 - 114*				
Surr: Dibromofluoromethane	*54.8*	*1.0*	*50*	*0*	*110*	*80 - 119*				
Surr: Toluene-d8	*53.87*	*1.0*	*50*	*0*	*108*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061210-04MS** Units: **UG/L** Analysis Date: **01-Jul-2019 15:13**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149146** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.02	1.0	20	0	85.1	78 - 124				
1,1,1-Trichloroethane	17.58	1.0	20	0	87.9	74 - 131				
1,1,2,2-Tetrachloroethane	18.62	1.0	20	0	93.1	71 - 121				
1,1,2-Trichloroethane	18.04	1.0	20	0	90.2	80 - 119				
1,1-Dichloroethane	16.54	1.0	20	0	82.7	77 - 125				
1,1-Dichloroethene	17.79	1.0	20	0	88.9	71 - 131				
1,1-Dichloropropene	18.36	1.0	20	0	91.8	78 - 125				
1,2,3-Trichlorobenzene	21.43	1.0	20	0	107	69 - 129				
1,2,3-Trichloropropane	18.9	1.0	20	0	94.5	73 - 122				
1,2,4-Trichlorobenzene	20.15	1.0	20	0	101	69 - 130				
1,2,4-Trimethylbenzene	17.71	1.0	20	0	88.5	76 - 124				
1,2-Dibromo-3-chloropropane	20.52	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	17.45	1.0	20	0	87.3	77 - 121				
1,2-Dichlorobenzene	17.28	1.0	20	0	86.4	80 - 119				
1,2-Dichloroethane	16.37	1.0	20	0	81.9	73 - 128				
1,2-Dichloropropane	16.77	1.0	20	0	83.8	78 - 122				
1,3,5-Trimethylbenzene	17.74	1.0	20	0	88.7	75 - 124				
1,3-Dichlorobenzene	17.27	1.0	20	0	86.4	80 - 119				
1,3-Dichloropropane	17.64	1.0	20	0	88.2	80 - 119				
1,4-Dichlorobenzene	18.24	1.0	20	0	91.2	79 - 118				
2,2-Dichloropropane	18.02	1.0	20	0	90.1	60 - 139				
2-Butanone	36.58	2.0	40	0	91.5	56 - 143				
2-Chlorotoluene	18.42	1.0	20	0	92.1	79 - 122				
2-Hexanone	35.46	2.0	40	0	88.6	57 - 139				
4-Chlorotoluene	18.55	1.0	20	0	92.8	78 - 122				
4-Isopropyltoluene	18.67	1.0	20	0	93.4	77 - 127				
4-Methyl-2-pentanone	34.54	2.0	40	0	86.4	67 - 130				
Acetone	41.91	2.0	40	0	105	39 - 160				
Benzene	17.59	1.0	20	0	88.0	79 - 120				
Bromobenzene	16.17	1.0	20	0	80.9	80 - 120				
Bromochloromethane	15.85	1.0	20	0	79.2	78 - 123				
Bromodichloromethane	17.02	1.0	20	0	85.1	79 - 125				
Bromoform	17.99	1.0	20	0	90.0	66 - 130				
Bromomethane	17.61	1.0	20	0	88.0	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061210-04MS** Units: **UG/L** Analysis Date: **01-Jul-2019 15:13**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149146** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	32.41	2.0	40	0	81.0	64 - 133				
Carbon tetrachloride	18.3	1.0	20	0	91.5	72 - 136				
Chlorobenzene	16.87	1.0	20	0	84.3	82 - 118				
Chloroethane	16.94	1.0	20	0	84.7	60 - 138				
Chloroform	16.72	1.0	20	0	83.6	79 - 124				
Chloromethane	16.11	1.0	20	0	80.6	50 - 139				
cis-1,2-Dichloroethene	16.73	1.0	20	0	83.7	78 - 123				
cis-1,3-Dichloropropene	16.21	1.0	20	0	81.1	75 - 124				
Dibromochloromethane	17.08	1.0	20	0	85.4	74 - 126				
Dibromomethane	16.7	1.0	20	0	83.5	79 - 123				
Dichlorodifluoromethane	16.34	1.0	20	0	81.7	32 - 152				
Ethylbenzene	17.84	1.0	20	0	89.2	79 - 121				
Hexachlorobutadiene	22.65	1.0	20	0	113	66 - 134				
Isopropylbenzene	18.4	1.0	20	0	92.0	72 - 131				
m,p-Xylene	35.55	2.0	40	0	88.9	80 - 121				
Methylene chloride	15.55	2.0	20	0	77.8	74 - 124				
Naphthalene	20.06	1.0	20	0	100	61 - 128				
n-Butylbenzene	19.2	1.0	20	0	96.0	75 - 128				
n-Propylbenzene	19.54	1.0	20	0	97.7	76 - 126				
o-Xylene	17.22	1.0	20	0	86.1	78 - 122				
sec-Butylbenzene	19.96	1.0	20	0	99.8	77 - 126				
Styrene	17.96	1.0	20	0	89.8	78 - 123				
tert-Butylbenzene	19.4	1.0	20	0	97.0	78 - 124				
Tetrachloroethene	18.1	1.0	20	0	90.5	74 - 129				
Toluene	17.4	1.0	20	0	87.0	80 - 121				
trans-1,2-Dichloroethene	17.08	1.0	20	0	85.4	75 - 124				
trans-1,3-Dichloropropene	16.44	1.0	20	0	82.2	73 - 127				
Trichloroethene	17.51	1.0	20	0	87.5	79 - 123				
Trichlorofluoromethane	17.76	1.0	20	0	88.8	65 - 141				
Vinyl chloride	16.34	1.0	20	0	81.7	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.83*	*1.0*	*50*	*0*	*99.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.6*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*47.78*	*1.0*	*50*	*0*	*95.6*	*80 - 119*				
Surr: Toluene-d8	*50.33*	*1.0*	*50*	*0*	*101*	*89 - 112*				

Revision: 1

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ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061210-04MSD** Units: **UG/L** Analysis Date: **01-Jul-2019 15:37**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149147** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.11	1.0	20	0	85.5	78 - 124	17.02	0.548	20	
1,1,1-Trichloroethane	17.64	1.0	20	0	88.2	74 - 131	17.58	0.364	20	
1,1,2,2-Tetrachloroethane	19.75	1.0	20	0	98.8	71 - 121	18.62	5.89	20	
1,1,2-Trichloroethane	18.6	1.0	20	0	93.0	80 - 119	18.04	3.08	20	
1,1-Dichloroethane	16.64	1.0	20	0	83.2	77 - 125	16.54	0.573	20	
1,1-Dichloroethene	17.88	1.0	20	0	89.4	71 - 131	17.79	0.528	20	
1,1-Dichloropropene	18.5	1.0	20	0	92.5	78 - 125	18.36	0.808	20	
1,2,3-Trichlorobenzene	23.84	1.0	20	0	119	69 - 129	21.43	10.6	20	
1,2,3-Trichloropropane	19.4	1.0	20	0	97.0	73 - 122	18.9	2.62	20	
1,2,4-Trichlorobenzene	21.4	1.0	20	0	107	69 - 130	20.15	6.01	20	
1,2,4-Trimethylbenzene	17.75	1.0	20	0	88.7	76 - 124	17.71	0.222	20	
1,2-Dibromo-3-chloropropane	21.82	1.0	20	0	109	62 - 128	20.52	6.14	20	
1,2-Dibromoethane	17.94	1.0	20	0	89.7	77 - 121	17.45	2.74	20	
1,2-Dichlorobenzene	17.88	1.0	20	0	89.4	80 - 119	17.28	3.4	20	
1,2-Dichloroethane	16.83	1.0	20	0	84.1	73 - 128	16.37	2.75	20	
1,2-Dichloropropane	16.88	1.0	20	0	84.4	78 - 122	16.77	0.684	20	
1,3,5-Trimethylbenzene	17.58	1.0	20	0	87.9	75 - 124	17.74	0.943	20	
1,3-Dichlorobenzene	17.25	1.0	20	0	86.3	80 - 119	17.27	0.142	20	
1,3-Dichloropropane	18.28	1.0	20	0	91.4	80 - 119	17.64	3.57	20	
1,4-Dichlorobenzene	18.6	1.0	20	0	93.0	79 - 118	18.24	1.96	20	
2,2-Dichloropropane	17.75	1.0	20	0	88.7	60 - 139	18.02	1.53	20	
2-Butanone	39	2.0	40	0	97.5	56 - 143	36.58	6.4	20	
2-Chlorotoluene	18.34	1.0	20	0	91.7	79 - 122	18.42	0.454	20	
2-Hexanone	37.74	2.0	40	0	94.3	57 - 139	35.46	6.23	20	
4-Chlorotoluene	18.58	1.0	20	0	92.9	78 - 122	18.55	0.145	20	
4-Isopropyltoluene	18.44	1.0	20	0	92.2	77 - 127	18.67	1.25	20	
4-Methyl-2-pentanone	37.2	2.0	40	0	93.0	67 - 130	34.54	7.41	20	
Acetone	45.62	2.0	40	0	114	39 - 160	41.91	8.48	20	
Benzene	17.78	1.0	20	0	88.9	79 - 120	17.59	1.07	20	
Bromobenzene	16.29	1.0	20	0	81.4	80 - 120	16.17	0.725	20	
Bromochloromethane	16.28	1.0	20	0	81.4	78 - 123	15.85	2.68	20	
Bromodichloromethane	17.54	1.0	20	0	87.7	79 - 125	17.02	3.04	20	
Bromoform	18.5	1.0	20	0	92.5	66 - 130	17.99	2.8	20	
Bromomethane	17.59	1.0	20	0	88.0	53 - 141	17.61	0.0727	20	

Revision: 1

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ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061210-04MSD** Units: **UG/L** Analysis Date: **01-Jul-2019 15:37**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149147** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	32.2	2.0	40	0	80.5	64 - 133	32.41	0.667	20	
Carbon tetrachloride	18.41	1.0	20	0	92.1	72 - 136	18.3	0.627	20	
Chlorobenzene	17.17	1.0	20	0	85.8	82 - 118	16.87	1.75	20	
Chloroethane	17.55	1.0	20	0	87.7	60 - 138	16.94	3.51	20	
Chloroform	16.87	1.0	20	0	84.4	79 - 124	16.72	0.903	20	
Chloromethane	15.3	1.0	20	0	76.5	50 - 139	16.11	5.15	20	
cis-1,2-Dichloroethene	17.11	1.0	20	0	85.6	78 - 123	16.73	2.24	20	
cis-1,3-Dichloropropene	16.68	1.0	20	0	83.4	75 - 124	16.21	2.82	20	
Dibromochloromethane	17.53	1.0	20	0	87.6	74 - 126	17.08	2.59	20	
Dibromomethane	17.52	1.0	20	0	87.6	79 - 123	16.7	4.78	20	
Dichlorodifluoromethane	16.36	1.0	20	0	81.8	32 - 152	16.34	0.128	20	
Ethylbenzene	17.63	1.0	20	0	88.2	79 - 121	17.84	1.18	20	
Hexachlorobutadiene	23.43	1.0	20	0	117	66 - 134	22.65	3.36	20	
Isopropylbenzene	18.34	1.0	20	0	91.7	72 - 131	18.4	0.344	20	
m,p-Xylene	35.63	2.0	40	0	89.1	80 - 121	35.55	0.201	20	
Methylene chloride	16.02	2.0	20	0	80.1	74 - 124	15.55	2.95	20	
Naphthalene	23.21	1.0	20	0	116	61 - 128	20.06	14.5	20	
n-Butylbenzene	19.2	1.0	20	0	96.0	75 - 128	19.2	0.0383	20	
n-Propylbenzene	19.2	1.0	20	0	96.0	76 - 126	19.54	1.78	20	
o-Xylene	17.44	1.0	20	0	87.2	78 - 122	17.22	1.29	20	
sec-Butylbenzene	20.03	1.0	20	0	100	77 - 126	19.96	0.311	20	
Styrene	17.9	1.0	20	0	89.5	78 - 123	17.96	0.32	20	
tert-Butylbenzene	19.25	1.0	20	0	96.2	78 - 124	19.4	0.794	20	
Tetrachloroethene	17.58	1.0	20	0	87.9	74 - 129	18.1	2.91	20	
Toluene	17.27	1.0	20	0	86.3	80 - 121	17.4	0.735	20	
trans-1,2-Dichloroethene	17.3	1.0	20	0	86.5	75 - 124	17.08	1.25	20	
trans-1,3-Dichloropropene	16.89	1.0	20	0	84.5	73 - 127	16.44	2.74	20	
Trichloroethene	17.2	1.0	20	0	86.0	79 - 123	17.51	1.78	20	
Trichlorofluoromethane	18.29	1.0	20	0	91.5	65 - 141	17.76	2.95	20	
Vinyl chloride	16.23	1.0	20	0	81.2	58 - 137	16.34	0.663	20	
Surr: 1,2-Dichloroethane-d4	*50.94*	*1.0*	*50*	*0*	*102*	*81 - 118*	*49.83*	*2.21*	*20*	
Surr: 4-Bromofluorobenzene	*50.71*	*1.0*	*50*	*0*	*101*	*85 - 114*	*50.6*	*0.217*	*20*	
Surr: Dibromofluoromethane	*49.23*	*1.0*	*50*	*0*	*98.5*	*80 - 119*	*47.78*	*2.99*	*20*	
Surr: Toluene-d8	*50.46*	*1.0*	*50*	*0*	*101*	*89 - 112*	*50.33*	*0.265*	*20*	

Revision: 1

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ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061164

QC BATCH REPORT

Batch ID: R341659 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:	HS19061164-02	HS19061164-03	HS19061164-04	HS19061164-05

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19061164**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

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ALS Houston, US Date: 16-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19061164
Date/Time Received: **21-Jun-2019 09:00**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 21-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature 23-Jun-2019 Date

Matrices: **Groundwater**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.8c U/c	IR11
Cooler(s)/Kit(s):	44316	
Date/Time sample(s) sent to storage:	6/21/19 17:30	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes: Trip Blank logged in on hold

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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bhate

Page: 1 of 1

Project/Phase No: NWO1312.0150

COC Number(1):

LIMS Number:

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERP/MS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE								Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
AW21-062019		20 Jun 2019	0745	-	N		WG	1				✓											
I20-062019		20 Jun 2019	0825	-	N		WG	5	✓	✓		✓											
MW4-062019		20 Jun 2019	1045	-	N		WG	6	✓	✓	✓	✓											
AW4-062019-a		20 Jun 2019	1045		N		WG	6	✓	✓	✓	✓											
AW2-062019		20 Jun 2019	1230		N		WG	4	✓	✓													
				-																			
				-																			
				-																			
				-																			
				-																			
				-																			

Sample Analysis Requested (5)

Quality Assurance Samples (6)

HS19061164

Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS:

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received By (Signed)	Date	Time
1. Kenneth Moon	6/20/19	1430	1. SM	6/21/19	09:00
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped No.:

_____ Method of Shipment: _____

_____ Fed Ex _____ Airbill Number:

_____ Analytical Lab: ALS 10450 Stanciff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

44316 DIC. 1.3 C 11 CF 6.3

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00940993

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44316

CUSTODY SEAL

Date: 6/20/19 Time: 1430
Name: SCOTT BEESINER
Company: BHATE

Seal Broken By:
Date: 06/21/19

44316

ORIGIN ID:SGRA (903) 920-6193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE PMB202
MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 24MAY19
ACTWGT: 1.00 LB MAN
CAD: 300130/CAFE3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099

44316

(281) 530-5656

REF:

FedEx Express

FRI - 21 JUN 10:30A
PRIORITY OVERNIGHT

FedEx
TRK# 0221 4809 7834 3159

77099
TX-US
IAH

AB SGRA

FTD 162705 20JUN19 GGGA 563C1/0216/8CDA

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1917698, 1917856, 1918052

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2266 (242597)

General Set Information: There were seventeen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 661480) was less than 1/2 the CRDL. The recovery for the LCS (661481) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on samples 1917698005/06 (Client ID: MW5_061819). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The parent sample and the MS/MSD were analyzed and reported from 1:1,000 dilutions. The effective spike target was 4,000.µg/L. The MS/MSD percent recoveries and relative percent difference were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 661478) is reported from the analysis of the Laboratory Control Sample (LCS – 661481) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafile 01JULD15.

Thomas Bosch July 5, 2019
Analyst Date

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ANALYTICAL REPORT

Report Date: July 05, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1918052**
Project ID: HS19061164
Purchase Order: HS19061164
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
120_062019	1918052001	06/20/19	06/22/19	
MW14_062019	1918052002	06/20/19	06/22/19	
MW14_062019_a	1918052003	06/20/19	06/22/19	
MW12_062019	1918052004	06/20/19	06/22/19	

ANALYTICAL REPORT

Workorder: 34-1918052
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **120_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918052001 | Media: 125 mL Nalgene | Received: 06/22/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 13:16 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**13000**	1000	2000	4000	1000	

Sample ID: **MW14_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918052002 | Media: 125 mL Nalgene | Received: 06/22/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 13:30 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**240000**	10000	20000	40000	10000	

Sample ID: **MW14_062019_a** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918052003 | Media: 125 mL Nalgene | Received: 06/22/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 13:44 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**230000**	10000	20000	40000	10000	

Sample ID: **MW12_062019** | Sampling Site: NA | Collected: 06/20/2019
Lab ID: 1918052004 | Media: 125 mL Nalgene | Received: 06/22/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2266 (HBN: 242597) | **Percent Solid:** NA
Analyzed: 07/01/2019 13:57 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

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ANALYTICAL REPORT

Workorder: 34-1918052
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 242597)

The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/03/2019 09:40	/S/ Stephen Brose 07/05/2019 11:57

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

ANALYTICAL REPORT

Workorder: 34-1918052
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1918052

Limits:	Client SOW/Contract Specified	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	ELMS/2266 (HBN: 242597)
Preparation:	NA	**Analyzed By:**	Thomas Bosch
Batch:	NA		
Prepared By:	NA		

Blank

LMB: 661480
Analyzed: 07/01/2019 09:16
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 661481
Analyzed: 07/01/2019 08:48
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.28	4.00	107	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1917698004	**MS:**	1917698005	**MSD:**	1917698006
Analyzed:	07/01/2019 10:12	**Analyzed:**	07/01/2019 10:28	**Analyzed:**	07/01/2019 10:43
Dilution:	1000	**Dilution:**	1000	**Dilution:**	1000
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	4400	8910	4000	113	78.8	123.8	8810	110	1.19	0.0	20.0

Comments

The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/03/2019 12:16	07/05/2019 11:57

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11649**

SUBCONTRACT TO:

1918052

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123 **Phone:** +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19061164
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19061164-02**	**120_062019**	**Water**	**20 Jun 2019 09:25**
	SUB_Perch-6850			01 Jul 2019
2.	**HS19061164-03**	**MW14_062019**	**Water**	**20 Jun 2019 10:45**
	SUB_Perch-6850			01 Jul 2019
3.	**HS19061164-04**	**MW14_062019_a**	**Water**	**20 Jun 2019 10:45**
	SUB_Perch-6850			01 Jul 2019
4.	**HS19061164-05**	**MW12_062019**	**Water**	**20 Jun 2019 12:30**
	SUB_Perch-6850			01 Jul 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Mussman Date/Time: 6/21/19 18:00

Received By: [signature] Date/Time: 6/22/19 905

Cooler ID(s): 9778 Temperature(s): 2°

ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS19061164 | ***Split:*** | **Workorder ID:** 1918052 | **Level:** ENV_LVL4 | **Requested Analysis**

Client: ALS Environmental (Houston) | **Account:** 8101 | **Type:** 125Poly

Comments:

Preservatives: COOL

Containers

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count	EPA 6850, DoD OSM
1	06/20/2019 09:25	120_062019	1918052001		Water	A	1	A
2	06/20/2019 10:45	MW14_062019	1918052002		Water	A	1	A
3	06/20/2019 10:45	MW14_062019_a	1918052003		Water	A	1	A
4	06/20/2019 12:30	MW12_062019	1918052004		Water	A	1	A
5								
6								
7								
8								
9								
10								

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Wrath, Julie	06/22/2019 09:05	ALS Sample Receiving	Sample Login
[signature]	6/24/19 1400	GB	Storage
R-33-1	6/27/19 12:20	T. Bussell	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 1918852

Date/Time of Receipt: 6/22/19 905

Number of Coolers Received: 2

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Cooler/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9713	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [signature] Signature — Meredith Hopkins Printed Name — 6/22/19 Date

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ Printed Name — Returned to Sample Receipt by: _____ Signature — Date: _____

CRIR.doc — Revised 01/01/2018

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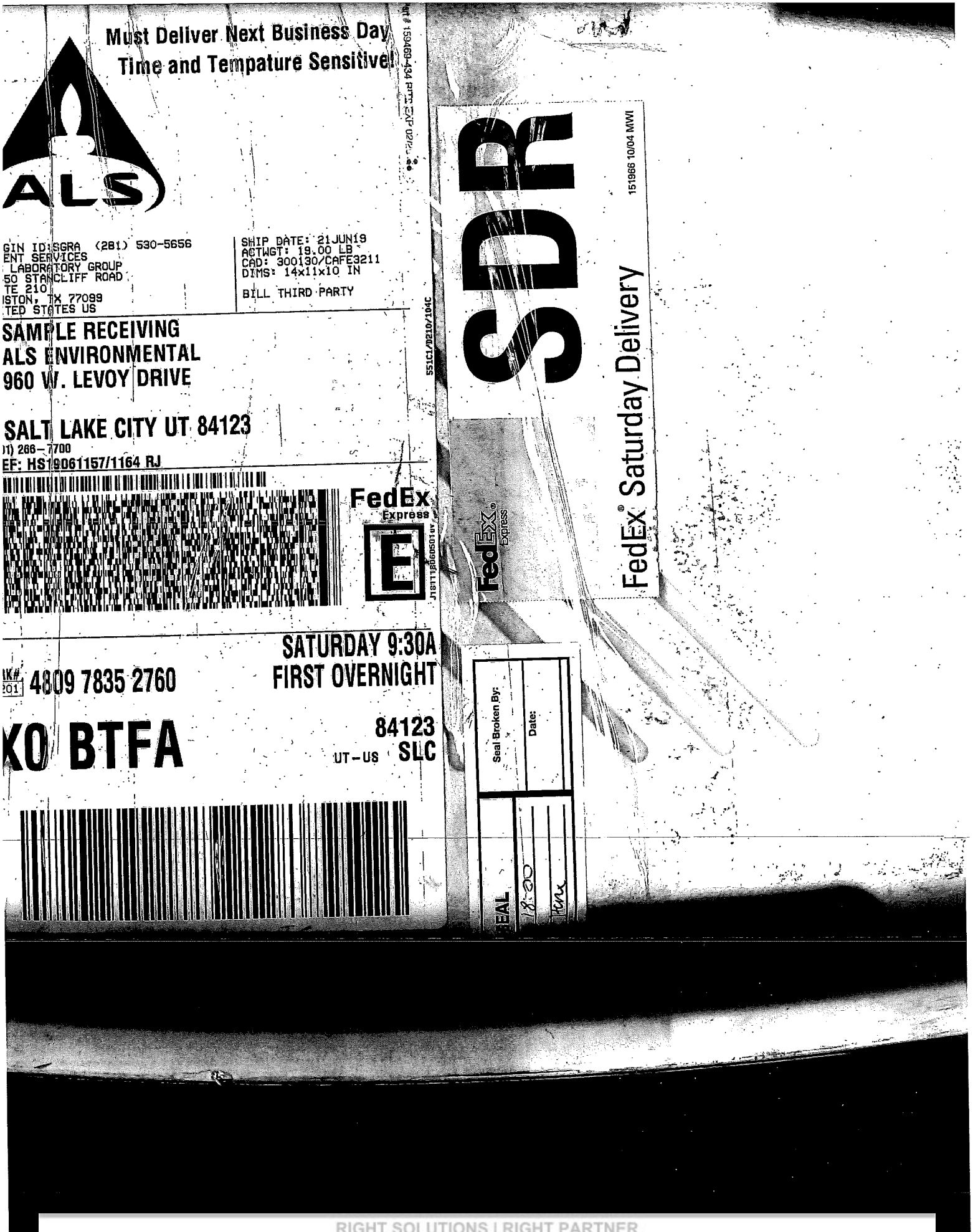
00941005



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Batch Worklist

Batch: ELMS/ 2266 **Created:** 7/1/2019 08:25 **Instrument:** LCMS04 **HBN:** 242597
Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1917698 [ENV_LVL4]
Workorder: 1917856 [ENV_LVL4]
Workorder: 1918052 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	661477	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019
2	661481	LCS for HBN 242597 [ELMS/2266]				LCS	3		E6850Q413Q	5311		7/3/2019	7/1/2019
3	661479	ICS for HBN 242597 [ELMS/2266]				ICS	3		E6850..D3Q	5311		7/3/2019	7/1/2019
4	661480	LMB for HBN 242597 [ELMS/2266]				LMB	3		E6850Q413Q	5311		7/3/2019	7/1/2019
5	1917698001	18CPTMW08SW_061819				SAMPLE	3	1917698001-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
6	1917698002	MW5_061819				SAMPLE	3	1917698002-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
7	1917698004	MW6_061819				SAMPLE	3	1917698004-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
8	1917698005	MW6_061819MS				MS	3	1917698005-A	E6850Q413Q	5480		7/3/2019	7/1/2019
9	1917698006	MW6_061819MSD				MSD	3	1917698006-A	E6850Q413Q	5480		7/3/2019	7/1/2019
10	1917698007	109_061819				SAMPLE	3	1917698007-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
13	1917856003	18CPTMW01DW_061919				SAMPLE	3	1917856003-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
14	1917856004	18CPTMW015W_061919				SAMPLE	3	1917856004-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
15	661482	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019
16	1917856005	18CPTMW045W_061919				SAMPLE	3	1917856005-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
17	1917856006	18CPTMW04_061919				SAMPLE	3	1917856006-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
18	1917856007	MW1_061919				SAMPLE	3	1917856007-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
19	1918052001	120_062019				SAMPLE	3	1918052001-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
20	1918052002	MW14_062019				SAMPLE	3	1918052002-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
21	1918052003	MW14_062019_a				SAMPLE	3	1918052003-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
22	1918052004	MW12_062019				SAMPLE	3	1918052004-A	E6850Q41.3	5480	7/18/2019	7/5/2019	7/1/2019
23	1917698003	19CPTMW08DW_061819				SAMPLE	3	1917698003-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
24	1917698008	MW21_061819				SAMPLE	3	1917698008-A	E6850Q41.3	5480	7/16/2019	7/3/2019	7/1/2019
25	1917856001	MW2_061919				SAMPLE	3	1917856001-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
26	661483	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019
27	1917856002	MW2_061919_a				SAMPLE	3	1917856002-A	E6850Q41.3	5480	7/17/2019	7/5/2019	7/1/2019
28	661478	RLVS for HBN 242597 [ELMS/2266				RLVS	3		E685041C3Q	5311		7/3/2019	7/1/2019
29	661661	CCV for HBN 242597 [ELMS/2266]				CCV	3		E685041C3Q	5311		7/3/2019	7/1/2019

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1917698 (001-08), 1917856 (001-07), 1918052 (001-04)
ELMS Batch/HBN ID: 2266 (242597)
Prep Date: 06/27/2019 Analysis Date: 07/01/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\01JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 661481; Target = 4.0µg/L. ASTM type II water was used for LMB 661480.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on samples 1917698005/06 (Client ID: MW6_061819). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L. The parent sample and the MS/MSD were analyzed and reported from 1:1,000 dilutions. The effective spike target was 4,000.µg/L.

COMMENTS:

1) Results reported in µg/L. The following samples were analyzed and reported from various dilutions as specified. 1917698001/02/04-08; 1918052001: 1:1,000. 1917698003; 1917856006/07: 1:100. 1918052002/03: 1:10,000. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\242597-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 661478) is reported from the analysis of the Laboratory Control Sample (LCS – 661481) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 01JULD15.

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2266 HBN: 242597 Sample Set IDs if Applicable: 1917698/1917856/1918052	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ANAB ACCREDITED

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

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125 Market Street
New Haven, CT 06513
USA

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AccuStandard®

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Signal Word: None

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

Page 1 of 1

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015
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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Report: C:\HPCHEM\1\DATA\01JUL19D\01JUL19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	661477 CCV@25	Vial 71	1	Control	1	1.94364e6	8.502	26.12624
*	661481 QC@4.0	Vial 72	1	Control	2	3.56116e5	8.215	4.27672
*	661479 ICS@4.0	Vial 73	1	Control	3	2.74101e5	8.013	3.76269
*	661480 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917698001 1K	Vial 75	1	Sample	5	1.80575e6	8.547	2.30697e4
*	1917698002 1K	Vial 76	1	Sample	6	2.06010e6	8.593	2.58627e4
*	1917698004 1K	Vial 78	1	Sample	8	3.25841e5	8.618	4410.00331
*	1917698005 MS	Vial 79	1	Sample	9	6.67091e5	8.655	8914.28717
*	1917698006 MSD	Vial 80	1	Sample	10	6.51482e5	8.597	8808.96977
*	1917698007 1K	Vial 81	1	Sample	11	7.47888e5	8.647	1.04112e4
*	1917856001	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1917856002	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1917856003	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1917856004	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	661482 CCV@25	Vial 71	1	Control	17	1.60409e6	8.558	25.00349
*	1917856005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917856006 100	Vial 88	1	Sample	19	4.03838e5	8.639	621.06433
*	1917856007 100	Vial 89	1	Sample	20	4.34274e5	8.657	588.15812
*	1918052001 1K	Vial 90	1	Sample	21	9.58579e5	8.665	1.34755e4
*	1918052002 10K	Vial 91	1	Sample	22	1.70174e6	8.689	2.36511e5
*	1918052003 10K	Vial 92	1	Sample	23	1.68203e6	8.679	2.30798e5
*	1918052004	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	1917698003 100	Vial 94	1	Sample	25	3.02113e6	8.615	4300.62656
*	1917698008 1K	Vial 95	1	Sample	26	1.64048e6	8.691	2.37316e4
*	1917856001 RE	Vial 83	1	Sample	27	0.00000	0.000	0.00000
*	661483 CCV@25	Vial 71	1	Control	28	1.50603e6	8.597	25.41985
*	1917856002 RE	Vial 84	1	Sample	29	0.00000	0.000	0.00000
*	661661 CCV@25	Vial 71	1	Control	30	1.45949e6	8.576	25.10137

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	661477 CCV@25	Vial 71	1	Control	1	5.88479e5	8.517	26.62967
*	661481 QC@4.0	Vial 72	1	Control	2	1.16200e5	8.258	4.54646
*	661479 ICS@4.0	Vial 73	1	Control	3	8.51455e4	8.028	3.78922
*	661480 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1917698001 1K	Vial 75	1	Sample	5	5.48648e5	8.553	2.35743e4
*	1917698002 1K	Vial 76	1	Sample	6	6.20226e5	8.595	2.62187e4
*	1917698004 1K	Vial 78	1	Sample	8	1.08064e5	8.621	4769.85352
*	1917698005 MS	Vial 79	1	Sample	9	2.16450e5	8.652	9609.46002
*	1917698006 MSD	Vial 80	1	Sample	10	2.06556e5	8.628	9281.28672
*	1917698007 1K	Vial 81	1	Sample	11	2.34170e5	8.675	1.08652e4
*	1917856001	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1917856002	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	1917856003	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1917856004	Vial 86	1	Sample	16	0.00000	0.000	0.00000
*	661482 CCV@25	Vial 71	1	Control	17	4.85334e5	8.571	25.46167
*	1917856005	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1917856006 100	Vial 88	1	Sample	19	1.32726e5	8.663	672.87107
*	1917856007 100	Vial 89	1	Sample	20	1.40119e5	8.663	624.82071
*	1918052001 1K	Vial 90	1	Sample	21	2.95207e5	8.681	1.38848e4
*	1918052002 10K	Vial 91	1	Sample	22	5.16167e5	8.701	2.41334e5
*	1918052003 10K	Vial 92	1	Sample	23	5.17000e5	8.701	2.38460e5
*	1918052004	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	1917698003 100	Vial 94	1	Sample	25	8.88076e5	8.626	4275.40488
*	1917698008 1K	Vial 95	1	Sample	26	4.99687e5	8.711	2.43133e4
*	1917856001 RE	Vial 83	1	Sample	27	0.00000	0.000	0.00000
*	661483 CCV@25	Vial 71	1	Control	28	4.53099e5	8.615	25.74994
*	1917856002 RE	Vial 84	1	Sample	29	0.00000	0.000	0.00000
*	661661 CCV@25	Vial 71	1	Control	30	4.45116e5	8.600	25.75597

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Batch Report: C:\HPCHEM\1\DATA\01JUL19D\01JUL19S.B

#	*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
	*	661477 CCV@25	Vial 71	1	Control	1	2.25730e5	8.518	5.00000
	*	661481 QC@4.0	Vial 72	1	Control	2	2.73485e5	8.237	5.00000
	*	661479 ICS@4.0	Vial 73	1	Control	3	2.40789e5	8.048	5.00000
	*	661480 LMB	Vial 74	1	Control	4	2.63576e5	8.496	5.00000
	*	1917698001 1K	Vial 75	1	Sample	5	2.39255e5	8.564	5000.00000
	*	1917698002 1K	Vial 76	1	Sample	6	2.41844e5	8.612	5000.00000
	*	1917698004 1K	Vial 78	1	Sample	8	2.42320e5	8.640	5000.00000
	*	1917698005 MS	Vial 79	1	Sample	9	2.38518e5	8.669	5000.00000
	*	1917698006 MSD	Vial 80	1	Sample	10	2.35827e5	8.629	5000.00000
	*	1917698007 1K	Vial 81	1	Sample	11	2.27615e5	8.679	5000.00000
	*	1917856001	Vial 83	1	Sample	13	9.31342e4	7.613	5.00000
	*	1917856002	Vial 84	1	Sample	14	8.79498e4	7.621	5.00000
	*	1917856003	Vial 85	1	Sample	15	2.30973e5	7.860	5.00000
	*	1917856004	Vial 86	1	Sample	16	2.08544e5	7.904	5.00000
	*	661482 CCV@25	Vial 71	1	Control	17	1.95182e5	8.589	5.00000
	*	1917856005	Vial 87	1	Sample	18	2.92027e5	7.936	5.00000
	*	1917856006 100	Vial 88	1	Sample	19	2.10142e5	8.654	500.00000
	*	1917856007 100	Vial 89	1	Sample	20	2.39145e5	8.684	500.00000
	*	1918052001 1K	Vial 90	1	Sample	21	2.23102e5	8.672	5000.00000
	*	1918052002 10K	Vial 91	1	Sample	22	2.19618e5	8.709	5.00000e4
	*	1918052003 10K	Vial 92	1	Sample	23	2.22758e5	8.695	5.00000e4
	*	1918052004	Vial 93	1	Sample	24	1.88746e5	7.876	5.00000
	*	1917698003 100	Vial 94	1	Sample	25	2.05249e5	8.640	500.00000
	*	1917698008 1K	Vial 95	1	Sample	26	2.10954e5	8.695	5000.00000
	*	1917856001 RE	Vial 83	1	Sample	27	1.44962e5	7.630	5.00000
	*	661483 CCV@25	Vial 71	1	Control	28	1.80070e5	8.618	5.00000
	*	1917856002 RE	Vial 84	1	Sample	29	1.42651e5	7.637	5.00000
	*	661661 CCV@25	Vial 71	1	Control	30	1.76854e5	8.601	5.00000

*** End of Report ***

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Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	661477 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	661481 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	661479 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	661480 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1917698001 1K	CLO4-AQN	1	Sample		
6	Vial 76	1917698002 1K	CLO4-AQN	1	Sample		
7	Vial 77	1917698003 1K	CLO4-AQN	1	Sample		
8	Vial 78	1917698004 1K	CLO4-AQN	1	Sample		
9	Vial 79	1917698005 MS	CLO4-AQN	1	Sample		
10	Vial 80	1917698006 MSD	CLO4-AQN	1	Sample		
11	Vial 81	1917698007 1K	CLO4-AQN	1	Sample		
12	Vial 82	1917698008 10K	CLO4-AQN	1	Sample		
13	Vial 83	1917856001	CLO4-AQN	1	Sample		
14	Vial 84	1917856002	CLO4-AQN	1	Sample		
15	Vial 85	1917856003	CLO4-AQN	1	Sample		
16	Vial 86	1917856004	CLO4-AQN	1	Sample		
17	Vial 71	661482 CCV@25	CLO4-AQN	1	Ctrl Samp		
18	Vial 87	1917856005	CLO4-AQN	1	Sample		
19	Vial 88	1917856006 100	CLO4-AQN	1	Sample		
20	Vial 89	1917856007 100	CLO4-AQN	1	Sample		
21	Vial 90	1918052001 1K	CLO4-AQN	1	Sample		
22	Vial 91	1918052002 10K	CLO4-AQN	1	Sample		
23	Vial 92	1918052003 10K	CLO4-AQN	1	Sample		
24	Vial 93	1918052004	CLO4-AQN	1	Sample		
25	Vial 94	1917698003 100	CLO4-AQN	1	Sample		
26	Vial 95	1917698008 1K	CLO4-AQN	1	Sample		
27	Vial 83	1917856001 RE	CLO4-AQN	1	Sample		
28	Vial 71	661483 CCV@25	CLO4-AQN	1	Ctrl Samp		
29	Vial 84	1917856002 RE	CLO4-AQN	1	Sample		
30	Vial 71	661661 CCV@25	CLO4-AQN	1	Ctrl Samp		

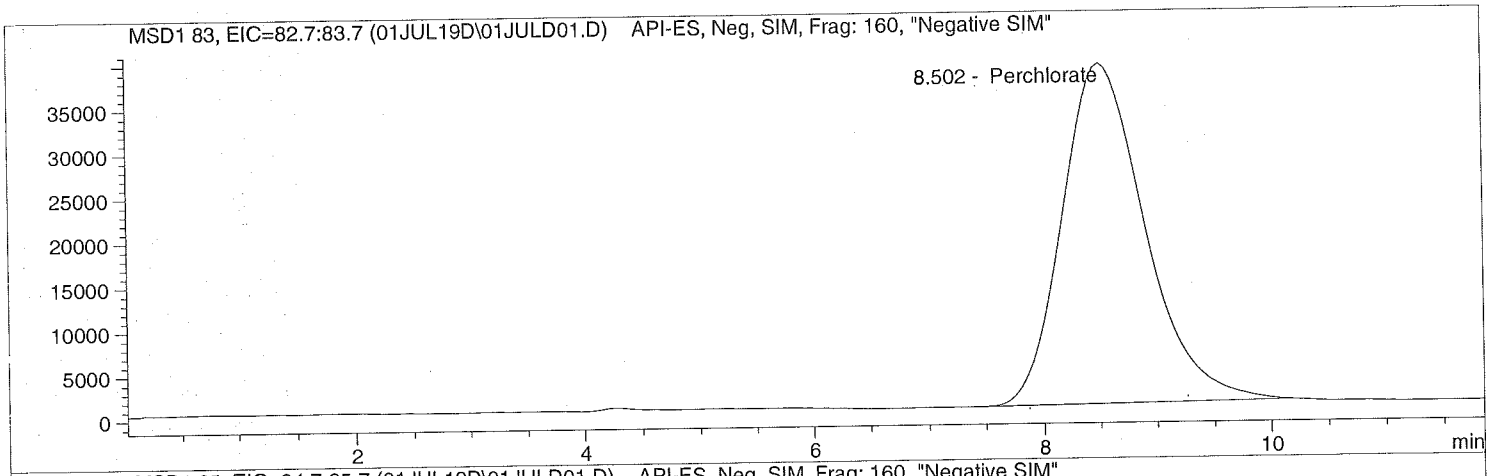
RIGHT SOLUTIONS | RIGHT PARTNER

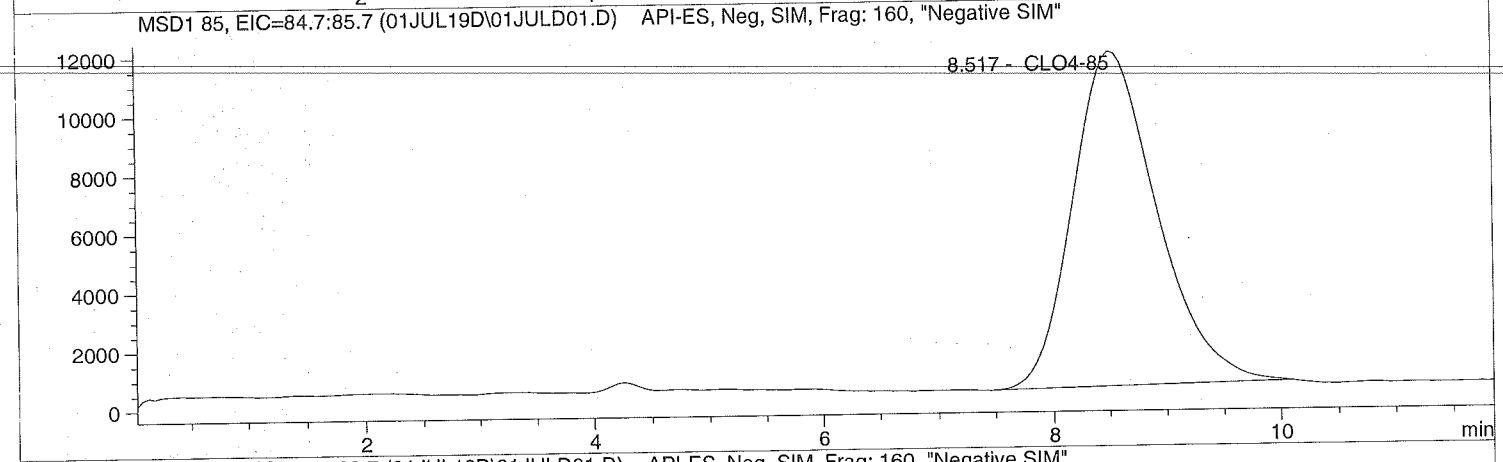
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD01.D Sample Name: 661477 CCV@25

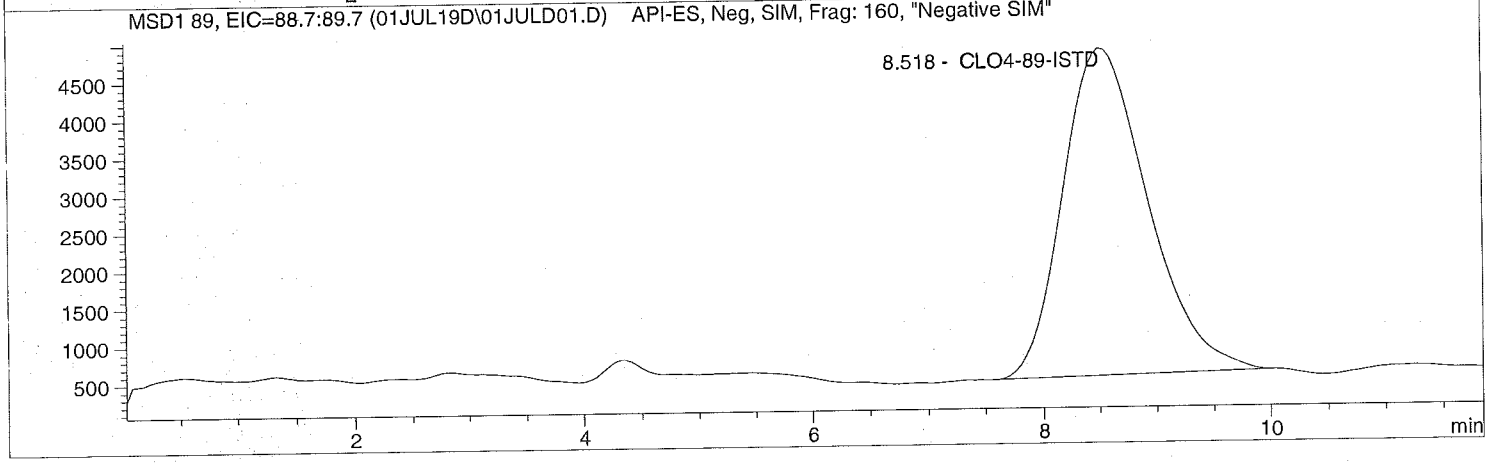
Injection Date:	7/01/2019 08:34:23	Seq Line:	1
Sample Name:	661477 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD01.D Sample Name: 661477 CCV@25

Injection Date:	7/01/2019 08:34:23	Seq Line:	1
Sample Name:	661477 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	PBA	1943636.6	26.1262	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.517	PBA	588479.1	26.6297	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.518	PBA	225730.5	5.0000	CLO4-89-ISTD

*** End of Report ***

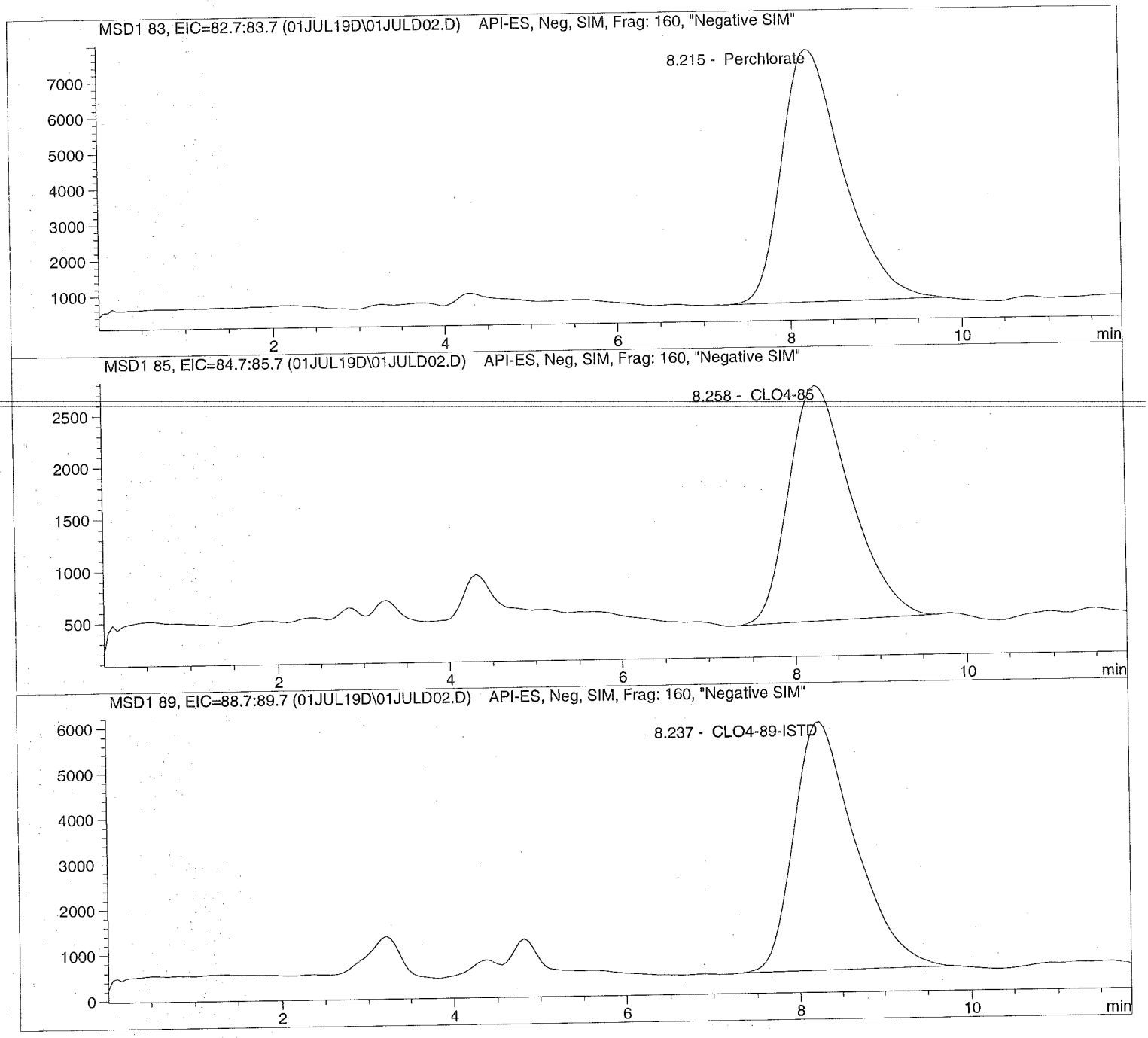
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD02.D Sample Name: 661481 QC@4.0

Injection Date:	7/01/2019 08:48:56	Seq Line:	2
Sample Name:	661481 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD02.D Sample Name: 661481 QC@4.0

Injection Date:	7/01/2019 08:48:56	Seq Line:	2
Sample Name:	661481 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.215	PBA	356116.2	4.2767	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.258	PBA	116199.5	4.5465	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.237	PBA	273484.5	5.0000	CLO4-89-ISTD

*** End of Report ***

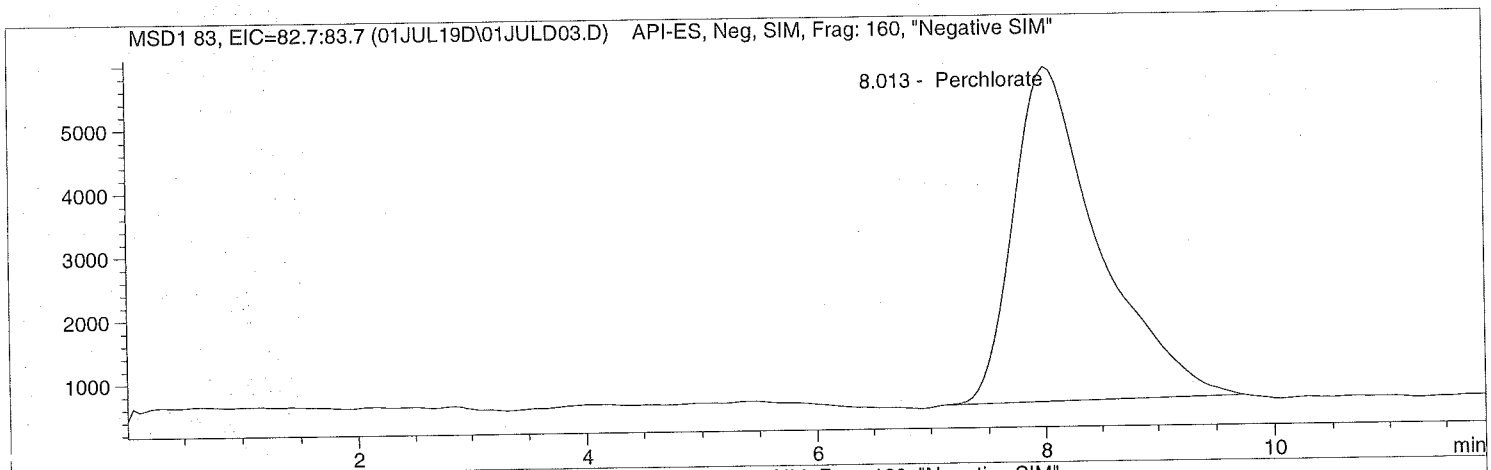
RIGHT SOLUTIONS | RIGHT PARTNER

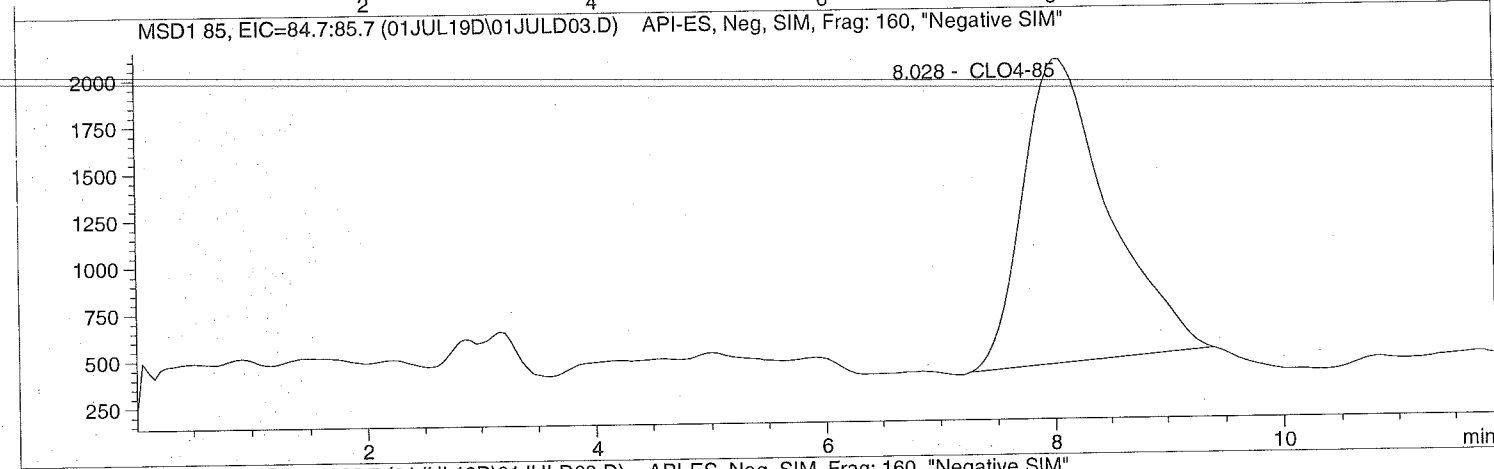
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD03.D Sample Name: 661479 ICS@4.0

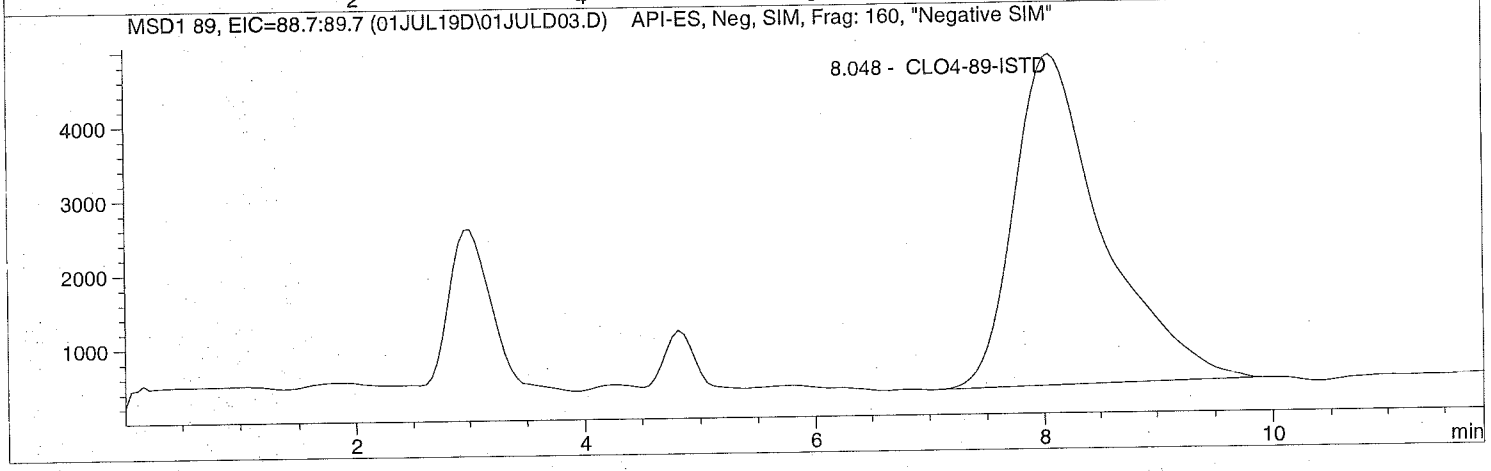
Injection Date:	7/01/2019 09:02:47	Seq Line:	3
Sample Name:	661479 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD03.D Sample Name: 661479 ICS@4.0

Injection Date:	7/01/2019 09:02:47	Seq Line:	3
Sample Name:	661479 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.013	BBA	274101.4	3.7627	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.028	PBA	85145.5	3.7892	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.048	PBA	240788.6	5.0000	CLO4-89-ISTD

*** End of Report ***

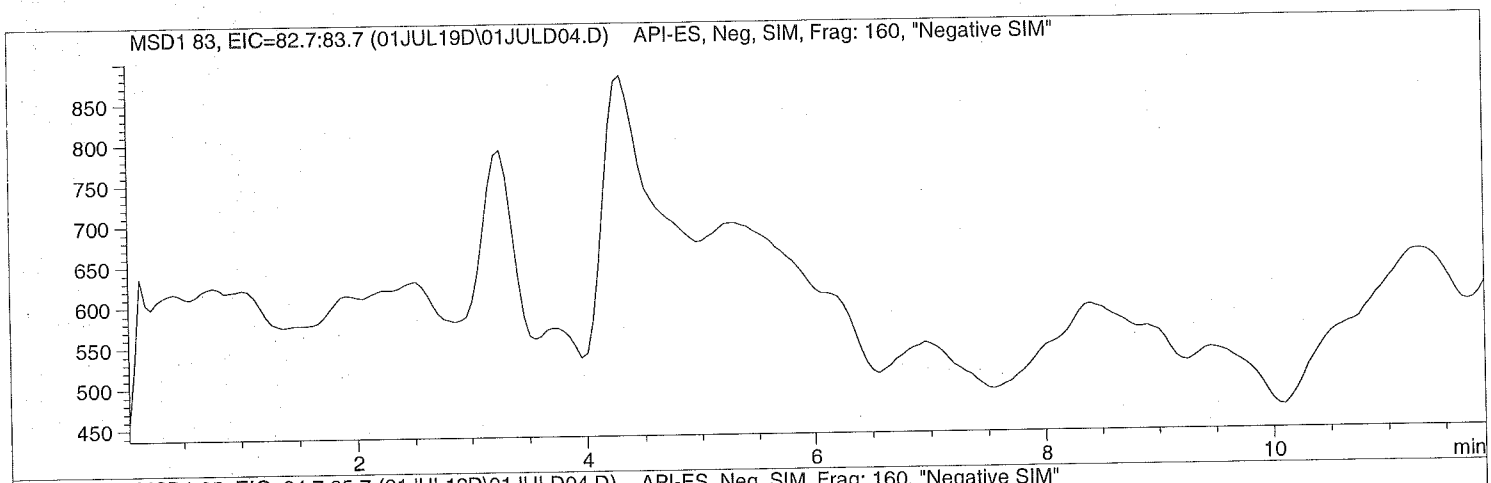
RIGHT SOLUTIONS | RIGHT PARTNER

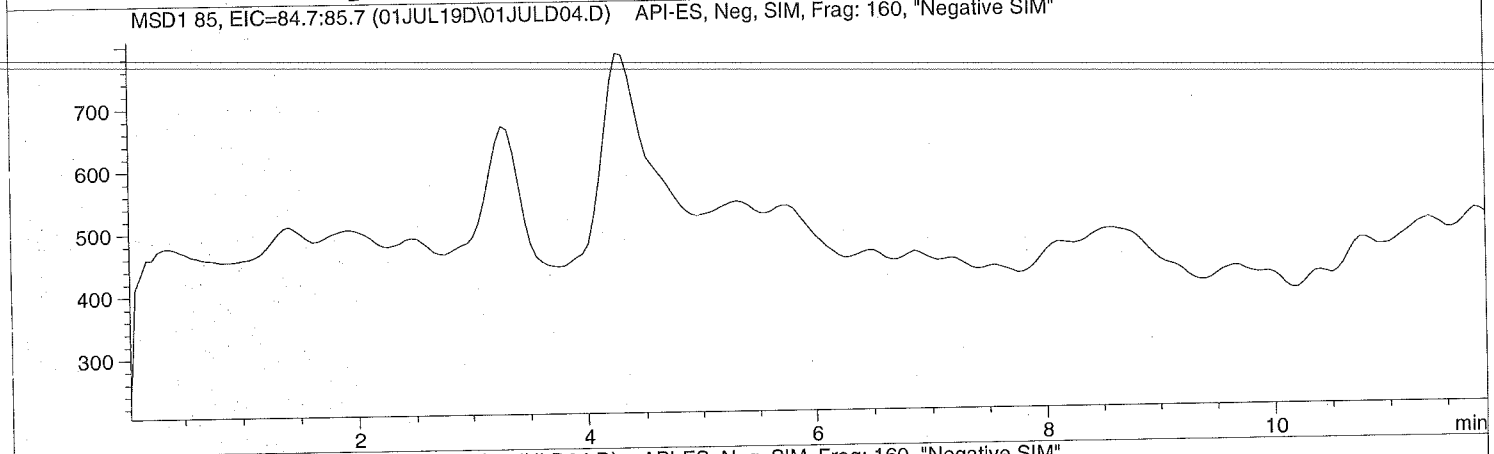
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD04.D Sample Name: 661480 LMB

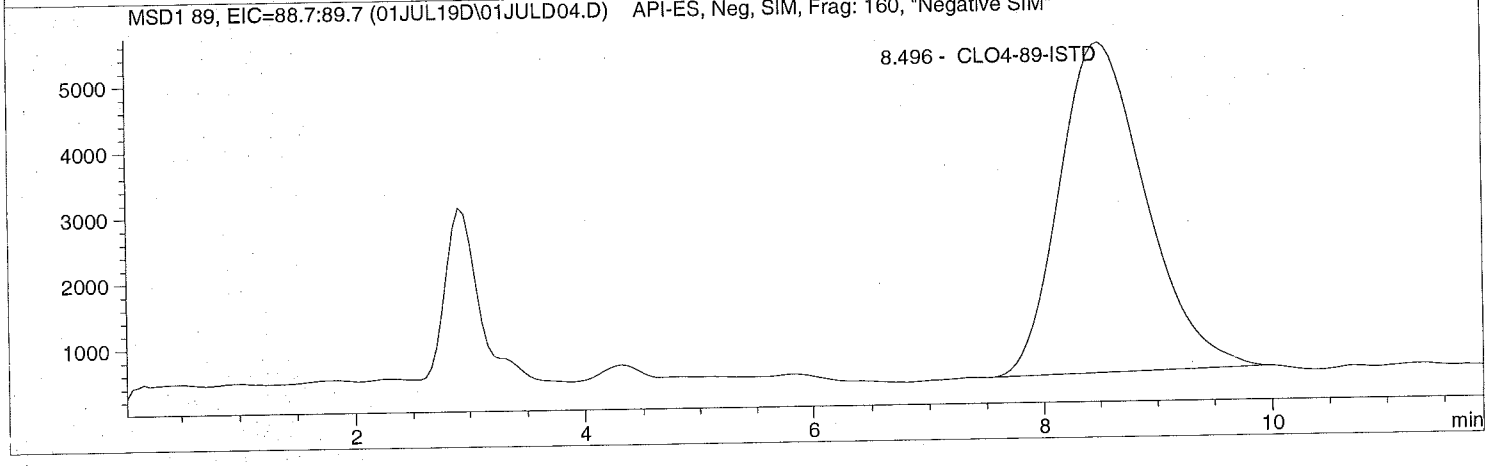
Injection Date:	7/01/2019 09:16:47	Seq Line:	4
Sample Name:	661480 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD04.D Sample Name: 661480 LMB

Injection Date:	7/01/2019 09:16:47	Seq Line:	4
Sample Name:	661480 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.496	PBA	263576.3	5.0000	CLO4-89-ISTD

*** End of Report ***

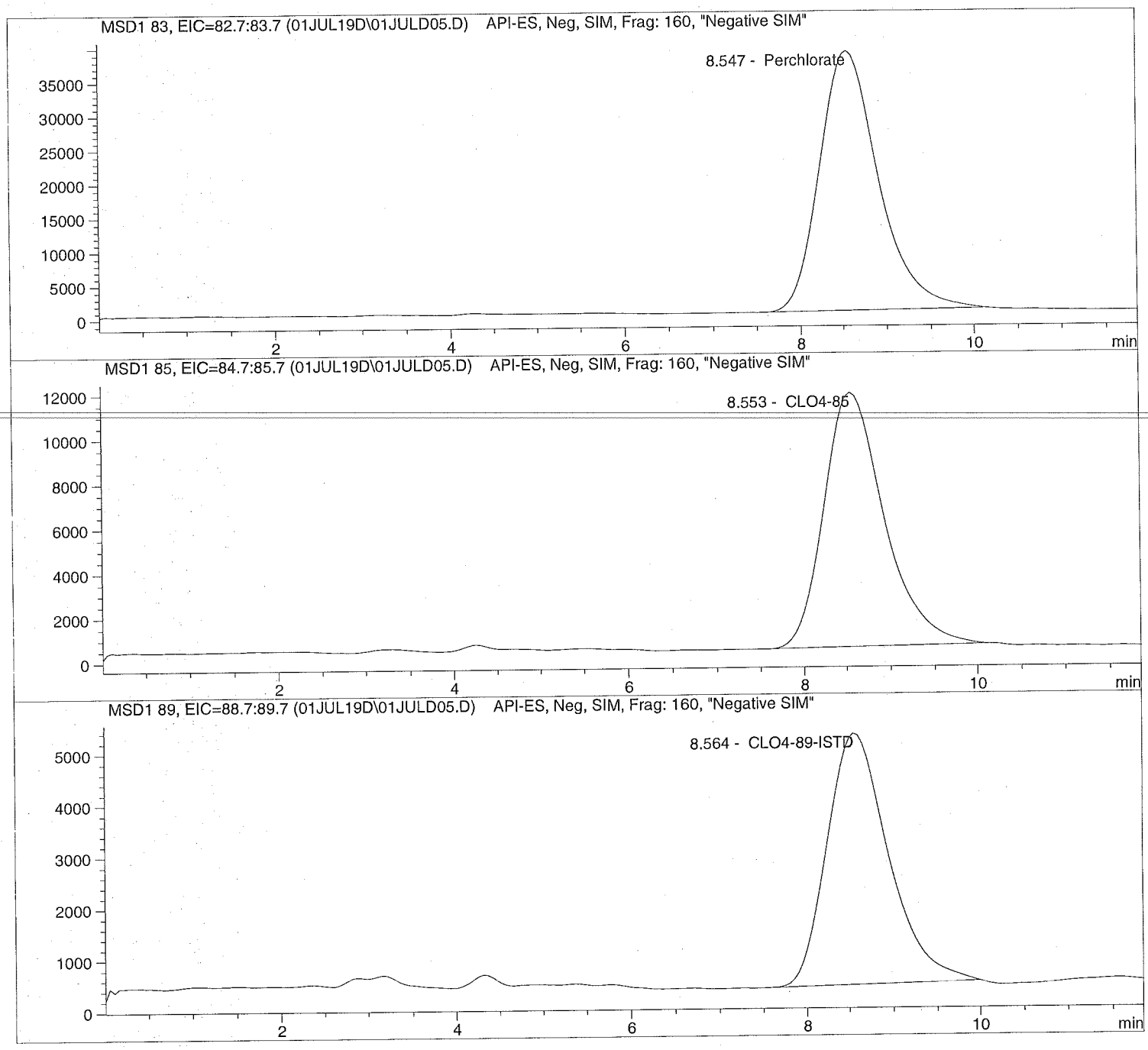
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD05.D Sample Name: 1917698001 1K

Injection Date:	7/01/2019 09:30:40	Seq Line:	5
Sample Name:	1917698001 1K	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD05.D Sample Name: 1917698001 1K

Injection Date:	7/01/2019 09:30:40	Seq Line:	5
Sample Name:	1917698001 1K	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.547	PBA	1805754.9	23069.7173	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.553	PBA	548647.9	23574.3344	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.564	PBA	239254.8	5000.0000	CLO4-89-ISTD

*** End of Report ***

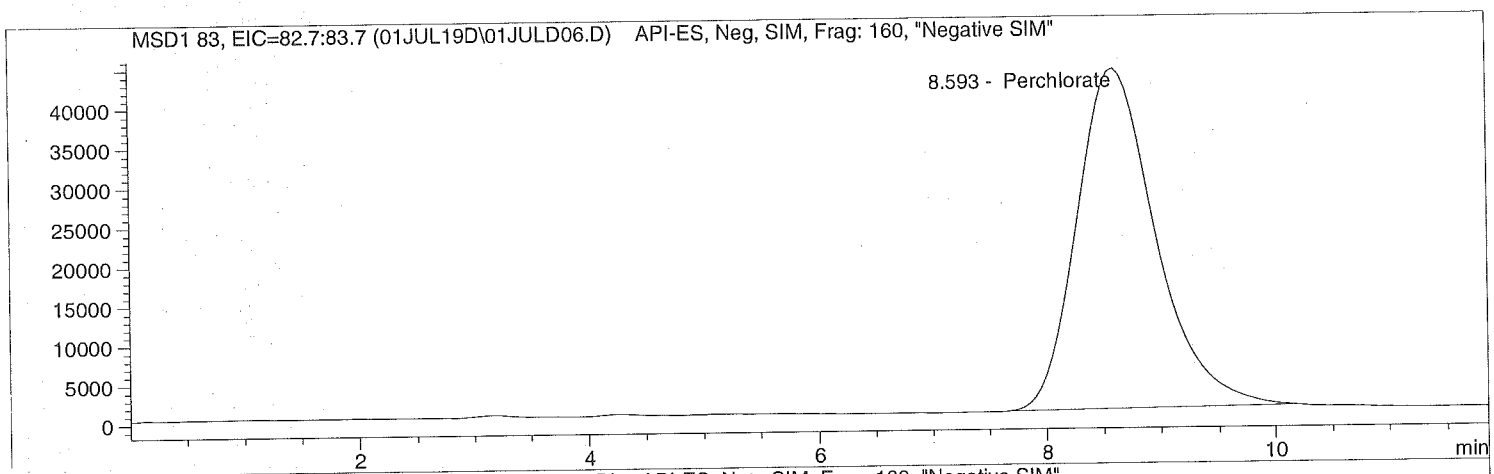
RIGHT SOLUTIONS | RIGHT PARTNER

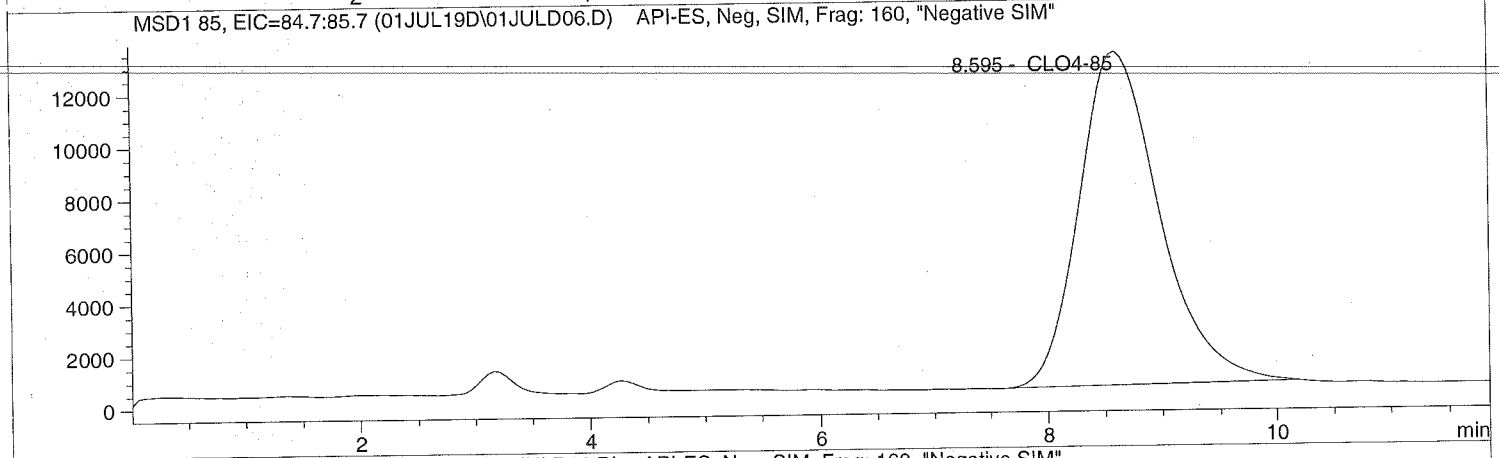
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD06.D Sample Name: 1917698002 1K

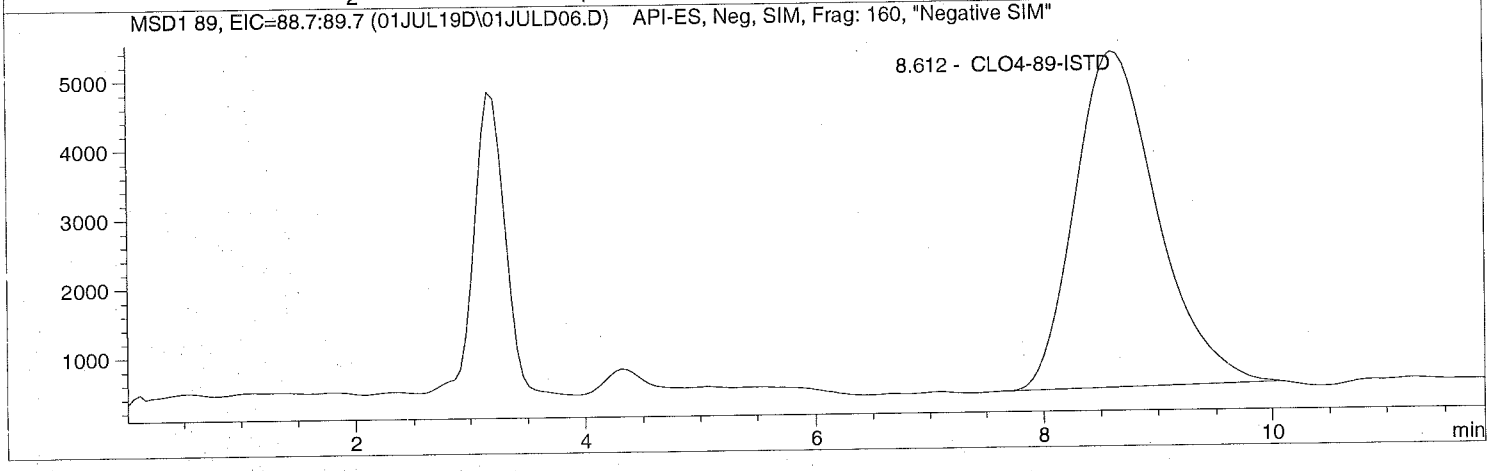
Injection Date:	7/01/2019 09:44:35	Seq Line:	6
Sample Name:	1917698002 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD06.D Sample Name: 1917698002 1K

Injection Date:	7/01/2019 09:44:35	Seq Line:	6
Sample Name:	1917698002 1K	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.593	PBA	2060095.9	25862.7348	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.595	PBA	620225.7	26218.7320	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.612	PBA	241844.5	5000.0000	CLO4-89-ISTD

*** End of Report ***

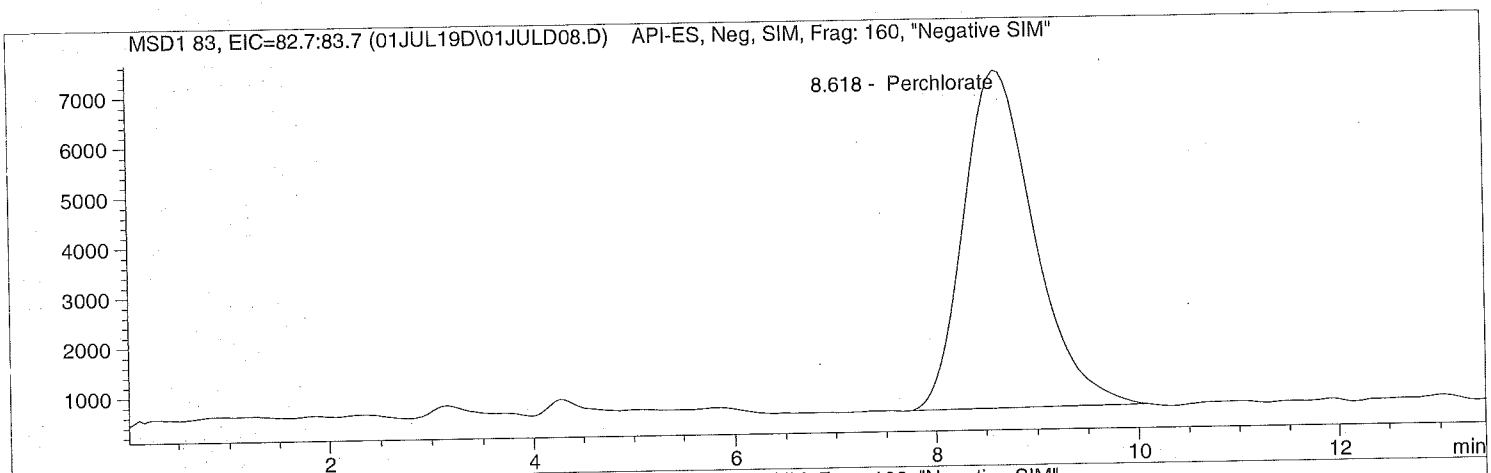
RIGHT SOLUTIONS | RIGHT PARTNER

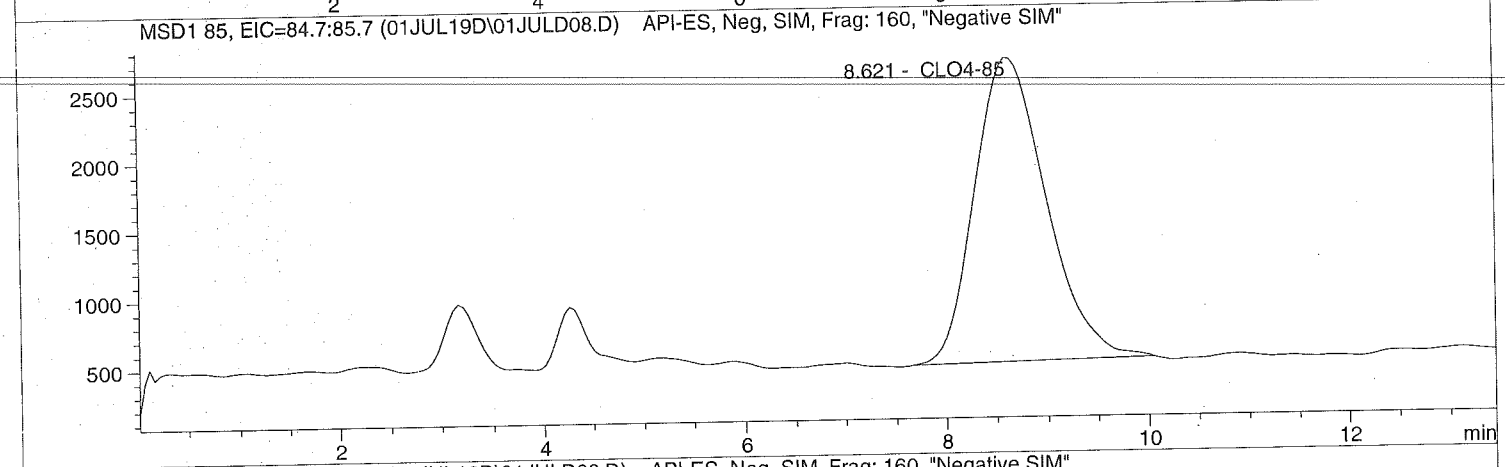
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD08.D Sample Name: 1917698004 1K

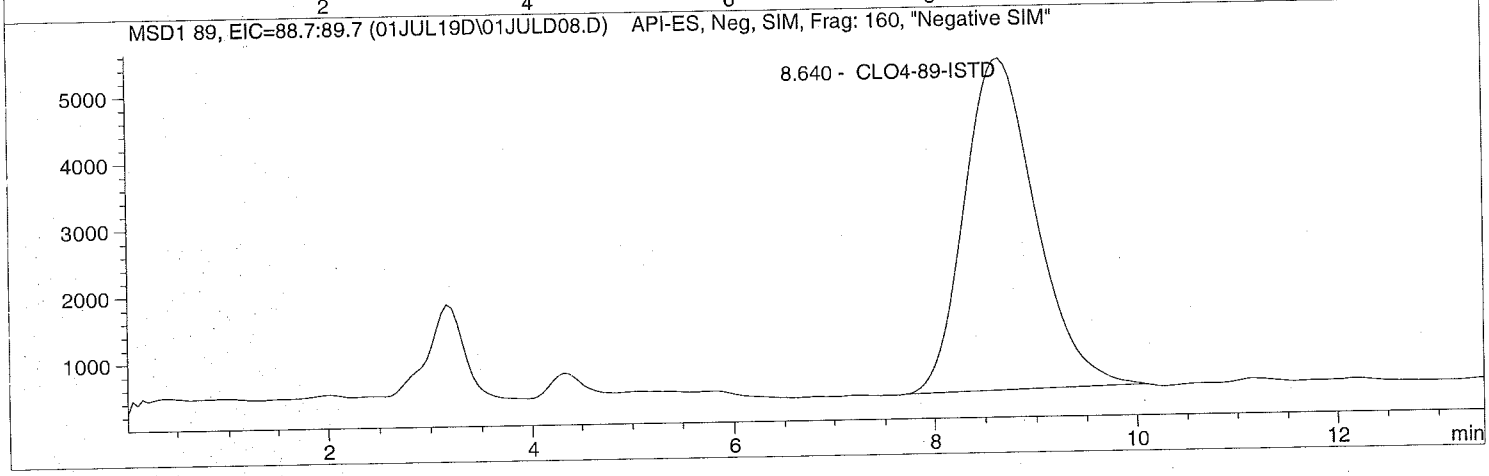
Injection Date:	7/01/2019 10:12:34	Seq Line:	8
Sample Name:	1917698004 1K	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD08.D Sample Name: 1917698004 1K

Injection Date:	7/01/2019 10:12:34	Seq Line:	8
Sample Name:	1917698004 1K	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.618	PBA	325841.4	4410.0033	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.621	PBA	108064.0	4769.8535	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.640	PBA	242319.7	5000.0000	CLO4-89-ISTD

*** End of Report ***

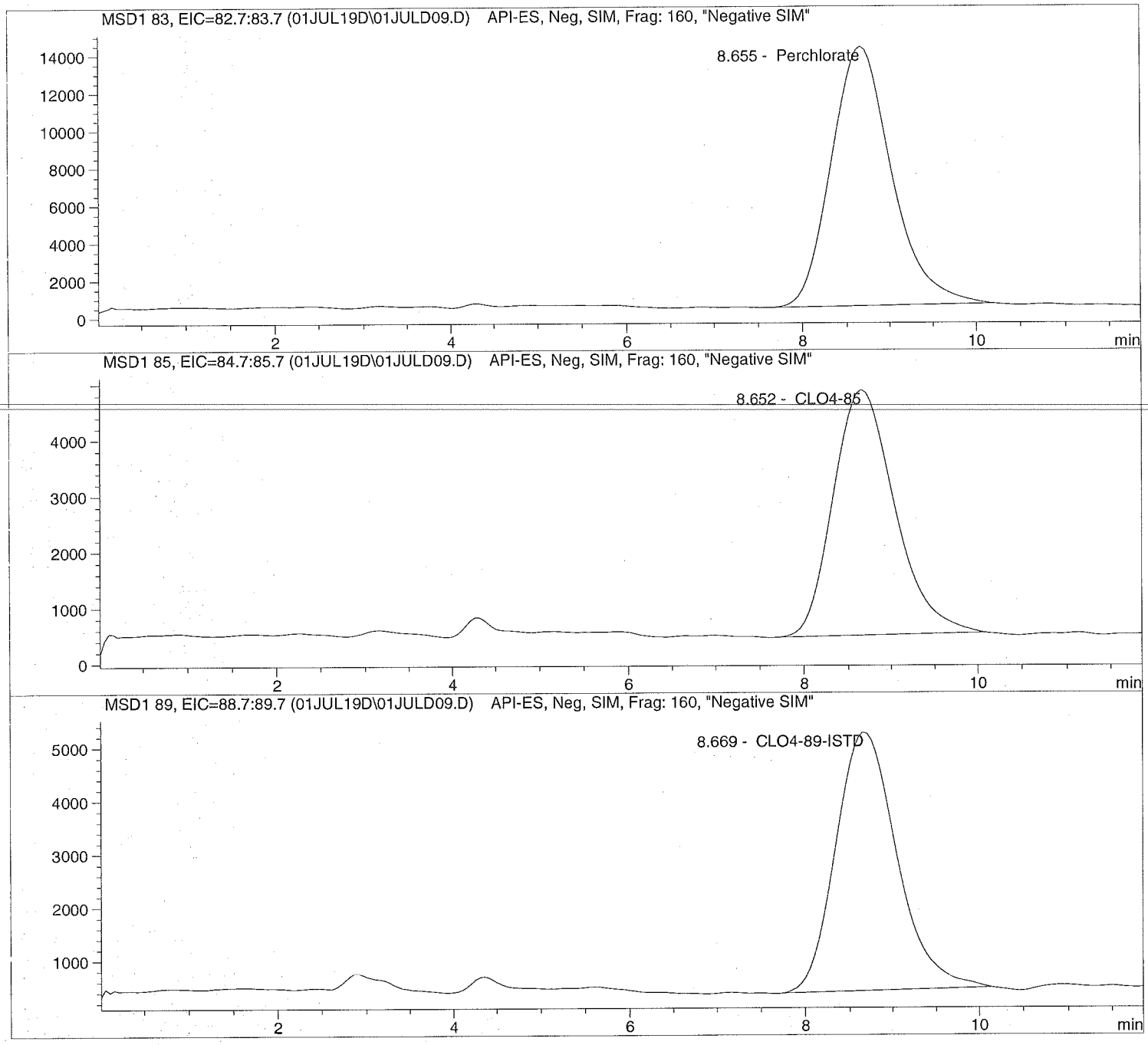
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD09.D Sample Name: 1917698005 MS

Injection Date:	7/01/2019 10:28:15	Seq Line:	9
Sample Name:	1917698005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD09.D Sample Name: 1917698005 MS

Injection Date:	7/01/2019 10:28:15	Seq Line:	9
Sample Name:	1917698005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.655	PBA	667091.1	8914.2872	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.652	PBA	216450.0	9609.4600	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.669	PBA	238517.6	5000.0000	CLO4-89-ISTD

*** End of Report ***

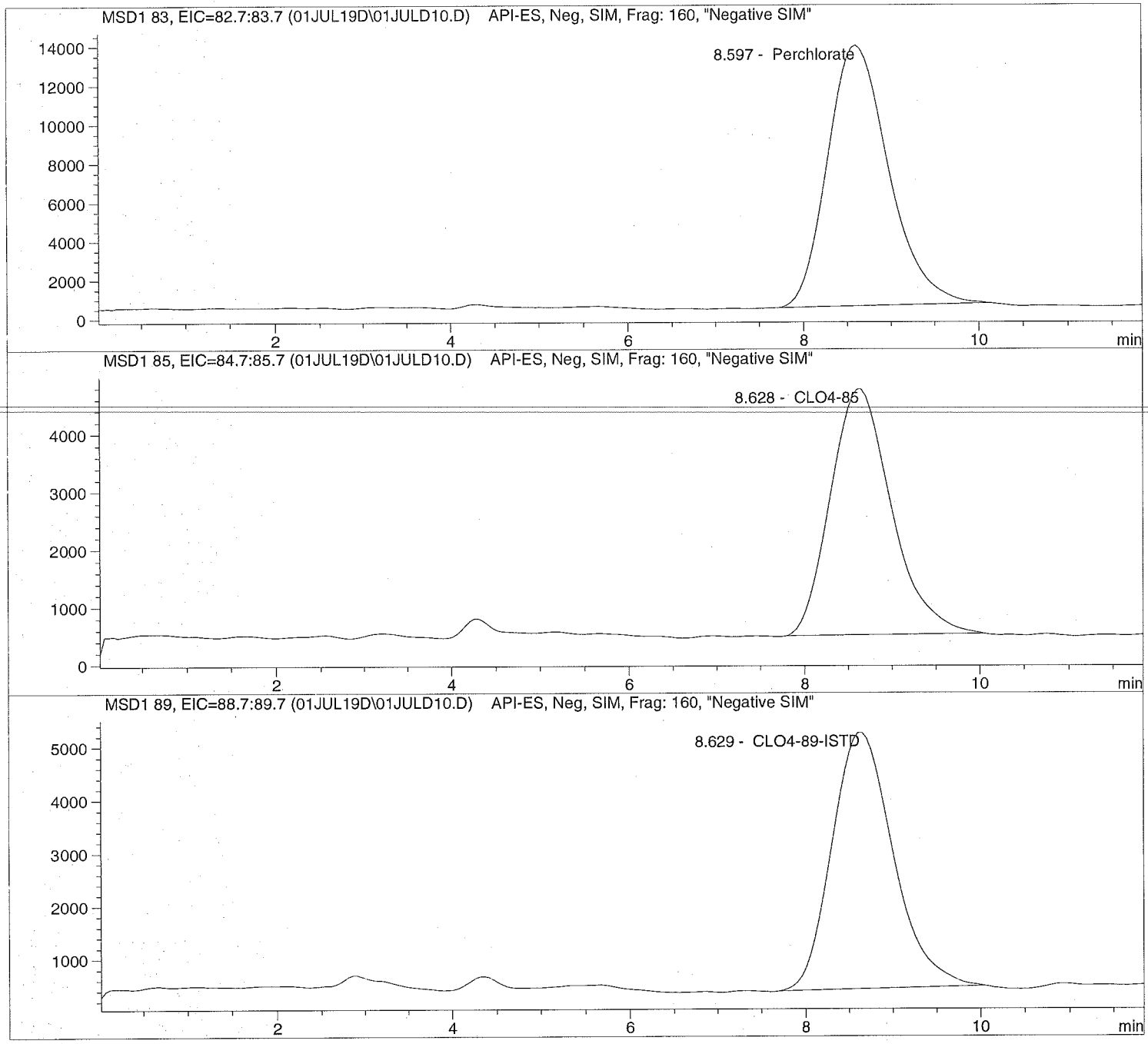
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD10.D Sample Name: 1917698006 MSD

Injection Date:	7/01/2019 10:43:07	Seq Line:	10
Sample Name:	1917698006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD10.D Sample Name: 1917698006 MSD

Injection Date:	7/01/2019 10:43:07	Seq Line:	10
Sample Name:	1917698006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.597	PBA	651481.5	8808.9698	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.628	BBA	206556.3	9281.2867	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.629	PBA	235827.1	5000.0000	CLO4-89-ISTD

*** End of Report ***

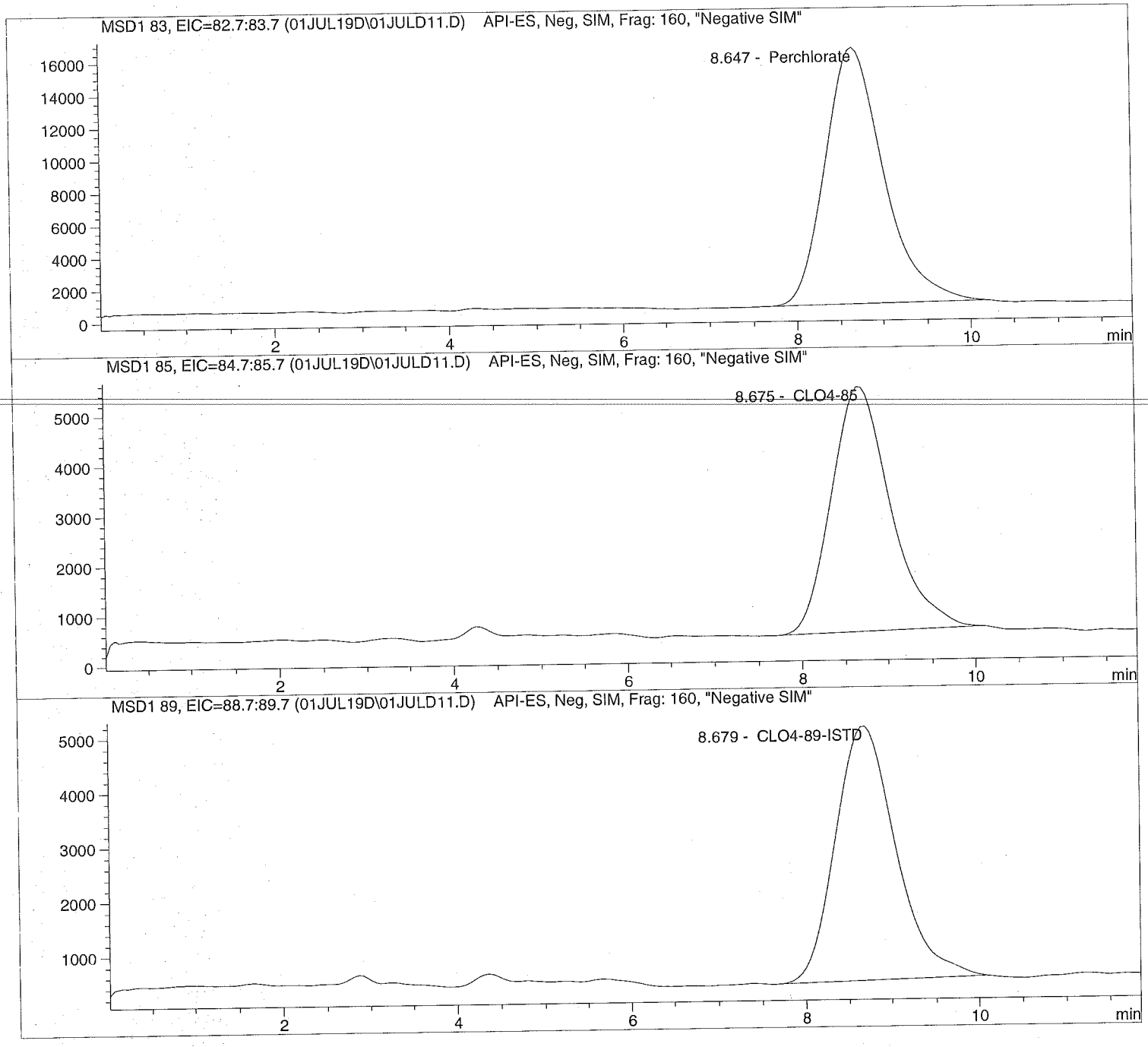
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD11.D Sample Name: 1917698007 1K

Injection Date:	7/01/2019 10:56:59	Seq Line:	11
Sample Name:	1917698007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD11.D Sample Name: 1917698007 1K

Injection Date:	7/01/2019 10:56:59	Seq Line:	11
Sample Name:	1917698007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.647	PBA	747887.6	10411.1564	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.675	PBA	234170.4	10865.1642	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.679	PBA	227614.9	5000.0000	CLO4-89-ISTD

*** End of Report ***

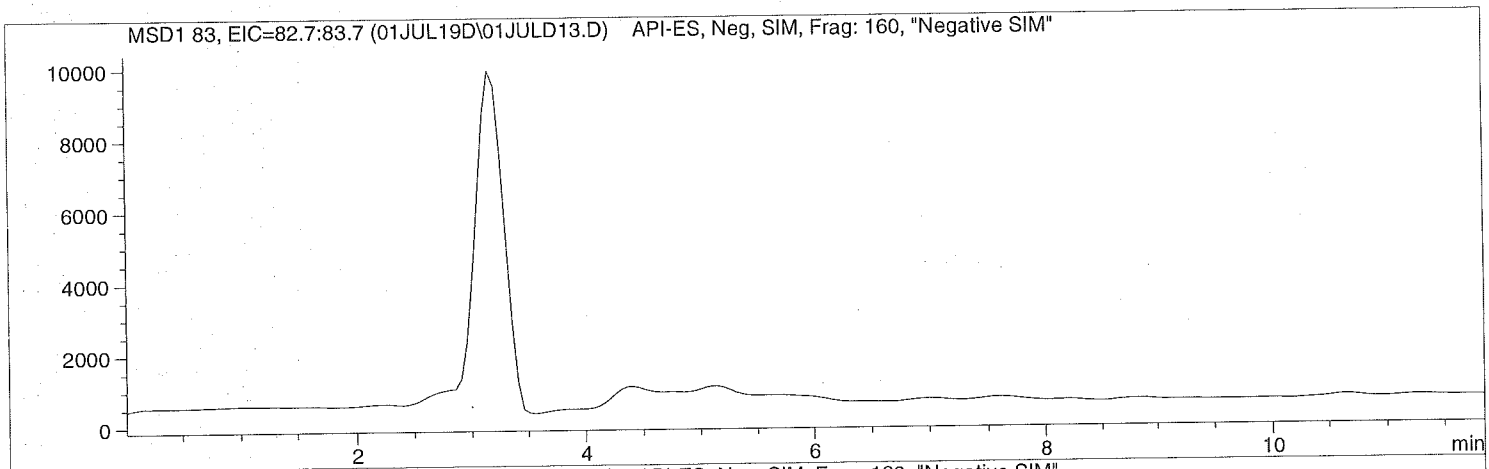
RIGHT SOLUTIONS | RIGHT PARTNER

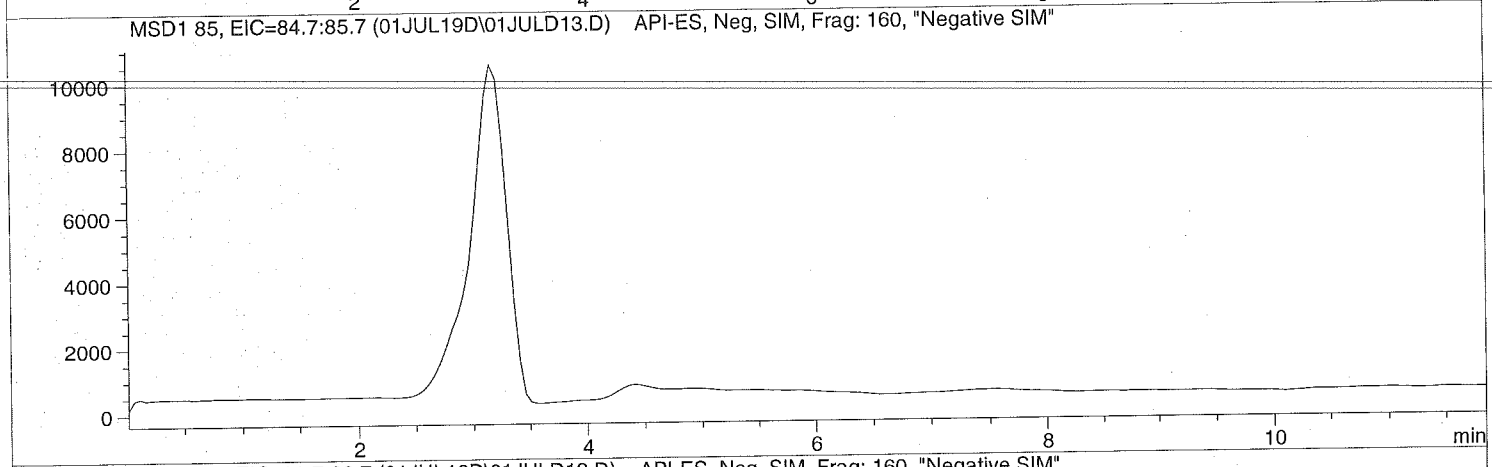
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD13.D Sample Name: 1917856001

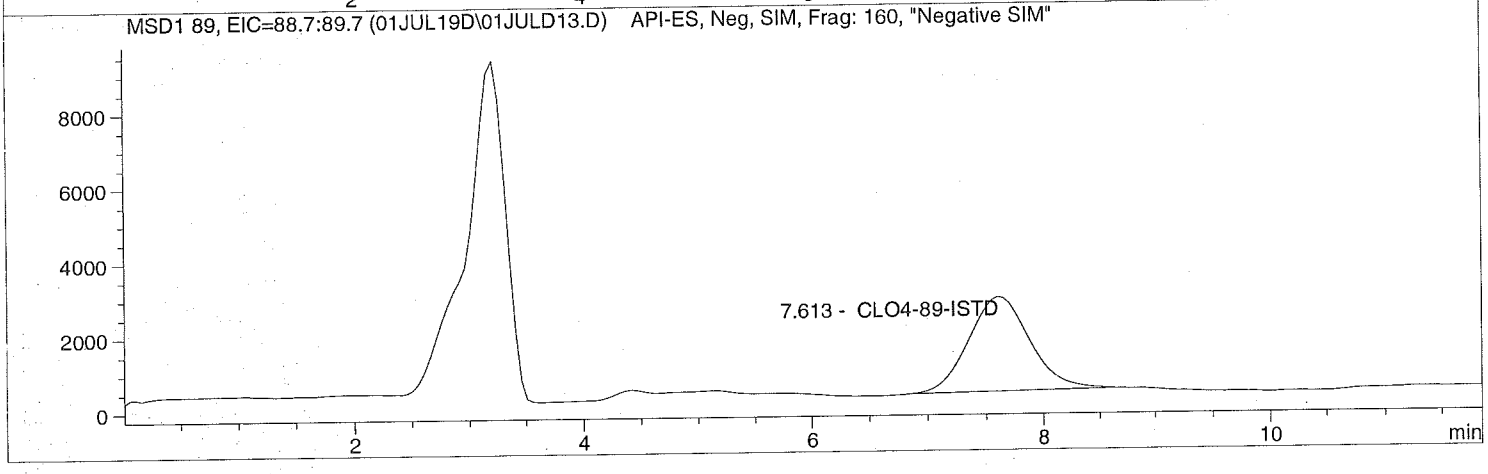
Injection Date:	7/01/2019 11:24:46	Seq Line:	13
Sample Name:	1917856001	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD13.D Sample Name: 1917856001

Injection Date:	7/01/2019 11:24:46	Seq Line:	13
Sample Name:	1917856001	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.613	PBA	93134.2	5.0000	CLO4-89-ISTD

*** End of Report ***

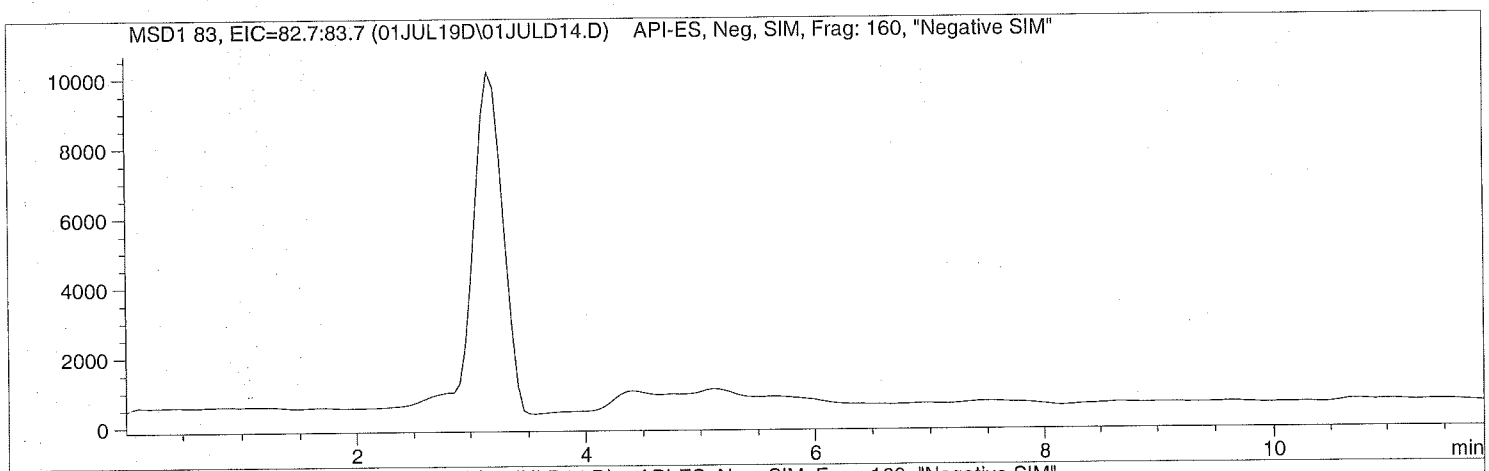
RIGHT SOLUTIONS | RIGHT PARTNER

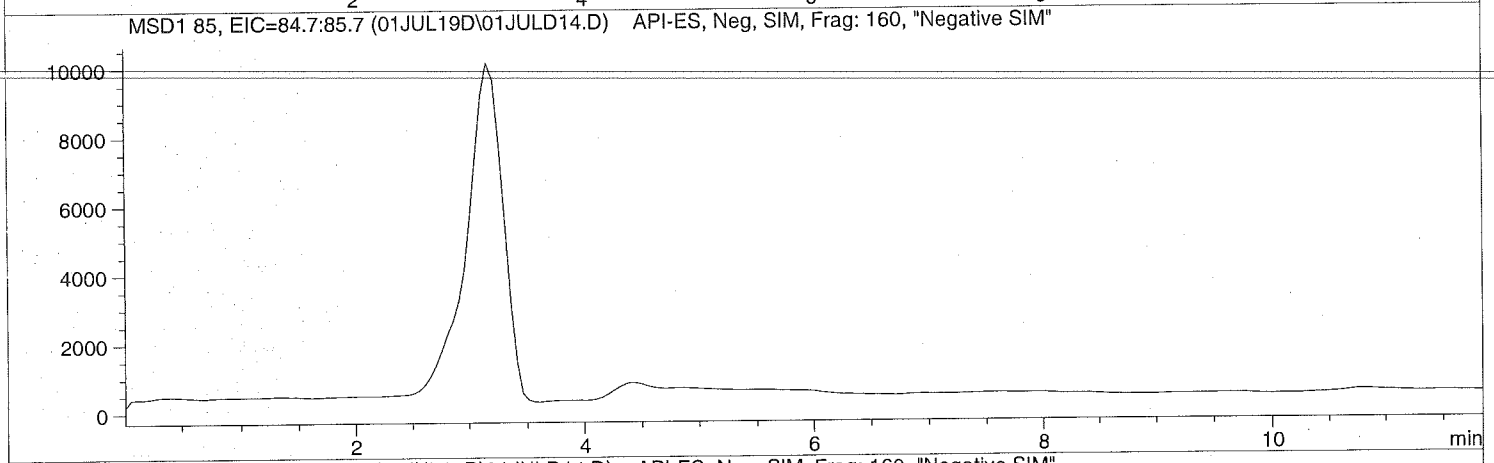
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD14.D Sample Name: 1917856002

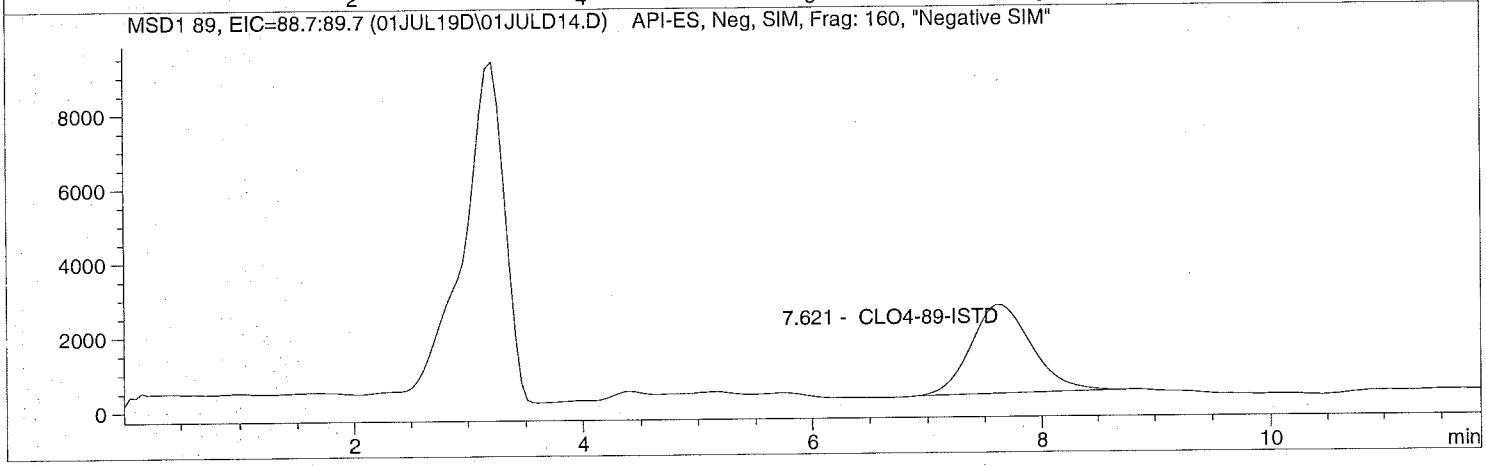
Injection Date:	7/01/2019 11:38:38	Seq Line:	14
Sample Name:	1917856002	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD14.D Sample Name: 1917856002

Injection Date:	7/01/2019 11:38:38	Seq Line:	14
Sample Name:	1917856002	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.621	PBA	87949.8	5.0000	CLO4-89-ISTD

*** End of Report ***

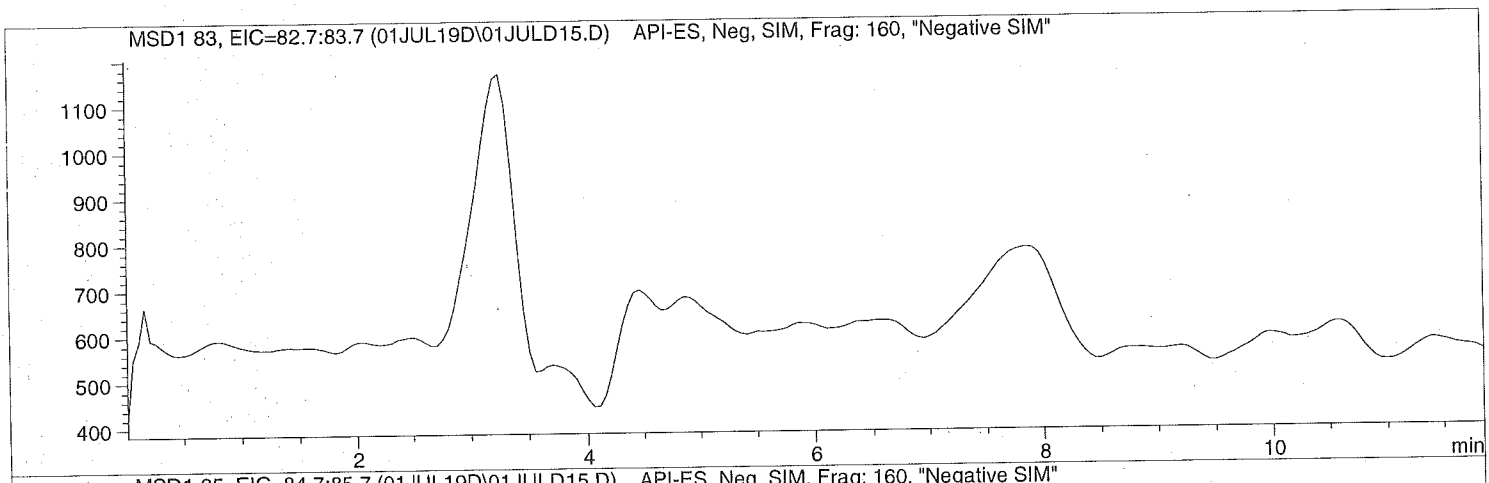
RIGHT SOLUTIONS | RIGHT PARTNER

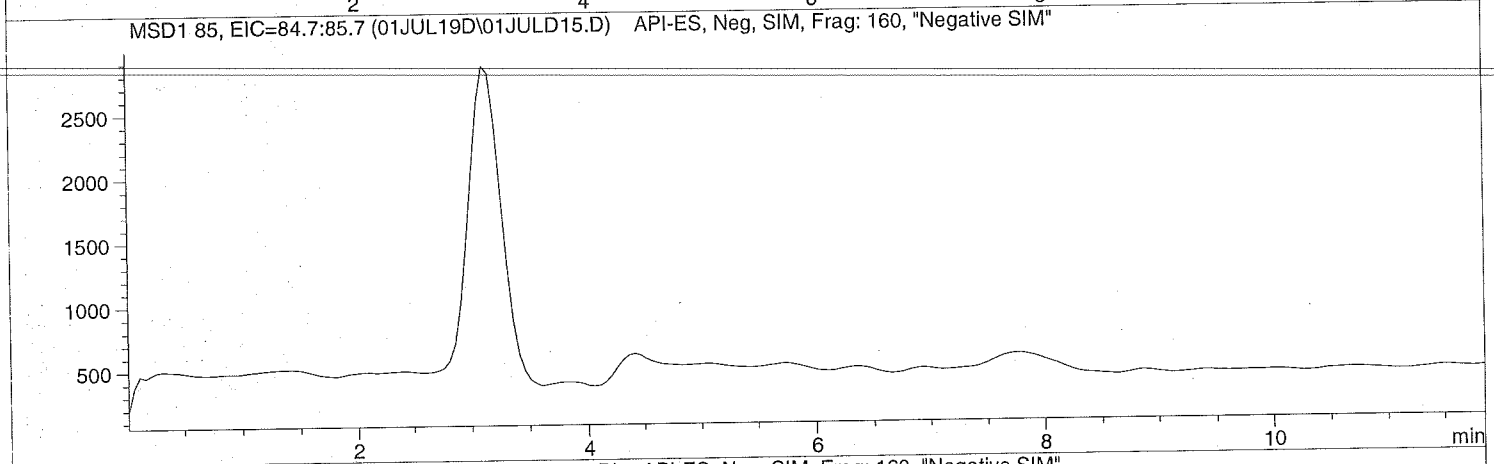
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

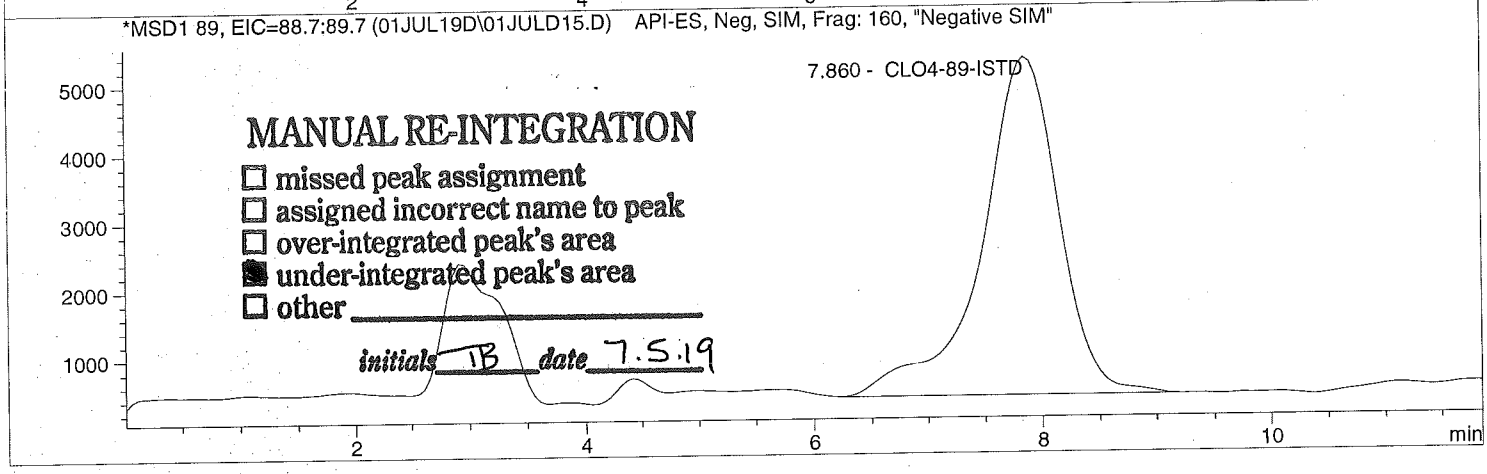
Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







MANUAL RE-INTEGRATION
- ☐ missed peak assignment
- ☐ assigned incorrect name to peak
- ☐ over-integrated peak's area
- ■ under-integrated peak's area
- ☐ other _____

initials TB date 7.5.19

RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.860	MM	230973.5	5.0000	CLO4-89-ISTD

*** End of Report ***

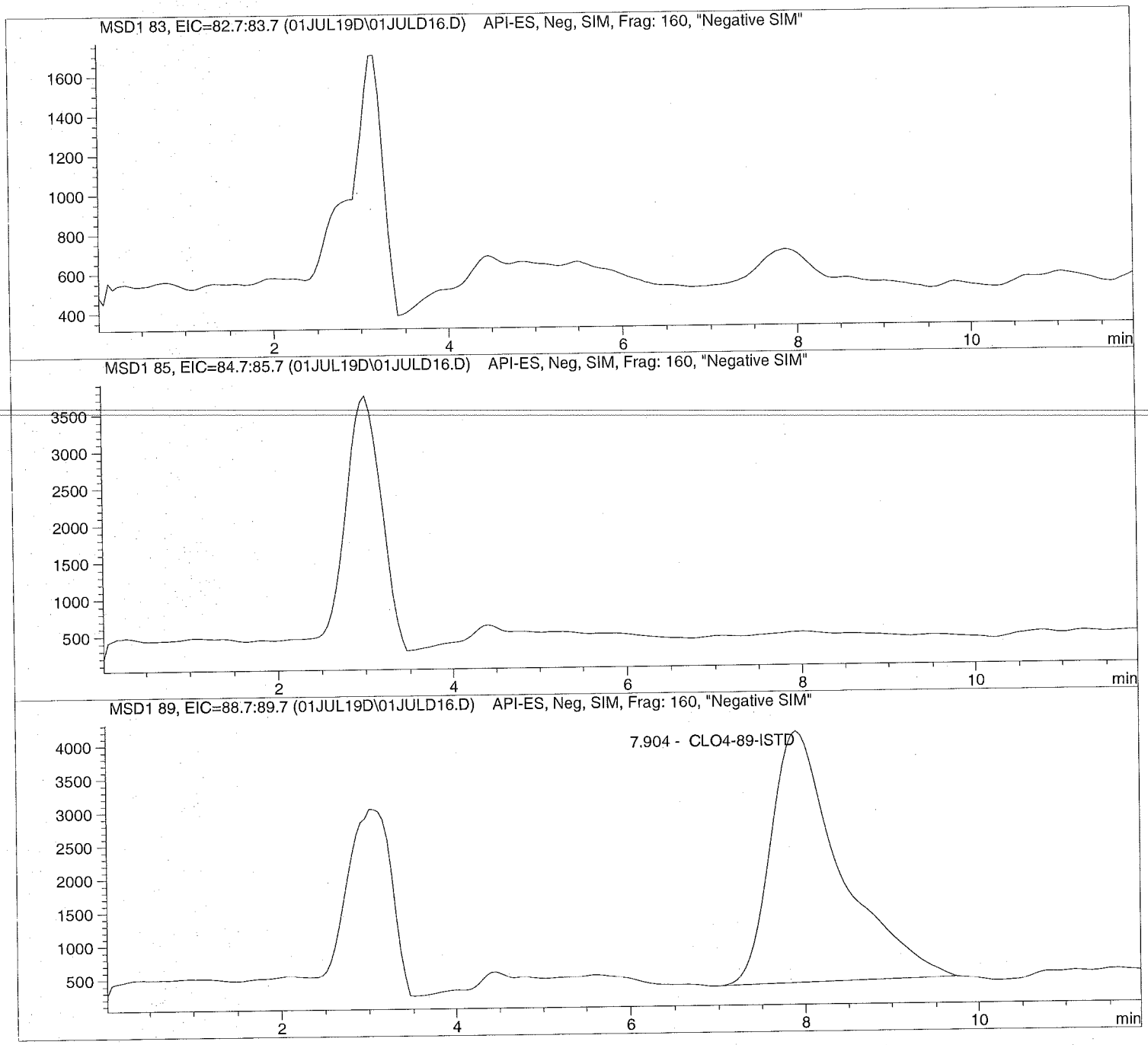
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD16.D Sample Name: 1917856004

Injection Date:	7/01/2019 12:06:28	Seq Line:	16
Sample Name:	1917856004	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD16.D Sample Name: 1917856004

Injection Date:	7/01/2019 12:06:28	Seq Line:	16
Sample Name:	1917856004	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.904	PBA	208544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

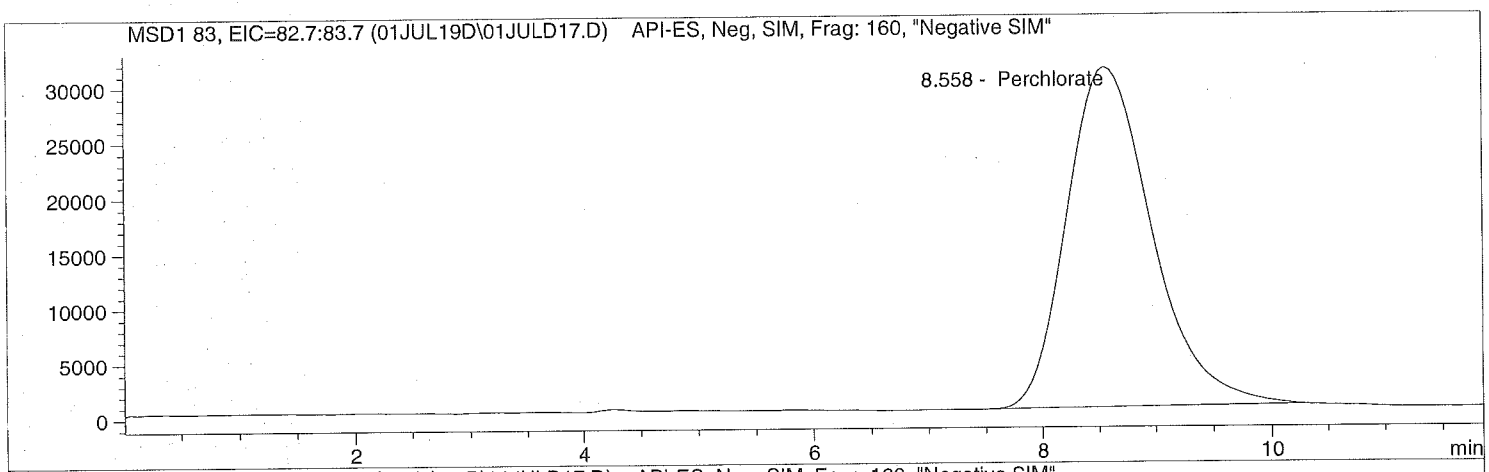
RIGHT SOLUTIONS | RIGHT PARTNER

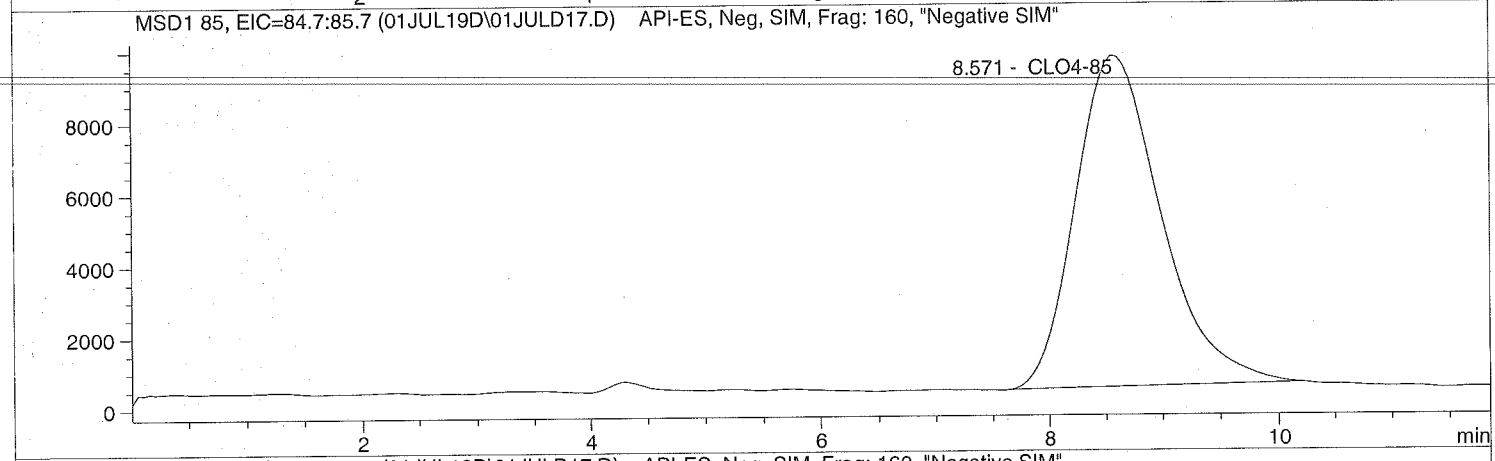
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD17.D Sample Name: 661482 CCV@25

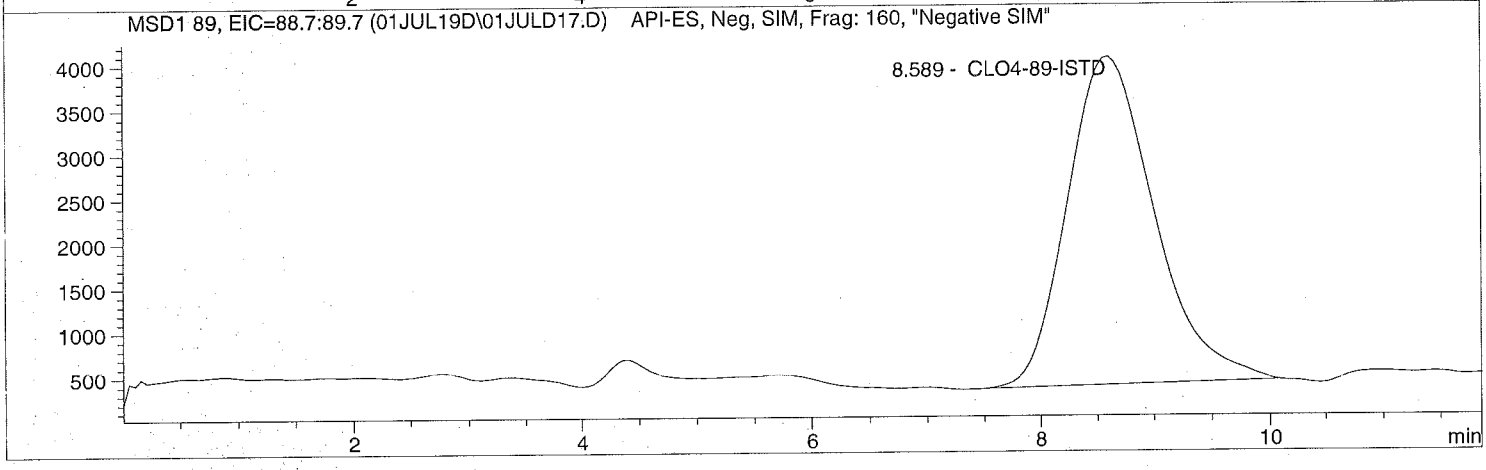
Injection Date:	7/01/2019 12:20:29	Seq Line:	17
Sample Name:	661482 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD17.D Sample Name: 661482 CCV@25

Injection Date:	7/01/2019 12:20:29	Seq Line:	17
Sample Name:	661482 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.558	PBA	1604090.1	25.0035	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.571	PBA	485334.3	25.4617	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.589	PBA	195182.3	5.0000	CLO4-89-ISTD

*** End of Report ***

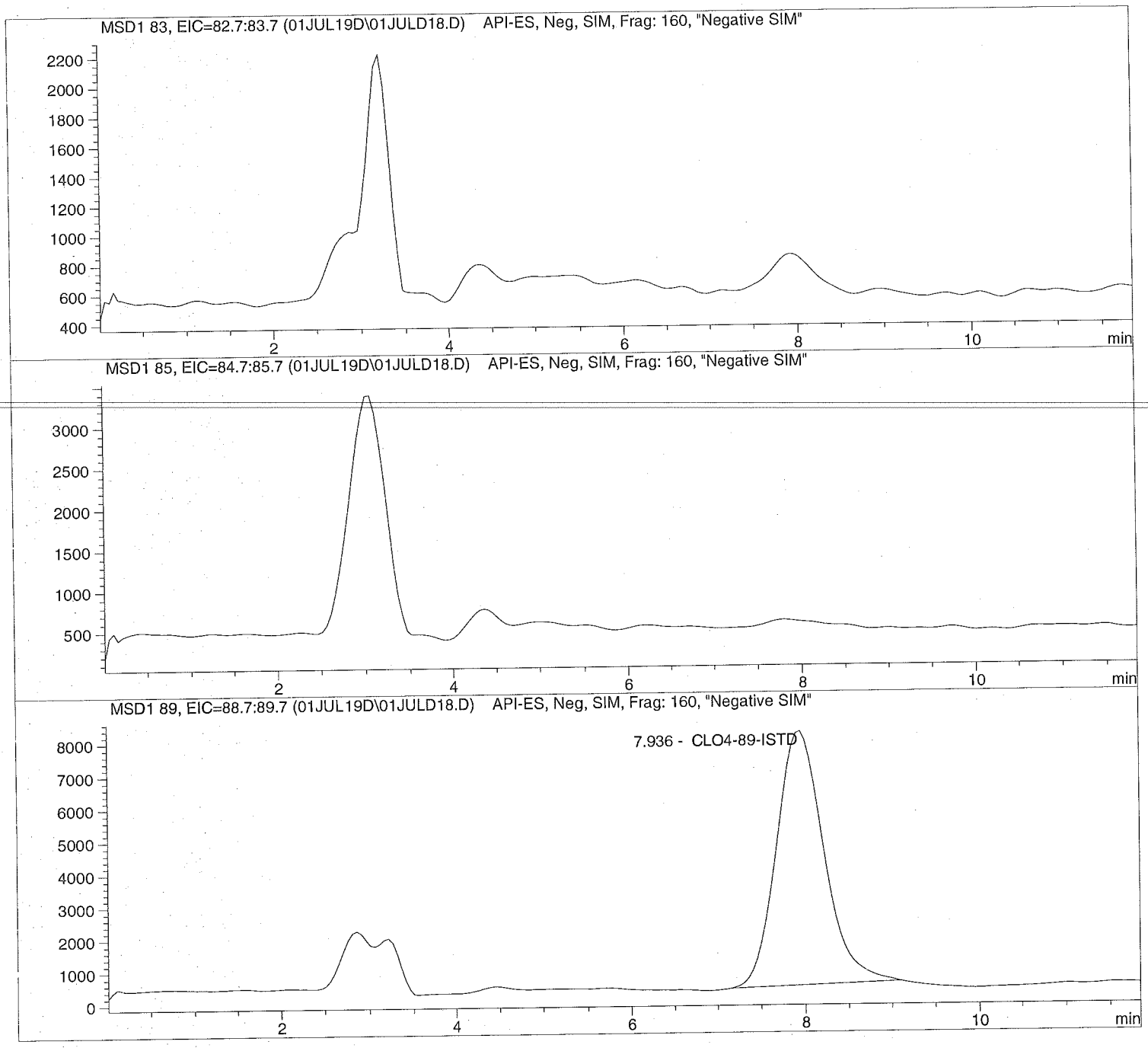
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD18.D Sample Name: 1917856005

Injection Date:	7/01/2019 12:34:22	Seq Line:	18
Sample Name:	1917856005	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD18.D Sample Name: 1917856005

Injection Date:	7/01/2019 12:34:22	Seq Line:	18
Sample Name:	1917856005	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.936	PBA	292027.4	5.0000	CLO4-89-ISTD

*** End of Report ***

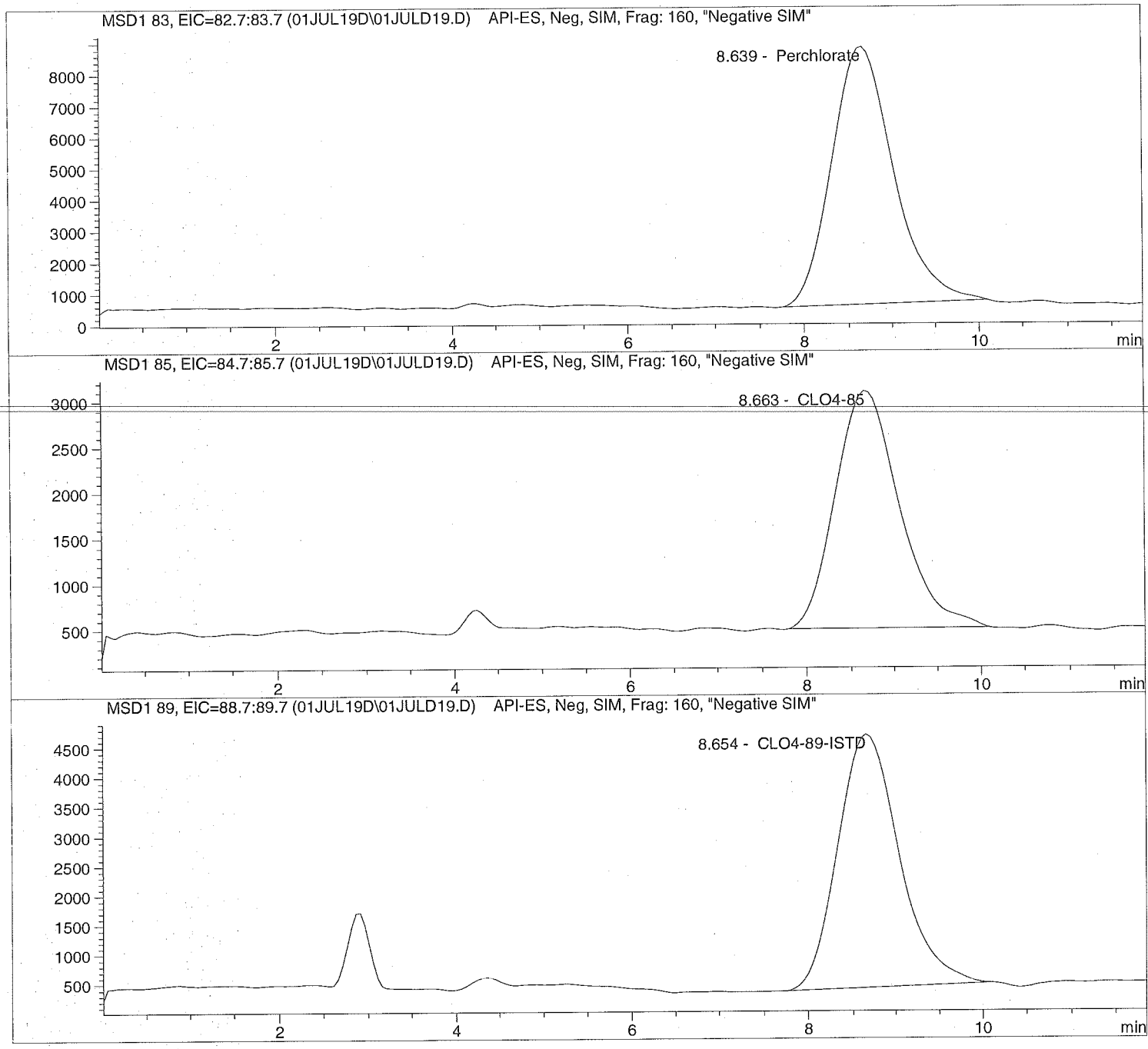
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD19.D Sample Name: 1917856006 100

Injection Date:	7/01/2019 12:48:15	Seq Line:	19
Sample Name:	1917856006 100	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD19.D Sample Name: 1917856006 100

Injection Date:	7/01/2019 12:48:15	Seq Line:	19
Sample Name:	1917856006 100	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.639	PBA	403838.0	621.0643	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.663	BBA	132725.9	672.8711	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.654	PBA	210141.8	500.0000	CLO4-89-ISTD

*** End of Report ***

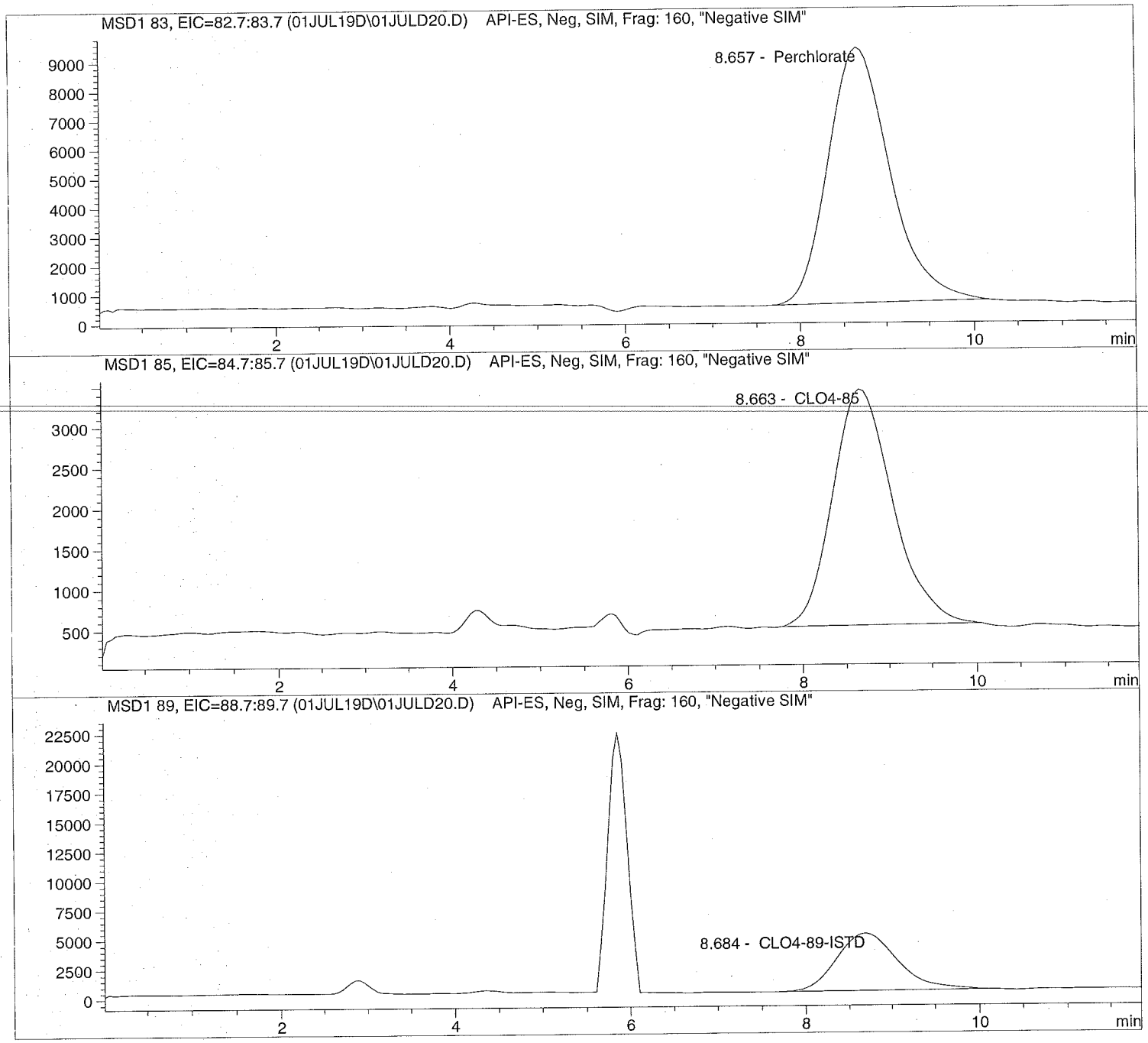
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD20.D Sample Name: 1917856007 100

Injection Date:	7/01/2019 13:02:10	Seq Line:	20
Sample Name:	1917856007 100	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD20.D Sample Name: 1917856007 100

Injection Date:	7/01/2019 13:02:10	Seq Line:	20
Sample Name:	1917856007 100	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.657	PBA	434273.7	588.1581	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.663	BBA	140119.4	624.8207	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.684	PBA	239145.3	500.0000	CLO4-89-ISTD

*** End of Report ***

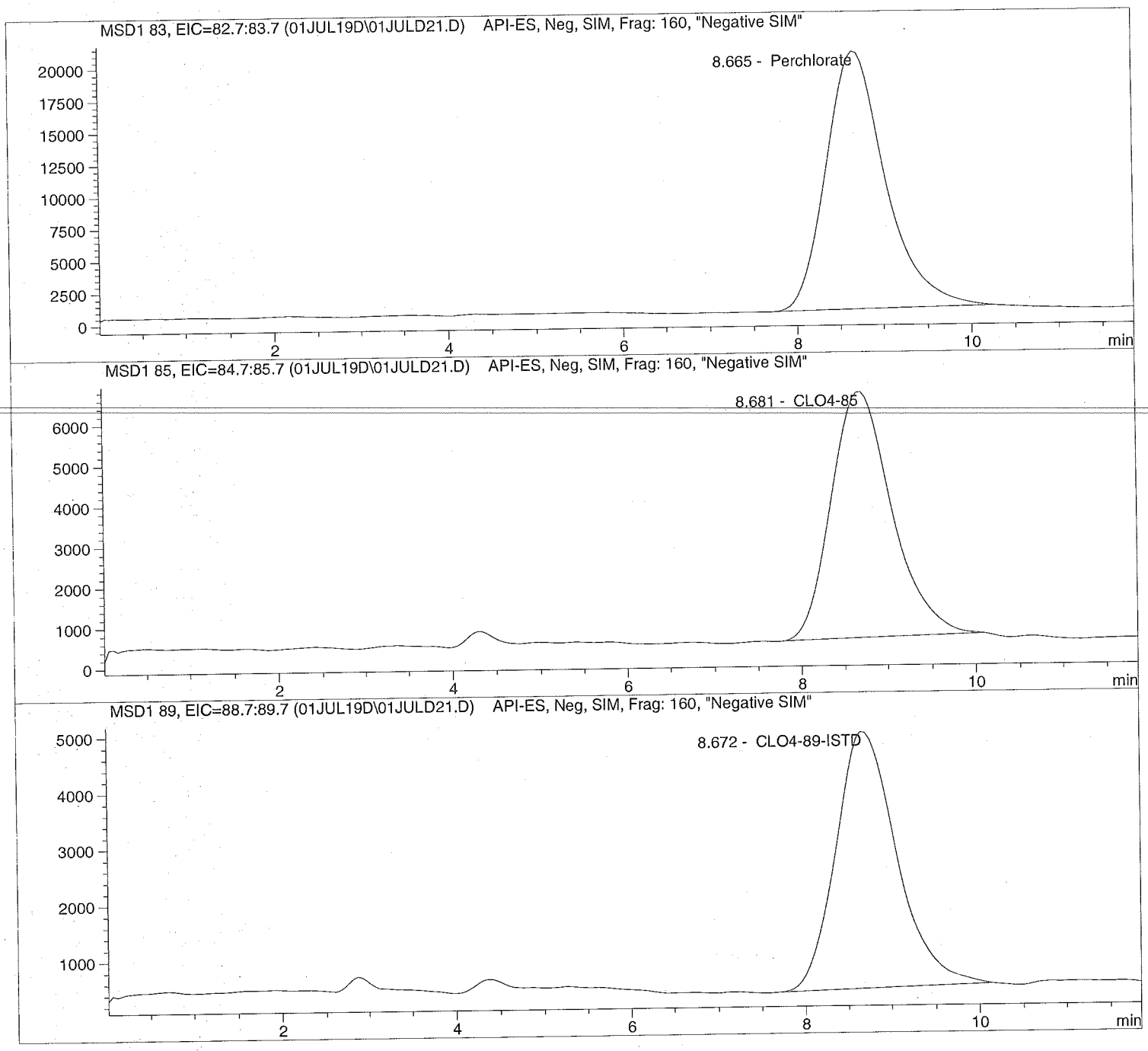
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD21.D Sample Name: 1918052001 1K

Injection Date:	7/01/2019 13:16:12	Seq Line:	21
Sample Name:	1918052001 1K	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD21.D Sample Name: 1918052001 1K

Injection Date:	7/01/2019 13:16:12	Seq Line:	21
Sample Name:	1918052001 1K	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.665	PBA	958578.9	13475.4930	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.681	PBA	295207.3	13884.7680	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.672	PBA	223102.2	5000.0000	CLO4-89-ISTD

*** End of Report ***

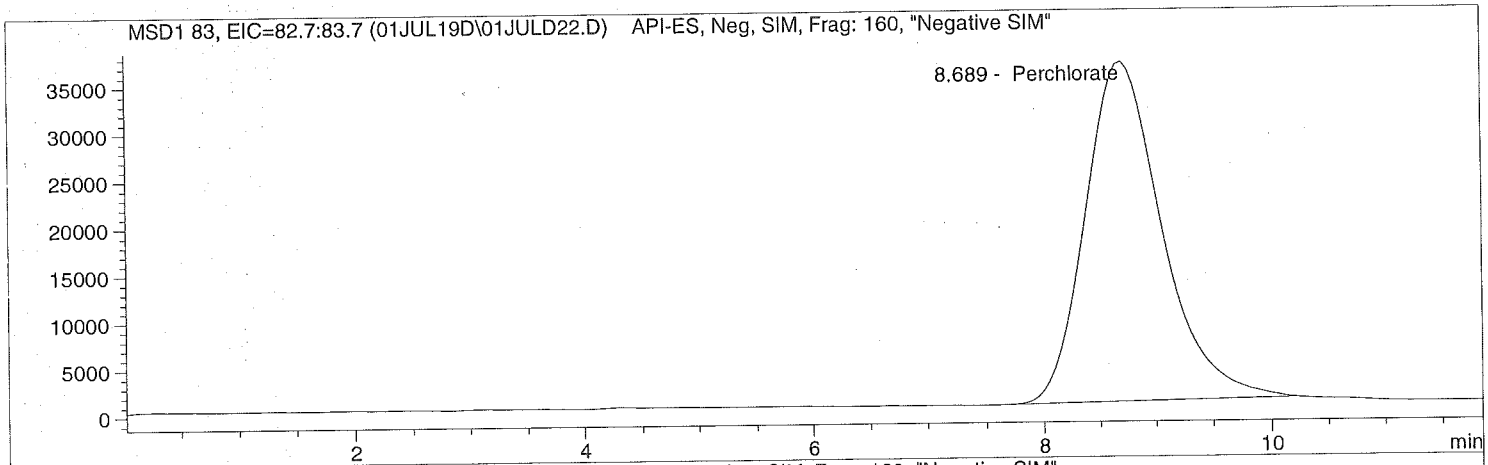
RIGHT SOLUTIONS | RIGHT PARTNER

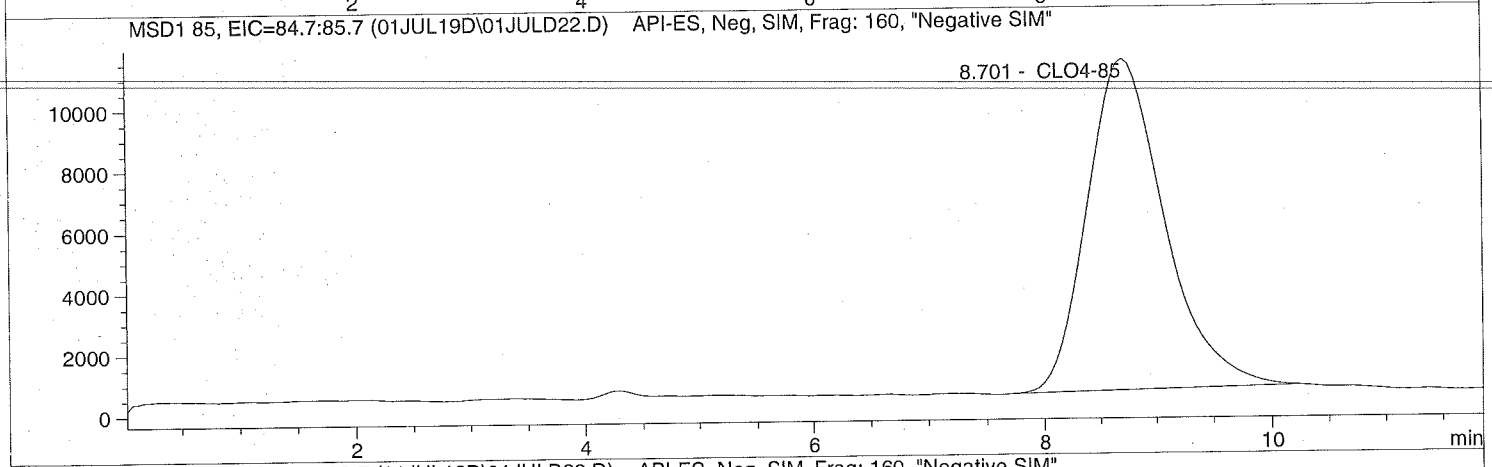
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD22.D Sample Name: 1918052002 10K

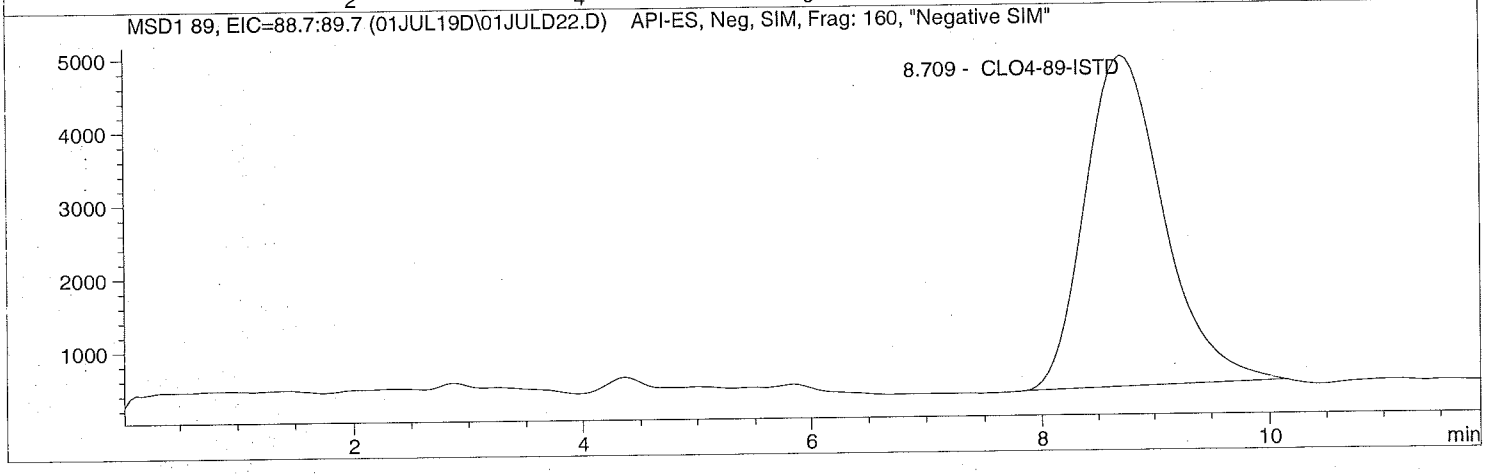
Injection Date:	7/01/2019 13:30:09	Seq Line:	22
Sample Name:	1918052002 10K	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD22.D Sample Name: 1918052002 10K

Injection Date:	7/01/2019 13:30:09	Seq Line:	22
Sample Name:	1918052002 10K	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.689	PBA	1701736.0	236511.4245	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.701	PBA	516167.1	241333.7557	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.709	PBA	219618.3	50000.0000	CLO4-89-ISTD

*** End of Report ***

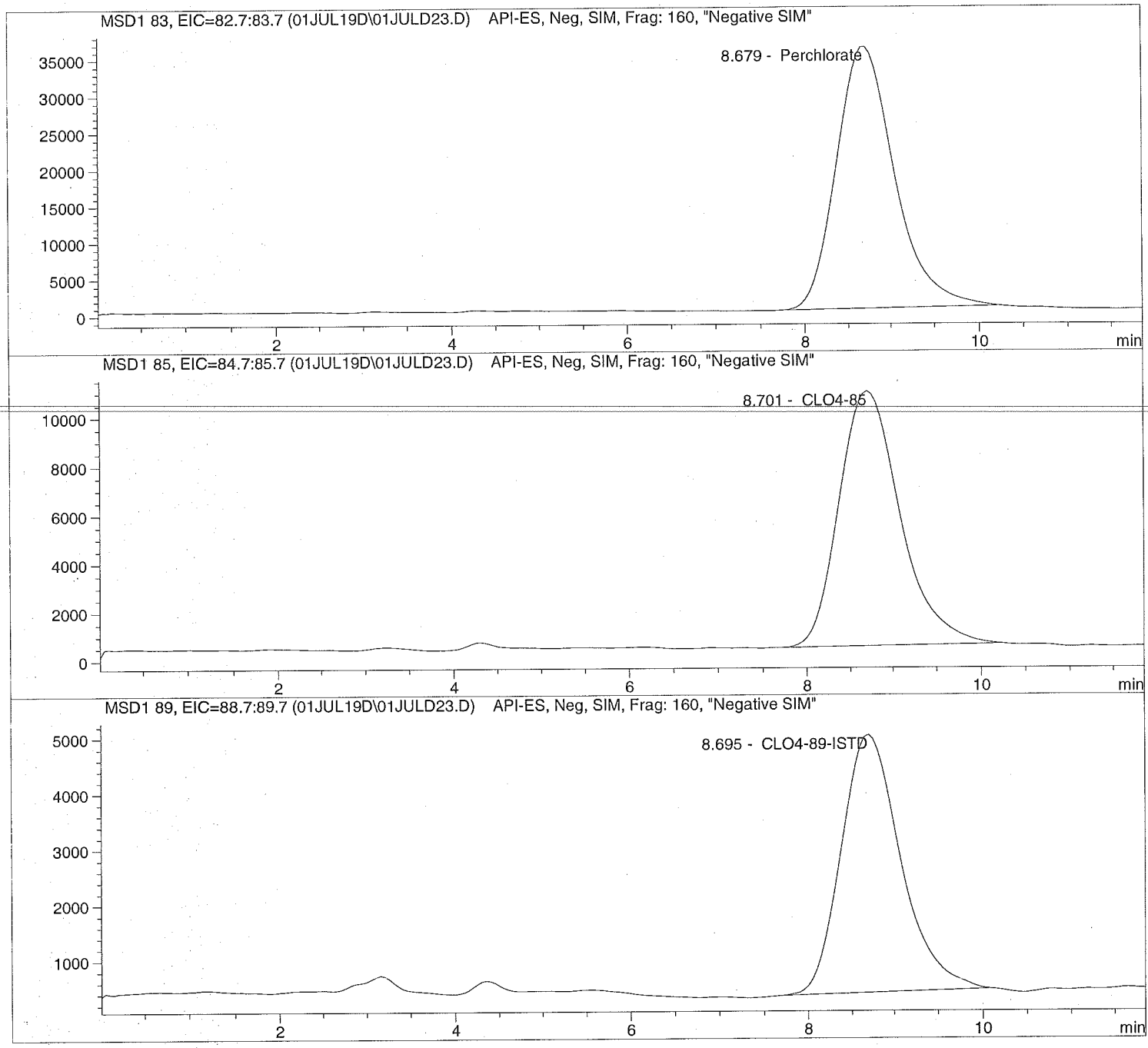
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD23.D Sample Name: 1918052003 10K

Injection Date:	7/01/2019 13:44:04	Seq Line:	23
Sample Name:	1918052003 10K	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD23.D Sample Name: 1918052003 10K

Injection Date:	7/01/2019 13:44:04	Seq Line:	23
Sample Name:	1918052003 10K	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.679	PBA	1682027.8	230798.4297	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.701	PBA	516999.9	238459.8445	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.695	PBA	222758.2	50000.0000	CLO4-89-ISTD

*** End of Report ***

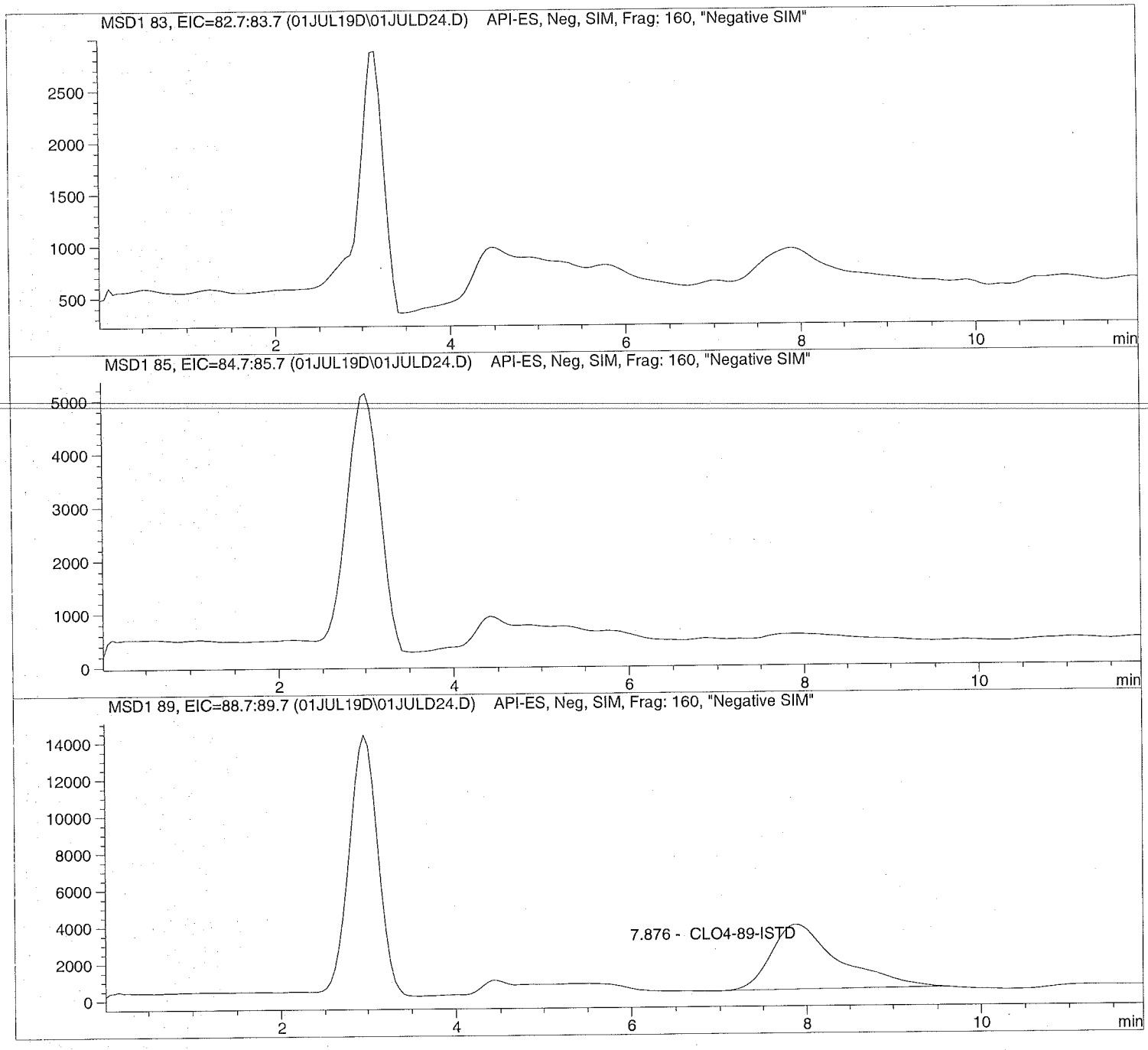
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD24.D Sample Name: 1918052004

Injection Date:	7/01/2019 13:57:58	Seq Line:	24
Sample Name:	1918052004	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD24.D Sample Name: 1918052004

Injection Date:	7/01/2019 13:57:58	Seq Line:	24
Sample Name:	1918052004	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.876	PBA	188746.5	5.0000	CLO4-89-ISTD

*** End of Report ***

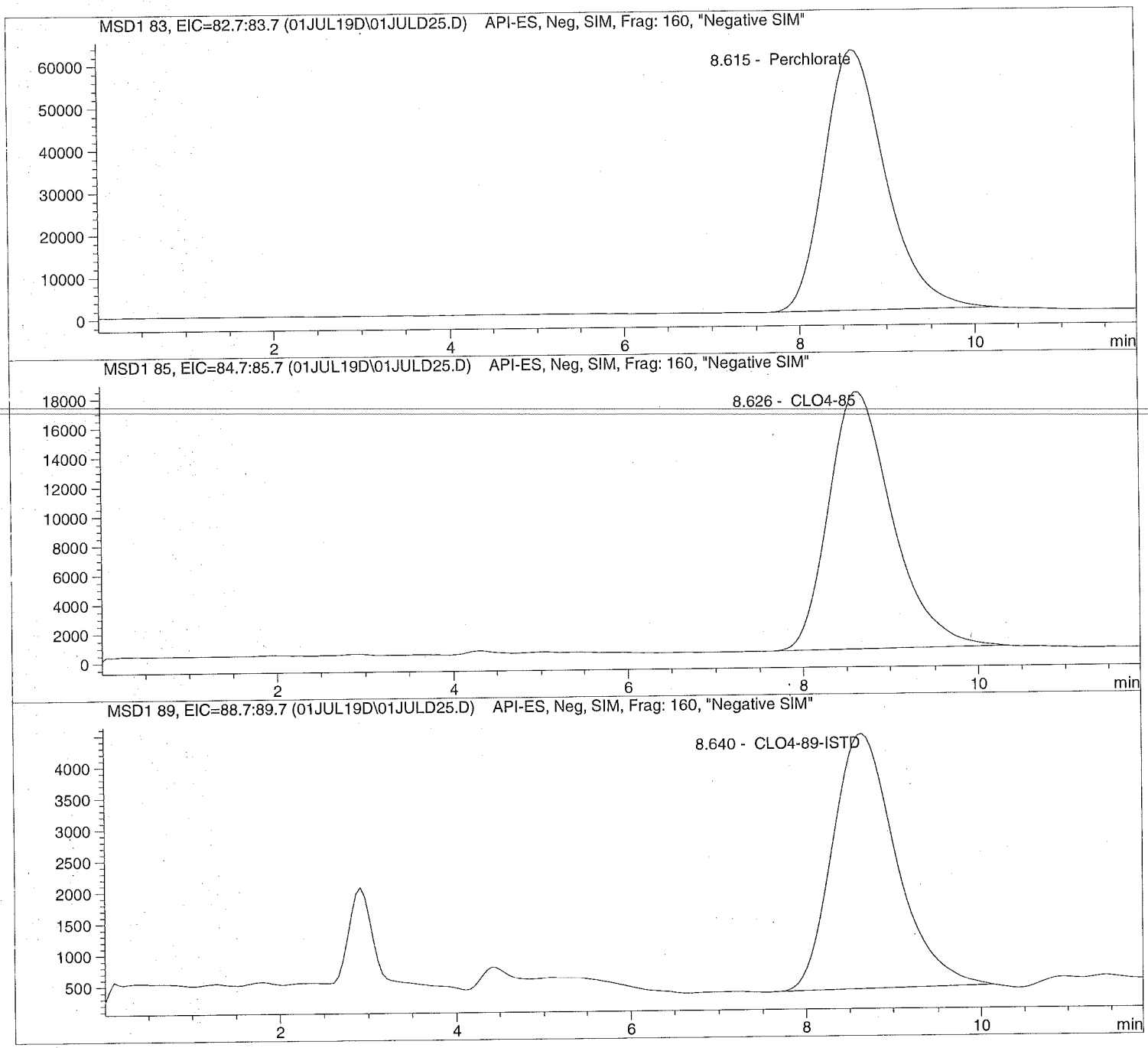
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD25.D Sample Name: 1917698003 100

Injection Date:	7/01/2019 14:11:59	Seq Line:	25
Sample Name:	1917698003 100	Location:	Vial 94
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD25.D Sample Name: 1917698003 100

Injection Date:	7/01/2019 14:11:59	Seq Line:	25
Sample Name:	1917698003 100	Location:	Vial 94
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.615	PBA	3021130.8	4300.6266	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.626	PBA	888075.5	4275.4049	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.640	PBA	205249.1	500.0000	CLO4-89-ISTD

*** End of Report ***

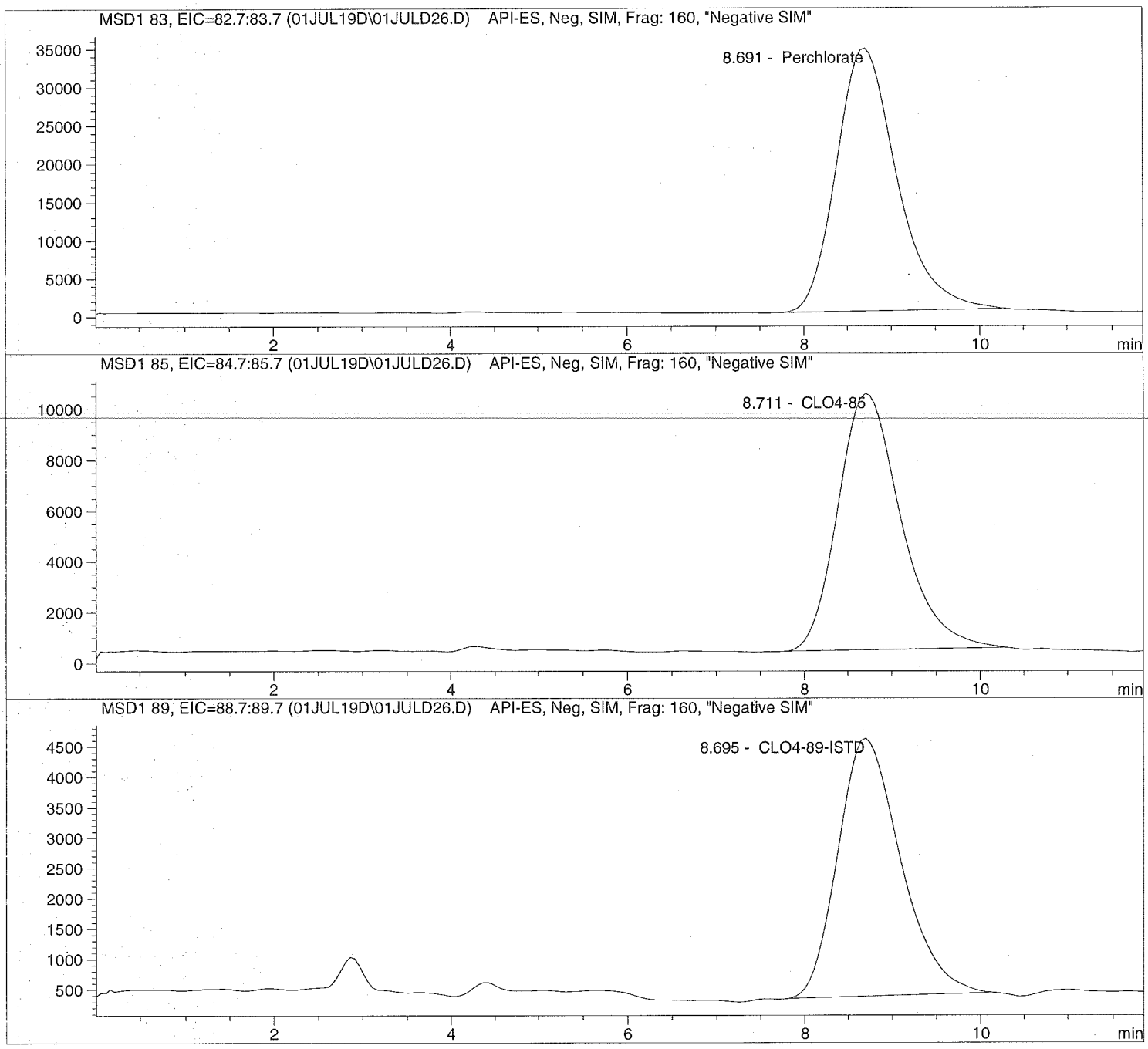
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD26.D Sample Name: 1917698008 1K

Injection Date:	7/01/2019 14:25:54	Seq Line:	26
Sample Name:	1917698008 1K	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD26.D Sample Name: 1917698008 1K

Injection Date:	7/01/2019 14:25:54	Seq Line:	26
Sample Name:	1917698008 1K	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.691	PBA	1640477.0	23731.5795	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.711	PBA	499687.1	24313.2650	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.695	PBA	210953.7	5000.0000	CLO4-89-ISTD

*** End of Report ***

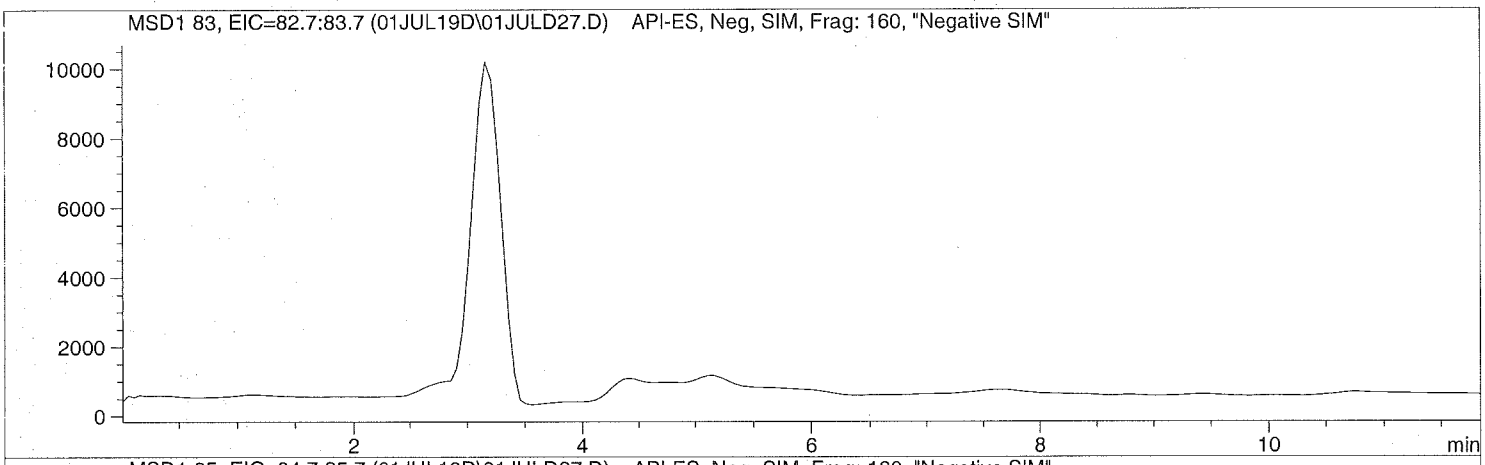
RIGHT SOLUTIONS | RIGHT PARTNER

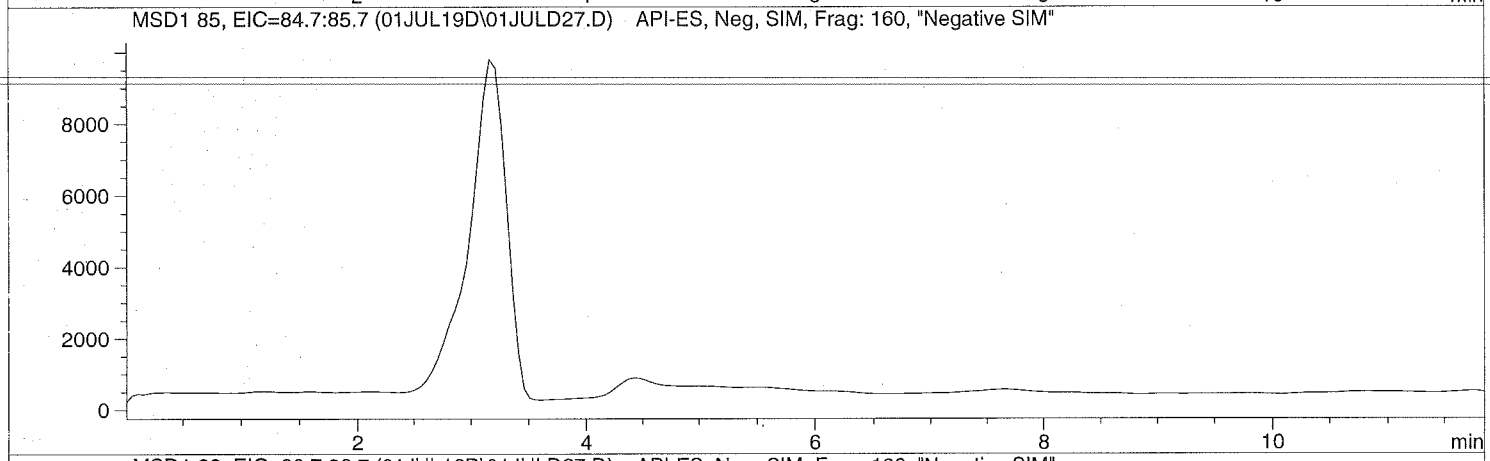
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD27.D Sample Name: 1917856001 RE

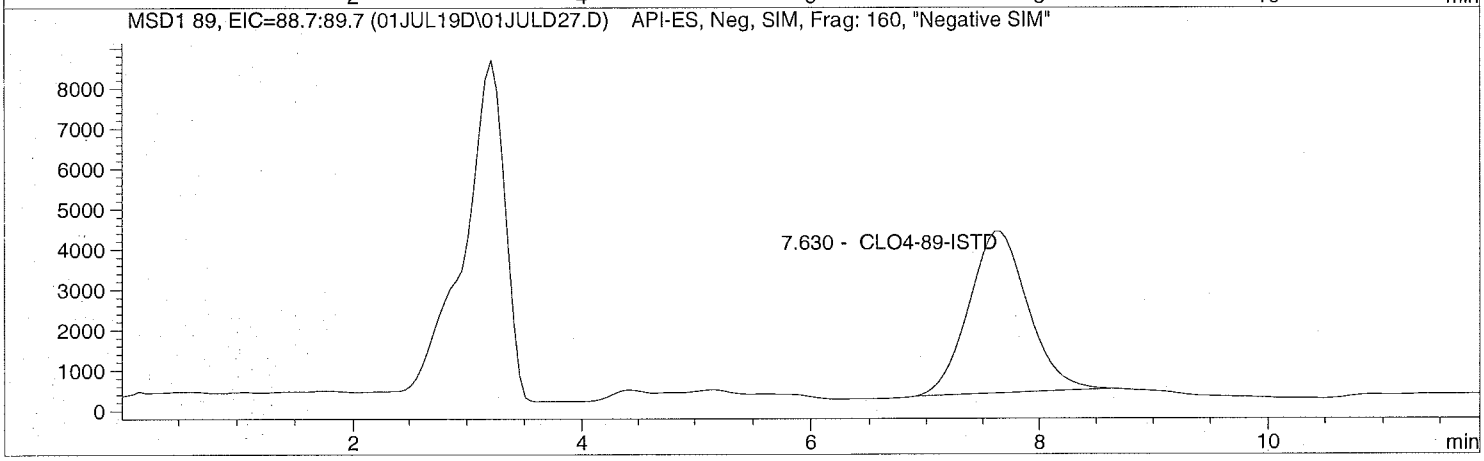
Injection Date:	7/01/2019 14:39:49	Seq Line:	27
Sample Name:	1917856001 RE	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD27.D Sample Name: 1917856001 RE

Injection Date:	7/01/2019 14:39:49	Seq Line:	27
Sample Name:	1917856001 RE	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.630	PBA	144962.0	5.0000	CLO4-89-ISTD

*** End of Report ***

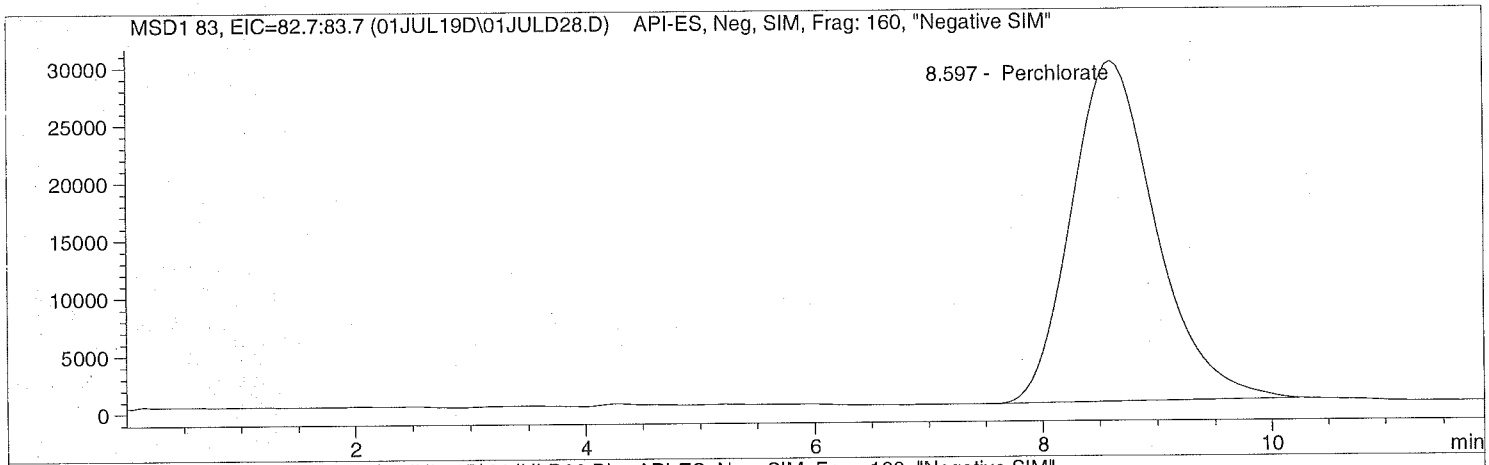
RIGHT SOLUTIONS | RIGHT PARTNER

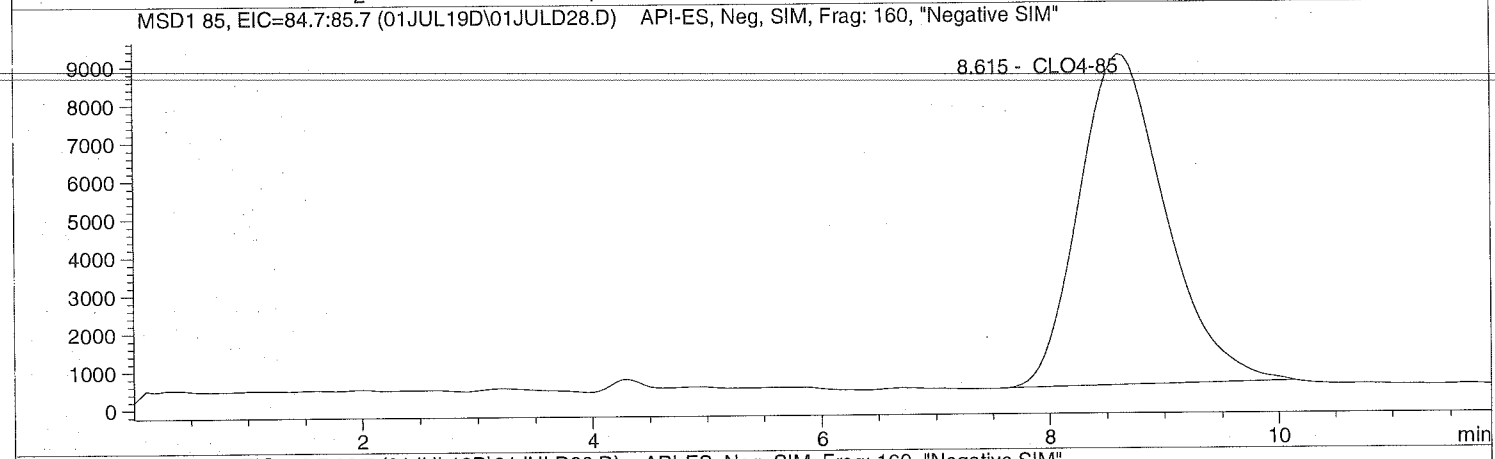
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD28.D Sample Name: 661483 CCV@25

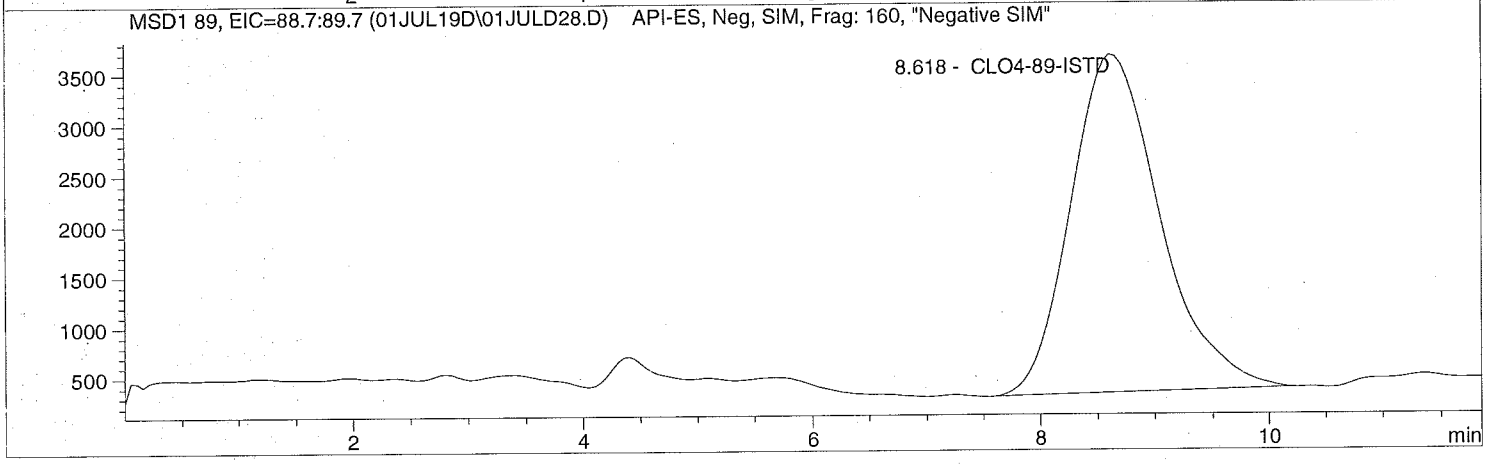
Injection Date:	7/01/2019 14:53:42	Seq Line:	28
Sample Name:	661483 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD28.D Sample Name: 661483 CCV@25

Injection Date:	7/01/2019 14:53:42	Seq Line:	28
Sample Name:	661483 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.597	PBA	1506029.6	25.4198	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.615	PBA	453099.1	25.7499	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.618	PBA	180069.9	5.0000	CLO4-89-ISTD

*** End of Report ***

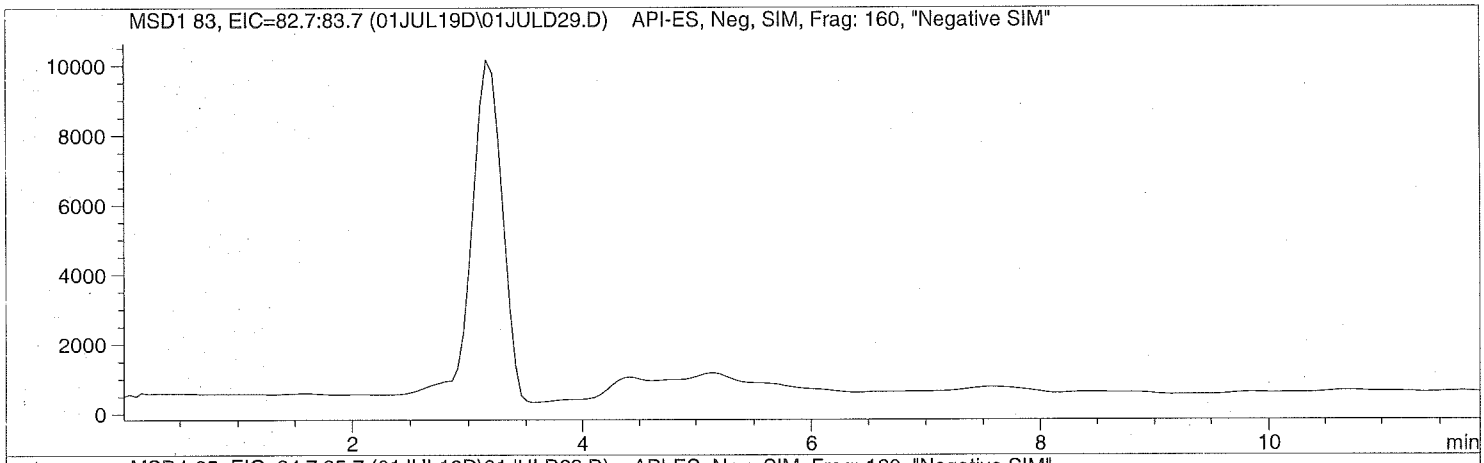
RIGHT SOLUTIONS | RIGHT PARTNER

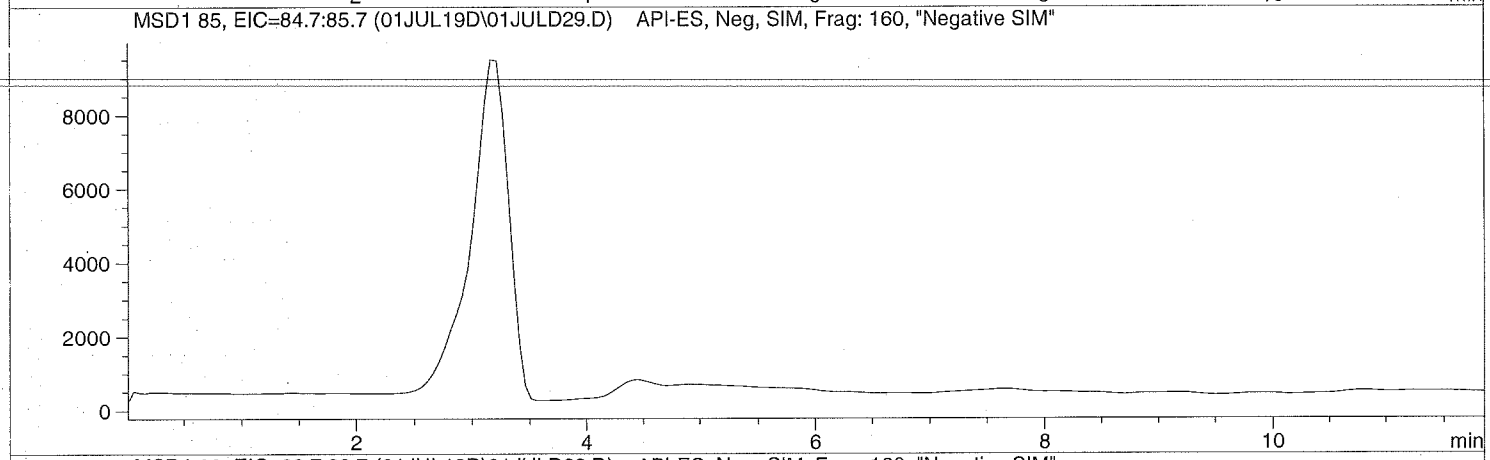
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD29.D Sample Name: 1917856002 RE

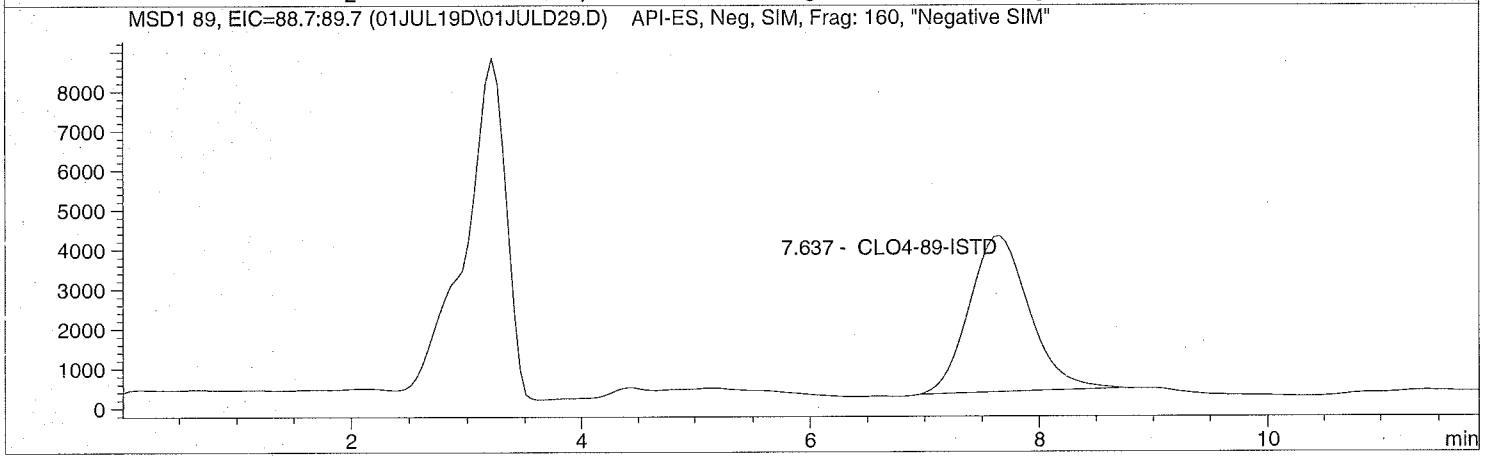
Injection Date:	7/01/2019 15:07:32	Seq Line:	29
Sample Name:	1917856002 RE	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD29.D Sample Name: 1917856002 RE

Injection Date:	7/01/2019 15:07:32	Seq Line:	29
Sample Name:	1917856002 RE	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.637	PBA	142651.0	5.0000	CLO4-89-ISTD

*** End of Report ***

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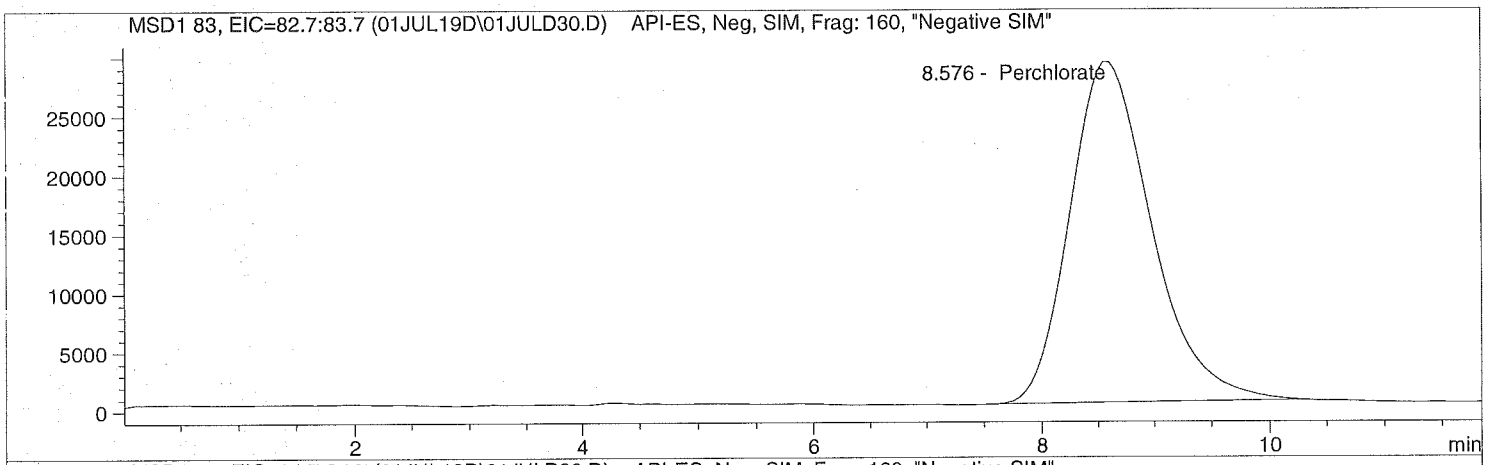
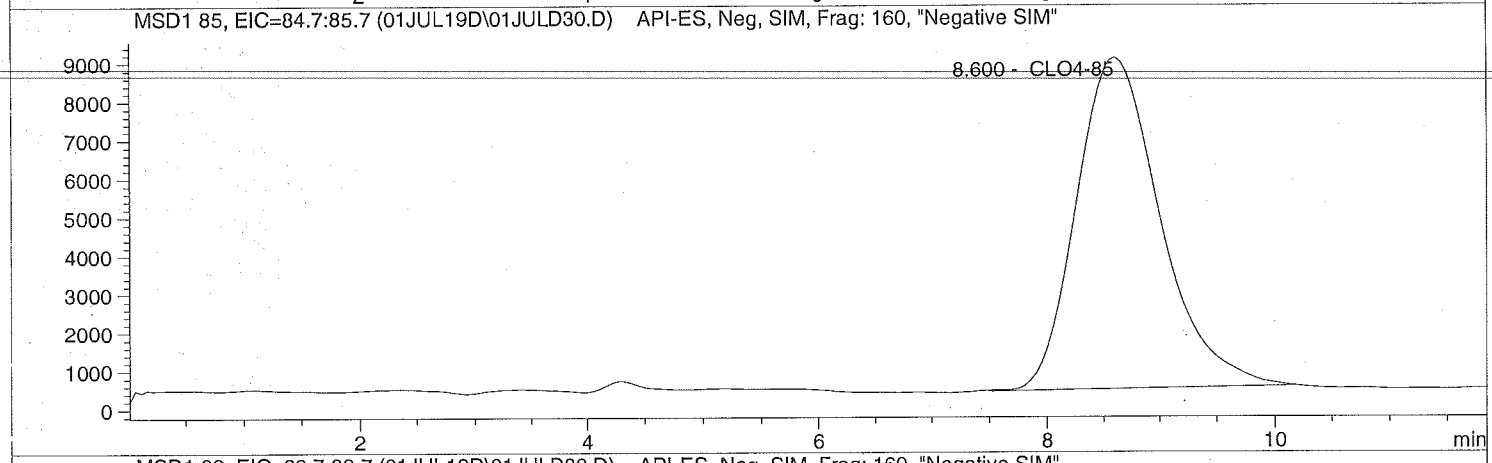
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD30.D Sample Name: 661661 CCV@25

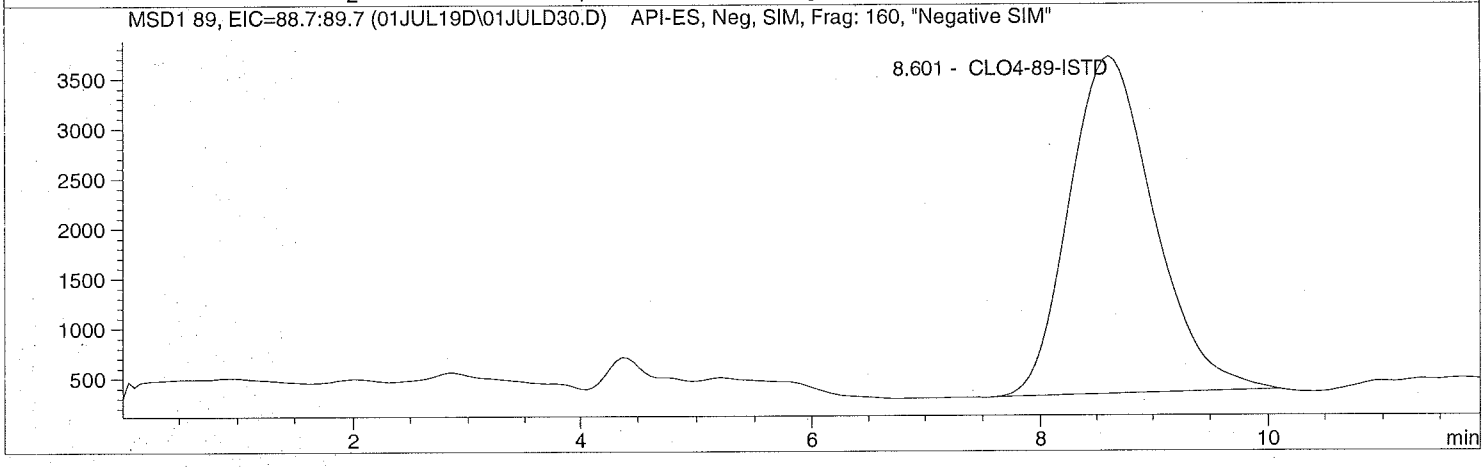
Injection Date:	7/01/2019 15:21:25	Seq Line:	30
Sample Name:	661661 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD30.D Sample Name: 661661 CCV@25

Injection Date:	7/01/2019 15:21:25	Seq Line:	30
Sample Name:	661661 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.576	PBA	1459488.9	25.1014	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.600	BBA	445116.2	25.7560	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.601	PBA	176853.7	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

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Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

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RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

Peak Sum Table

No Entries in table

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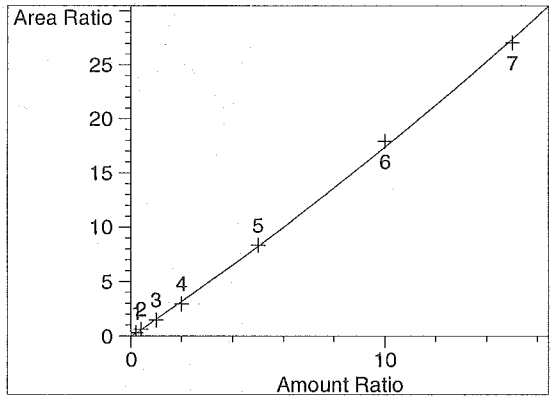
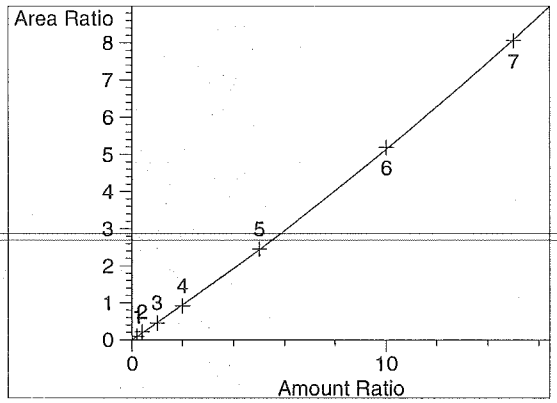
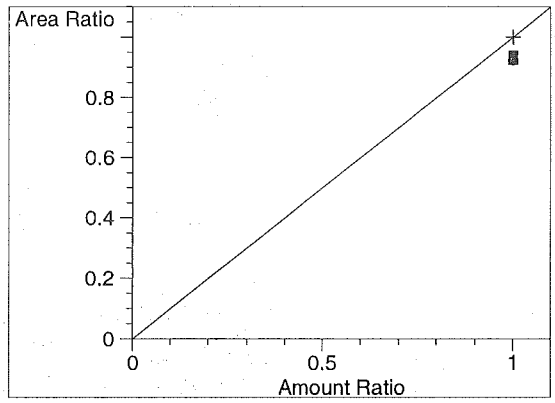
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: y = ax² + bx + c
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: y = ax² + bx + c
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: y = mx + b
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

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Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

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Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

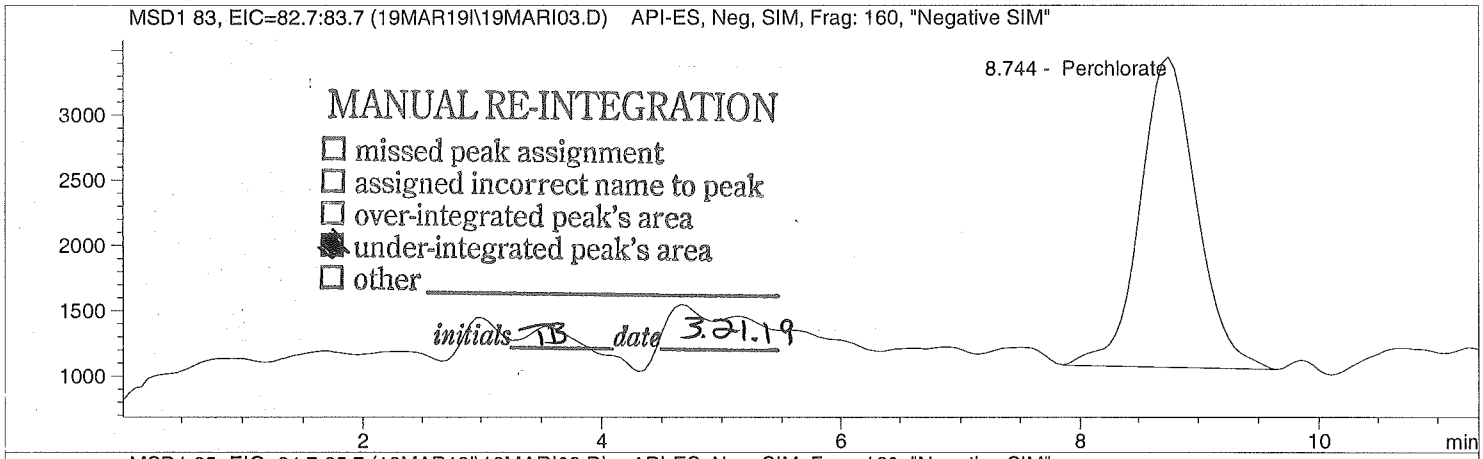
RIGHT SOLUTIONS | RIGHT PARTNER

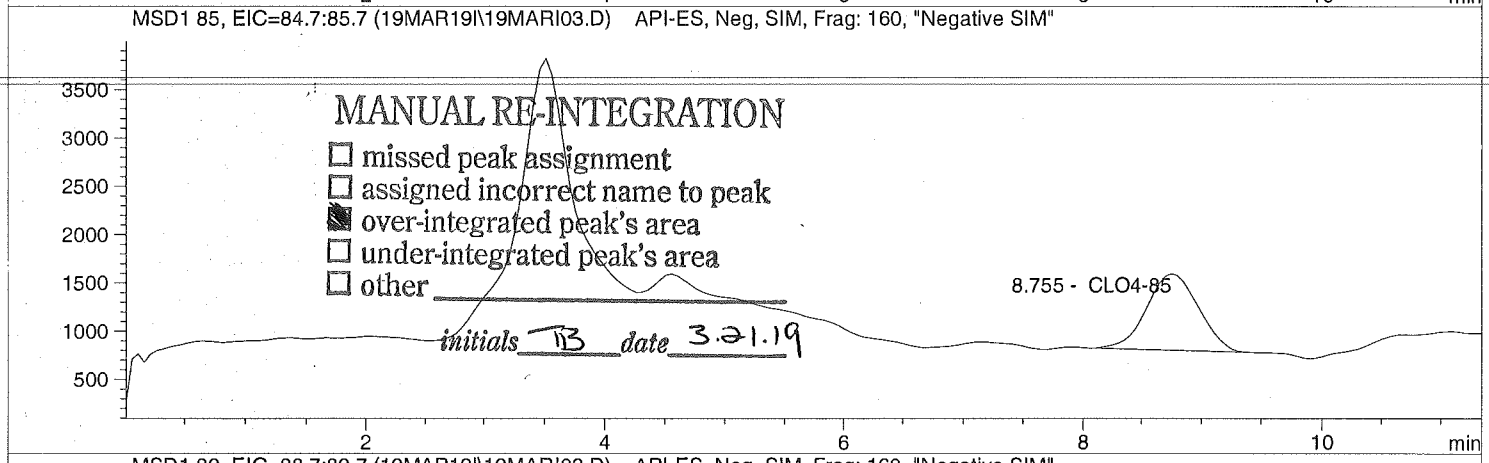
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

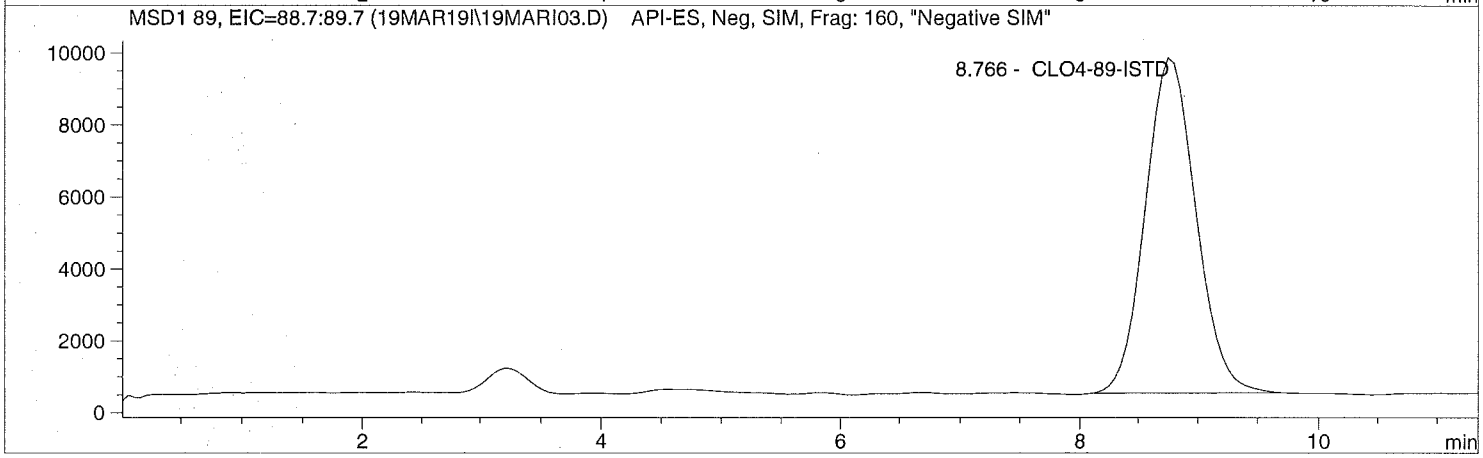
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

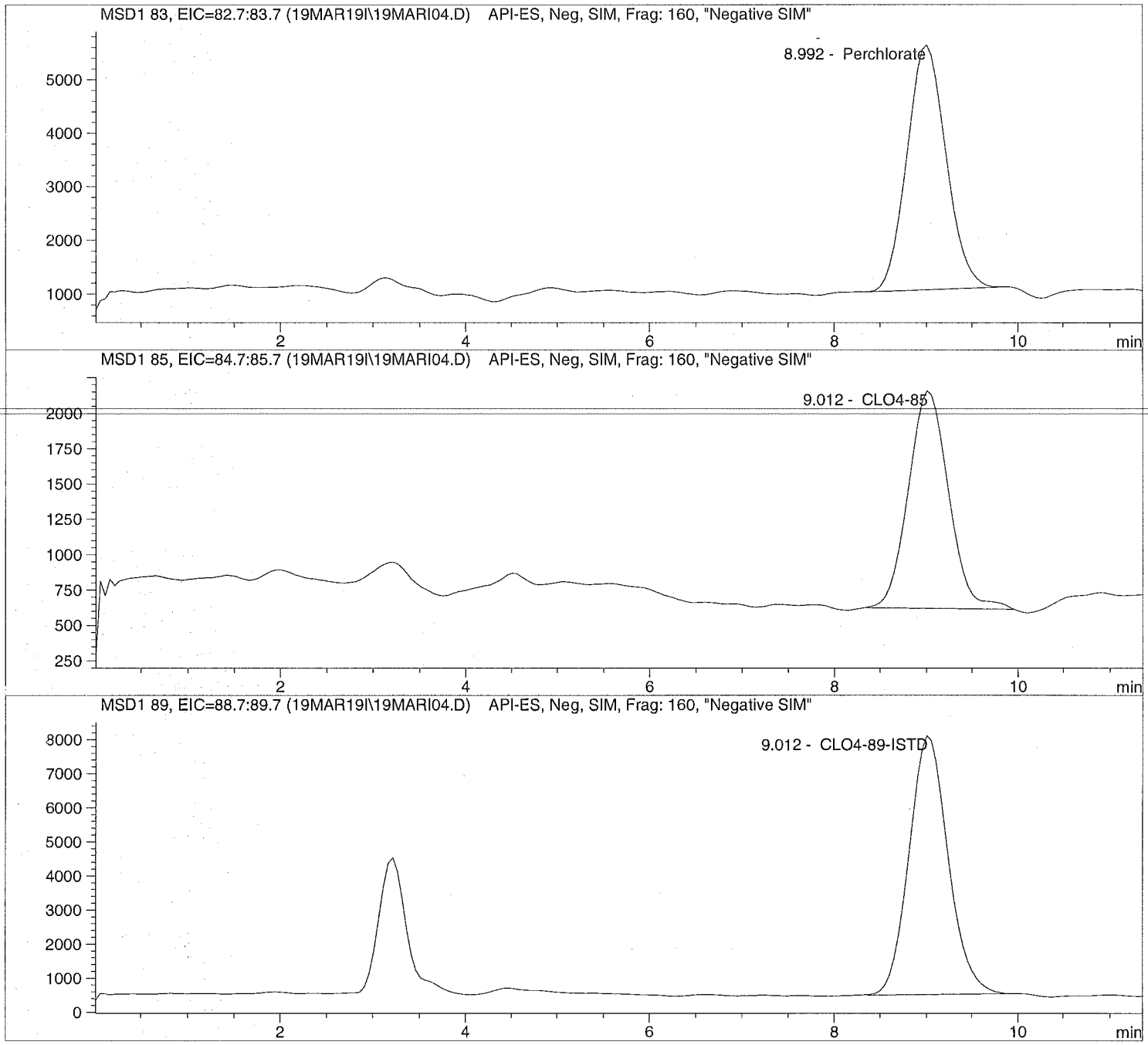
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

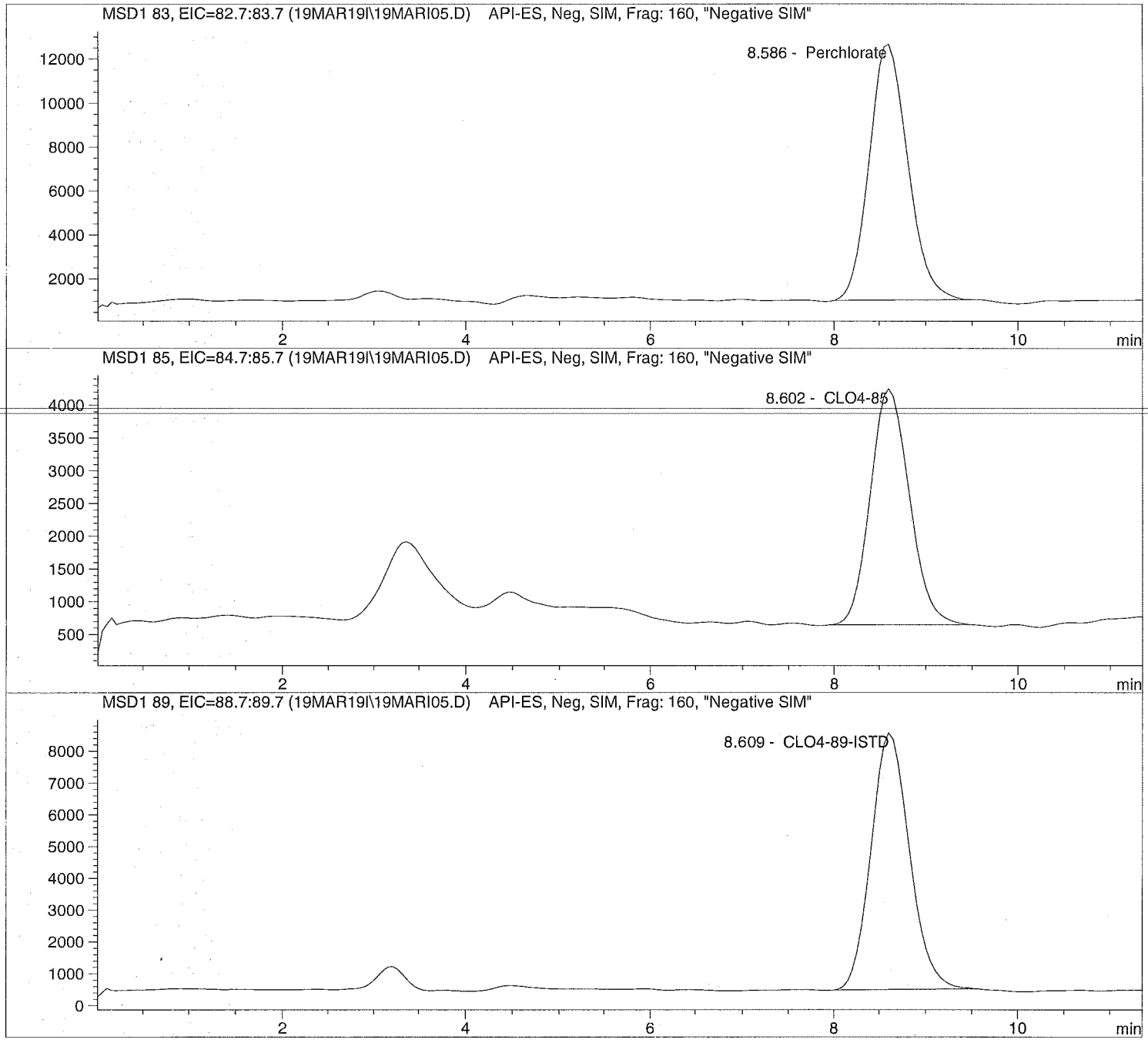
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

*** End of Report ***

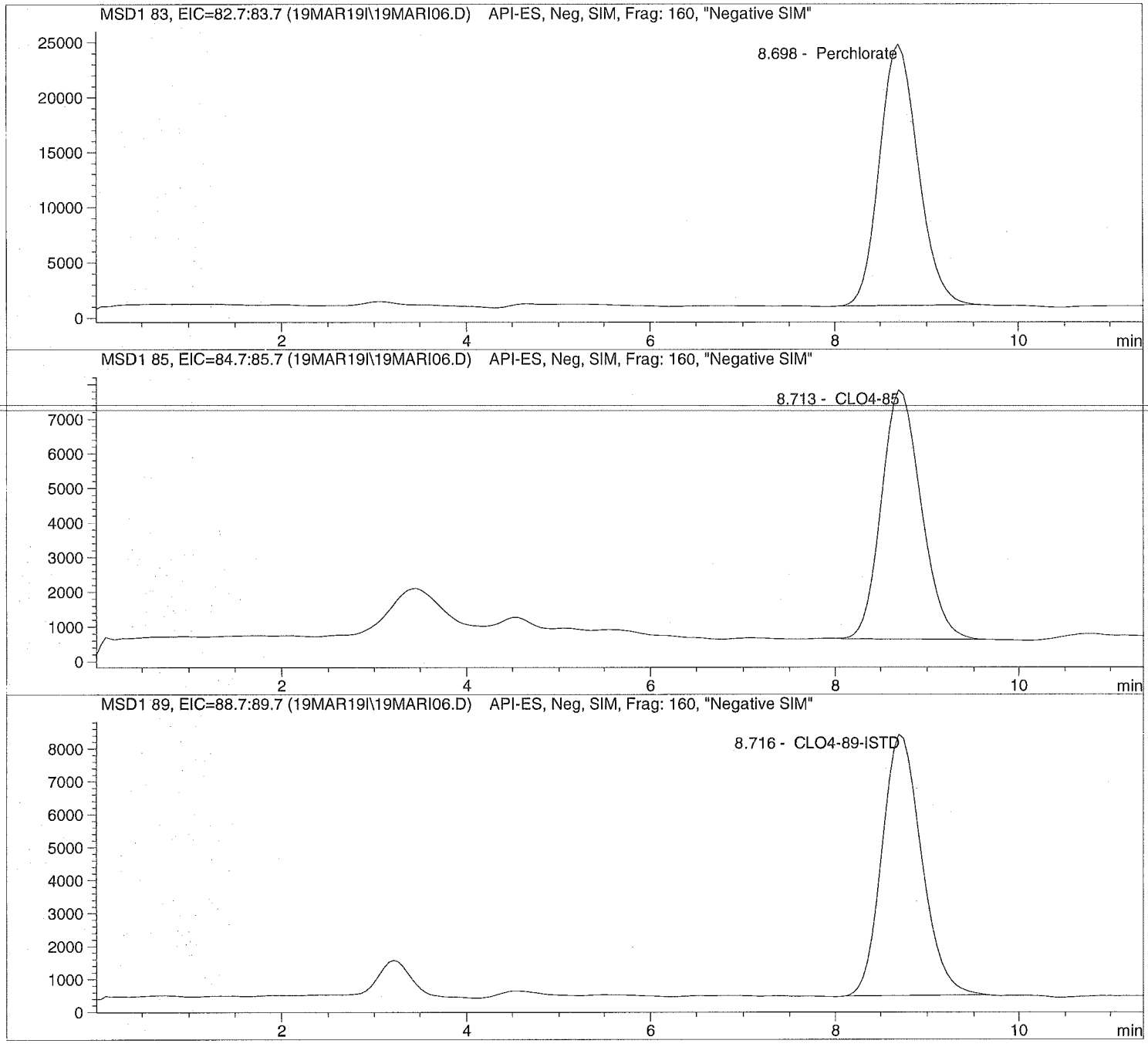
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

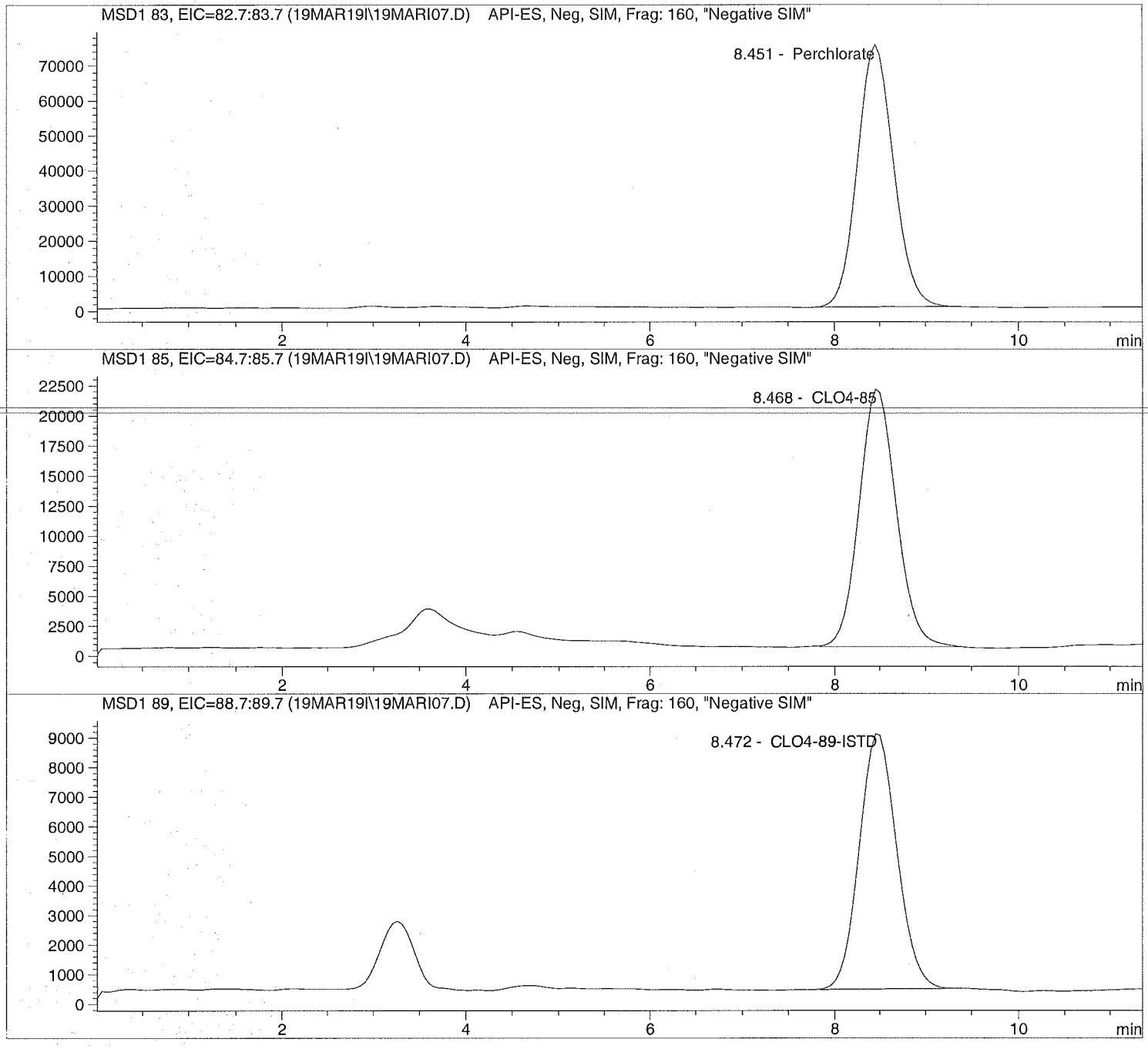
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

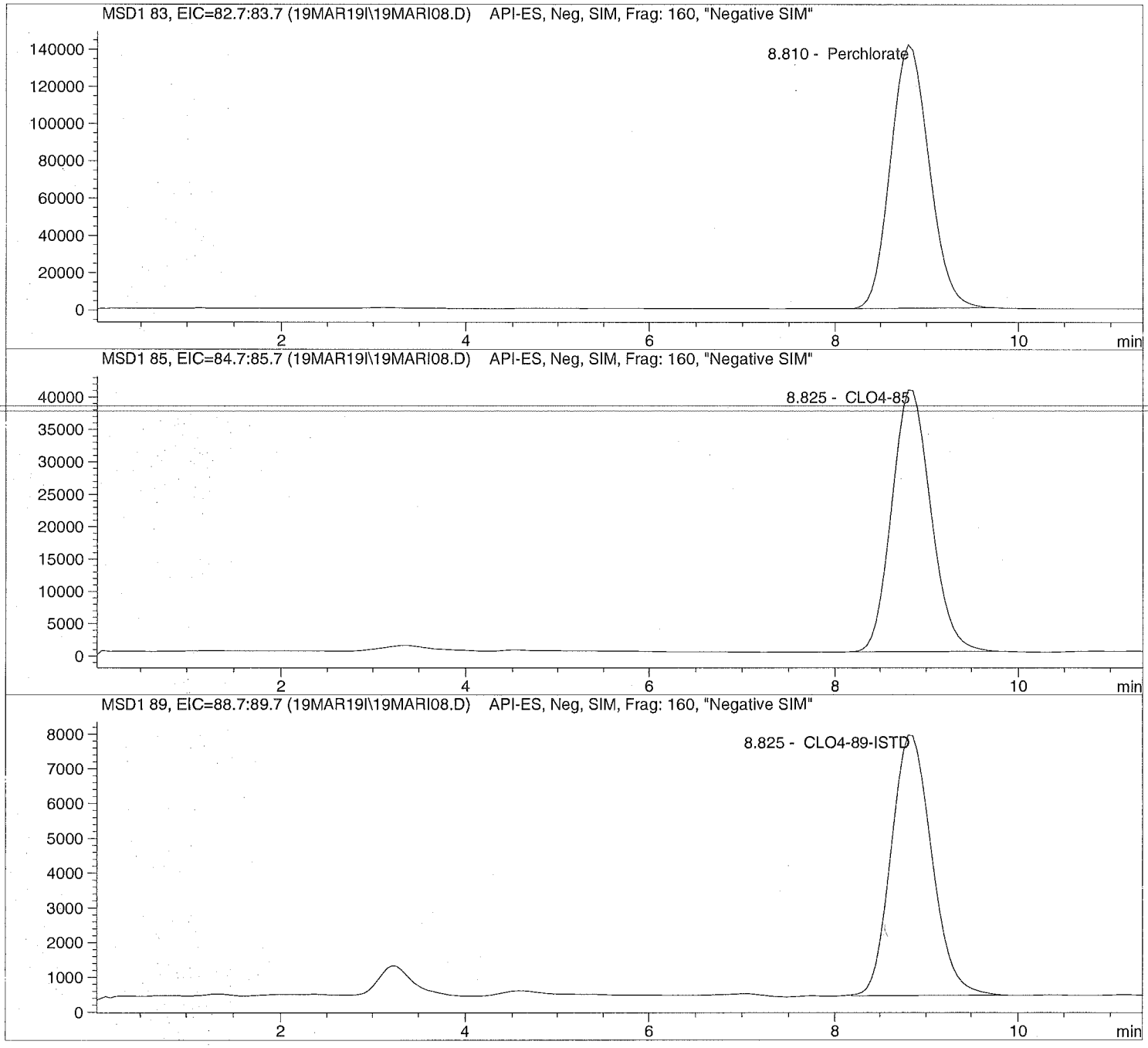
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

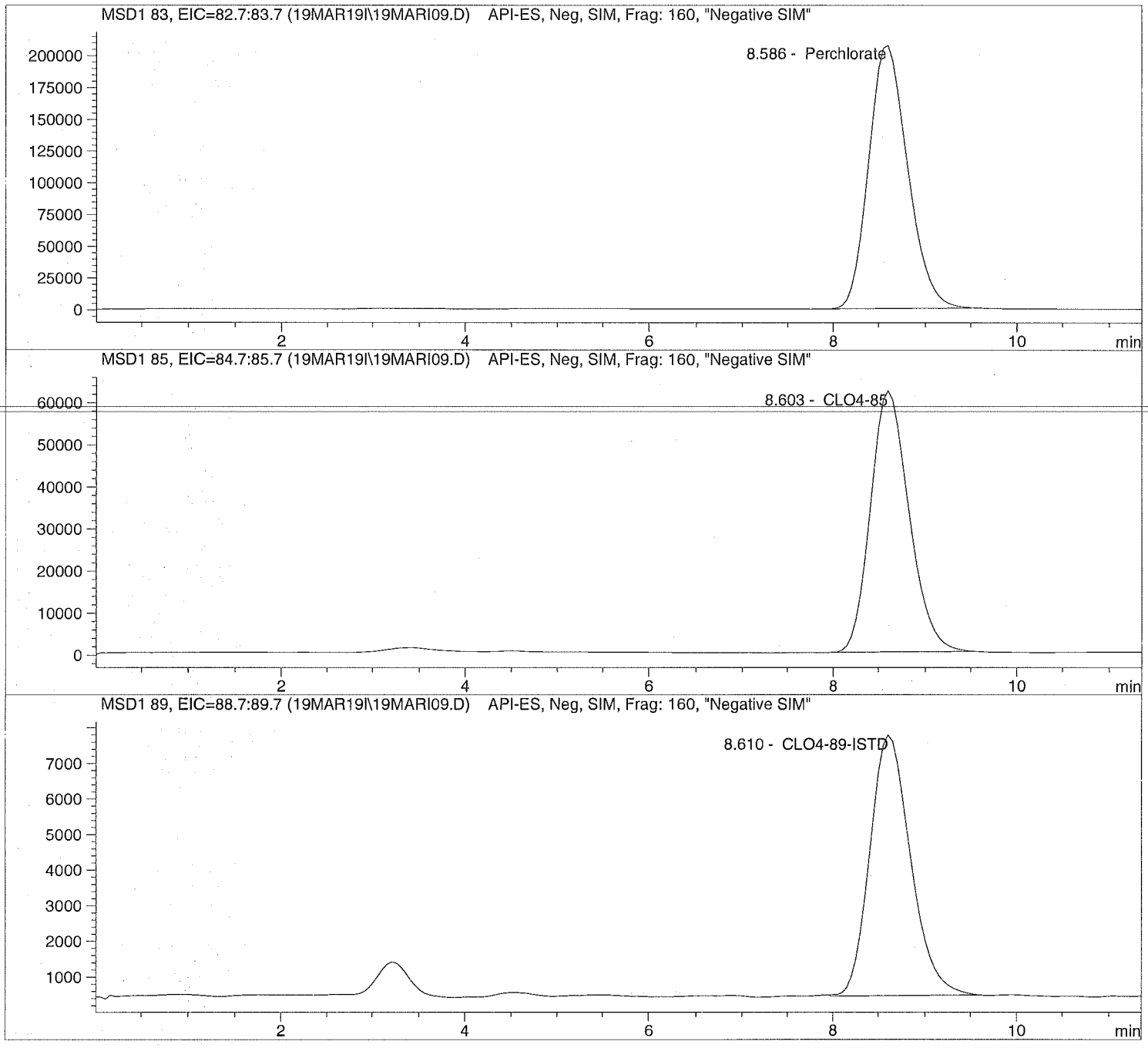
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

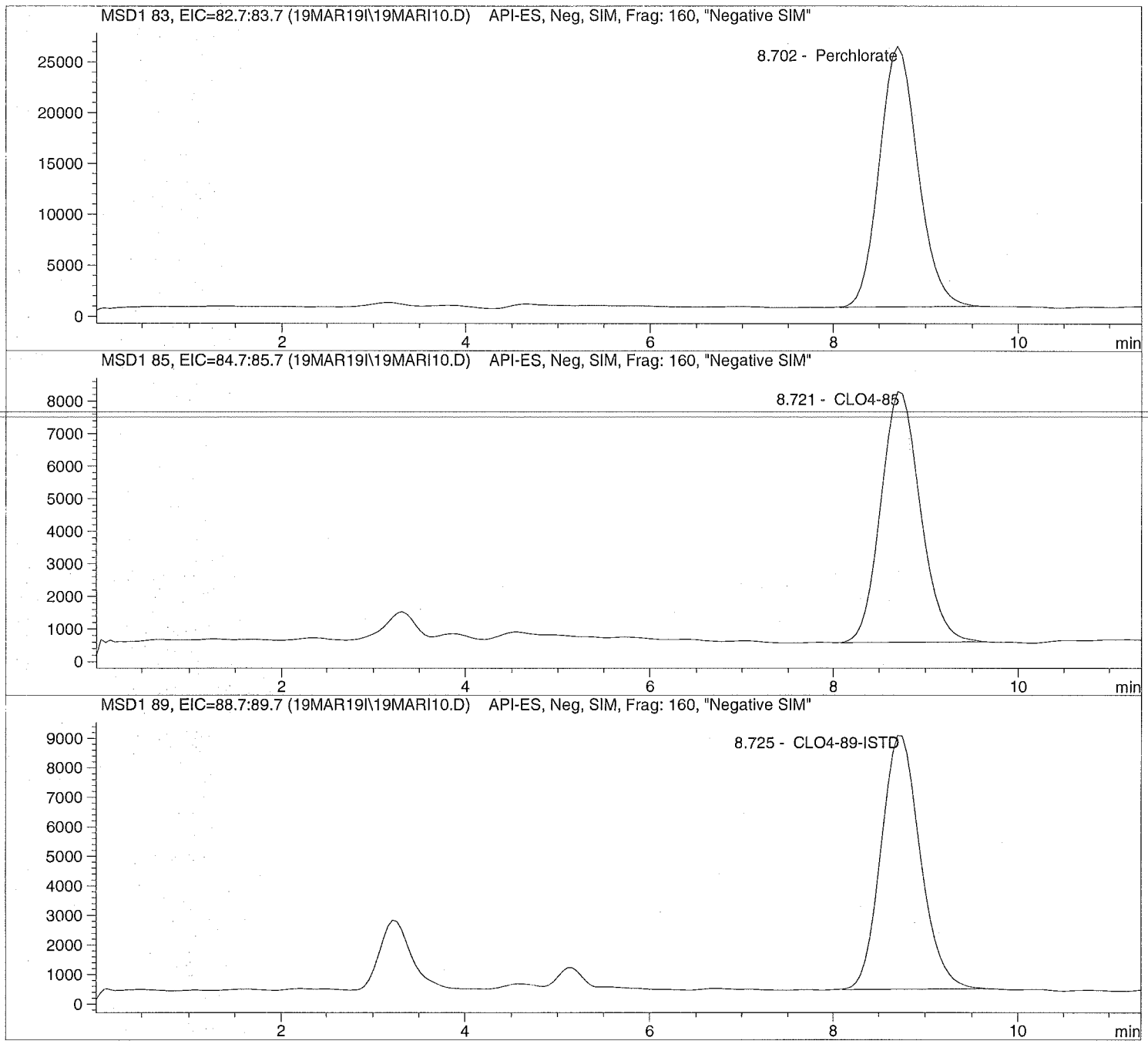
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

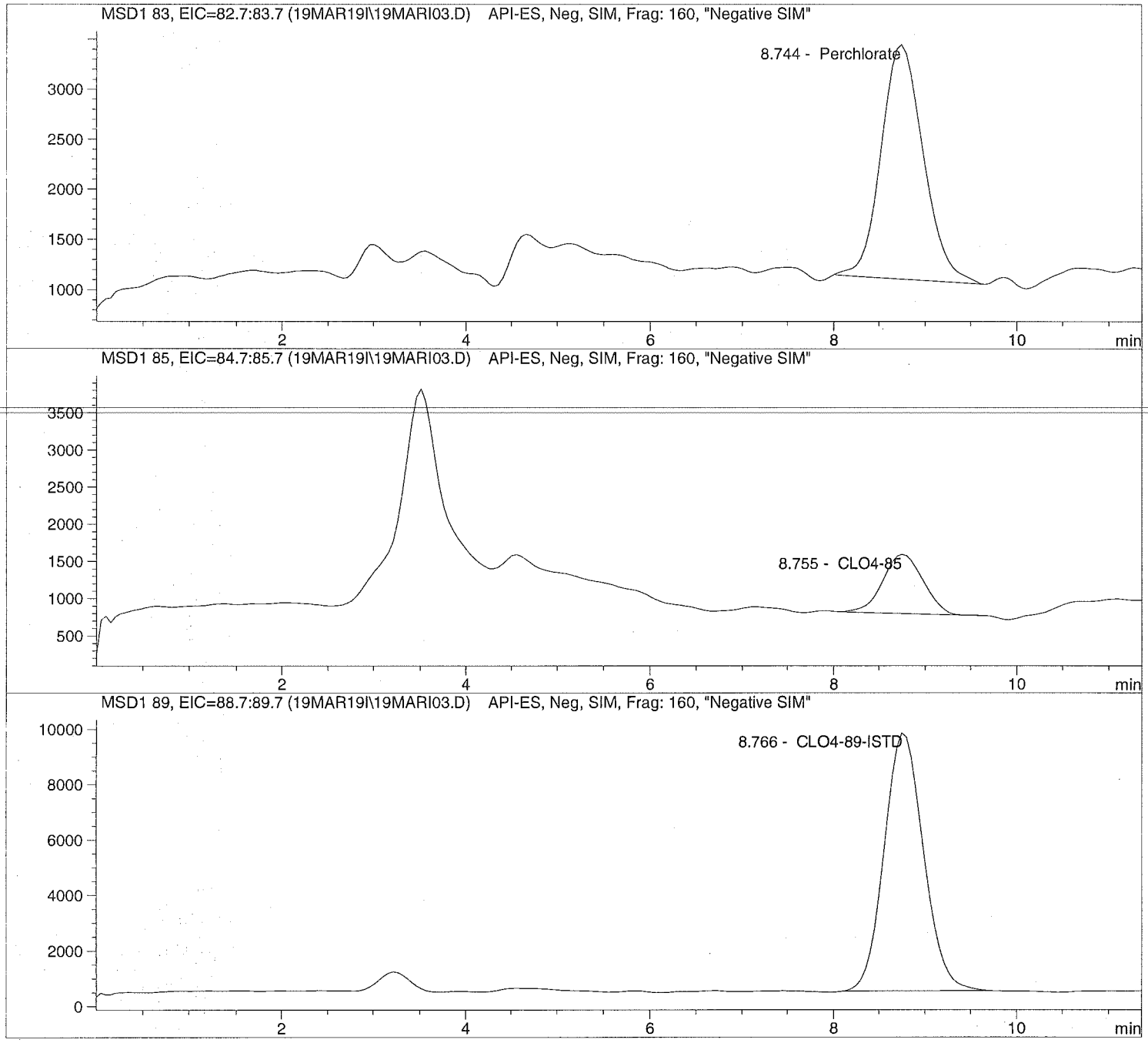
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

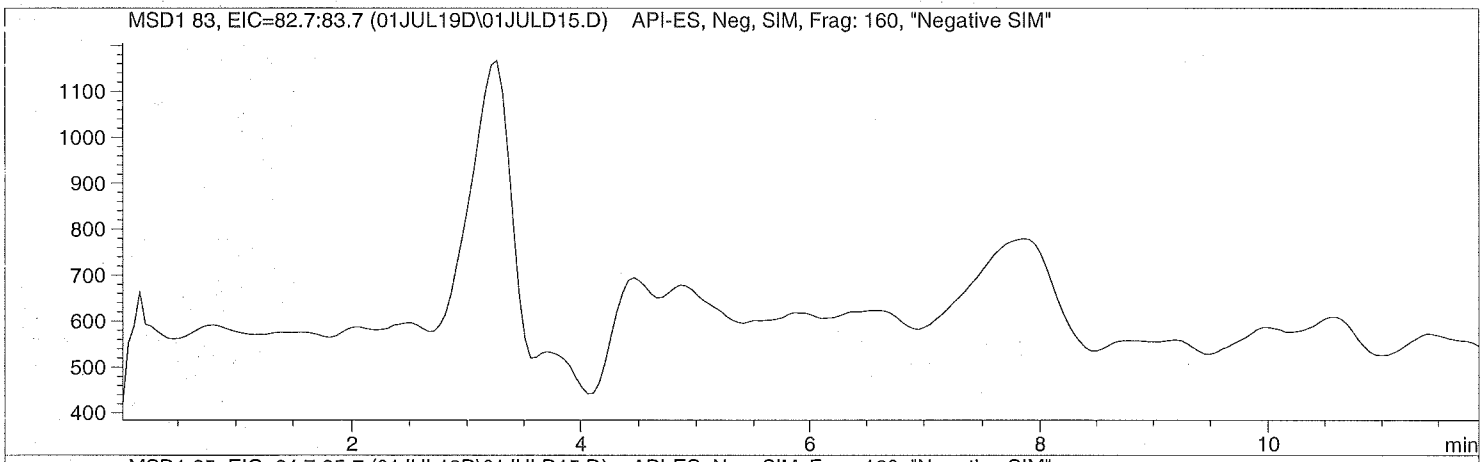
RIGHT SOLUTIONS | RIGHT PARTNER

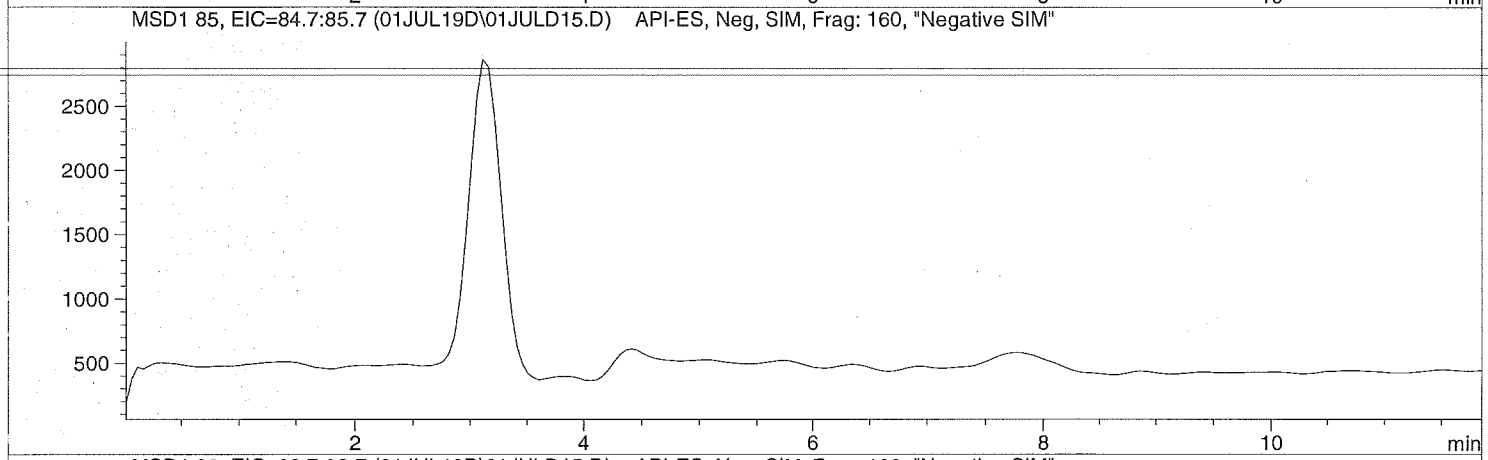
Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

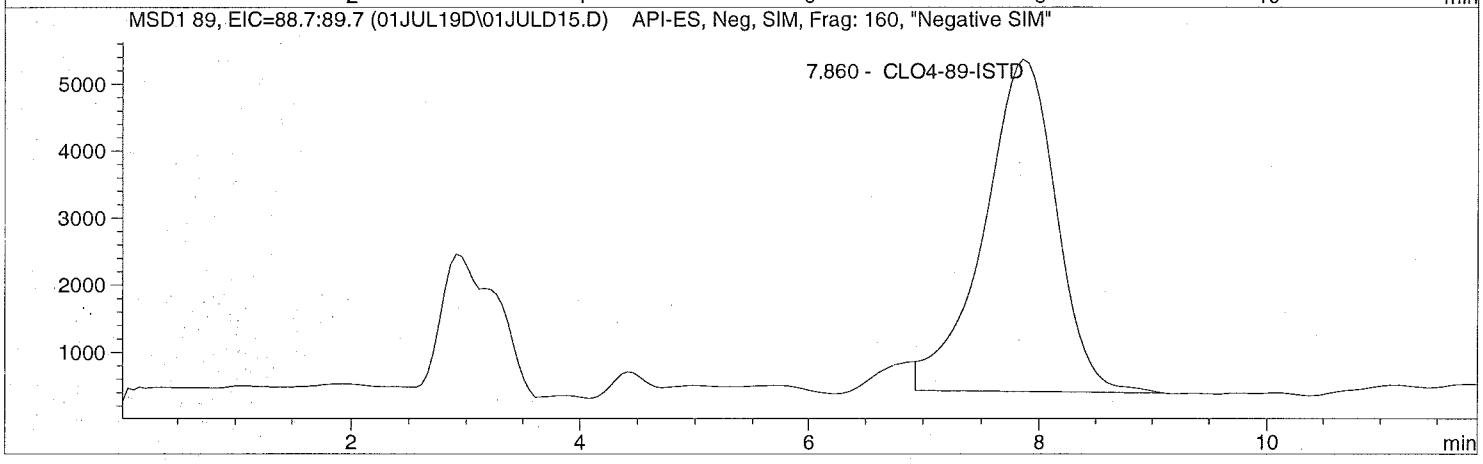
Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\01JUL19D\01JULD15.D Sample Name: 1917856003

Injection Date:	7/01/2019 11:52:34	Seq Line:	15
Sample Name:	1917856003	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.860	BBA	216713.3	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

July 15, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19061210**

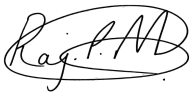
Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 10 sample(s) on Jun 22, 2019 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 15-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061210

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19061210-01	18CpTMW06_062119	Water		21-Jun-2019 07:10	22-Jun-2019 08:55	☐
HS19061210-02	18CpTMW06_062119_a	Water		21-Jun-2019 07:10	22-Jun-2019 08:55	☐
HS19061210-03	MW22_062119	Water		21-Jun-2019 08:00	22-Jun-2019 08:55	☐
HS19061210-04	CO1_062119	Water		21-Jun-2019 08:50	22-Jun-2019 08:55	☐
HS19061210-05	MW8_062119	Water		21-Jun-2019 09:40	22-Jun-2019 08:55	☐
HS19061210-06	18CpTMW15_062119	Water		21-Jun-2019 10:30	22-Jun-2019 08:55	☐
HS19061210-07	18CpTMW03SW_062119	Water		21-Jun-2019 07:50	22-Jun-2019 08:55	☐
HS19061210-08	AWD3_062119	Water		21-Jun-2019 09:00	22-Jun-2019 08:55	☐
HS19061210-09	CO8_062119	Water		21-Jun-2019 10:35	22-Jun-2019 08:55	☐
HS19061210-10	Trip blank	Water		21-Jun-2019 00:00	22-Jun-2019 08:55	☐

Revision:2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19061210

Work Order Comments

- Revised to add Trip blank on 07/12/2019
- Revised to correct the reporting limit for Mercury

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142510

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R342424

Sample ID: Trip blank (HS19061210-10)

- Sample was analyzed outside of the holding time at the request of the client. Results should be considered estimated.

Batch ID: R341659

Sample ID: AWD3_062119 (HS19061210-08)

- Lowest practical dilution due to high concentration of non-target compound.

Sample ID: CCV

- Bromoform and 1,2-Dibromo-3-Chloropropane exceeded %D limits for CCV. Samples are ND for these compounds./

Metals by Method SW6020

Batch ID: 142750

Sample ID: HS19070016-05MS

- MS and MSD are for an unrelated sample

Metals by Method SW7470

Batch ID: 142615

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CpTMW06_062119
Collection Date: 21-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 18:48
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 18:48
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	01-Jul-2019 18:48
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 18:48
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	01-Jul-2019 18:48
Acetone	**3.1**		**0.40**	**1.0**	**2.0**	**UG/L**	1	01-Jul-2019 18:48
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	01-Jul-2019 18:48
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CpTMW06_062119
Collection Date: 21-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	01-Jul-2019 18:48
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 18:48
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	01-Jul-2019 18:48
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 18:48
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Trichloroethene	**0.98**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	01-Jul-2019 18:48
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 18:48
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*1*	*01-Jul-2019 18:48*
Surr: 4-Bromofluorobenzene	*95.1*			**0**	*85-114*	*%REC*	*1*	*01-Jul-2019 18:48*
Surr: Dibromofluoromethane	*96.6*			**0**	*80-119*	*%REC*	*1*	*01-Jul-2019 18:48*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*01-Jul-2019 18:48*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	**0.46**		**0.010**	**0.010**	**0.010**	**ug/L**	1	28-Jun-2019 05:11
Surr: 2-Fluorobiphenyl	*87.6*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 05:11*
Surr: 4-Terphenyl-d14	*122*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 05:11*
Surr: Nitrobenzene-d5	*109*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 05:11*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CpTMW06_062119_a
Collection Date: 21-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:12
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 19:12
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	01-Jul-2019 19:12
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:12
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	01-Jul-2019 19:12
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	01-Jul-2019 19:12
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	01-Jul-2019 19:12
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CpTMW06_062119_a
Collection Date: 21-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	01-Jul-2019 19:12
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 19:12
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	01-Jul-2019 19:12
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:12
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Trichloroethene	**0.88**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	01-Jul-2019 19:12
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:12
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*1*	*01-Jul-2019 19:12*
Surr: 4-Bromofluorobenzene	*95.4*			**0**	*85-114*	*%REC*	*1*	*01-Jul-2019 19:12*
Surr: Dibromofluoromethane	*95.7*			**0**	*80-119*	*%REC*	*1*	*01-Jul-2019 19:12*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*01-Jul-2019 19:12*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	**0.052**		**0.010**	**0.010**	**0.010**	**ug/L**	1	28-Jun-2019 05:32
Surr: 2-Fluorobiphenyl	*82.0*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 05:32*
Surr: 4-Terphenyl-d14	*116*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 05:32*
Surr: Nitrobenzene-d5	*97.5*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 05:32*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW22_062119
Collection Date: 21-Jun-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,2-Dichloroethane	**3.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	01-Jul-2019 14:49
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 14:49
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	01-Jul-2019 14:49
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:49
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	01-Jul-2019 14:49
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	01-Jul-2019 14:49
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	01-Jul-2019 14:49
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW22_062119
Collection Date: 21-Jun-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49
cis-1,2-Dichloroethene	**0.90**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	01-Jul-2019 14:49
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	01-Jul-2019 14:49
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 14:49
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	01-Jul-2019 14:49
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:49
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Trichloroethene	**230**		**2.0**	**5.0**	**10**	**UG/L**	10	01-Jul-2019 18:24
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:49
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*01-Jul-2019 14:49*
Surr: 1,2-Dichloroethane-d4	*104*			**0**	*81-118*	*%REC*	*10*	*01-Jul-2019 18:24*
Surr: 4-Bromofluorobenzene	*94.9*			**0**	*85-114*	*%REC*	*1*	*01-Jul-2019 14:49*
Surr: 4-Bromofluorobenzene	*94.0*			**0**	*85-114*	*%REC*	*10*	*01-Jul-2019 18:24*
Surr: Dibromofluoromethane	*93.8*			**0**	*80-119*	*%REC*	*1*	*01-Jul-2019 14:49*
Surr: Dibromofluoromethane	*96.7*			**0**	*80-119*	*%REC*	*10*	*01-Jul-2019 18:24*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*01-Jul-2019 14:49*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*10*	*01-Jul-2019 18:24*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW22_062119
Collection Date: 21-Jun-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.0158**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 16:08
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:43
Arsenic	**0.00145**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:43
Barium	**0.683**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:43
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:43
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:43
Calcium	**76.1**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:43
Chromium	**0.0930**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:43
Cobalt	**0.00142**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:43
Copper	**0.00249**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:43
Iron	**1.13**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:43
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 00:43
Magnesium	**34.5**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:43
Manganese	**0.0164**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:43
Nickel	**0.179**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:43
Potassium	**1.93**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:43
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:43
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 16:08
Sodium	**383**		**0.140**	**0.500**	**2.00**	**mg/L**	10	09-Jul-2019 16:10
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:43
Vanadium	**0.00257**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:43
Zinc	**0.0241**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:43
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 01-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	01-Jul-2019 16:24
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: CO1_062119
Collection Date: 21-Jun-2019 08:50

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 13:37
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 13:37
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	01-Jul-2019 13:37
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 13:37
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	01-Jul-2019 13:37
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	01-Jul-2019 13:37
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	01-Jul-2019 13:37
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: CO1_062119
Collection Date: 21-Jun-2019 08:50

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	01-Jul-2019 13:37
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 13:37
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	01-Jul-2019 13:37
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 13:37
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 13:37
Surr: 1,2-Dichloroethane-d4	*97.5*			**0**	*81-118*	*%REC*	*1*	*01-Jul-2019 13:37*
Surr: 4-Bromofluorobenzene	*93.1*			**0**	*85-114*	*%REC*	*1*	*01-Jul-2019 13:37*
Surr: Dibromofluoromethane	*92.6*			**0**	*80-119*	*%REC*	*1*	*01-Jul-2019 13:37*
Surr: Toluene-d8	*99.6*			**0**	*89-112*	*%REC*	*1*	*01-Jul-2019 13:37*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW8_062119
Collection Date: 21-Jun-2019 09:40

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,2-Dichloroethane	**0.75**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	01-Jul-2019 14:01
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:01
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 14:01
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	01-Jul-2019 14:01
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:01
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	01-Jul-2019 14:01
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	01-Jul-2019 14:01
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	01-Jul-2019 14:01
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW8_062119
Collection Date: 21-Jun-2019 09:40

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	01-Jul-2019 14:01
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 14:01
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	01-Jul-2019 14:01
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 14:01
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Trichloroethene	**120**		**0.20**	**0.50**	**1.0**	**UG/L**	1	01-Jul-2019 14:01
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 14:01
Surr: 1,2-Dichloroethane-d4	*100*			**0**	*81-118*	*%REC*	*1*	*01-Jul-2019 14:01*
Surr: 4-Bromofluorobenzene	*93.6*			**0**	*85-114*	*%REC*	*1*	*01-Jul-2019 14:01*
Surr: Dibromofluoromethane	*94.2*			**0**	*80-119*	*%REC*	*1*	*01-Jul-2019 14:01*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*01-Jul-2019 14:01*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	**0.46**		**0.010**	**0.010**	**0.010**	**ug/L**	1	28-Jun-2019 05:53
Surr: 2-Fluorobiphenyl	*88.3*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 05:53*
Surr: 4-Terphenyl-d14	*124*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 05:53*
Surr: Nitrobenzene-d5	*105*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 05:53*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CpTMW15_062119
Collection Date: 21-Jun-2019 10:30

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:36
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 19:36
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	01-Jul-2019 19:36
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:36
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	01-Jul-2019 19:36
Acetone	**5.0**		**0.40**	**1.0**	**2.0**	**UG/L**	1	01-Jul-2019 19:36
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	01-Jul-2019 19:36
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19061210
Sample ID: 18CpTMW15_062119
Lab ID:HS19061210-06
Collection Date: 21-Jun-2019 10:30
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	01-Jul-2019 19:36
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 19:36
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	01-Jul-2019 19:36
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 19:36
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Trichloroethene	**2.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	01-Jul-2019 19:36
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 19:36
Surr: 1,2-Dichloroethane-d4	*104*			**0**	*81-118*	*%REC*	*1*	*01-Jul-2019 19:36*
Surr: 4-Bromofluorobenzene	*96.9*			**0**	*85-114*	*%REC*	*1*	*01-Jul-2019 19:36*
Surr: Dibromofluoromethane	*97.0*			**0**	*80-119*	*%REC*	*1*	*01-Jul-2019 19:36*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*01-Jul-2019 19:36*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	**0.43**		**0.010**	**0.010**	**0.010**	**ug/L**	1	28-Jun-2019 06:13
Surr: 2-Fluorobiphenyl	*97.4*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 06:13*
Surr: 4-Terphenyl-d14	*110*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 06:13*
Surr: Nitrobenzene-d5	*111*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 06:13*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24 WorkOrder:HS19061210
Sample ID: 18CpTMW03SW_062119 Lab ID:HS19061210-07
Collection Date: 21-Jun-2019 07:50 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,2-Dichloroethane	**1.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	01-Jul-2019 20:00
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:00
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 20:00
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	01-Jul-2019 20:00
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:00
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	01-Jul-2019 20:00
Acetone	**5.2**		**0.40**	**1.0**	**2.0**	**UG/L**	1	01-Jul-2019 20:00
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	01-Jul-2019 20:00
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CpTMW03SW_062119
Collection Date: 21-Jun-2019 07:50

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-07
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00
cis-1,2-Dichloroethene	**1.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	01-Jul-2019 20:00
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	01-Jul-2019 20:00
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 20:00
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	01-Jul-2019 20:00
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:00
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Trichloroethene	**19**		**0.20**	**0.50**	**1.0**	**UG/L**	1	01-Jul-2019 20:00
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:00
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*01-Jul-2019 20:00*
Surr: 4-Bromofluorobenzene	*94.7*			**0**	*85-114*	*%REC*	*1*	*01-Jul-2019 20:00*
Surr: Dibromofluoromethane	*95.6*			**0**	*80-119*	*%REC*	*1*	*01-Jul-2019 20:00*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*01-Jul-2019 20:00*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	**0.67**		**0.050**	**0.050**	**0.050**	**ug/L**	5	28-Jun-2019 18:45
Surr: 2-Fluorobiphenyl	*83.3*			**0**	*40-140*	*%REC*	*5*	*28-Jun-2019 18:45*
Surr: 4-Terphenyl-d14	*121*			**0**	*40-140*	*%REC*	*5*	*28-Jun-2019 18:45*
Surr: Nitrobenzene-d5	*82.8*			**0**	*40-140*	*%REC*	*5*	*28-Jun-2019 18:45*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CpTMW03SW_062119
Collection Date: 21-Jun-2019 07:50

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-07
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.0446**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 16:12
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:46
Arsenic	**0.00272**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:46
Barium	**0.172**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:46
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:46
Cadmium	**0.000367**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:46
Calcium	**21.0**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:46
Chromium	**0.0163**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:46
Cobalt	**0.00263**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:46
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	09-Jul-2019 00:46
Iron	**1.75**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:46
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 00:46
Magnesium	**7.22**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:46
Manganese	**0.0478**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:46
Nickel	**0.00956**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:46
Potassium	**233**		**0.180**	**0.500**	**2.00**	**mg/L**	10	09-Jul-2019 16:15
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:46
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 16:12
Sodium	**265**		**0.140**	**0.500**	**2.00**	**mg/L**	10	09-Jul-2019 16:15
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:46
Vanadium	**0.00183**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:46
Zinc	**0.0987**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:46
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 01-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	01-Jul-2019 16:29
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: AWD3_062119
Collection Date: 21-Jun-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,1-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,2-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	01-Jul-2019 20:48
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
2-Butanone	10	U	5.0	10	20	UG/L	10	01-Jul-2019 20:48
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
2-Hexanone	10	U	10	10	20	UG/L	10	01-Jul-2019 20:48
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	01-Jul-2019 20:48
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	01-Jul-2019 20:48
Acetone	10	U	4.0	10	20	UG/L	10	01-Jul-2019 20:48
Benzene	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Bromochloromethane	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Carbon disulfide	10	U	6.0	10	20	UG/L	10	01-Jul-2019 20:48
Carbon tetrachloride	**35**		**5.0**	**5.0**	**10**	**UG/L**	10	01-Jul-2019 20:48
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Chloroform	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: AWD3_062119
Collection Date: 21-Jun-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
cis-1,2-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Hexachlorobutadiene	10	U	10	10	10	UG/L	10	01-Jul-2019 20:48
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
m,p-Xylene	10	U	5.0	10	20	UG/L	10	01-Jul-2019 20:48
Methylene chloride	10	U	4.0	10	20	UG/L	10	01-Jul-2019 20:48
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	01-Jul-2019 20:48
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Styrene	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Tetrachloroethene	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Toluene	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
trans-1,2-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Trichloroethene	**580**		**2.0**	**5.0**	**10**	**UG/L**	10	01-Jul-2019 20:48
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Vinyl chloride	5.0	U	2.0	5.0	10	UG/L	10	01-Jul-2019 20:48
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*10*	*01-Jul-2019 20:48*
Surr: 4-Bromofluorobenzene	*94.7*			**0**	*85-114*	*%REC*	*10*	*01-Jul-2019 20:48*
Surr: Dibromofluoromethane	*96.3*			**0**	*80-119*	*%REC*	*10*	*01-Jul-2019 20:48*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*10*	*01-Jul-2019 20:48*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: AWD3_062119
Collection Date: 21-Jun-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.157**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 16:17
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:48
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:48
Barium	**0.0352**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:48
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:48
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:48
Calcium	**0.817**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:48
Chromium	**0.0808**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:48
Cobalt	**0.000846**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:48
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	09-Jul-2019 00:48
Iron	**0.430**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:48
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 00:48
Magnesium	**0.586**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:48
Manganese	**0.00771**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:48
Nickel	**0.0253**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:48
Potassium	**0.746**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:48
Selenium	**0.00434**	J	**0.00110**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:48
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 16:17
Sodium	**30.1**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:48
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:48
Vanadium	**0.00191**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:48
Zinc	**0.0177**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:48
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 01-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	01-Jul-2019 16:34
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	06-Jul-2019 09:58

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: CO8_062119
Collection Date: 21-Jun-2019 10:35

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-09
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:24
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 20:24
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	01-Jul-2019 20:24
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:24
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	01-Jul-2019 20:24
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	01-Jul-2019 20:24
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	01-Jul-2019 20:24
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: CO8_062119
Collection Date: 21-Jun-2019 10:35

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-09
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	01-Jul-2019 20:24
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	01-Jul-2019 20:24
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	01-Jul-2019 20:24
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	01-Jul-2019 20:24
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Trichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	01-Jul-2019 20:24
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	01-Jul-2019 20:24
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*1*	*01-Jul-2019 20:24*
Surr: 4-Bromofluorobenzene	*96.4*			**0**	*85-114*	*%REC*	*1*	*01-Jul-2019 20:24*
Surr: Dibromofluoromethane	*98.1*			**0**	*80-119*	*%REC*	*1*	*01-Jul-2019 20:24*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*01-Jul-2019 20:24*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 06:55
Surr: 2-Fluorobiphenyl	*103*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 06:55*
Surr: 4-Terphenyl-d14	*98.8*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 06:55*
Surr: Nitrobenzene-d5	*107*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 06:55*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	10-Jul-2019 14:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip blank
Collection Date: 21-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-10
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,1,1-Trichloroethane	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,1,2,2-Tetrachloroethane	0.50	HU	0.50	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,1,2-Trichloroethane	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,1-Dichloroethane	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,1-Dichloroethene	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,1-Dichloropropene	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,2,3-Trichlorobenzene	0.50	HU	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,2,3-Trichloropropane	0.50	HU	0.50	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,2,4-Trichlorobenzene	0.50	HU	0.50	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,2,4-Trimethylbenzene	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,2-Dibromo-3-chloropropane	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,2-Dibromoethane	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,2-Dichlorobenzene	0.50	HU	0.50	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,2-Dichloroethane	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,2-Dichloropropane	0.50	HU	0.50	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,3,5-Trimethylbenzene	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,3-Dichlorobenzene	0.50	HU	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,3-Dichloropropane	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
1,4-Dichlorobenzene	0.50	HU	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:10
2,2-Dichloropropane	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
2-Butanone	1.0	HU	0.50	1.0	2.0	UG/L	1	15-Jul-2019 15:10
2-Chlorotoluene	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
2-Hexanone	1.0	HU	1.0	1.0	2.0	UG/L	1	15-Jul-2019 15:10
4-Chlorotoluene	0.50	HU	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:10
4-Isopropyltoluene	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
4-Methyl-2-pentanone	1.0	HU	0.70	1.0	2.0	UG/L	1	15-Jul-2019 15:10
Acetone	1.0	HU	0.40	1.0	2.0	UG/L	1	15-Jul-2019 15:10
Benzene	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Bromobenzene	0.50	HU	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Bromochloromethane	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Bromodichloromethane	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Bromoform	0.50	HU	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Bromomethane	0.50	HU	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Carbon disulfide	1.0	HU	0.60	1.0	2.0	UG/L	1	15-Jul-2019 15:10
Carbon tetrachloride	0.50	HU	0.50	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Chlorobenzene	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Chloroethane	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Chloroform	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip blank
Collection Date: 21-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061210
Lab ID:HS19061210-10
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
cis-1,2-Dichloroethene	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
cis-1,3-Dichloropropene	0.50	HU	0.10	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Dibromochloromethane	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Dibromomethane	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Dichlorodifluoromethane	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Ethylbenzene	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Hexachlorobutadiene	1.0	HU	1.0	1.0	1.0	UG/L	1	15-Jul-2019 15:10
Isopropylbenzene	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
m,p-Xylene	1.0	HU	0.50	1.0	2.0	UG/L	1	15-Jul-2019 15:10
Methylene chloride	1.0	HU	0.40	1.0	2.0	UG/L	1	15-Jul-2019 15:10
n-Butylbenzene	0.50	HU	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:10
n-Propylbenzene	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Naphthalene	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
o-Xylene	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
sec-Butylbenzene	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Styrene	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
tert-Butylbenzene	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Tetrachloroethene	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Toluene	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
trans-1,2-Dichloroethene	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
trans-1,3-Dichloropropene	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Trichloroethene	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Trichlorofluoromethane	0.50	HU	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Vinyl chloride	0.50	HU	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:10
Surr: 1,2-Dichloroethane-d4	*95.0*			**0**	*81-118*	*%REC*	*1*	*15-Jul-2019 15:10*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*15-Jul-2019 15:10*
Surr: Dibromofluoromethane	*95.0*			**0**	*80-119*	*%REC*	*1*	*15-Jul-2019 15:10*
Surr: Toluene-d8	*107*			**0**	*89-112*	*%REC*	*1*	*15-Jul-2019 15:10*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

Revision: 2

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

Batch ID: 142510 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061210-01	1	1000	1 (mL)	0.001
HS19061210-02	1	1000	1 (mL)	0.001
HS19061210-05	1	1000	1 (mL)	0.001
HS19061210-06	1	1000	1 (mL)	0.001
HS19061210-07	1	1000	1 (mL)	0.001
HS19061210-09	1	1000	1 (mL)	0.001

Batch ID: 142615 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061210-03	1	10 (mL)	10 (mL)	1
HS19061210-07	1	10 (mL)	10 (mL)	1
HS19061210-08	1	10 (mL)	10 (mL)	1

Batch ID: 142750 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061210-03	1	10	10 (mL)	1
HS19061210-07	1	10	10 (mL)	1
HS19061210-08	1	10	10 (mL)	1

ALS Houston, US Date: 15-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142510 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Water	
HS19061210-01	18CpTMW06_062119	21 Jun 2019 07:10		27 Jun 2019 14:45	28 Jun 2019 05:11	1
HS19061210-02	18CpTMW06_062119_a	21 Jun 2019 07:10		27 Jun 2019 14:45	28 Jun 2019 05:32	1
HS19061210-05	MW8_062119	21 Jun 2019 09:40		27 Jun 2019 14:45	28 Jun 2019 05:53	1
HS19061210-06	18CpTMW15_062119	21 Jun 2019 10:30		27 Jun 2019 14:45	28 Jun 2019 06:13	1
HS19061210-07	18CpTMW03SW_062119	21 Jun 2019 07:50		27 Jun 2019 14:45	28 Jun 2019 18:45	5
HS19061210-09	CO8_062119	21 Jun 2019 10:35		27 Jun 2019 14:45	28 Jun 2019 06:55	1
Batch ID: 142615 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Water	
HS19061210-03	MW22_062119	21 Jun 2019 08:00		01 Jul 2019 10:30	01 Jul 2019 16:24	1
HS19061210-07	18CpTMW03SW_062119	21 Jun 2019 07:50		01 Jul 2019 10:30	01 Jul 2019 16:29	1
HS19061210-08	AWD3_062119	21 Jun 2019 09:00		01 Jul 2019 10:30	01 Jul 2019 16:34	1
Batch ID: 142750 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Water	
HS19061210-03	MW22_062119	21 Jun 2019 08:00		05 Jul 2019 10:03	09 Jul 2019 16:10	10
HS19061210-03	MW22_062119	21 Jun 2019 08:00		05 Jul 2019 10:03	09 Jul 2019 16:08	1
HS19061210-03	MW22_062119	21 Jun 2019 08:00		05 Jul 2019 10:03	09 Jul 2019 00:43	1
HS19061210-07	18CpTMW03SW_062119	21 Jun 2019 07:50		05 Jul 2019 10:03	09 Jul 2019 16:15	10
HS19061210-07	18CpTMW03SW_062119	21 Jun 2019 07:50		05 Jul 2019 10:03	09 Jul 2019 16:12	1
HS19061210-07	18CpTMW03SW_062119	21 Jun 2019 07:50		05 Jul 2019 10:03	09 Jul 2019 00:46	1
HS19061210-08	AWD3_062119	21 Jun 2019 09:00		05 Jul 2019 10:03	09 Jul 2019 16:17	1
HS19061210-08	AWD3_062119	21 Jun 2019 09:00		05 Jul 2019 10:03	09 Jul 2019 00:48	1
Batch ID: R341659 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19061210-01	18CpTMW06_062119	21 Jun 2019 07:10			01 Jul 2019 18:48	1
HS19061210-02	18CpTMW06_062119_a	21 Jun 2019 07:10			01 Jul 2019 19:12	1
HS19061210-03	MW22_062119	21 Jun 2019 08:00			01 Jul 2019 18:24	10
HS19061210-03	MW22_062119	21 Jun 2019 08:00			01 Jul 2019 14:49	1
HS19061210-04	CO1_062119	21 Jun 2019 08:50			01 Jul 2019 13:37	1
HS19061210-05	MW8_062119	21 Jun 2019 09:40			01 Jul 2019 14:01	1
HS19061210-06	18CpTMW15_062119	21 Jun 2019 10:30			01 Jul 2019 19:36	1
HS19061210-07	18CpTMW03SW_062119	21 Jun 2019 07:50			01 Jul 2019 20:00	1
HS19061210-08	AWD3_062119	21 Jun 2019 09:00			01 Jul 2019 20:48	10
HS19061210-09	CO8_062119	21 Jun 2019 10:35			01 Jul 2019 20:24	1

Revision: 2

ALS Houston, US Date: 15-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R341930 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS19061210-01	18CpTMW06_062119	21 Jun 2019 07:10			06 Jul 2019 09:58	1
HS19061210-02	18CpTMW06_062119_a	21 Jun 2019 07:10			06 Jul 2019 09:58	1
HS19061210-03	MW22_062119	21 Jun 2019 08:00			06 Jul 2019 09:58	1
HS19061210-04	CO1_062119	21 Jun 2019 08:50			06 Jul 2019 09:58	1
HS19061210-05	MW8_062119	21 Jun 2019 09:40			06 Jul 2019 09:58	1
HS19061210-06	18CpTMW15_062119	21 Jun 2019 10:30			06 Jul 2019 09:58	1
HS19061210-07	18CpTMW03SW_062119	21 Jun 2019 07:50			06 Jul 2019 09:58	1
HS19061210-08	AWD3_062119	21 Jun 2019 09:00			06 Jul 2019 09:58	1
Batch ID: R342166 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS19061210-09	CO8_062119	21 Jun 2019 10:35			10 Jul 2019 14:38	1
Batch ID: R342424 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19061210-10	Trip blank	21 Jun 2019 00:00			15 Jul 2019 15:10	1

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: 142615 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142615** Units: **mg/L** Analysis Date: **01-Jul-2019 16:21**
Client ID: Run ID: **HG03_341667** SeqNo: **5149453** PrepDate: **01-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142615** Units: **mg/L** Analysis Date: **01-Jul-2019 16:22**
Client ID: Run ID: **HG03_341667** SeqNo: **5149454** PrepDate: **01-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00513	0.000200	0.005	0	103	80 - 120				

MS Sample ID: **HS19061210-03MS** Units: **mg/L** Analysis Date: **01-Jul-2019 16:26**
Client ID: **MW22_062119** Run ID: **HG03_341667** SeqNo: **5149456** PrepDate: **01-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000504	0.000000200	5e-006	0.0000000070	101	75 - 125				

MSD Sample ID: **HS19061210-03MSD** Units: **mg/L** Analysis Date: **01-Jul-2019 16:27**
Client ID: **MW22_062119** Run ID: **HG03_341667** SeqNo: **5149457** PrepDate: **01-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000505	0.000000200	5e-006	0.0000000070	101	75 - 125	0.000005040	0.198	20	

The following samples were analyzed in this batch: HS19061210-03 HS19061210-07 HS19061210-08

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 14:46**
Client ID: Run ID: **ICPMS05_342082** SeqNo: **5159142** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.00500	0.0100								U
Antimony	0.00078	0.00500								J
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00100	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.000871	0.00500								J
Zinc	0.00250	0.00500								U

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 00:09**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157973** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.01569	0.0100								
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00100	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0188	0.200								J
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.01316	0.00500								

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 00:11**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157974** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.105	0.0100	0.1	0	105	84 - 117				
Antimony	0.05026	0.00500	0.05	0	101	85 - 117				
Arsenic	0.05045	0.00500	0.05	0	101	84 - 116				
Barium	0.04898	0.00500	0.05	0	98.0	86 - 114				
Beryllium	0.0522	0.00200	0.05	0	104	83 - 121				
Cadmium	0.05062	0.00200	0.05	0	101	87 - 115				
Calcium	5.044	0.500	5	0	101	87 - 118				
Chromium	0.05022	0.00500	0.05	0	100	85 - 116				
Cobalt	0.05178	0.00500	0.05	0	104	86 - 115				
Copper	0.05054	0.00500	0.05	0	101	85 - 118				
Iron	5.157	0.200	5	0	103	87 - 118				
Lead	0.04892	0.00500	0.05	0	97.8	88 - 115				
Magnesium	5.207	0.200	5	0	104	83 - 118				
Manganese	0.05151	0.00500	0.05	0	103	87 - 115				
Nickel	0.05192	0.00500	0.05	0	104	85 - 117				
Potassium	5.01	0.200	5	0	100	87 - 115				
Selenium	0.05098	0.00500	0.05	0	102	80 - 120				
Sodium	5.131	0.200	5	0	103	85 - 117				
Thallium	0.04741	0.00200	0.05	0	94.8	82 - 116				
Vanadium	0.04942	0.00500	0.05	0	98.8	86 - 115				
Zinc	0.05405	0.00500	0.05	0	108	83 - 119				

LCS Sample ID: **LCS-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 16:22**
Client ID: Run ID: **ICPMS05_342082** SeqNo: **5159203** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Silver	0.05104	0.00500	0.05	0	102	85 - 116				

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19070016-05MS** Units: **mg/L** Analysis Date: **09-Jul-2019 00:18**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157977** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09637	0.0100	0.1	0.008457	87.9	84 - 117				
Antimony	0.04754	0.00500	0.05	0.000233	94.6	85 - 117				
Arsenic	0.04735	0.00500	0.05	0.000332	94.0	84 - 116				
Barium	0.5018	0.00500	0.05	0.443	118	86 - 114				SO
Beryllium	0.05054	0.00200	0.05	0.000285	101	83 - 121				
Cadmium	0.04557	0.00200	0.05	0.000354	90.4	87 - 115				
Calcium	15.22	0.500	5	10.34	97.6	87 - 118				
Chromium	0.1883	0.00500	0.05	0.1422	92.1	85 - 116				
Cobalt	0.05284	0.00500	0.05	0.004809	96.1	86 - 115				
Copper	0.05149	0.00500	0.05	0.004724	93.5	85 - 118				
Iron	5.767	0.200	5	1.003	95.3	87 - 118				
Lead	0.04574	0.00500	0.05	0.000066	91.3	88 - 115				
Magnesium	11.72	0.200	5	7.041	93.6	83 - 118				
Manganese	0.255	0.00500	0.05	0.2048	100	87 - 115				O
Nickel	0.6207	0.00500	0.05	0.5635	114	85 - 117				O
Potassium	5.81	0.200	5	0.934	97.5	87 - 115				
Selenium	0.05067	0.00500	0.05	0.000254	101	80 - 120				
Silver	0.05394	0.00500	0.05	0.000034	108	85 - 116				
Sodium	70.47	0.200	5	64.83	113	85 - 117				O
Thallium	0.04418	0.00200	0.05	0.000618	87.1	82 - 116				
Vanadium	0.0472	0.00500	0.05	0.001088	92.2	86 - 115				
Zinc	0.1359	0.00500	0.05	0.09015	91.5	83 - 119				

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19070016-05MSD** Units: **mg/L** Analysis Date: **09-Jul-2019 00:21**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157978** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.0988	0.0100	0.1	0.008457	90.3	84 - 117	0.09637	2.49	20	
Antimony	0.04561	0.00500	0.05	0.000233	90.8	85 - 117	0.04754	4.15	20	
Arsenic	0.0475	0.00500	0.05	0.000332	94.3	84 - 116	0.04735	0.314	20	
Barium	0.5084	0.00500	0.05	0.443	131	86 - 114	0.5018	1.3	20	SO
Beryllium	0.05016	0.00200	0.05	0.000285	99.8	83 - 121	0.05054	0.751	20	
Cadmium	0.04804	0.00200	0.05	0.000354	95.4	87 - 115	0.04557	5.28	20	
Calcium	14.79	0.500	5	10.34	89.1	87 - 118	15.22	2.83	20	
Chromium	0.1943	0.00500	0.05	0.1422	104	85 - 116	0.1883	3.17	20	
Cobalt	0.05273	0.00500	0.05	0.004809	95.8	86 - 115	0.05284	0.201	20	
Copper	0.05346	0.00500	0.05	0.004724	97.5	85 - 118	0.05149	3.75	20	
Iron	5.694	0.200	5	1.003	93.8	87 - 118	5.767	1.28	20	
Lead	0.04407	0.00500	0.05	0.000066	88.0	88 - 115	0.04574	3.72	20	
Magnesium	11.29	0.200	5	7.041	85.1	83 - 118	11.72	3.73	20	
Manganese	0.2539	0.00500	0.05	0.2048	98.1	87 - 115	0.255	0.456	20	O
Nickel	0.6206	0.00500	0.05	0.5635	114	85 - 117	0.6207	0.00725	20	O
Potassium	5.591	0.200	5	0.934	93.1	87 - 115	5.81	3.84	20	
Selenium	0.0495	0.00500	0.05	0.000254	98.5	80 - 120	0.05067	2.33	20	
Silver	0.05636	0.00500	0.05	0.000034	113	85 - 116	0.05394	4.39	20	
Sodium	68.43	0.200	5	64.83	71.9	85 - 117	70.47	2.94	20	SO
Thallium	0.04256	0.00200	0.05	0.000618	83.9	82 - 116	0.04418	3.74	20	
Vanadium	0.04785	0.00500	0.05	0.001088	93.5	86 - 115	0.0472	1.37	20	
Zinc	0.1384	0.00500	0.05	0.09015	96.5	83 - 119	0.1359	1.82	20	

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ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19070016-05PDS** Units: **mg/L** Analysis Date: **09-Jul-2019 00:23**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157979** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1004	0.0100	0.1	0.008457	92.0	80 - 120				
Antimony	0.08827	0.00500	0.1	0.000233	88.0	80 - 120				
Arsenic	0.1014	0.00500	0.1	0.000332	101	80 - 120				
Barium	0.5467	0.00500	0.1	0.443	104	80 - 120				O
Beryllium	0.09789	0.00200	0.1	0.000285	97.6	80 - 120				
Cadmium	0.09739	0.00200	0.1	0.000354	97.0	80 - 120				
Calcium	19.93	0.500	10	10.34	96.0	80 - 120				
Chromium	0.2417	0.00500	0.1	0.1422	99.5	80 - 120				
Cobalt	0.1061	0.00500	0.1	0.004809	101	80 - 120				
Copper	0.1034	0.00500	0.1	0.004724	98.7	80 - 120				
Iron	11.04	0.200	10	1.003	100	80 - 120				
Lead	0.09432	0.00500	0.1	0.000066	94.2	80 - 120				
Magnesium	16.83	0.200	10	7.041	97.9	80 - 120				
Manganese	0.3036	0.00500	0.1	0.2048	98.8	80 - 120				
Nickel	0.652	0.00500	0.1	0.5635	88.5	80 - 120				O
Potassium	10.66	0.200	10	0.934	97.2	80 - 120				
Selenium	0.1067	0.00500	0.1	0.000254	106	80 - 120				
Silver	0.1124	0.00500	0.1	0.000034	112	80 - 120				
Sodium	73.52	0.200	10	64.83	86.9	80 - 120				O
Thallium	0.09198	0.00200	0.1	0.000618	91.4	80 - 120				
Vanadium	0.101	0.00500	0.1	0.001088	99.9	80 - 120				
Zinc	0.1865	0.00500	0.1	0.09015	96.3	80 - 120				

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19070016-05SD** Units: **mg/L** Analysis Date: **09-Jul-2019 00:16**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157976** PrepDate: **05-Jul-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.0250	0.0500					0.008457	0	10	U
Antimony	0.00250	0.0250					0.000233	0	10	U
Arsenic	0.00250	0.0250					0.000332	0	10	U
Barium	0.4183	0.0250					0.443	5.57	10	
Beryllium	0.00250	0.0100					0.000285	0	10	U
Cadmium	0.00250	0.0100					0.000354	0	10	U
Calcium	10.41	2.50					10.34	0.714	10	
Chromium	0.1432	0.0250					0.1422	0.69	10	
Cobalt	0.005021	0.0250					0.004809	0	10	J
Copper	0.00500	0.0250					0.004724	0	10	U
Iron	1.017	1.00					1.003	1.35	10	
Lead	0.00500	0.0250					0.000066	0	10	U
Magnesium	6.942	1.00					7.041	1.41	10	
Manganese	0.2079	0.0250					0.2048	1.52	10	
Nickel	0.5877	0.0250					0.5635	4.3	10	
Potassium	0.9174	1.00					0.934	0	10	J
Selenium	0.0125	0.0250					0.000254	0	10	U
Silver	0.00250	0.0250					0.000034	0	10	U
Sodium	66.24	1.00					64.83	2.17	10	
Thallium	0.00250	0.0100					0.000618	0	10	U
Vanadium	0.00500	0.0250					0.001088	0	10	U
Zinc	0.08743	0.0250					0.09015	3.02	10	

The following samples were analyzed in this batch: HS19061210-03 HS19061210-07 HS19061210-08

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: 142510 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142510** Units: **ug/L** Analysis Date: **27-Jun-2019 22:37**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146408** PrepDate: **27-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.0594*	*0*	*0.08*	*0*	*74.3*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.08022*	*0*	*0.08*	*0*	*100*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07461*	*0*	*0.08*	*0*	*93.3*	*40 - 140*				

LCS Sample ID: **LCS-142510** Units: **ug/L** Analysis Date: **27-Jun-2019 22:58**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146409** PrepDate: **27-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08012	0.010	0.08	0	100	40 - 140				
Surr: 2-Fluorobiphenyl	*0.07847*	*0*	*0.08*	*0*	*98.1*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.08943*	*0*	*0.08*	*0*	*112*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08221*	*0*	*0.08*	*0*	*103*	*40 - 140*				

LCSD Sample ID: **LCSD-142510** Units: **ug/L** Analysis Date: **27-Jun-2019 23:19**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146410** PrepDate: **27-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07797	0.010	0.08	0	97.5	40 - 140	0.08012	2.72	20	
Surr: 2-Fluorobiphenyl	*0.07625*	*0*	*0.08*	*0*	*95.3*	*40 - 140*	*0.07847*	*2.86*	*20*	
Surr: 4-Terphenyl-d14	*0.09409*	*0*	*0.08*	*0*	*118*	*40 - 140*	*0.08943*	*5.08*	*20*	
Surr: Nitrobenzene-d5	*0.08067*	*0*	*0.08*	*0*	*101*	*40 - 140*	*0.08221*	*1.89*	*20*	

The following samples were analyzed in this batch: HS19061210-01 HS19061210-02 HS19061210-05 HS19061210-06 HS19061210-07 HS19061210-09

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190701** Units: **UG/L** Analysis Date: **01-Jul-2019 13:13**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149141** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190701** Units: **UG/L** Analysis Date: **01-Jul-2019 13:13**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149141** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*50.46*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.58*	*1.0*	*50*	*0*	*95.2*	*85 - 114*				
Surr: Dibromofluoromethane	*47*	*1.0*	*50*	*0*	*94.0*	*80 - 119*				
Surr: Toluene-d8	*50.26*	*1.0*	*50*	*0*	*101*	*89 - 112*				

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190701** Units: **UG/L** Analysis Date: **01-Jul-2019 12:25**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149140** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.11	1.0	20	0	101	78 - 124				
1,1,1-Trichloroethane	20.63	1.0	20	0	103	74 - 131				
1,1,2,2-Tetrachloroethane	22.67	1.0	20	0	113	71 - 121				
1,1,2-Trichloroethane	21.52	1.0	20	0	108	80 - 119				
1,1-Dichloroethane	20.18	1.0	20	0	101	77 - 125				
1,1-Dichloroethene	20.08	1.0	20	0	100	71 - 131				
1,1-Dichloropropene	19.97	1.0	20	0	99.9	78 - 125				
1,2,3-Trichlorobenzene	25.38	1.0	20	0	127	69 - 129				
1,2,3-Trichloropropane	22.97	1.0	20	0	115	73 - 122				
1,2,4-Trichlorobenzene	22.39	1.0	20	0	112	69 - 130				
1,2,4-Trimethylbenzene	18.77	1.0	20	0	93.8	76 - 124				
1,2-Dibromo-3-chloropropane	24.24	1.0	20	0	121	62 - 128				
1,2-Dibromoethane	21.01	1.0	20	0	105	77 - 121				
1,2-Dichlorobenzene	20.29	1.0	20	0	101	80 - 119				
1,2-Dichloroethane	19.6	1.0	20	0	98.0	73 - 128				
1,2-Dichloropropane	20.22	1.0	20	0	101	78 - 122				
1,3,5-Trimethylbenzene	18.12	1.0	20	0	90.6	75 - 124				
1,3-Dichlorobenzene	19.14	1.0	20	0	95.7	80 - 119				
1,3-Dichloropropane	20.91	1.0	20	0	105	80 - 119				
1,4-Dichlorobenzene	20.69	1.0	20	0	103	79 - 118				
2,2-Dichloropropane	21.55	1.0	20	0	108	60 - 139				
2-Butanone	46.4	2.0	40	0	116	56 - 143				
2-Chlorotoluene	20.24	1.0	20	0	101	79 - 122				
2-Hexanone	42.95	2.0	40	0	107	57 - 139				
4-Chlorotoluene	20.21	1.0	20	0	101	78 - 122				
4-Isopropyltoluene	18.13	1.0	20	0	90.7	77 - 127				
4-Methyl-2-pentanone	42.21	2.0	40	0	106	67 - 130				
Acetone	51.9	2.0	40	0	130	39 - 160				
Benzene	20.86	1.0	20	0	104	79 - 120				
Bromobenzene	19.3	1.0	20	0	96.5	80 - 120				
Bromochloromethane	19.63	1.0	20	0	98.1	78 - 123				
Bromodichloromethane	20.78	1.0	20	0	104	79 - 125				
Bromoform	21.56	1.0	20	0	108	66 - 130				
Bromomethane	22.3	1.0	20	0	111	53 - 141				

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190701** Units: **UG/L** Analysis Date: **01-Jul-2019 12:25**
Client ID: Run ID: **VOA6_341659** SeqNo: **5149140** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	38.23	2.0	40	0	95.6	64 - 133				
Carbon tetrachloride	19.74	1.0	20	0	98.7	72 - 136				
Chlorobenzene	19.92	1.0	20	0	99.6	82 - 118				
Chloroethane	20.74	1.0	20	0	104	60 - 138				
Chloroform	24.47	1.0	20	0	122	79 - 124				
Chloromethane	18.24	1.0	20	0	91.2	50 - 139				
cis-1,2-Dichloroethene	20.8	1.0	20	0	104	78 - 123				
cis-1,3-Dichloropropene	20.13	1.0	20	0	101	75 - 124				
Dibromochloromethane	20.47	1.0	20	0	102	74 - 126				
Dibromomethane	20.24	1.0	20	0	101	79 - 123				
Dichlorodifluoromethane	20.65	1.0	20	0	103	32 - 152				
Ethylbenzene	19.49	1.0	20	0	97.4	79 - 121				
Hexachlorobutadiene	24.85	1.0	20	0	124	66 - 134				
Isopropylbenzene	18.53	1.0	20	0	92.6	72 - 131				
m,p-Xylene	38.92	2.0	40	0	97.3	80 - 121				
Methylene chloride	20.4	2.0	20	0	102	74 - 124				
Naphthalene	24.33	1.0	20	0	122	61 - 128				
n-Butylbenzene	18.77	1.0	20	0	93.9	75 - 128				
n-Propylbenzene	19.53	1.0	20	0	97.6	76 - 126				
o-Xylene	19.03	1.0	20	0	95.1	78 - 122				
sec-Butylbenzene	19.27	1.0	20	0	96.4	77 - 126				
Styrene	20.47	1.0	20	0	102	78 - 123				
tert-Butylbenzene	19.27	1.0	20	0	96.4	78 - 124				
Tetrachloroethene	19.09	1.0	20	0	95.4	74 - 129				
Toluene	19.9	1.0	20	0	99.5	80 - 121				
trans-1,2-Dichloroethene	20.71	1.0	20	0	104	75 - 124				
trans-1,3-Dichloropropene	20.46	1.0	20	0	102	73 - 127				
Trichloroethene	19.73	1.0	20	0	98.7	79 - 123				
Trichlorofluoromethane	20.37	1.0	20	0	102	65 - 141				
Vinyl chloride	19.04	1.0	20	0	95.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*56.59*	*1.0*	*50*	*0*	*113*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*54.46*	*1.0*	*50*	*0*	*109*	*85 - 114*				
Surr: Dibromofluoromethane	*54.8*	*1.0*	*50*	*0*	*110*	*80 - 119*				
Surr: Toluene-d8	*53.87*	*1.0*	*50*	*0*	*108*	*89 - 112*				

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19061210-04MS** Units: **UG/L** Analysis Date: **01-Jul-2019 15:13**
Client ID: **CO1_062119** Run ID: **VOA6_341659** SeqNo: **5149146** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.02	1.0	20	0	85.1	78 - 124				
1,1,1-Trichloroethane	17.58	1.0	20	0	87.9	74 - 131				
1,1,2,2-Tetrachloroethane	18.62	1.0	20	0	93.1	71 - 121				
1,1,2-Trichloroethane	18.04	1.0	20	0	90.2	80 - 119				
1,1-Dichloroethane	16.54	1.0	20	0	82.7	77 - 125				
1,1-Dichloroethene	17.79	1.0	20	0	88.9	71 - 131				
1,1-Dichloropropene	18.36	1.0	20	0	91.8	78 - 125				
1,2,3-Trichlorobenzene	21.43	1.0	20	0	107	69 - 129				
1,2,3-Trichloropropane	18.9	1.0	20	0	94.5	73 - 122				
1,2,4-Trichlorobenzene	20.15	1.0	20	0	101	69 - 130				
1,2,4-Trimethylbenzene	17.71	1.0	20	0	88.5	76 - 124				
1,2-Dibromo-3-chloropropane	20.52	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	17.45	1.0	20	0	87.3	77 - 121				
1,2-Dichlorobenzene	17.28	1.0	20	0	86.4	80 - 119				
1,2-Dichloroethane	16.37	1.0	20	0	81.9	73 - 128				
1,2-Dichloropropane	16.77	1.0	20	0	83.8	78 - 122				
1,3,5-Trimethylbenzene	17.74	1.0	20	0	88.7	75 - 124				
1,3-Dichlorobenzene	17.27	1.0	20	0	86.4	80 - 119				
1,3-Dichloropropane	17.64	1.0	20	0	88.2	80 - 119				
1,4-Dichlorobenzene	18.24	1.0	20	0	91.2	79 - 118				
2,2-Dichloropropane	18.02	1.0	20	0	90.1	60 - 139				
2-Butanone	36.58	2.0	40	0	91.5	56 - 143				
2-Chlorotoluene	18.42	1.0	20	0	92.1	79 - 122				
2-Hexanone	35.46	2.0	40	0	88.6	57 - 139				
4-Chlorotoluene	18.55	1.0	20	0	92.8	78 - 122				
4-Isopropyltoluene	18.67	1.0	20	0	93.4	77 - 127				
4-Methyl-2-pentanone	34.54	2.0	40	0	86.4	67 - 130				
Acetone	41.91	2.0	40	0	105	39 - 160				
Benzene	17.59	1.0	20	0	88.0	79 - 120				
Bromobenzene	16.17	1.0	20	0	80.9	80 - 120				
Bromochloromethane	15.85	1.0	20	0	79.2	78 - 123				
Bromodichloromethane	17.02	1.0	20	0	85.1	79 - 125				
Bromoform	17.99	1.0	20	0	90.0	66 - 130				
Bromomethane	17.61	1.0	20	0	88.0	53 - 141				

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19061210-04MS** Units: **UG/L** Analysis Date: **01-Jul-2019 15:13**
Client ID: **CO1_062119** Run ID: **VOA6_341659** SeqNo: **5149146** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	32.41	2.0	40	0	81.0	64 - 133				
Carbon tetrachloride	18.3	1.0	20	0	91.5	72 - 136				
Chlorobenzene	16.87	1.0	20	0	84.3	82 - 118				
Chloroethane	16.94	1.0	20	0	84.7	60 - 138				
Chloroform	16.72	1.0	20	0	83.6	79 - 124				
Chloromethane	16.11	1.0	20	0	80.6	50 - 139				
cis-1,2-Dichloroethene	16.73	1.0	20	0	83.7	78 - 123				
cis-1,3-Dichloropropene	16.21	1.0	20	0	81.1	75 - 124				
Dibromochloromethane	17.08	1.0	20	0	85.4	74 - 126				
Dibromomethane	16.7	1.0	20	0	83.5	79 - 123				
Dichlorodifluoromethane	16.34	1.0	20	0	81.7	32 - 152				
Ethylbenzene	17.84	1.0	20	0	89.2	79 - 121				
Hexachlorobutadiene	22.65	1.0	20	0	113	66 - 134				
Isopropylbenzene	18.4	1.0	20	0	92.0	72 - 131				
m,p-Xylene	35.55	2.0	40	0	88.9	80 - 121				
Methylene chloride	15.55	2.0	20	0	77.8	74 - 124				
Naphthalene	20.06	1.0	20	0	100	61 - 128				
n-Butylbenzene	19.2	1.0	20	0	96.0	75 - 128				
n-Propylbenzene	19.54	1.0	20	0	97.7	76 - 126				
o-Xylene	17.22	1.0	20	0	86.1	78 - 122				
sec-Butylbenzene	19.96	1.0	20	0	99.8	77 - 126				
Styrene	17.96	1.0	20	0	89.8	78 - 123				
tert-Butylbenzene	19.4	1.0	20	0	97.0	78 - 124				
Tetrachloroethene	18.1	1.0	20	0	90.5	74 - 129				
Toluene	17.4	1.0	20	0	87.0	80 - 121				
trans-1,2-Dichloroethene	17.08	1.0	20	0	85.4	75 - 124				
trans-1,3-Dichloropropene	16.44	1.0	20	0	82.2	73 - 127				
Trichloroethene	17.51	1.0	20	0	87.5	79 - 123				
Trichlorofluoromethane	17.76	1.0	20	0	88.8	65 - 141				
Vinyl chloride	16.34	1.0	20	0	81.7	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.83*	*1.0*	*50*	*0*	*99.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.6*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*47.78*	*1.0*	*50*	*0*	*95.6*	*80 - 119*				
Surr: Toluene-d8	*50.33*	*1.0*	*50*	*0*	*101*	*89 - 112*				

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061210-04MSD** Units: **UG/L** Analysis Date: **01-Jul-2019 15:37**
Client ID: **CO1_062119** Run ID: **VOA6_341659** SeqNo: **5149147** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.11	1.0	20	0	85.5	78 - 124	17.02	0.548	20	
1,1,1-Trichloroethane	17.64	1.0	20	0	88.2	74 - 131	17.58	0.364	20	
1,1,2,2-Tetrachloroethane	19.75	1.0	20	0	98.8	71 - 121	18.62	5.89	20	
1,1,2-Trichloroethane	18.6	1.0	20	0	93.0	80 - 119	18.04	3.08	20	
1,1-Dichloroethane	16.64	1.0	20	0	83.2	77 - 125	16.54	0.573	20	
1,1-Dichloroethene	17.88	1.0	20	0	89.4	71 - 131	17.79	0.528	20	
1,1-Dichloropropene	18.5	1.0	20	0	92.5	78 - 125	18.36	0.808	20	
1,2,3-Trichlorobenzene	23.84	1.0	20	0	119	69 - 129	21.43	10.6	20	
1,2,3-Trichloropropane	19.4	1.0	20	0	97.0	73 - 122	18.9	2.62	20	
1,2,4-Trichlorobenzene	21.4	1.0	20	0	107	69 - 130	20.15	6.01	20	
1,2,4-Trimethylbenzene	17.75	1.0	20	0	88.7	76 - 124	17.71	0.222	20	
1,2-Dibromo-3-chloropropane	21.82	1.0	20	0	109	62 - 128	20.52	6.14	20	
1,2-Dibromoethane	17.94	1.0	20	0	89.7	77 - 121	17.45	2.74	20	
1,2-Dichlorobenzene	17.88	1.0	20	0	89.4	80 - 119	17.28	3.4	20	
1,2-Dichloroethane	16.83	1.0	20	0	84.1	73 - 128	16.37	2.75	20	
1,2-Dichloropropane	16.88	1.0	20	0	84.4	78 - 122	16.77	0.684	20	
1,3,5-Trimethylbenzene	17.58	1.0	20	0	87.9	75 - 124	17.74	0.943	20	
1,3-Dichlorobenzene	17.25	1.0	20	0	86.3	80 - 119	17.27	0.142	20	
1,3-Dichloropropane	18.28	1.0	20	0	91.4	80 - 119	17.64	3.57	20	
1,4-Dichlorobenzene	18.6	1.0	20	0	93.0	79 - 118	18.24	1.96	20	
2,2-Dichloropropane	17.75	1.0	20	0	88.7	60 - 139	18.02	1.53	20	
2-Butanone	39	2.0	40	0	97.5	56 - 143	36.58	6.4	20	
2-Chlorotoluene	18.34	1.0	20	0	91.7	79 - 122	18.42	0.454	20	
2-Hexanone	37.74	2.0	40	0	94.3	57 - 139	35.46	6.23	20	
4-Chlorotoluene	18.58	1.0	20	0	92.9	78 - 122	18.55	0.145	20	
4-Isopropyltoluene	18.44	1.0	20	0	92.2	77 - 127	18.67	1.25	20	
4-Methyl-2-pentanone	37.2	2.0	40	0	93.0	67 - 130	34.54	7.41	20	
Acetone	45.62	2.0	40	0	114	39 - 160	41.91	8.48	20	
Benzene	17.78	1.0	20	0	88.9	79 - 120	17.59	1.07	20	
Bromobenzene	16.29	1.0	20	0	81.4	80 - 120	16.17	0.725	20	
Bromochloromethane	16.28	1.0	20	0	81.4	78 - 123	15.85	2.68	20	
Bromodichloromethane	17.54	1.0	20	0	87.7	79 - 125	17.02	3.04	20	
Bromoform	18.5	1.0	20	0	92.5	66 - 130	17.99	2.8	20	
Bromomethane	17.59	1.0	20	0	88.0	53 - 141	17.61	0.0727	20	

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R341659 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061210-04MSD** Units: **UG/L** Analysis Date: **01-Jul-2019 15:37**
Client ID: **CO1_062119** Run ID: **VOA6_341659** SeqNo: **5149147** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	32.2	2.0	40	0	80.5	64 - 133	32.41	0.667	20	
Carbon tetrachloride	18.41	1.0	20	0	92.1	72 - 136	18.3	0.627	20	
Chlorobenzene	17.17	1.0	20	0	85.8	82 - 118	16.87	1.75	20	
Chloroethane	17.55	1.0	20	0	87.7	60 - 138	16.94	3.51	20	
Chloroform	16.87	1.0	20	0	84.4	79 - 124	16.72	0.903	20	
Chloromethane	15.3	1.0	20	0	76.5	50 - 139	16.11	5.15	20	
cis-1,2-Dichloroethene	17.11	1.0	20	0	85.6	78 - 123	16.73	2.24	20	
cis-1,3-Dichloropropene	16.68	1.0	20	0	83.4	75 - 124	16.21	2.82	20	
Dibromochloromethane	17.53	1.0	20	0	87.6	74 - 126	17.08	2.59	20	
Dibromomethane	17.52	1.0	20	0	87.6	79 - 123	16.7	4.78	20	
Dichlorodifluoromethane	16.36	1.0	20	0	81.8	32 - 152	16.34	0.128	20	
Ethylbenzene	17.63	1.0	20	0	88.2	79 - 121	17.84	1.18	20	
Hexachlorobutadiene	23.43	1.0	20	0	117	66 - 134	22.65	3.36	20	
Isopropylbenzene	18.34	1.0	20	0	91.7	72 - 131	18.4	0.344	20	
m,p-Xylene	35.63	2.0	40	0	89.1	80 - 121	35.55	0.201	20	
Methylene chloride	16.02	2.0	20	0	80.1	74 - 124	15.55	2.95	20	
Naphthalene	23.21	1.0	20	0	116	61 - 128	20.06	14.5	20	
n-Butylbenzene	19.2	1.0	20	0	96.0	75 - 128	19.2	0.0383	20	
n-Propylbenzene	19.2	1.0	20	0	96.0	76 - 126	19.54	1.78	20	
o-Xylene	17.44	1.0	20	0	87.2	78 - 122	17.22	1.29	20	
sec-Butylbenzene	20.03	1.0	20	0	100	77 - 126	19.96	0.311	20	
Styrene	17.9	1.0	20	0	89.5	78 - 123	17.96	0.32	20	
tert-Butylbenzene	19.25	1.0	20	0	96.2	78 - 124	19.4	0.794	20	
Tetrachloroethene	17.58	1.0	20	0	87.9	74 - 129	18.1	2.91	20	
Toluene	17.27	1.0	20	0	86.3	80 - 121	17.4	0.735	20	
trans-1,2-Dichloroethene	17.3	1.0	20	0	86.5	75 - 124	17.08	1.25	20	
trans-1,3-Dichloropropene	16.89	1.0	20	0	84.5	73 - 127	16.44	2.74	20	
Trichloroethene	17.2	1.0	20	0	86.0	79 - 123	17.51	1.78	20	
Trichlorofluoromethane	18.29	1.0	20	0	91.5	65 - 141	17.76	2.95	20	
Vinyl chloride	16.23	1.0	20	0	81.2	58 - 137	16.34	0.663	20	
Surr: 1,2-Dichloroethane-d4	*50.94*	*1.0*	*50*	*0*	*102*	*81 - 118*	*49.83*	*2.21*	*20*	
Surr: 4-Bromofluorobenzene	*50.71*	*1.0*	*50*	*0*	*101*	*85 - 114*	*50.6*	*0.217*	*20*	
Surr: Dibromofluoromethane	*49.23*	*1.0*	*50*	*0*	*98.5*	*80 - 119*	*47.78*	*2.99*	*20*	
Surr: Toluene-d8	*50.46*	*1.0*	*50*	*0*	*101*	*89 - 112*	*50.33*	*0.265*	*20*	

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R341659 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS19061210-01	HS19061210-02	HS19061210-03	HS19061210-04
HS19061210-05	HS19061210-06	HS19061210-07	HS19061210-08
HS19061210-09			

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190715** Units: **UG/L** Analysis Date: **15-Jul-2019 13:10**
Client ID: Run ID: **VOA6_342424** SeqNo: **5166706** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190715** Units: **UG/L** Analysis Date: **15-Jul-2019 13:10**
Client ID: Run ID: **VOA6_342424** SeqNo: **5166706** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*49.57*	*1.0*	*50*	*0*	*99.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.04*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*49.56*	*1.0*	*50*	*0*	*99.1*	*80 - 119*				
Surr: Toluene-d8	*55.68*	*1.0*	*50*	*0*	*111*	*89 - 112*				

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190715** Units: **UG/L** Analysis Date: **15-Jul-2019 11:59**
Client ID: Run ID: **VOA6_342424** SeqNo: **5166705** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	23.08	1.0	20	0	115	78 - 124				
1,1,1-Trichloroethane	20.55	1.0	20	0	103	74 - 131				
1,1,2,2-Tetrachloroethane	21.83	1.0	20	0	109	71 - 121				
1,1,2-Trichloroethane	22.64	1.0	20	0	113	80 - 119				
1,1-Dichloroethane	21.04	1.0	20	0	105	77 - 125				
1,1-Dichloroethene	19.8	1.0	20	0	99.0	71 - 131				
1,1-Dichloropropene	21.29	1.0	20	0	106	78 - 125				
1,2,3-Trichlorobenzene	19.96	1.0	20	0	99.8	69 - 129				
1,2,3-Trichloropropane	20.27	1.0	20	0	101	73 - 122				
1,2,4-Trichlorobenzene	20.69	1.0	20	0	103	69 - 130				
1,2,4-Trimethylbenzene	21.91	1.0	20	0	110	76 - 124				
1,2-Dibromo-3-chloropropane	20.59	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	22.03	1.0	20	0	110	77 - 121				
1,2-Dichlorobenzene	21.64	1.0	20	0	108	80 - 119				
1,2-Dichloroethane	21.68	1.0	20	0	108	73 - 128				
1,2-Dichloropropane	22.98	1.0	20	0	115	78 - 122				
1,3,5-Trimethylbenzene	21.81	1.0	20	0	109	75 - 124				
1,3-Dichlorobenzene	22.13	1.0	20	0	111	80 - 119				
1,3-Dichloropropane	22.31	1.0	20	0	112	80 - 119				
1,4-Dichlorobenzene	21.13	1.0	20	0	106	79 - 118				
2,2-Dichloropropane	21.18	1.0	20	0	106	60 - 139				
2-Butanone	46.06	2.0	40	0	115	56 - 143				
2-Chlorotoluene	21.23	1.0	20	0	106	79 - 122				
2-Hexanone	45.11	2.0	40	0	113	57 - 139				
4-Chlorotoluene	21.32	1.0	20	0	107	78 - 122				
4-Isopropyltoluene	22.03	1.0	20	0	110	77 - 127				
4-Methyl-2-pentanone	44.64	2.0	40	0	112	67 - 130				
Acetone	54.2	2.0	40	0	136	39 - 160				
Benzene	21.8	1.0	20	0	109	79 - 120				
Bromobenzene	22.31	1.0	20	0	112	80 - 120				
Bromochloromethane	21.02	1.0	20	0	105	78 - 123				
Bromodichloromethane	22.31	1.0	20	0	112	79 - 125				
Bromoform	22.62	1.0	20	0	113	66 - 130				
Bromomethane	24.56	1.0	20	0	123	53 - 141				

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190715** Units: **UG/L** Analysis Date: **15-Jul-2019 11:59**
Client ID: Run ID: **VOA6_342424** SeqNo: **5166705** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	42.96	2.0	40	0	107	64 - 133				
Carbon tetrachloride	20.69	1.0	20	0	103	72 - 136				
Chlorobenzene	22.26	1.0	20	0	111	82 - 118				
Chloroethane	19.53	1.0	20	0	97.6	60 - 138				
Chloroform	21.85	1.0	20	0	109	79 - 124				
Chloromethane	21.86	1.0	20	0	109	50 - 139				
cis-1,2-Dichloroethene	21.2	1.0	20	0	106	78 - 123				
cis-1,3-Dichloropropene	22.97	1.0	20	0	115	75 - 124				
Dibromochloromethane	22.9	1.0	20	0	115	74 - 126				
Dibromomethane	21.79	1.0	20	0	109	79 - 123				
Dichlorodifluoromethane	20.91	1.0	20	0	105	32 - 152				
Ethylbenzene	22.45	1.0	20	0	112	79 - 121				
Hexachlorobutadiene	23.73	1.0	20	0	119	66 - 134				
Isopropylbenzene	22.67	1.0	20	0	113	72 - 131				
m,p-Xylene	45.25	2.0	40	0	113	80 - 121				
Methylene chloride	20.66	2.0	20	0	103	74 - 124				
Naphthalene	18.45	1.0	20	0	92.3	61 - 128				
n-Butylbenzene	23.5	1.0	20	0	118	75 - 128				
n-Propylbenzene	21.56	1.0	20	0	108	76 - 126				
o-Xylene	22.24	1.0	20	0	111	78 - 122				
sec-Butylbenzene	21.67	1.0	20	0	108	77 - 126				
Styrene	22.78	1.0	20	0	114	78 - 123				
tert-Butylbenzene	21.61	1.0	20	0	108	78 - 124				
Tetrachloroethene	23.77	1.0	20	0	119	74 - 129				
Toluene	22.66	1.0	20	0	113	80 - 121				
trans-1,2-Dichloroethene	21.15	1.0	20	0	106	75 - 124				
trans-1,3-Dichloropropene	22.36	1.0	20	0	112	73 - 127				
Trichloroethene	21.49	1.0	20	0	107	79 - 123				
Trichlorofluoromethane	19.87	1.0	20	0	99.3	65 - 141				
Vinyl chloride	19.88	1.0	20	0	99.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.08*	*1.0*	*50*	*0*	*98.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.54*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*49.16*	*1.0*	*50*	*0*	*98.3*	*80 - 119*				
Surr: Toluene-d8	*51.11*	*1.0*	*50*	*0*	*102*	*89 - 112*				

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19070656-99MS** Units: **UG/L** Analysis Date: **15-Jul-2019 15:58**
Client ID: Run ID: **VOA6_342424** SeqNo: **5167080** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	22.19	1.0	20	0	111	78 - 124				
1,1,1-Trichloroethane	20.93	1.0	20	0	105	74 - 131				
1,1,2,2-Tetrachloroethane	21.31	1.0	20	0	107	71 - 121				
1,1,2-Trichloroethane	21.42	1.0	20	0	107	80 - 119				
1,1-Dichloroethane	19.94	1.0	20	0	99.7	77 - 125				
1,1-Dichloroethene	19.89	1.0	20	0	99.4	71 - 131				
1,1-Dichloropropene	21.77	1.0	20	0	109	78 - 125				
1,2,3-Trichlorobenzene	20	1.0	20	0	100.0	69 - 129				
1,2,3-Trichloropropane	19.55	1.0	20	0	97.7	73 - 122				
1,2,4-Trichlorobenzene	20.88	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	22.01	1.0	20	0	110	76 - 124				
1,2-Dibromo-3-chloropropane	20.38	1.0	20	0	102	62 - 128				
1,2-Dibromoethane	21.35	1.0	20	0	107	77 - 121				
1,2-Dichlorobenzene	21.3	1.0	20	0	107	80 - 119				
1,2-Dichloroethane	20.74	1.0	20	0	104	73 - 128				
1,2-Dichloropropane	21.01	1.0	20	0	105	78 - 122				
1,3,5-Trimethylbenzene	22.34	1.0	20	0	112	75 - 124				
1,3-Dichlorobenzene	21.82	1.0	20	0	109	80 - 119				
1,3-Dichloropropane	21.23	1.0	20	0	106	80 - 119				
1,4-Dichlorobenzene	20.63	1.0	20	0	103	79 - 118				
2,2-Dichloropropane	20.62	1.0	20	0	103	60 - 139				
2-Butanone	46.35	2.0	40	7.115	98.1	56 - 143				
2-Chlorotoluene	21.8	1.0	20	0	109	79 - 122				
2-Hexanone	41.12	2.0	40	0	103	57 - 139				
4-Chlorotoluene	21.3	1.0	20	0	106	78 - 122				
4-Isopropyltoluene	22.48	1.0	20	0	112	77 - 127				
4-Methyl-2-pentanone	42.61	2.0	40	0	107	67 - 130				
Acetone	37.96	2.0	40	0	94.9	39 - 160				
Benzene	21.01	1.0	20	0	105	79 - 120				
Bromobenzene	21.94	1.0	20	0	110	80 - 120				
Bromochloromethane	19.37	1.0	20	0	96.9	78 - 123				
Bromodichloromethane	20.89	1.0	20	0	104	79 - 125				
Bromoform	21.69	1.0	20	0	108	66 - 130				
Bromomethane	20.3	1.0	20	0	101	53 - 141				

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19070656-99MS** Units: **UG/L** Analysis Date: **15-Jul-2019 15:58**
Client ID: Run ID: **VOA6_342424** SeqNo: **5167080** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	42.12	2.0	40	0	105	64 - 133				
Carbon tetrachloride	21.53	1.0	20	0	108	72 - 136				
Chlorobenzene	21.44	1.0	20	0	107	82 - 118				
Chloroethane	18.08	1.0	20	0	90.4	60 - 138				
Chloroform	20.3	1.0	20	0	102	79 - 124				
Chloromethane	20.45	1.0	20	0	102	50 - 139				
cis-1,2-Dichloroethene	19.61	1.0	20	0	98.0	78 - 123				
cis-1,3-Dichloropropene	21.18	1.0	20	0	106	75 - 124				
Dibromochloromethane	21.69	1.0	20	0	108	74 - 126				
Dibromomethane	19.78	1.0	20	0	98.9	79 - 123				
Dichlorodifluoromethane	15.49	1.0	20	0	77.5	32 - 152				
Ethylbenzene	22.57	1.0	20	0	113	79 - 121				
Hexachlorobutadiene	20.96	1.0	20	0	105	66 - 134				
Isopropylbenzene	23.29	1.0	20	0	116	72 - 131				
m,p-Xylene	45.27	2.0	40	0	113	80 - 121				
Methylene chloride	19.09	2.0	20	0	95.5	74 - 124				
Naphthalene	18.74	1.0	20	0	93.7	61 - 128				
n-Butylbenzene	23.43	1.0	20	0	117	75 - 128				
n-Propylbenzene	22.6	1.0	20	0	113	76 - 126				
o-Xylene	21.81	1.0	20	0	109	78 - 122				
sec-Butylbenzene	22.65	1.0	20	0	113	77 - 126				
Styrene	22.07	1.0	20	0	110	78 - 123				
tert-Butylbenzene	22.57	1.0	20	0	113	78 - 124				
Tetrachloroethene	24.52	1.0	20	0	123	74 - 129				
Toluene	22.62	1.0	20	0	113	80 - 121				
trans-1,2-Dichloroethene	20.36	1.0	20	0	102	75 - 124				
trans-1,3-Dichloropropene	20.06	1.0	20	0	100	73 - 127				
Trichloroethene	21.75	1.0	20	1.3	102	79 - 123				
Trichlorofluoromethane	19.75	1.0	20	0	98.8	65 - 141				
Vinyl chloride	17.97	1.0	20	0	89.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.57*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.96*	*1.0*	*50*	*0*	*108*	*85 - 114*				
Surr: Dibromofluoromethane	*51.4*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*55.82*	*1.0*	*50*	*0*	*112*	*89 - 112*				

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19070656-99MSD** Units: **UG/L** Analysis Date: **15-Jul-2019 16:22**
Client ID: Run ID: **VOA6_342424** SeqNo: **5167081** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	22.48	1.0	20	0	112	78 - 124	22.19	1.31	20	
1,1,1-Trichloroethane	20.66	1.0	20	0	103	74 - 131	20.93	1.33	20	
1,1,2,2-Tetrachloroethane	22.12	1.0	20	0	111	71 - 121	21.31	3.75	20	
1,1,2-Trichloroethane	22.14	1.0	20	0	111	80 - 119	21.42	3.32	20	
1,1-Dichloroethane	19.77	1.0	20	0	98.8	77 - 125	19.94	0.854	20	
1,1-Dichloroethene	19.87	1.0	20	0	99.3	71 - 131	19.89	0.107	20	
1,1-Dichloropropene	21.58	1.0	20	0	108	78 - 125	21.77	0.865	20	
1,2,3-Trichlorobenzene	21.32	1.0	20	0	107	69 - 129	20	6.39	20	
1,2,3-Trichloropropane	20.07	1.0	20	0	100	73 - 122	19.55	2.63	20	
1,2,4-Trichlorobenzene	21.47	1.0	20	0	107	69 - 130	20.88	2.78	20	
1,2,4-Trimethylbenzene	22.09	1.0	20	0	110	76 - 124	22.01	0.371	20	
1,2-Dibromo-3-chloropropane	20.51	1.0	20	0	103	62 - 128	20.38	0.633	20	
1,2-Dibromoethane	21.74	1.0	20	0	109	77 - 121	21.35	1.84	20	
1,2-Dichlorobenzene	21.77	1.0	20	0	109	80 - 119	21.3	2.17	20	
1,2-Dichloroethane	21.09	1.0	20	0	105	73 - 128	20.74	1.68	20	
1,2-Dichloropropane	21.54	1.0	20	0	108	78 - 122	21.01	2.49	20	
1,3,5-Trimethylbenzene	22.25	1.0	20	0	111	75 - 124	22.34	0.412	20	
1,3-Dichlorobenzene	22.15	1.0	20	0	111	80 - 119	21.82	1.49	20	
1,3-Dichloropropane	21.81	1.0	20	0	109	80 - 119	21.23	2.73	20	
1,4-Dichlorobenzene	21.29	1.0	20	0	106	79 - 118	20.63	3.15	20	
2,2-Dichloropropane	20.26	1.0	20	0	101	60 - 139	20.62	1.75	20	
2-Butanone	47.81	2.0	40	7.115	102	56 - 143	46.35	3.1	20	
2-Chlorotoluene	21.74	1.0	20	0	109	79 - 122	21.8	0.277	20	
2-Hexanone	43.06	2.0	40	0	108	57 - 139	41.12	4.6	20	
4-Chlorotoluene	21.37	1.0	20	0	107	78 - 122	21.3	0.333	20	
4-Isopropyltoluene	22.46	1.0	20	0	112	77 - 127	22.48	0.0765	20	
4-Methyl-2-pentanone	44.2	2.0	40	0	110	67 - 130	42.61	3.65	20	
Acetone	39.46	2.0	40	0	98.7	39 - 160	37.96	3.89	20	
Benzene	21.3	1.0	20	0	107	79 - 120	21.01	1.37	20	
Bromobenzene	22.41	1.0	20	0	112	80 - 120	21.94	2.08	20	
Bromochloromethane	19.5	1.0	20	0	97.5	78 - 123	19.37	0.687	20	
Bromodichloromethane	20.98	1.0	20	0	105	79 - 125	20.89	0.413	20	
Bromoform	22.22	1.0	20	0	111	66 - 130	21.69	2.42	20	
Bromomethane	19.56	1.0	20	0	97.8	53 - 141	20.3	3.69	20	

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061210

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19070656-99MSD** Units: **UG/L** Analysis Date: **15-Jul-2019 16:22**
Client ID: Run ID: **VOA6_342424** SeqNo: **5167081** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	41.77	2.0	40	0	104	64 - 133	42.12	0.843	20	
Carbon tetrachloride	21.34	1.0	20	0	107	72 - 136	21.53	0.868	20	
Chlorobenzene	21.78	1.0	20	0	109	82 - 118	21.44	1.6	20	
Chloroethane	18.46	1.0	20	0	92.3	60 - 138	18.08	2.08	20	
Chloroform	20.66	1.0	20	0	103	79 - 124	20.3	1.76	20	
Chloromethane	19.16	1.0	20	0	95.8	50 - 139	20.45	6.5	20	
cis-1,2-Dichloroethene	19.9	1.0	20	0	99.5	78 - 123	19.61	1.45	20	
cis-1,3-Dichloropropene	21.57	1.0	20	0	108	75 - 124	21.18	1.83	20	
Dibromochloromethane	21.78	1.0	20	0	109	74 - 126	21.69	0.436	20	
Dibromomethane	20.72	1.0	20	0	104	79 - 123	19.78	4.63	20	
Dichlorodifluoromethane	15.06	1.0	20	0	75.3	32 - 152	15.49	2.84	20	
Ethylbenzene	22.64	1.0	20	0	113	79 - 121	22.57	0.314	20	
Hexachlorobutadiene	21.26	1.0	20	0	106	66 - 134	20.96	1.39	20	
Isopropylbenzene	23.47	1.0	20	0	117	72 - 131	23.29	0.765	20	
m,p-Xylene	45.17	2.0	40	0	113	80 - 121	45.27	0.208	20	
Methylene chloride	19.2	2.0	20	0	96.0	74 - 124	19.09	0.533	20	
Naphthalene	20.18	1.0	20	0	101	61 - 128	18.74	7.38	20	
n-Butylbenzene	23.6	1.0	20	0	118	75 - 128	23.43	0.724	20	
n-Propylbenzene	22.52	1.0	20	0	113	76 - 126	22.6	0.355	20	
o-Xylene	21.84	1.0	20	0	109	78 - 122	21.81	0.127	20	
sec-Butylbenzene	22.53	1.0	20	0	113	77 - 126	22.65	0.536	20	
Styrene	22.39	1.0	20	0	112	78 - 123	22.07	1.45	20	
tert-Butylbenzene	22.68	1.0	20	0	113	78 - 124	22.57	0.48	20	
Tetrachloroethene	24.11	1.0	20	0	121	74 - 129	24.52	1.65	20	
Toluene	22.43	1.0	20	0	112	80 - 121	22.62	0.848	20	
trans-1,2-Dichloroethene	20.37	1.0	20	0	102	75 - 124	20.36	0.0286	20	
trans-1,3-Dichloropropene	20.9	1.0	20	0	105	73 - 127	20.06	4.1	20	
Trichloroethene	21.62	1.0	20	1.3	102	79 - 123	21.75	0.565	20	
Trichlorofluoromethane	19.75	1.0	20	0	98.7	65 - 141	19.75	0.0166	20	
Vinyl chloride	17.66	1.0	20	0	88.3	58 - 137	17.97	1.8	20	
Surr: 1,2-Dichloroethane-d4	*51.8*	*1.0*	*50*	*0*	*104*	*81 - 118*	*50.57*	*2.41*	*20*	
Surr: 4-Bromofluorobenzene	*53.88*	*1.0*	*50*	*0*	*108*	*85 - 114*	*53.96*	*0.148*	*20*	
Surr: Dibromofluoromethane	*51.96*	*1.0*	*50*	*0*	*104*	*80 - 119*	*51.4*	*1.08*	*20*	
Surr: Toluene-d8	*55.78*	*1.0*	*50*	*0*	*112*	*89 - 112*	*55.82*	*0.066*	*20*	

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP 18 24
WorkOrder:	HS19061210

QC BATCH REPORT

Batch ID:	**R342424 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19061210-10

Revision: 2

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19061210**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 15-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061210

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19061210-01	18CpTMW06_062119	Login	24/06/2019 10:40:51	RPG	Sub
HS19061210-01	18CpTMW06_062119	Login	24/06/2019 10:40:51	RPG	EXT004
HS19061210-01	18CpTMW06_062119	Login	24/06/2019 10:40:51	RPG	VOA257
HS19061210-04	CO1_062119	Login	24/06/2019 10:40:51	RPG	Sub
HS19061210-04	CO1_062119	Login	24/06/2019 10:40:51	RPG	VOA257
HS19061210-07	18CpTMW03SW_062119	Login	24/06/2019 10:40:51	RPG	MET081
HS19061210-07	18CpTMW03SW_062119	Login	24/06/2019 10:40:51	RPG	Sub
HS19061210-07	18CpTMW03SW_062119	Login	24/06/2019 10:40:51	RPG	EXT004
HS19061210-07	18CpTMW03SW_062119	Login	24/06/2019 10:40:51	RPG	VOA257
HS19061210-10	Trip blank	Login	24/06/2019 10:40:51	RPG	VOA257

Revision:2

ALS Houston, US Date: 15-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19061210
Date/Time Received: **22-Jun-2019 08:55**
Received by: **PMG**

Checklist completed by: *Raegen Giga* eSignature 24-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature 25-Jun-2019 Date

Matrices: **GW**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.3c uc/c	IR 25
Cooler(s)/Kit(s):	3210	
Date/Time sample(s) sent to storage:	06/22/19 15:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

bhate

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code [2]	Sample Number [3]	Sample Matrix [4]	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
18CPTMW06_062119		21-Jun-2019	0710	-	N		WG	5	X	X		X				
18CPTMW06_062119_a		21-Jun-2019	0710	-	FD		WG	5	X	X		X				
MW22_062119		21-Jun-2019	0900	-	N		WG	5	X	X	X					
Col_062119		21-Jun-2019	0850		N		WG	4	X	X						
Col_062119_MS		21-Jun-2019	0850		MS		WG	4	X	X						
Col_062119_MSD		21-Jun-2019	0850	-	SD		WG	4	X	X						
MW8_062119		21-Jun-2019	0940	-	N		WG	5	X	X		X				
18CPTMW15_062119		21-Jun-2019	1030	-	N		WG	5	X	X		X				
18CPTMW03SW_062119		21-Jun-2019	0750	-	N		WG	6	X	X	X	X				
AWD3_062119		21-Jun-2019	0900	-	N		WG	5	X	X	X					
C08_062119		21-Jun-2019	1035	-	N		WG	5	X	X		X				
TRIP BLANK		21-Jun-2019			TB		W	2	X							

Sample Analysis Requested [5] | Quality Assurance Samples [6]

HS19061210
Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS:

Custody Transfers Prior to Receipt By Laboratory

Relinquished By (Signed)	Date	Time	Received By (signed)	Date	Time
Scott Beesinger	6/21/19	1130	1. [illegible]	6/22/19	08:55
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped _____ No.:

Method of Shipment: _____

Fed Ex _____ Airbill _____ Number:

Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

3210 VOC 2.3 425 Cooler

00941171

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

3210

CUSTODY SEAL

Date: 6/21/19 Time: 1130
Name: SB Beesinger
Company: BL + E

Seal Broken By: AC
Date: 06/22/19

3210

Must Deliver Next Business Day
Time and Tempature Sensitive!

3210

ORIGIN ID:SGRA (903) 930-8193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202

MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 24MAY19
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211
DIMS: 26x14x14 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656

REF: LHAAP/18/24 & SURFACE WATER-RJ

RMA:

FedEx Express

FedEx
TRK# 0221 4809 7834 3229

SATURDAY 12:00P
PRIORITY OVERNIGHT

77099
TX-US
IAH

XØ SGRA

FID 5135800 21JUN19 CGSA 553C1/D210/0C8A

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1918260, 1918265

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2268 (242714)

General Set Information: There were nineteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1918260003/08 were analyzed and reported from 1:10 dilutions. Field sample 1918260007 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 661792) was less than 1/2 the CRDL. The recovery for the LCS (661793) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 1918260005/06 (Client ID: CO1_062119). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The MS/MSD percent recoveries and relative percent difference were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 661790) is reported from the analysis of the Laboratory Control Sample (LCS – 661793) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafile 03JULD03/06/19/23.

Thomas Bosch July 5, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: July 05, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1918260**
Project ID: HS19061210
Purchase Order: HS19061210
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
18CPTMW06_062119	1918260001	06/21/19	06/25/19	
18CPTMW06_062119_a	1918260002	06/21/19	06/25/19	
MW22_062119	1918260003	06/21/19	06/25/19	
CO1_062119	1918260004	06/21/19	06/25/19	
MW8_062119	1918260007	06/21/19	06/25/19	
18CPTMW15_062119	1918260008	06/21/19	06/25/19	
18CPTMW03SW_062119	1918260009	06/21/19	06/25/19	
AWD3_062119	1918260010	06/21/19	06/25/19	
CO8_062119	1918260011	06/21/19	06/25/19	

Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
CO1_062119MS	1918260005	06/21/19	06/25/19	
CO1_062119MSD	1918260006	06/21/19	06/25/19	

***Client QC is reported as part of the Quality Control results report, if requested.**

ANALYTICAL REPORT

Workorder: 34-1918260
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW06_062119** | Sampling Site: NA | Collected: 06/21/2019
Lab ID: 1918260001 | Media: 125 mL Nalgene | Received: 06/25/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 09:17 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1.7	1.0	2.0	4.0	1	J

Sample ID: **18CPTMW06_062119_a** | Sampling Site: NA | Collected: 06/21/2019
Lab ID: 1918260002 | Media: 125 mL Nalgene | Received: 06/25/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 09:31 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **MW22_062119** | Sampling Site: NA | Collected: 06/21/2019
Lab ID: 1918260003 | Media: 125 mL Nalgene | Received: 06/25/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 09:45 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**95**	10	20	40	10	

Sample ID: **CO1_062119** | Sampling Site: NA | Collected: 06/21/2019
Lab ID: 1918260004 | Media: 125 mL Nalgene | Received: 06/25/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 09:58 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

ANALYTICAL REPORT

Workorder: 34-1918260
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **MW8_062119** | Sampling Site: NA | Collected: 06/21/2019
Lab ID: 1918260007 | Media: 125 mL Nalgene | Received: 06/25/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 10:40 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**7100**	1000	2000	4000	1000	

Sample ID: **18CPTMW15_062119** | Sampling Site: NA | Collected: 06/21/2019
Lab ID: 1918260008 | Media: 125 mL Nalgene | Received: 06/25/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 10:54 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**410**	10	20	40	10	

Sample ID: **18CPTMW03SW_062119** | Sampling Site: NA | Collected: 06/21/2019
Lab ID: 1918260009 | Media: 125 mL Nalgene | Received: 06/25/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 11:08 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**9.9**	1.0	2.0	4.0	1	

Sample ID: **AWD3_062119** | Sampling Site: NA | Collected: 06/21/2019
Lab ID: 1918260010 | Media: 125 mL Nalgene | Received: 06/25/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2268 (HBN: 242714) | **Percent Solid:** NA
Analyzed: 07/03/2019 11:22 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1.8	1.0	2.0	4.0	1	J

ANALYTICAL REPORT

Workorder: 34-1918260
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **CO8_062119**	Sampling Site: NA	Collected: 06/21/2019
Lab ID: 1918260011	Media: 125 mL Nalgene	Received: 06/25/2019
Matrix: Water	Sampling Parameter: NA	

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:** LCMS04
	Batch: ELMS/2268 (HBN: 242714)	**Percent Solid:** NA
	Analyzed: 07/03/2019 11:36	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 242714)

Field samples 1918260003/08 were analyzed and reported from 1:10 dilutions. Field sample 1918260007 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/05/2019 11:10	/S/ Stephen Brose 07/05/2019 14:20

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1918260
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1918260

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2268 (HBN: 242714)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 661792
Analyzed: 07/03/2019 09:03
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 661793
Analyzed: 07/03/2019 08:35
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.21	4.00	105	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1918260004	**MS:**	1918260005	**MSD:**	1918260006
Analyzed:	07/03/2019 09:58	**Analyzed:**	07/03/2019 10:12	**Analyzed:**	07/03/2019 10:26
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.42	4	85.4	78.8	123.8	3.37	84.1	1.55	0.0	20.0

Comments

Field samples 1918260003/08 were analyzed and reported from 1:10 dilutions. Field sample 1918260007 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/05/2019 11:12	07/05/2019 14:20

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

W 1918260

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **11650**

1918260

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19061210
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19061210-01**	**18CpTMW06_062119**	**Water**	**21 Jun 2019 07:10**
	SUB_Perch-6850			09 Jul 2019
2.	**HS19061210-02**	**18CpTMW06_062119_a**	**Water**	**21 Jun 2019 07:10**
	SUB_Perch-6850			09 Jul 2019
3.	**HS19061210-03**	**MW22_062119**	**Water**	**21 Jun 2019 08:00**
	SUB_Perch-6850			09 Jul 2019
4.	**HS19061210-04**	**CO1_062119**	**Water**	**21 Jun 2019 08:50**
	SUB_Perch-6850 Designated MS/MSD			09 Jul 2019
5.	**HS19061210-05**	**MW8_062119**	**Water**	**21 Jun 2019 09:40**
	SUB_Perch-6850			09 Jul 2019
6.	**HS19061210-06**	**18CpTMW15_062119**	**Water**	**21 Jun 2019 10:30**
	SUB_Perch-6850			09 Jul 2019
7.	**HS19061210-07**	**18CpTMW03SW_062119**	**Water**	**21 Jun 2019 07:50**
	SUB_Perch-6850			09 Jul 2019
8.	**HS19061210-08**	**AWD3_062119**	**Water**	**21 Jun 2019 09:00**
	SUB_Perch-6850			09 Jul 2019
9.	**HS19061210-09**	**CO8_062119**	**Water**	**21 Jun 2019 10:35**

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID: 11650**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
SUB_Perch-6850			09 Jul 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
HS19061210-04B = DESIGNATED MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By: J. Museum Date/Time: 6/24/19 18:00

Received By: [signature] Date/Time: 06-25-19 8:57

Cooler ID(s): Temperature(s):

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19061210	***Split:***	**Workorder ID:** 1918260	**Level:** ENV_LVL4	**Requested Analysis**	
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly		
Comments:			**Preservatives**		
			COOL		
			Containers		

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	06/21/2019 07:10	18CPTMW06_062119	1918260001		Water	A	1	A
2	06/21/2019 07:10	18CPTMW06_062119_a	1918260002		Water	A	1	A
3	06/21/2019 08:00	MW22_062119	1918260003		Water	A	1	A
4	06/21/2019 08:50	CO1_062119	1918260004		Water	A	1	A
5	06/21/2019 08:50	CO1_062119MS	1918260005	MS	Water	A	1	A
6	06/21/2019 08:50	CO1_062119MSD	1918260006	MSD	Water	A	1	A
7	06/21/2019 09:40	MW8_062119	1918260007		Water	A	1	A
8	06/21/2019 10:30	18CPTMW15_062119	1918260008		Water	A	1	A
9	06/21/2019 07:50	18CPTMW03SW_062119	1918260009		Water	A	1	A
10	06/21/2019 09:00	AWD3_062119	1918260010		Water	A	1	A

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath Jolie	06/25/2019 08:57	ALS Sample Receiving	Sample Login
Lilli Workman	6/25/19 1400	SB	Storage
R.33.1	7.1.19/13:20	T. Bond	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00941183

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19061210	***Split:***	**Workorder ID:** 1918260	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
11	06/21/2019 10:35	CO8_062119	1918260011		Water	A	1	A
12								
13								
14								
15								
16								
17								
18								
19								
20								

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	06/25/2019 08:57	ALS Sample Receiving	Sample Login
Julie Warath	6/25/19 1400	SB	Storage
R-33.1	7-1-19/13:20	T. Bosch	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00941184

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston — Project/Task/Site: 19182760

Date/Time of Receipt: 12-05-19 8:57 — Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA	VOA Headspace Present?	Yes/No/NA
	Frozen/Melted/NA		

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9784	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Jennifer Jassell (Signature) — T. Vaitkus (Printed Name) — 12-05-19 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc — Revised 01/01/2018

Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 158469-434 RITZ EXP 0220

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 24JUN19
ACTWGT: 19.80 LB
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19061210/1157 RJ

5S1C1/0210/104C

FedEx Express

J181119060501aa

TRK# 0201 4809 7835 3035

TUE - 25 JUN 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

Batch Worklist

Batch: ELMS/ 2268 **Created:** 7/2/2019 08:52 **Instrument:** **HBN:** 242714

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1918260 [ENV_LVL4]

Workorder: 1918265 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	661789	CCV for HBN 242714 [ELMS/2268]				CCV	3		E685041C3Q	5311		7/5/2019	
2	661790	RLVS for HBN 242714 [ELMS/2268				RLVS	3		E685041C3Q	5311		7/5/2019	
3	661791	ICS for HBN 242714 [ELMS/2268]				ICS	3		E6850..D3Q	5311		7/5/2019	
4	661792	LMB for HBN 242714 [ELMS/2268]				LMB	3		E6850Q413Q	5311		7/5/2019	
5	661793	LCS for HBN 242714 [ELMS/2268]				LCS	3		E6850Q413Q	5311		7/5/2019	
6	1918260001	18CPTMW06_062119				SAMPLE	3	1918260001-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
7	1918260002	18CPTMW06_062119_a				SAMPLE	3	1918260002-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
8	1918260003	MW22_062119				SAMPLE	3	1918260003-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
9	1918260004	CO1_062119				SAMPLE	3	1918260004-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
10	1918260005	CO1_062119MS				MS	3	1918260005-A	E6850Q413Q	5480		7/5/2019	
11	1918260006	CO1_062119MSD				MSD	3	1918260006-A	E6850Q413Q	5480		7/5/2019	
12	1918260007	MW8_062119				SAMPLE	3	1918260007-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
13	1918260008	18CPTMW15_062119				SAMPLE	3	1918260008-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
14	1918260009	18CPTMW03SW_062119				SAMPLE	3	1918260009-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
15	1918260010	AWD3_062119				SAMPLE	3	1918260010-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
16	661794	CCV for HBN 242714 [ELMS/2268]				CCV	3		E685041C3Q	5311		7/5/2019	
17	1918260011	CO8_062119				SAMPLE	3	1918260011-A	E6850Q41.3	5480	7/19/2019	7/9/2019	
18	1918265001	18CPTMW10DW_062019				SAMPLE	3	1918265001-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
19	1918265002	18CPTMW10SW_062019				SAMPLE	3	1918265002-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
20	1918265003	18WW06_062019				SAMPLE	3	1918265003-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
21	1918265004	18WW02_062019				SAMPLE	3	1918265004-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
22	1918265005	18CPTMW19_062019				SAMPLE	3	1918265005-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
23	1918265006	18CPTMW19SW_062019				SAMPLE	3	1918265006-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
24	1918265007	18WW22_062019				SAMPLE	3	1918265007-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
25	1918265008	C04_062019				SAMPLE	3	1918265008-A	E6850Q41.3	5480	7/18/2019	7/5/2019	
26	661795	CCV for HBN 242714 [ELMS/2268]				CCV	3		E685041C3Q	5311		7/5/2019	

00941187

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1918260 (001-11), 1918265 (001-08)
ELMS Batch/HBN ID: 2268 (242714)
Prep Date: 07/01/2019 Analysis Date: 07/03/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\03JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 661793; Target = 4.0µg/L. ASTM type II water was used for LMB 661792.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on samples 1918260005/06 (Client ID: CO1_062119). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1918260003/08 were analyzed and reported from 1:10 dilutions. Field sample 1918260007 was analyzed and reported from a 1:1,000 dilution. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\242714-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 661790) is reported from the analysis of the Laboratory Control Sample (LCS – 661793) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 03JULD03/06/19/23.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2268 HBN: 242714 Sample Set IDs if Applicable: 1918260/1918265	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL
Standard: 43659	Created By: Thomas Bosch	Amount: 100 mL
MFG: AccuStandard	Create Date: 09/17/2018 09:09AM	Expires: 07/25/2020
MFG Lot: 218065075		Usable: No
Part ID: IC-PER-10X-1		Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration 1000 ug/mL
1	14797-73-0	Perchlorate	

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description - 6850 QC WKG STD 100ug/L

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED TESTING LABORATORY

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: JCC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

Tel (203)786-5290
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www.AccuStandard.com

AccuStandard®

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

OR-ORG/INO-001
Rev. 5/18

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

00941206

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	661789 CCV@25	Vial 71	1	Control	1	2.23045e6	8.436	26.59001
*	661793 QC@4.0	Vial 72	1	Control	2	3.72011e5	8.228	4.20689
*	661791 ICS@4.0	Vial 73	1	Control	3	2.92755e5	8.090	3.90370
*	661792 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1918260001	Vial 75	1	Sample	5	1.00339e5	7.926	1.72705
*	1918260002	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	1918260003 10X	Vial 77	1	Sample	7	7.28770e5	8.214	94.51960
*	1918260004	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1918260005 MS	Vial 79	1	Sample	9	1.74594e5	7.801	3.41772
*	1918260006 MSD	Vial 80	1	Sample	10	1.72844e5	7.800	3.36507
*	1918260007 1K	Vial 81	1	Sample	11	5.34661e5	8.739	7067.32278
*	1918260008 10X	Vial 82	1	Sample	12	3.53155e6	8.463	409.01406
*	1918260009	Vial 83	1	Sample	13	5.48800e5	7.917	9.89897
*	1918260010	Vial 84	1	Sample	14	1.27411e5	8.284	1.75055
*	1918260011	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1918265001	Vial 86	1	Sample	16	7.53597e5	7.981	9.07754
*	661794 CCV@25	Vial 71	1	Control	17	1.99251e6	8.576	26.33220
*	1918265002	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1918265003	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	1918265004	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	1918265005	Vial 90	1	Sample	21	2.73037e5	8.159	4.14589
*	1918265006	Vial 91	1	Sample	22	3.36289e6	8.129	39.03652
*	1918265007	Vial 92	1	Sample	23	0.00000	0.000	0.00000
*	1918265008	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	661795 CCV@25	Vial 71	1	Control	25	2.02866e6	8.520	25.81702

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	661789 CCV@25	Vial 71	1	Control	1	6.67744e5	8.470	26.81724
*	661793 QC@4.0	Vial 72	1	Control	2	1.20101e5	8.255	4.42244
*	661791 ICS@4.0	Vial 73	1	Control	3	9.57778e4	8.096	4.14544
*	661792 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1918260001	Vial 75	1	Sample	5	3.62166e4	7.941	1.91349
*	1918260002	Vial 76	1	Sample	6	0.00000	0.000	0.00000
*	1918260003 10X	Vial 77	1	Sample	7	2.32604e5	8.238	100.35898
*	1918260004	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1918260005 MS	Vial 79	1	Sample	9	6.56059e4	7.810	4.13918
*	1918260006 MSD	Vial 80	1	Sample	10	6.56232e4	7.815	4.11436
*	1918260007 1K	Vial 81	1	Sample	11	1.75075e5	8.767	7652.56480
*	1918260008 10X	Vial 82	1	Sample	12	1.06108e6	8.478	414.80020
*	1918260009	Vial 83	1	Sample	13	1.77272e5	7.934	10.64208
*	1918260010	Vial 84	1	Sample	14	4.40452e4	8.285	1.86025
*	1918260011	Vial 85	1	Sample	15	0.00000	0.000	0.00000
*	1918265001	Vial 86	1	Sample	16	2.38015e5	7.999	9.53324
*	661794 CCV@25	Vial 71	1	Control	17	5.92974e5	8.599	26.40646
*	1918265002	Vial 87	1	Sample	18	0.00000	0.000	0.00000
*	1918265003	Vial 88	1	Sample	19	0.00000	0.000	0.00000
*	1918265004	Vial 89	1	Sample	20	0.00000	0.000	0.00000
*	1918265005	Vial 90	1	Sample	21	8.77046e4	8.185	4.33407
*	1918265006	Vial 91	1	Sample	22	1.01421e6	8.147	39.71903
*	1918265007	Vial 92	1	Sample	23	0.00000	0.000	0.00000
*	1918265008	Vial 93	1	Sample	24	0.00000	0.000	0.00000
*	661795 CCV@25	Vial 71	1	Control	25	6.16068e5	8.540	26.38763

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	661789 CCV@25	Vial 71	1	Control	1	2.54244e5	8.447	5.00000
*	661793 QC@4.0	Vial 72	1	Control	2	2.90663e5	8.255	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	661791 ICS@4.0	Vial 73	1	Control	3	2.47418e5	8.122	5.00000
*	661792 LMB	Vial 74	1	Control	4	2.69965e5	8.571	5.00000
*	1918260001	Vial 75	1	Sample	5	2.03376e5	7.947	5.00000
*	1918260002	Vial 76	1	Sample	6	2.30322e5	7.928	5.00000
*	1918260003 10X	Vial 77	1	Sample	7	2.45205e5	8.229	50.00000
*	1918260004	Vial 78	1	Sample	8	1.64595e5	7.807	5.00000
*	1918260005 MS	Vial 79	1	Sample	9	1.69734e5	7.817	5.00000
*	1918260006 MSD	Vial 80	1	Sample	10	1.70811e5	7.823	5.00000
*	1918260007 1K	Vial 81	1	Sample	11	2.43260e5	8.755	5000.00000
*	1918260008 10X	Vial 82	1	Sample	12	2.53420e5	8.502	50.00000
*	1918260009	Vial 83	1	Sample	13	1.76005e5	7.940	5.00000
*	1918260010	Vial 84	1	Sample	14	2.54426e5	8.295	5.00000
*	1918260011	Vial 85	1	Sample	15	2.32351e5	7.915	5.00000
*	1918265001	Vial 86	1	Sample	16	2.64421e5	8.007	5.00000
*	661794 CCV@25	Vial 71	1	Control	17	2.29484e5	8.599	5.00000
*	1918265002	Vial 87	1	Sample	18	2.14730e5	7.877	5.00000
*	1918265003	Vial 88	1	Sample	19	1.83014e5	7.960	5.00000
*	1918265004	Vial 89	1	Sample	20	2.99495e5	8.239	5.00000
*	1918265005	Vial 90	1	Sample	21	2.16624e5	8.179	5.00000
*	1918265006	Vial 91	1	Sample	22	2.53872e5	8.144	5.00000
*	1918265007	Vial 92	1	Sample	23	2.63295e5	8.143	5.00000
*	1918265008	Vial 93	1	Sample	24	3.21651e5	8.236	5.00000
*	661795 CCV@25	Vial 71	1	Control	25	2.38601e5	8.561	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

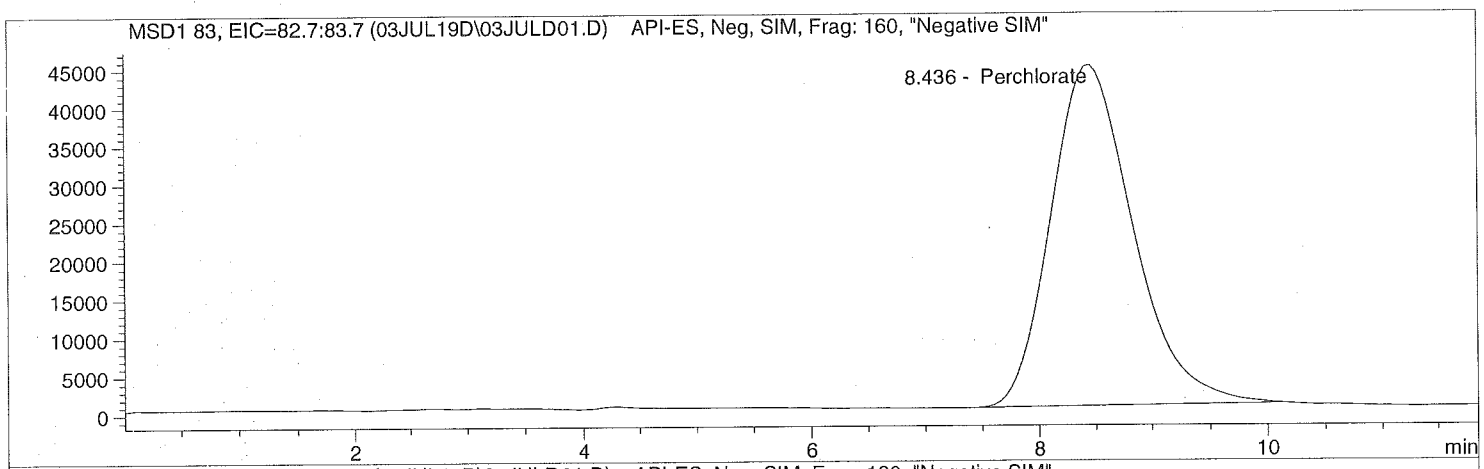
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	661789	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	661793	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	661791	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	661792	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1918260001		CLO4-AQN	1	Sample		
6	Vial 76	1918260002		CLO4-AQN	1	Sample		
7	Vial 77	1918260003	10X	CLO4-AQN	1	Sample		
8	Vial 78	1918260004		CLO4-AQN	1	Sample		
9	Vial 79	1918260005	MS	CLO4-AQN	1	Sample		
10	Vial 80	1918260006	MSD	CLO4-AQN	1	Sample		
11	Vial 81	1918260007	1K	CLO4-AQN	1	Sample		
12	Vial 82	1918260008	10X	CLO4-AQN	1	Sample		
13	Vial 83	1918260009		CLO4-AQN	1	Sample		
14	Vial 84	1918260010		CLO4-AQN	1	Sample		
15	Vial 85	1918260011		CLO4-AQN	1	Sample		
16	Vial 86	1918265001		CLO4-AQN	1	Sample		
17	Vial 71	661794	CCV@25	CLO4-AQN	1	Ctrl Samp		
18	Vial 87	1918265002		CLO4-AQN	1	Sample		
19	Vial 88	1918265003		CLO4-AQN	1	Sample		
20	Vial 89	1918265004		CLO4-AQN	1	Sample		
21	Vial 90	1918265005		CLO4-AQN	1	Sample		
22	Vial 91	1918265006		CLO4-AQN	1	Sample		
23	Vial 92	1918265007		CLO4-AQN	1	Sample		
24	Vial 93	1918265008		CLO4-AQN	1	Sample		
25	Vial 71	661795	CCV@25	CLO4-AQN	1	Ctrl Samp		

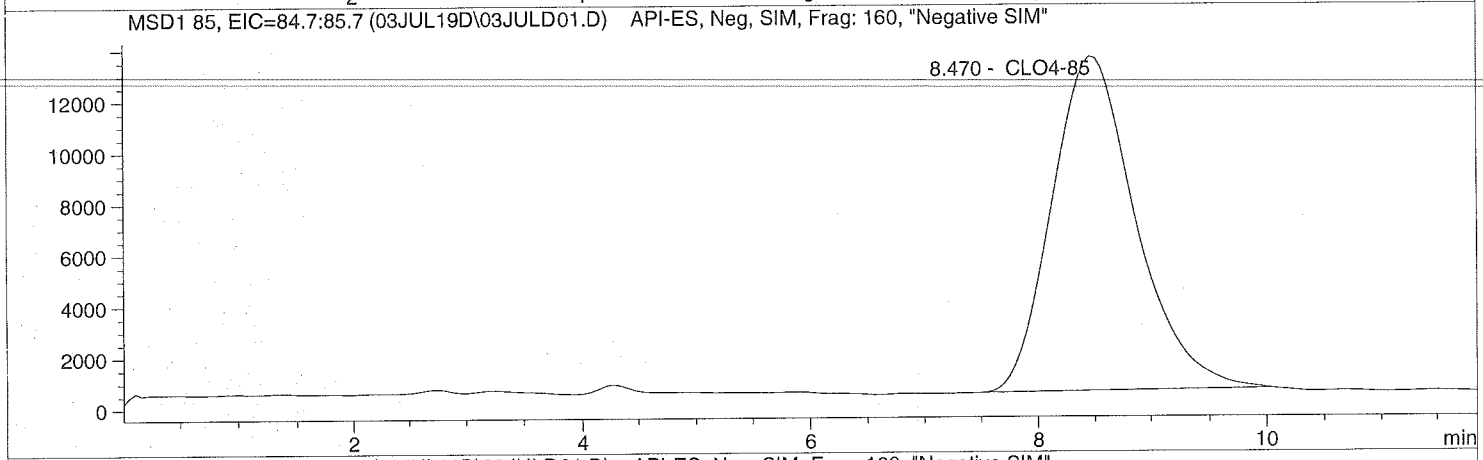
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD01.D Sample Name: 661789 CCV@25

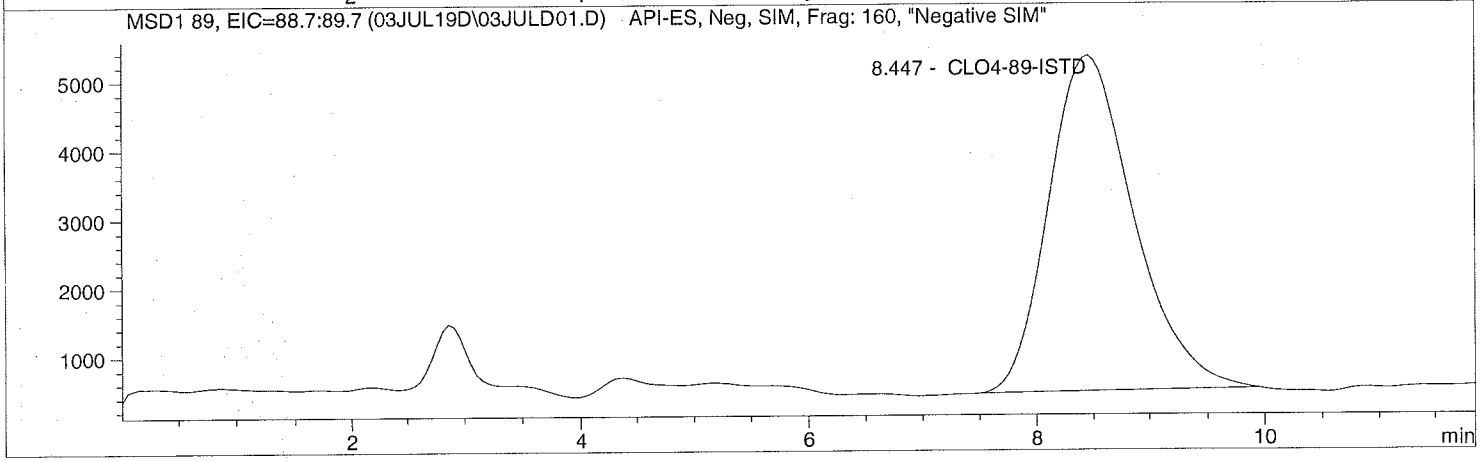
Injection Date:	7/03/2019 08:20:45	Seq Line:	1
Sample Name:	661789 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD01.D Sample Name: 661789 CCV@25

Injection Date:	7/03/2019 08:20:45	Seq Line:	1
Sample Name:	661789 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.436	PBA	2230452.0	26.5900	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.470	PBA	667744.2	26.8172	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.447	PBA	254244.0	5.0000	CLO4-89-ISTD

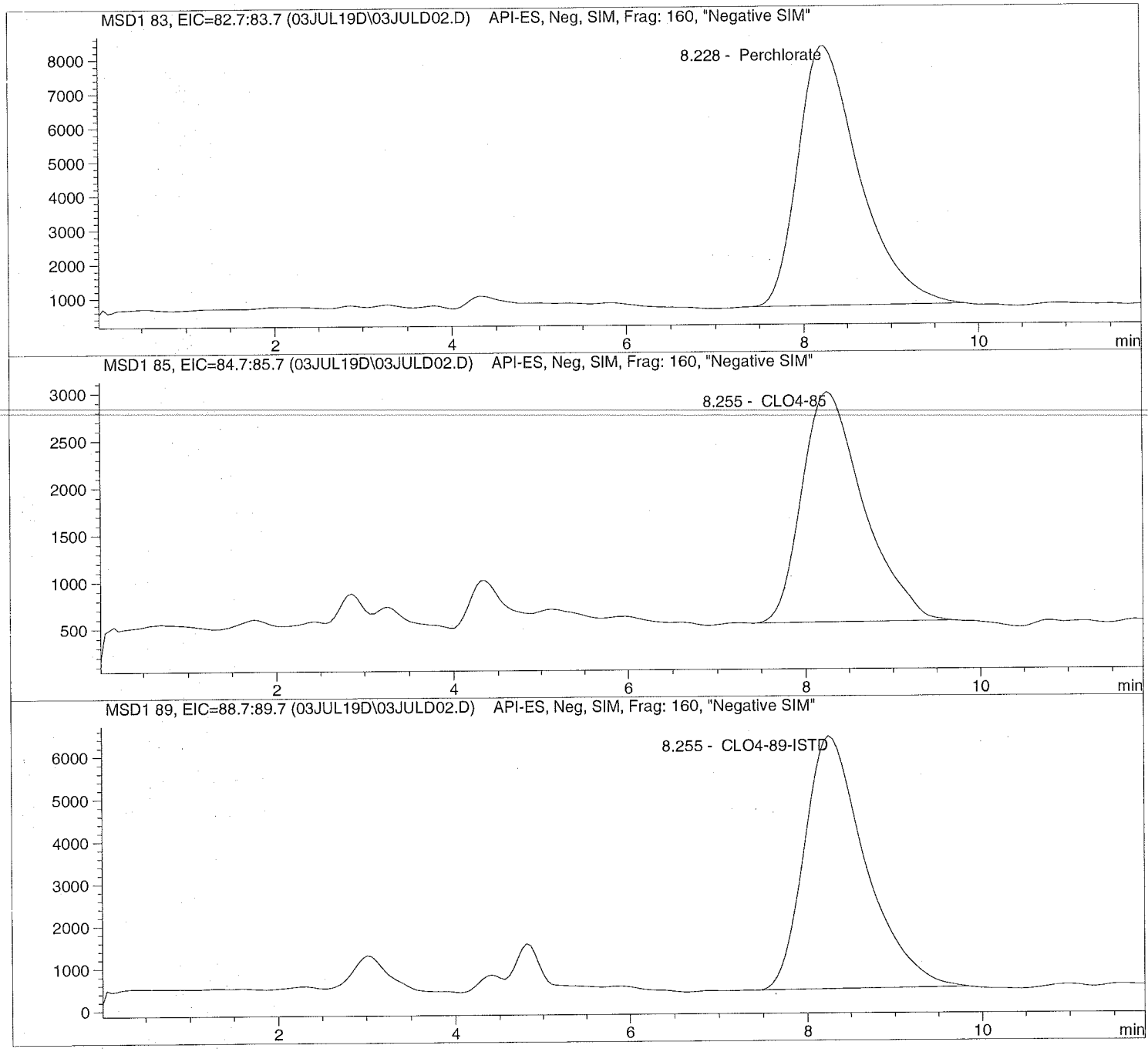
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD02.D Sample Name: 661793 QC@4.0

Injection Date:	7/03/2019 08:35:29	Seq Line:	2
Sample Name:	661793 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD02.D Sample Name: 661793 QC@4.0

Injection Date:	7/03/2019 08:35:29	Seq Line:	2
Sample Name:	661793 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.228	PBA	372011.4	4.2069	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.255	PBA	120100.8	4.4224	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.255	PBA	290663.2	5.0000	CLO4-89-ISTD

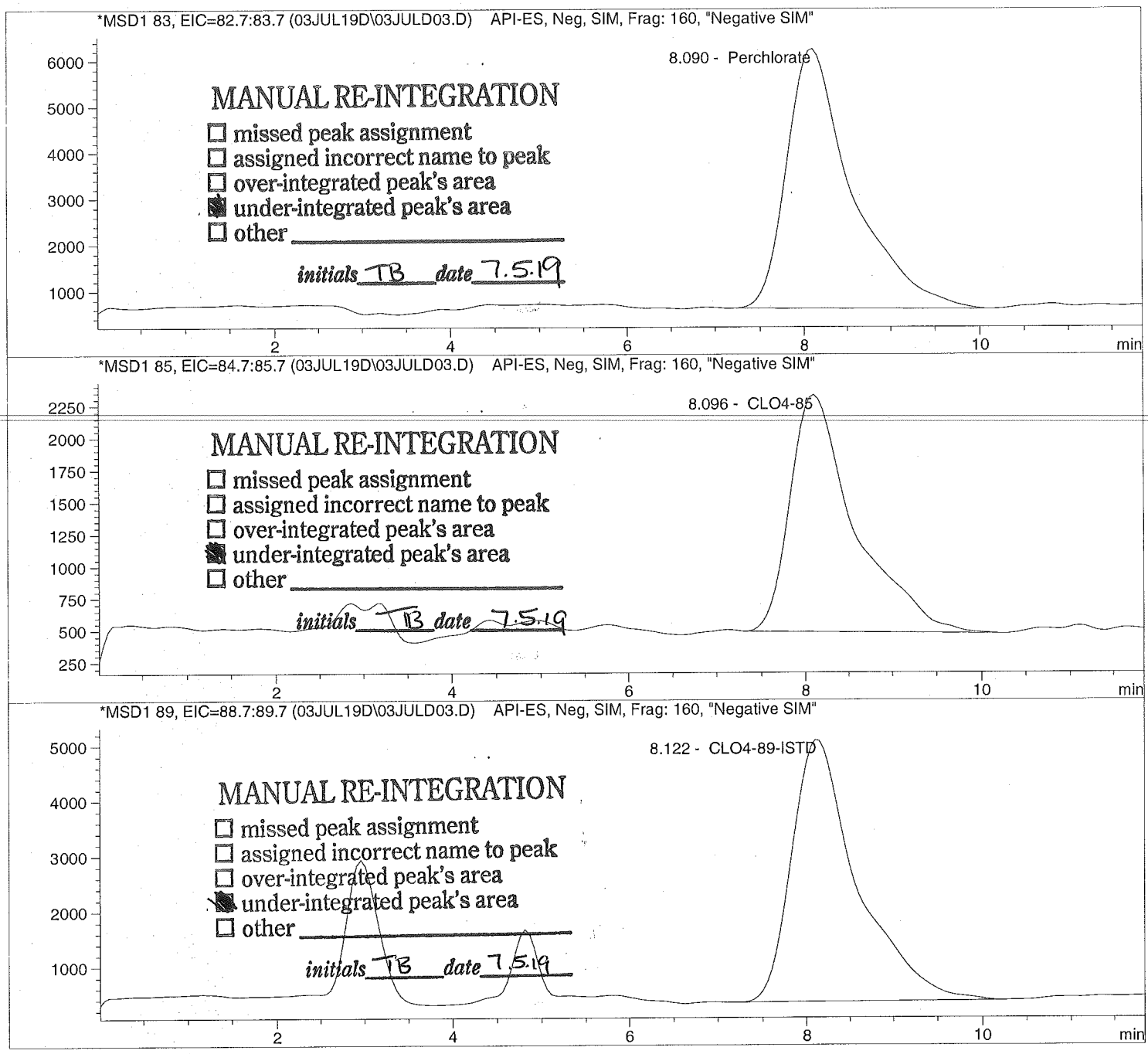
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD03.D Sample Name: 661791 ICS@4.0

Injection Date:	7/03/2019 08:49:21	Seq Line:	3
Sample Name:	661791 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD03.D Sample Name: 661791 ICS@4.0

Injection Date:	7/03/2019 08:49:21	Seq Line:	3
Sample Name:	661791 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.090	MM	292755.3	3.9037	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.096	MM	95777.8	4.1454	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.122	MM	247417.5	5.0000	CLO4-89-ISTD

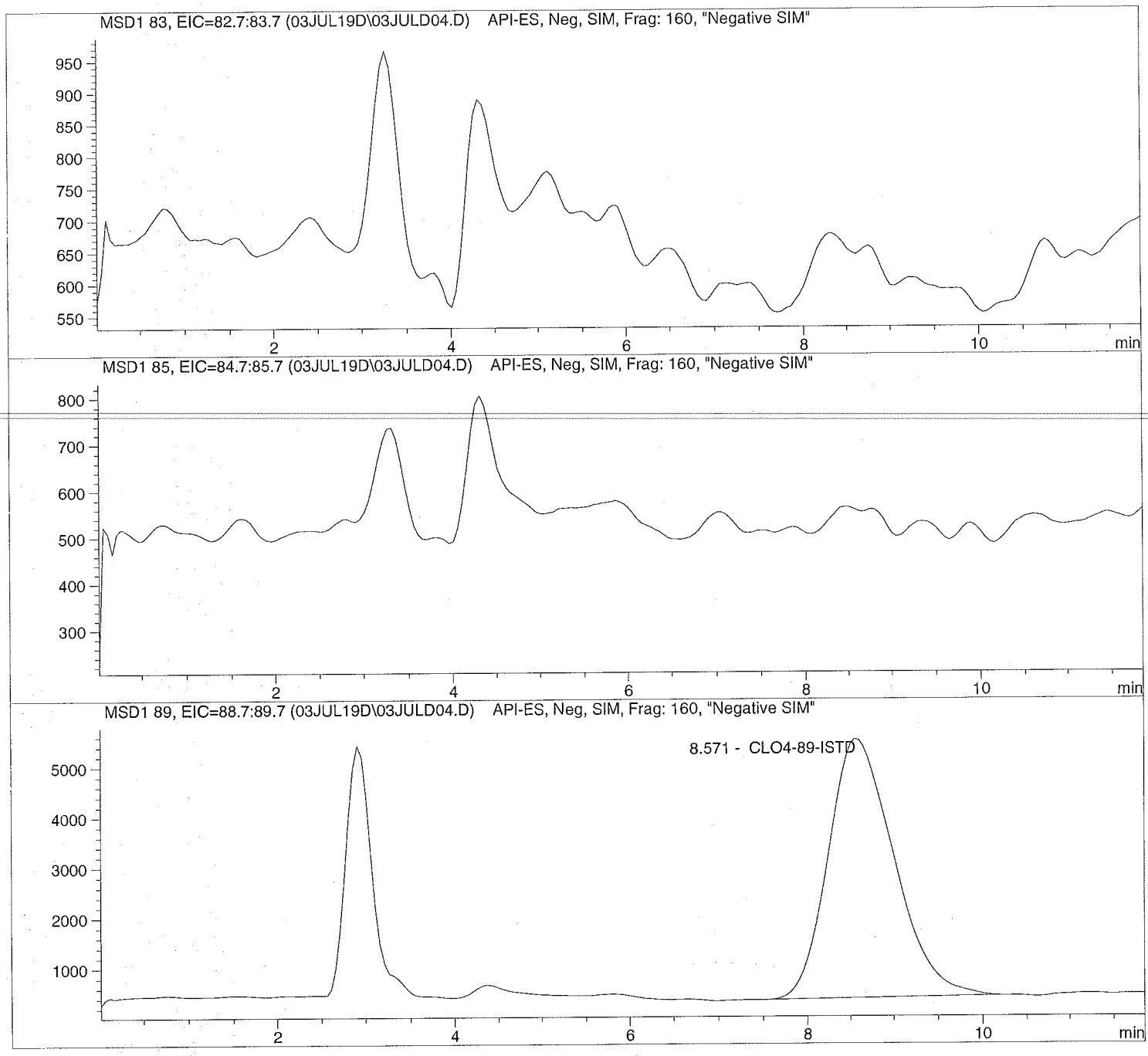
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD04.D Sample Name: 661792 LMB

Injection Date:	7/03/2019 09:03:15	Seq Line:	4
Sample Name:	661792 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD04.D Sample Name: 661792 LMB

Injection Date:	7/03/2019 09:03:15	Seq Line:	4
Sample Name:	661792 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.571	PBA	269964.7	5.0000	CLO4-89-ISTD

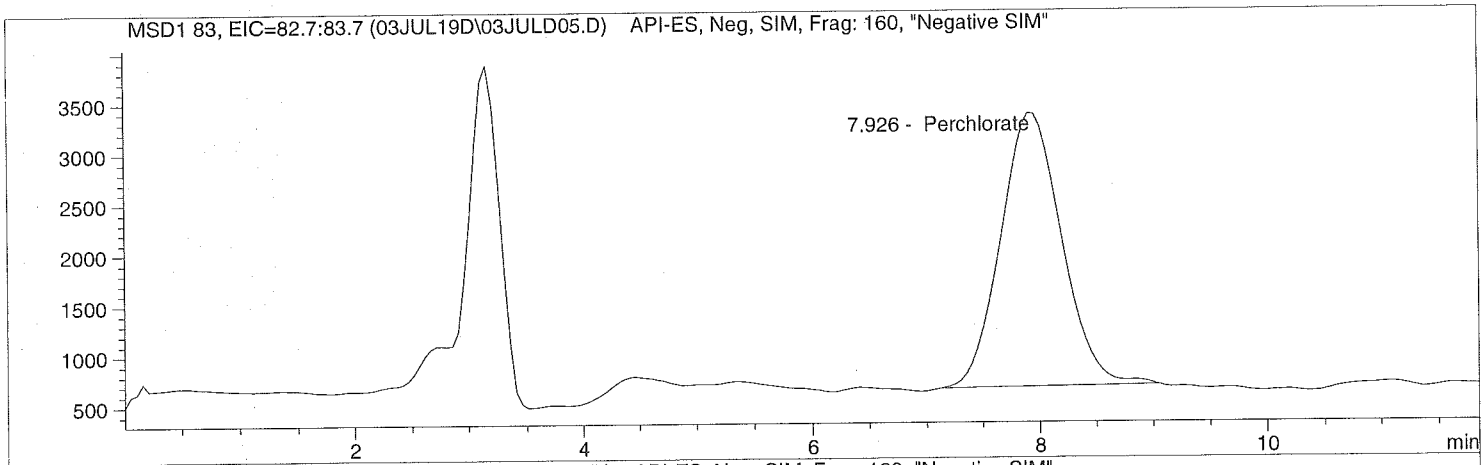
*** End of Report ***

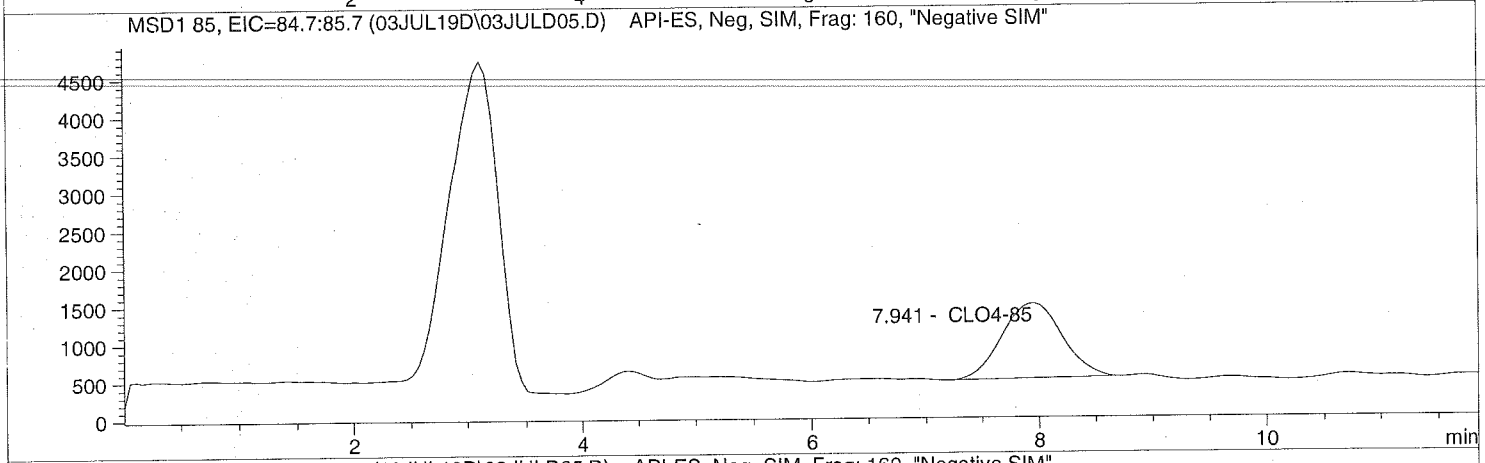
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD05.D Sample Name: 1918260001

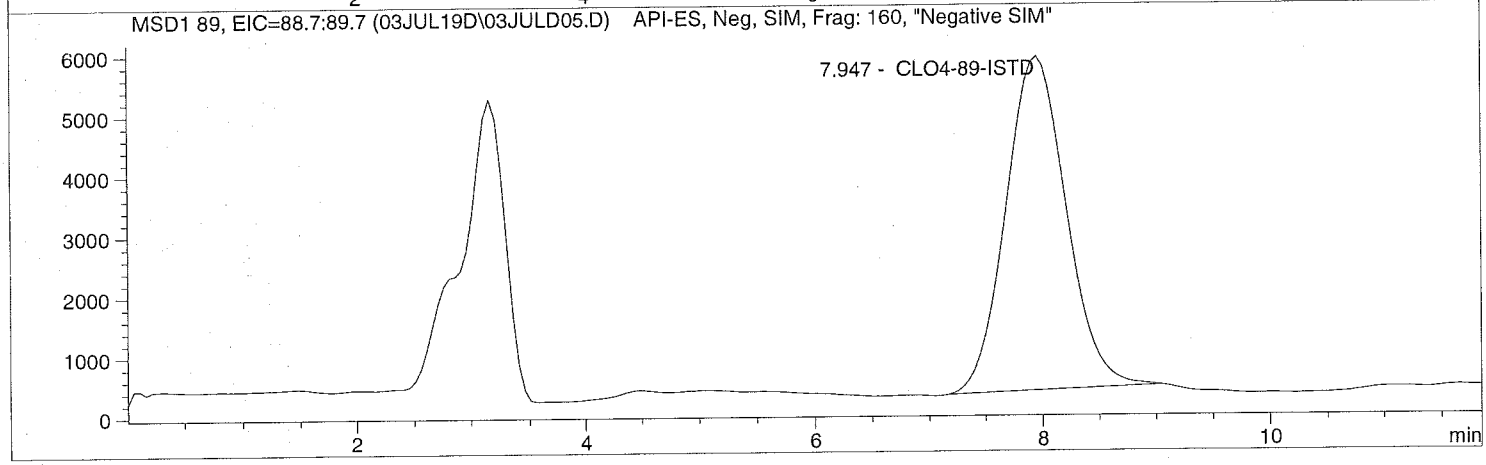
Injection Date:	7/03/2019 09:17:08	Seq Line:	5
Sample Name:	1918260001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD05.D Sample Name: 1918260001

Injection Date:	7/03/2019 09:17:08	Seq Line:	5
Sample Name:	1918260001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.926	BBA	100338.5	1.7270	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.941	PBA	36216.6	1.9135	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.947	PBA	203376.5	5.0000	CLO4-89-ISTD

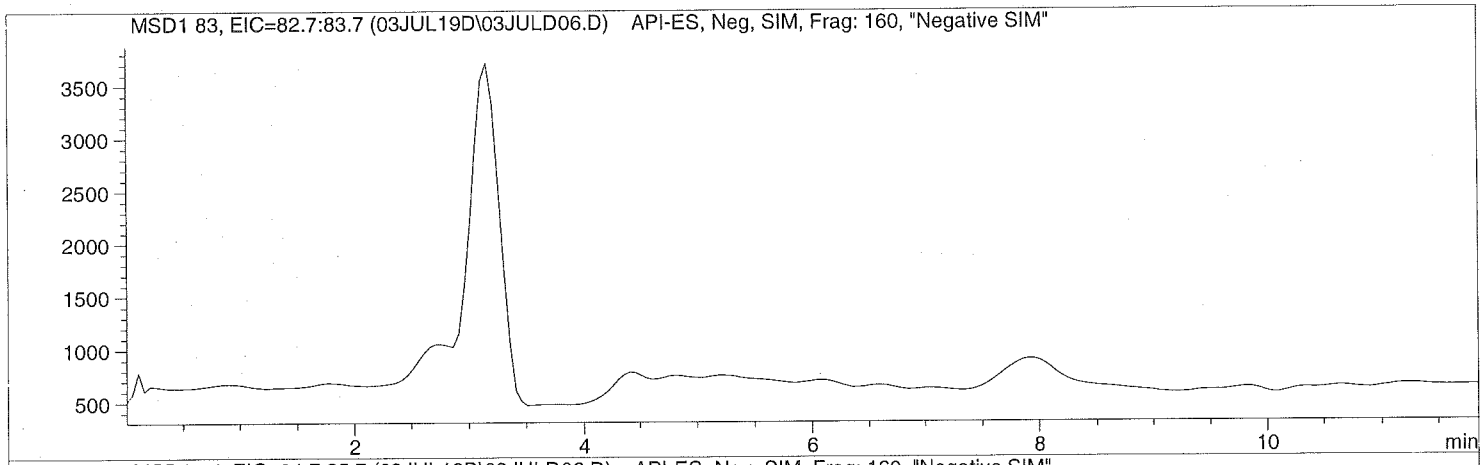
*** End of Report ***

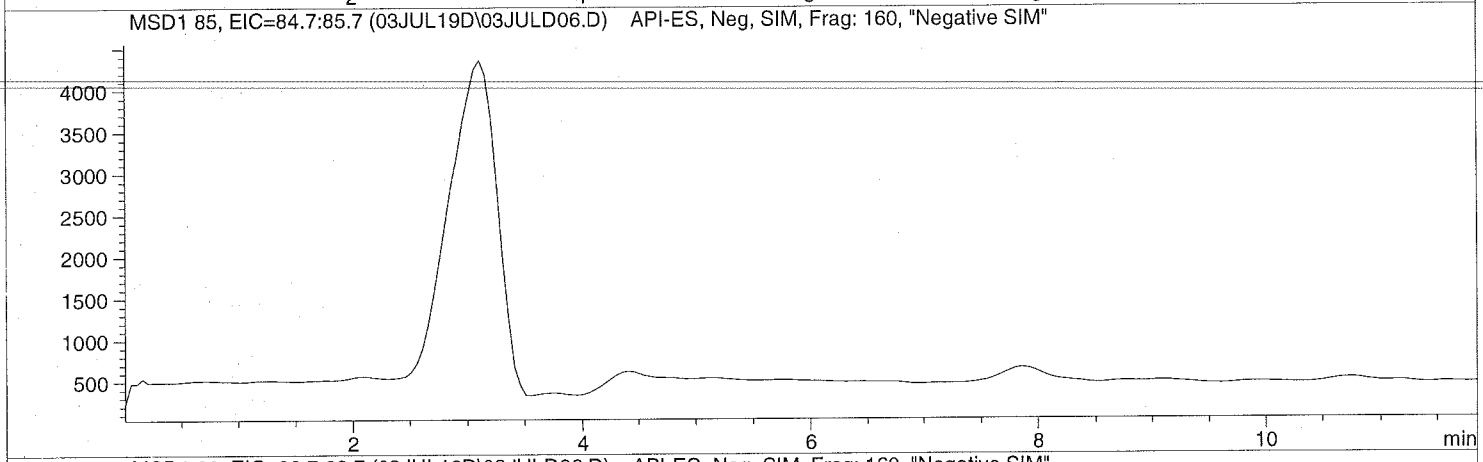
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD06.D Sample Name: 1918260002

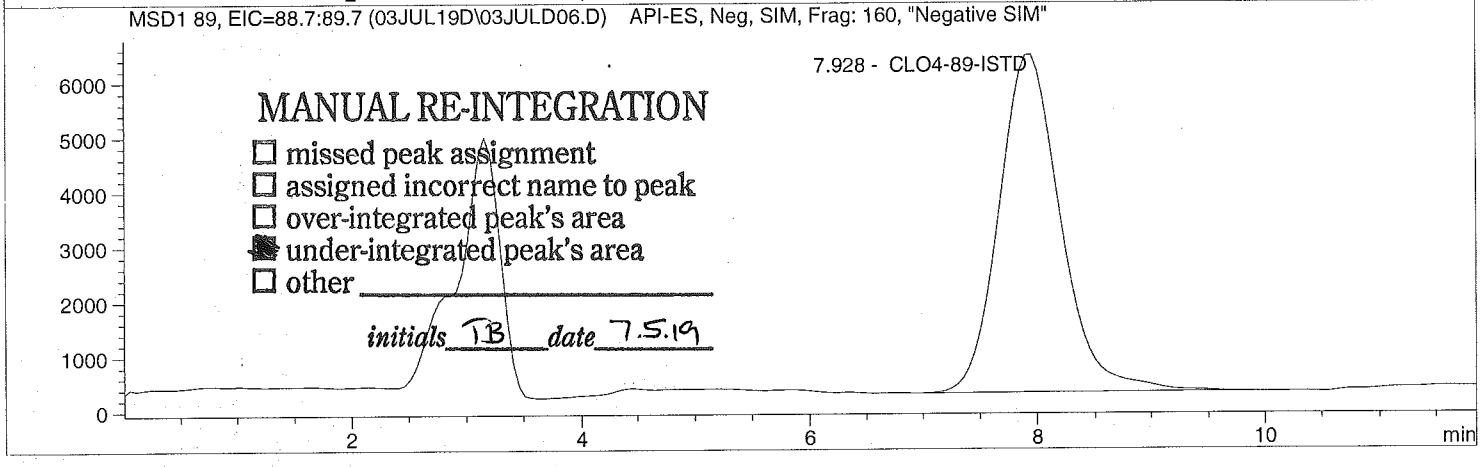
Injection Date:	7/03/2019 09:31:06	Seq Line:	6
Sample Name:	1918260002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







MANUAL RE-INTEGRATION

- ☐ missed peak assignment
- ☐ assigned incorrect name to peak
- ☐ over-integrated peak's area
- ■ under-integrated peak's area
- ☐ other _____

initials TB *date* 7.5.19

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD06.D Sample Name: 1918260002

Injection Date:	7/03/2019 09:31:06	Seq Line:	6
Sample Name:	1918260002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.928	MM	230321.8	5.0000	CLO4-89-ISTD

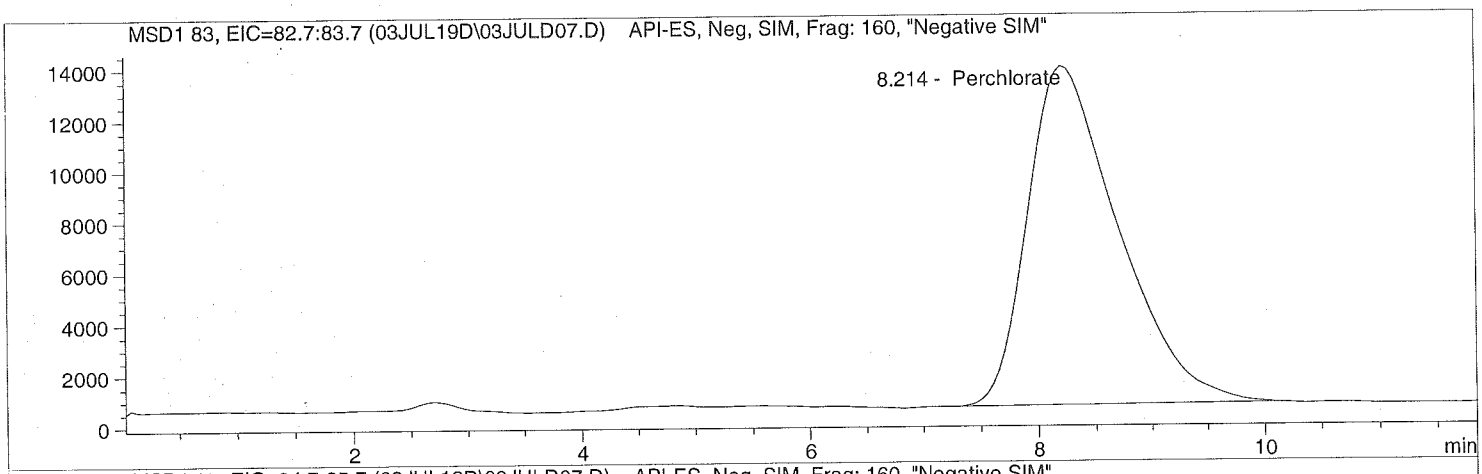
*** End of Report ***

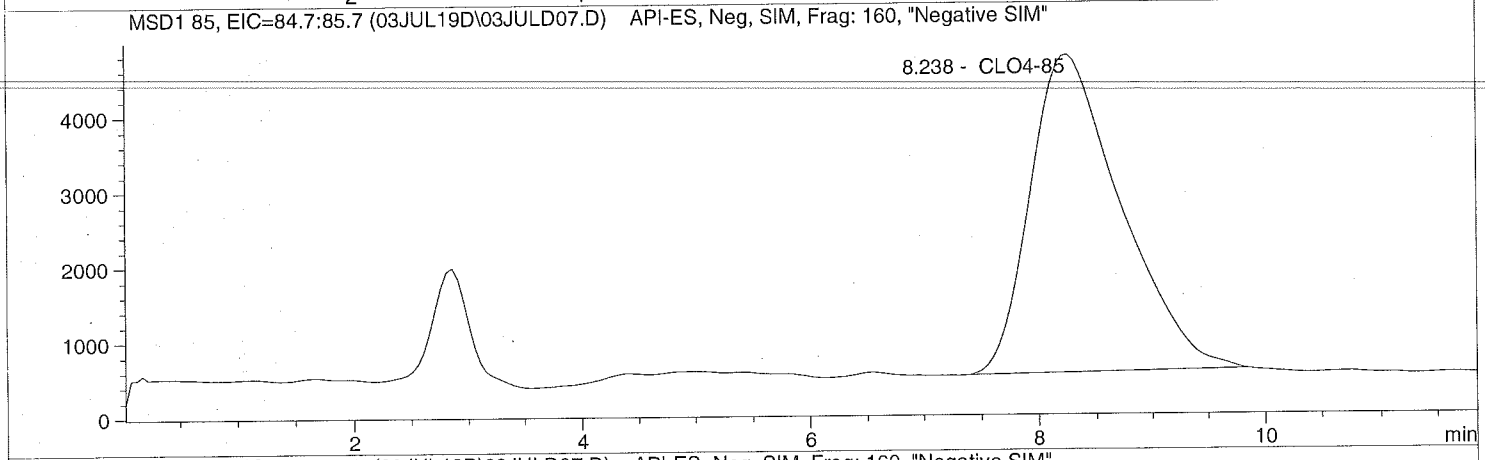
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD07.D Sample Name: 1918260003 10X

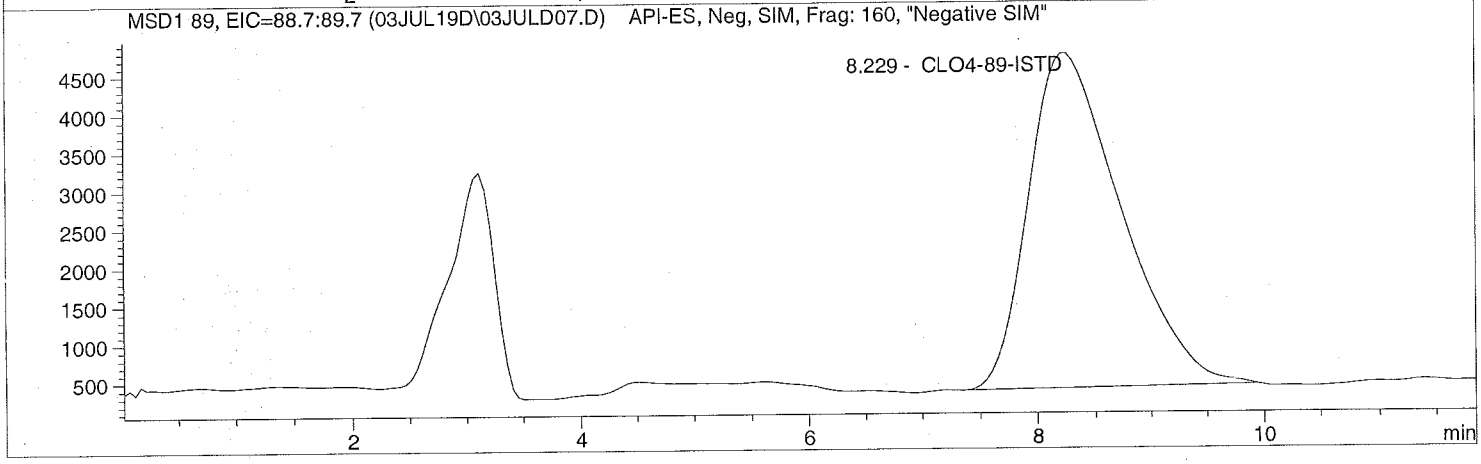
Injection Date:	7/03/2019 09:45:04	Seq Line:	7
Sample Name:	1918260003 10X	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD07.D Sample Name: 1918260003 10X

Injection Date:	7/03/2019 09:45:04	Seq Line:	7
Sample Name:	1918260003 10X	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.214	PBA	728769.6	94.5196	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.238	PBA	232603.6	100.3590	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.229	PBA	245205.1	50.0000	CLO4-89-ISTD

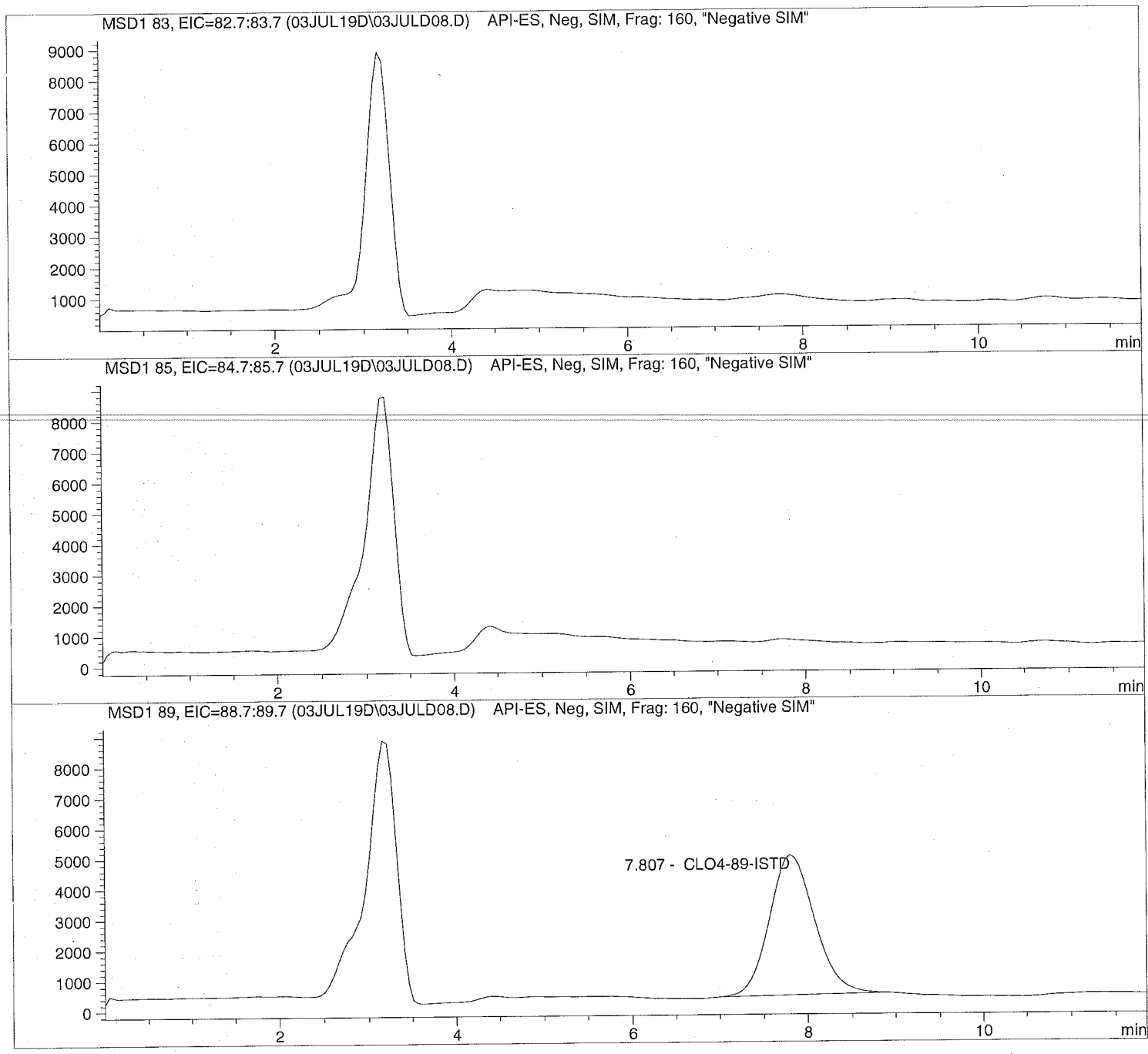
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD08.D Sample Name: 1918260004

Injection Date:	7/03/2019 09:58:59	Seq Line:	8
Sample Name:	1918260004	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD08.D Sample Name: 1918260004

Injection Date:	7/03/2019 09:58:59	Seq Line:	8
Sample Name:	1918260004	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.807	PBA	164595.2	5.0000	CLO4-89-ISTD

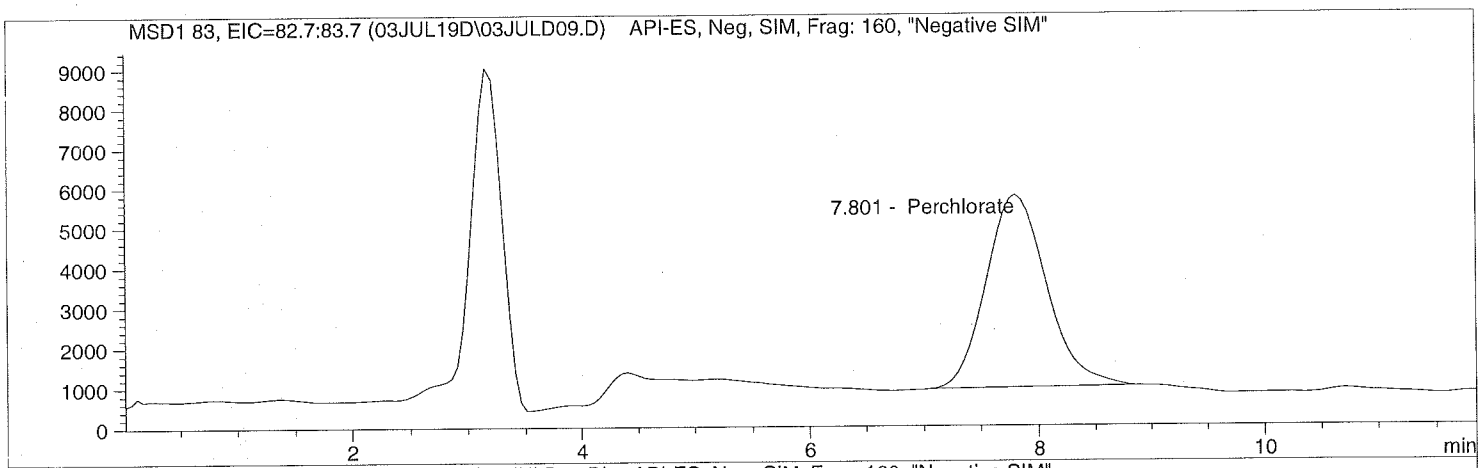
*** End of Report ***

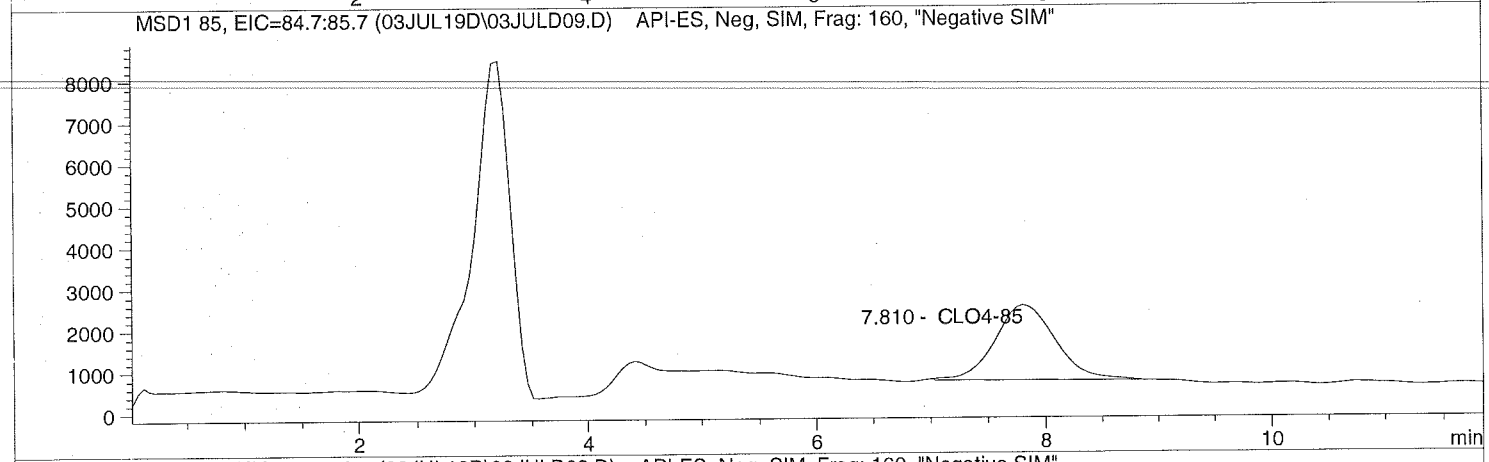
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD09.D Sample Name: 1918260005 MS

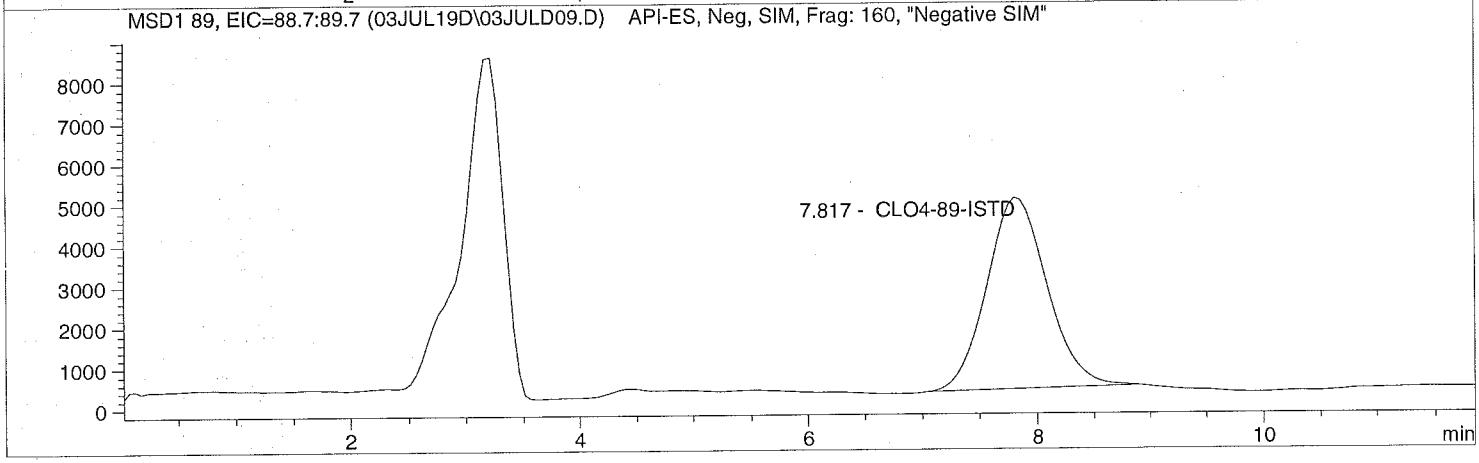
Injection Date:	7/03/2019 10:12:53	Seq Line:	9
Sample Name:	1918260005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD09.D Sample Name: 1918260005 MS

Injection Date:	7/03/2019 10:12:53	Seq Line:	9
Sample Name:	1918260005 MS	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.801	PBA	174594.0	3.4177	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.810	BBA	65605.9	4.1392	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.817	PBA	169734.3	5.0000	CLO4-89-ISTD

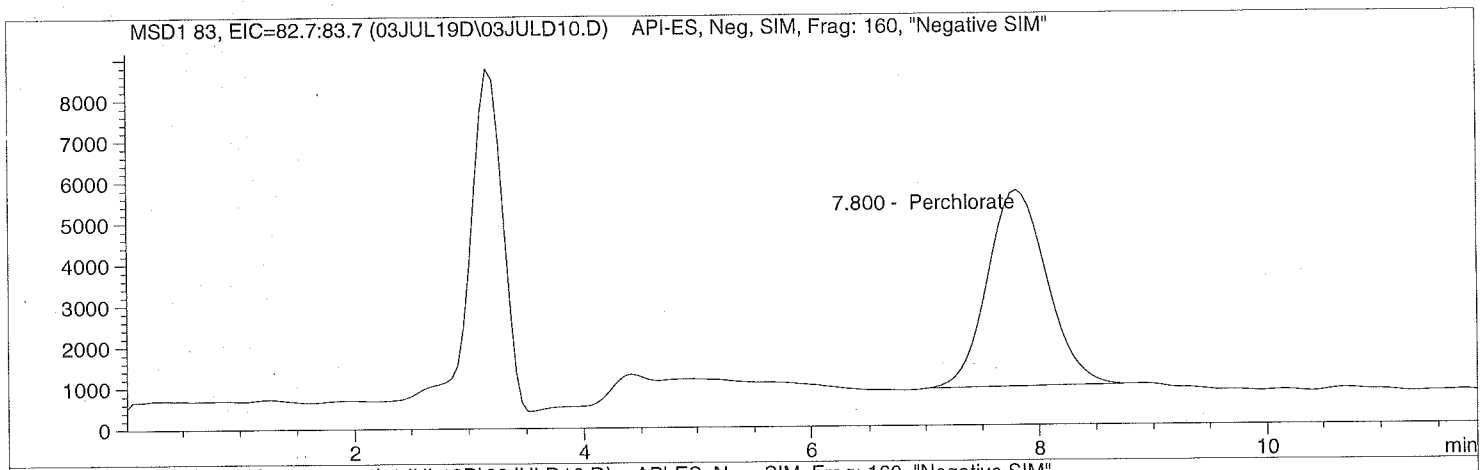
*** End of Report ***

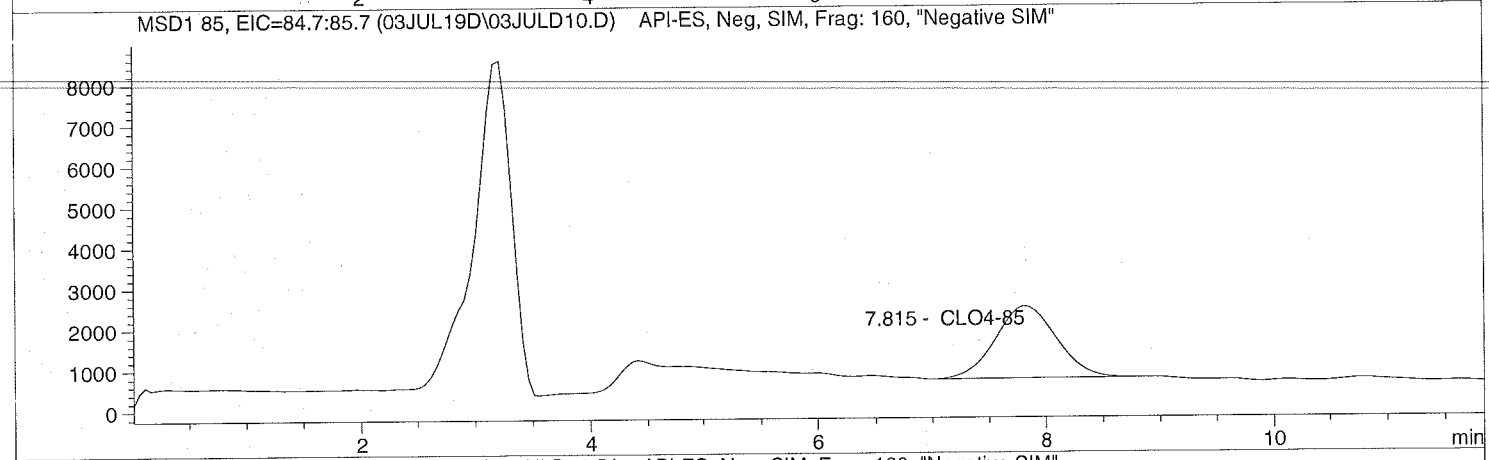
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD10.D Sample Name: 1918260006 MSD

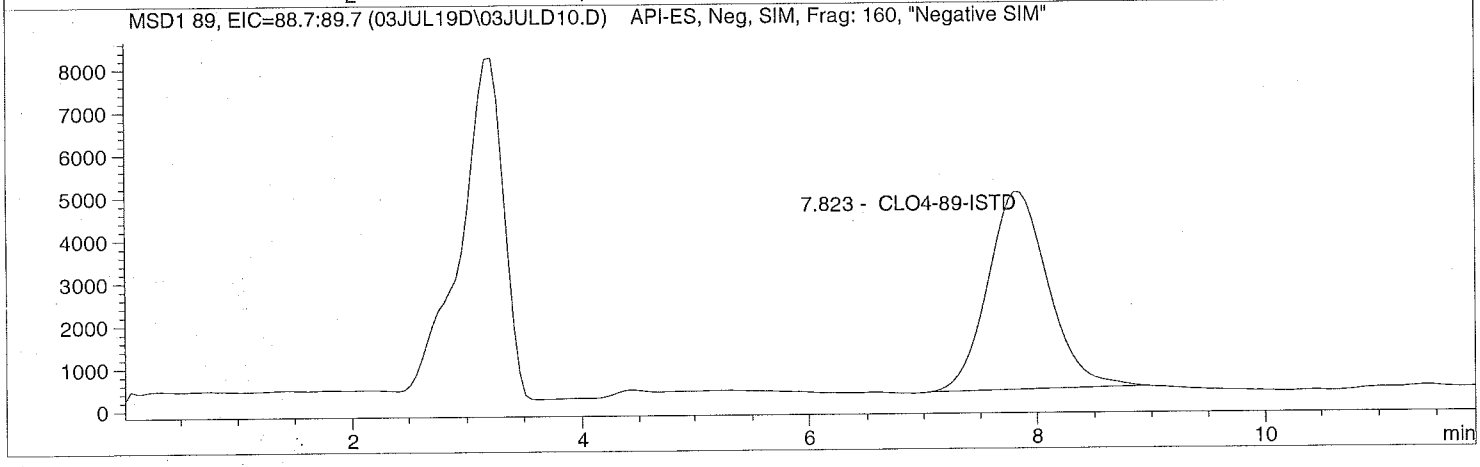
Injection Date:	7/03/2019 10:26:51	Seq Line:	10
Sample Name:	1918260006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD10.D Sample Name: 1918260006 MSD

Injection Date:	7/03/2019 10:26:51	Seq Line:	10
Sample Name:	1918260006 MSD	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.800	PBA	172844.2	3.3651	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.815	PBA	65623.2	4.1144	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.823	PBA	170811.3	5.0000	CLO4-89-ISTD

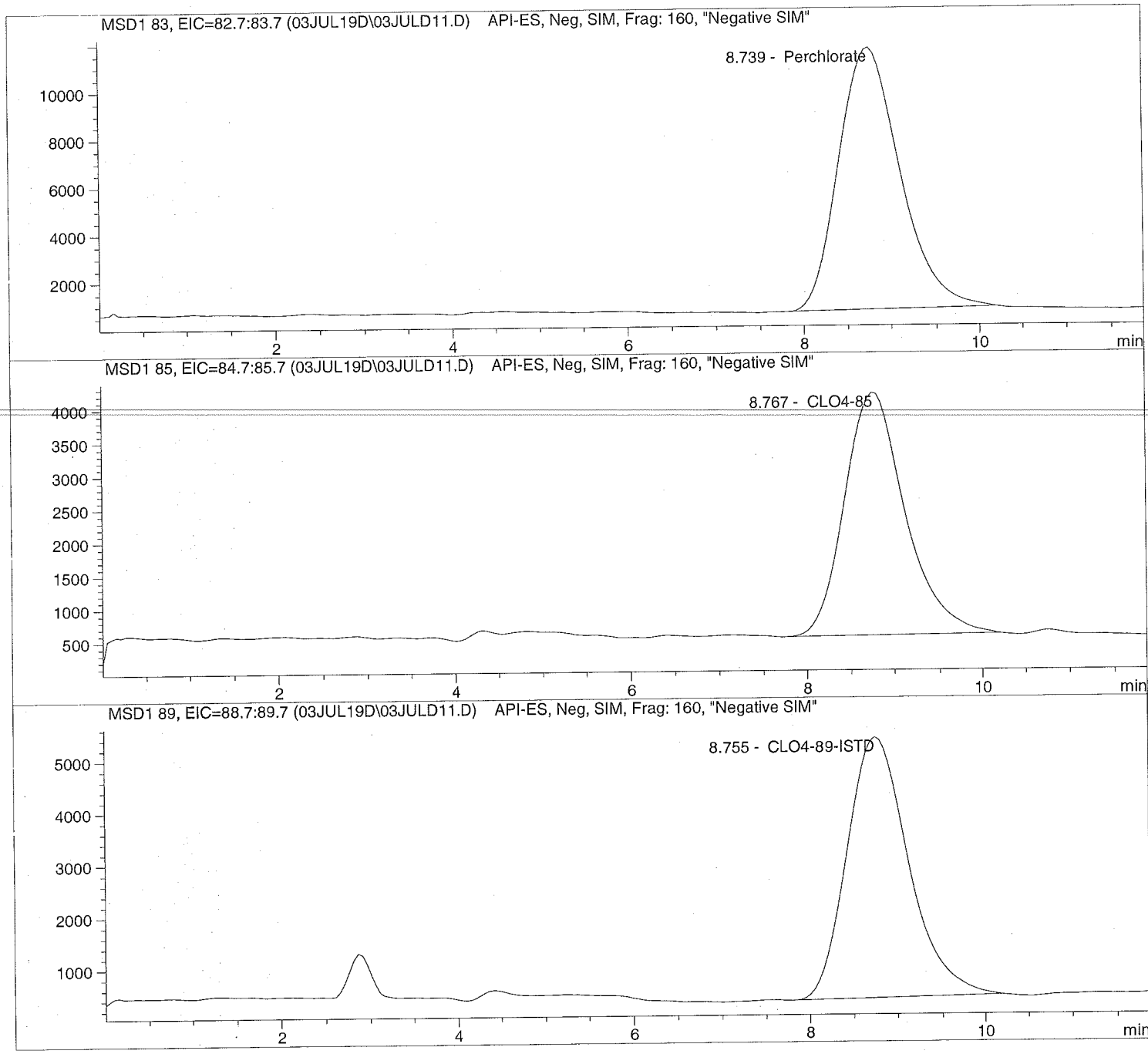
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD11.D Sample Name: 1918260007 1K

Injection Date:	7/03/2019 10:40:43	Seq Line:	11
Sample Name:	1918260007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD11.D Sample Name: 1918260007 1K

Injection Date:	7/03/2019 10:40:43	Seq Line:	11
Sample Name:	1918260007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.739	PBA	534660.9	7067.3228	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.767	PBA	175075.3	7652.5648	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	PBA	243259.9	5000.0000	CLO4-89-ISTD

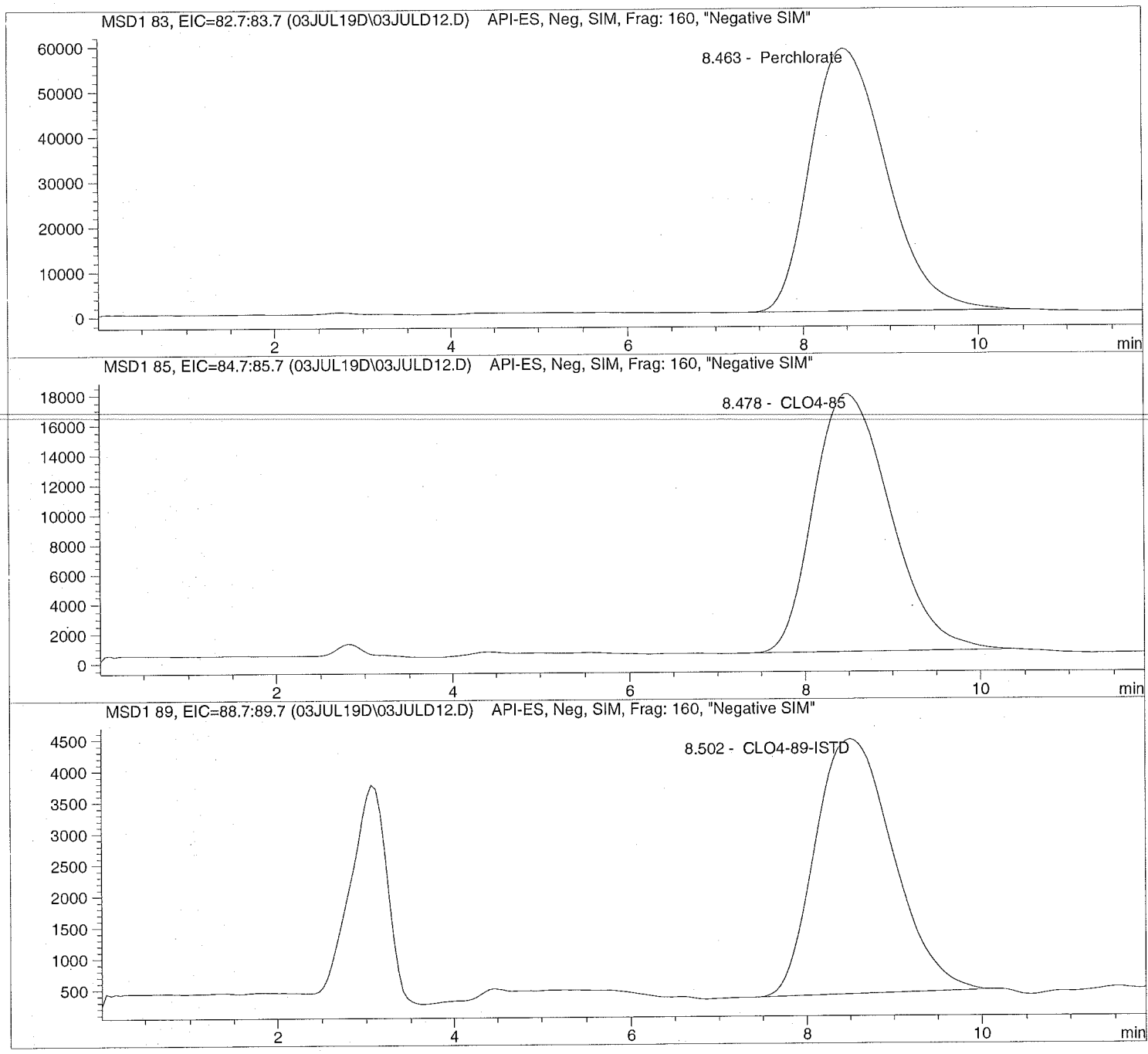
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD12.D Sample Name: 1918260008 10X

Injection Date:	7/03/2019 10:54:34	Seq Line:	12
Sample Name:	1918260008 10X	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD12.D Sample Name: 1918260008 10X

Injection Date:	7/03/2019 10:54:34	Seq Line:	12
Sample Name:	1918260008 10X	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.463	PBA	3531551.7	409.0141	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.478	PBA	1061081.0	414.8002	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	PBA	253420.0	50.0000	CLO4-89-ISTD

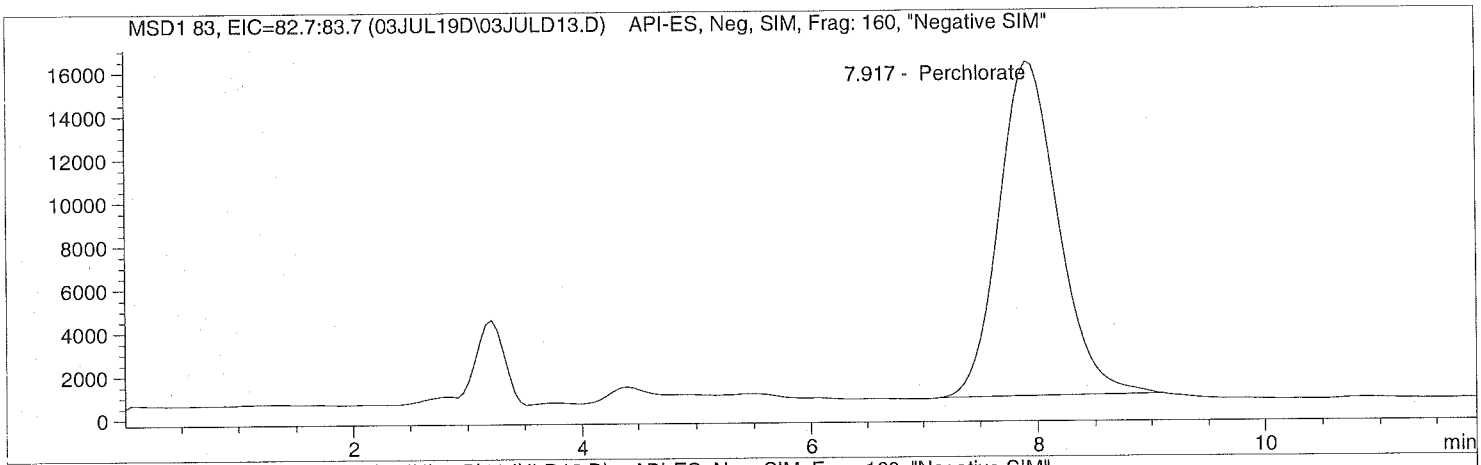
*** End of Report ***

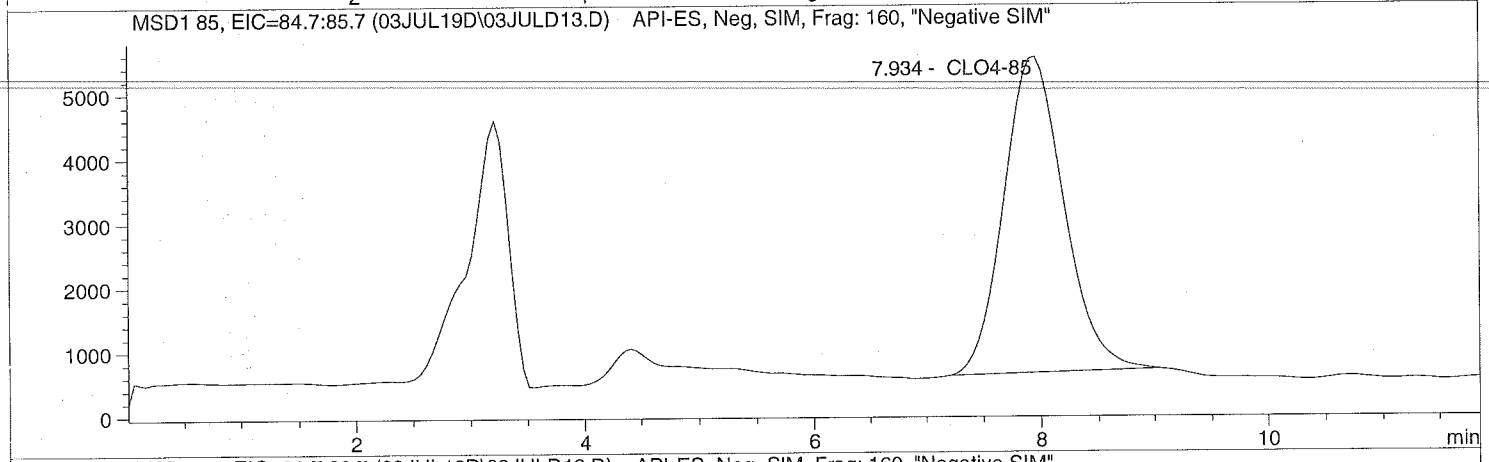
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD13.D Sample Name: 1918260009

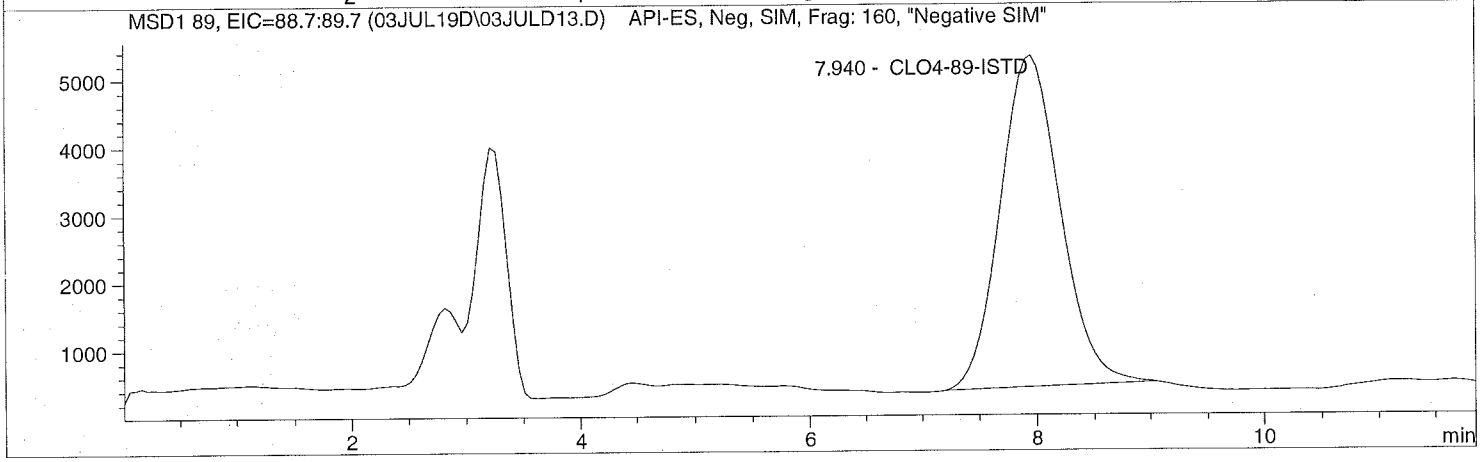
Injection Date:	7/03/2019 11:08:30	Seq Line:	13
Sample Name:	1918260009	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD13.D Sample Name: 1918260009

Injection Date:	7/03/2019 11:08:30	Seq Line:	13
Sample Name:	1918260009	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.917	PBA	548800.2	9.8990	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.934	PBA	177271.9	10.6421	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.940	PBA	176004.6	5.0000	CLO4-89-ISTD

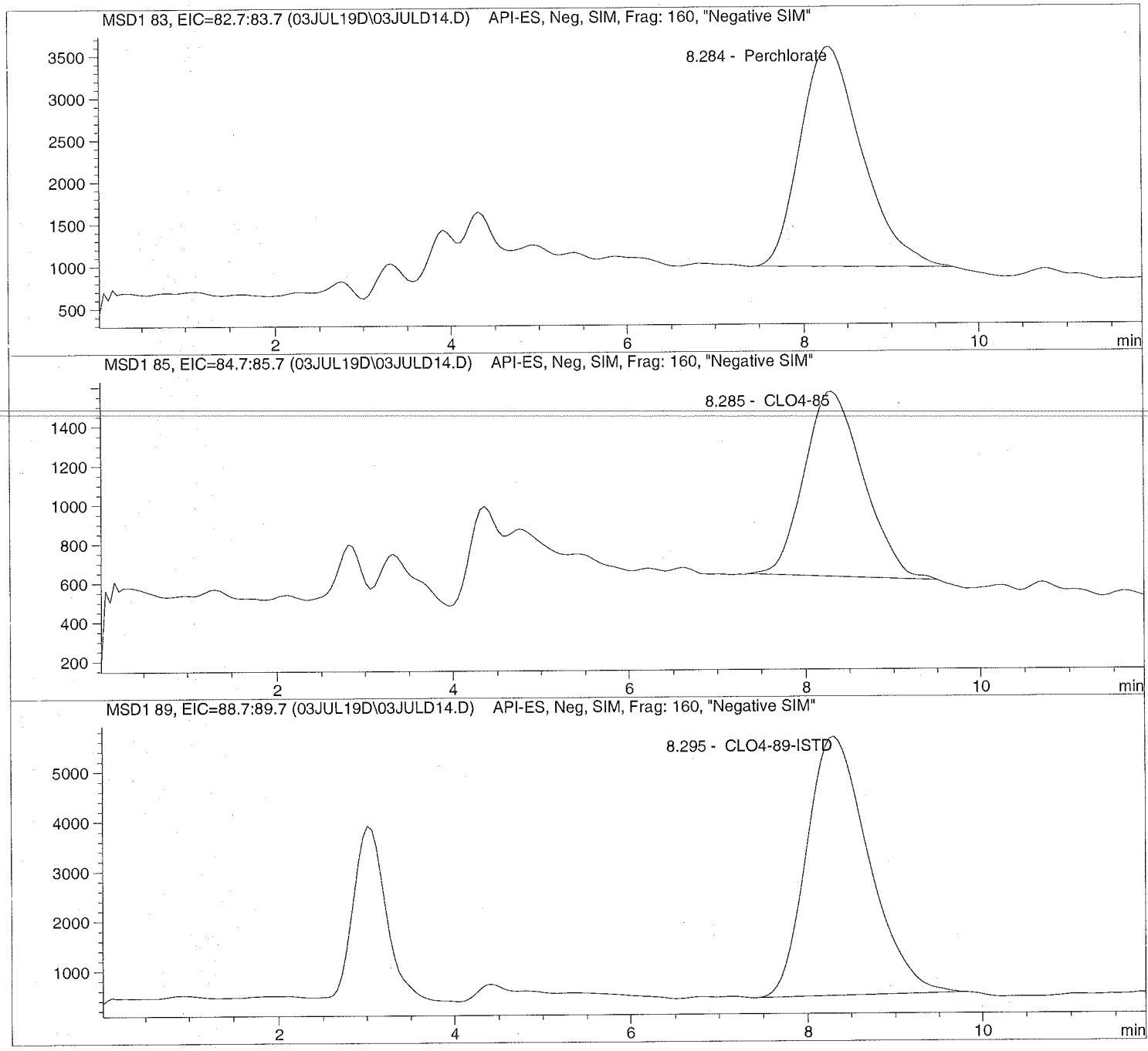
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD14.D Sample Name: 1918260010

Injection Date:	7/03/2019 11:22:22	Seq Line:	14
Sample Name:	1918260010	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD14.D Sample Name: 1918260010

Injection Date:	7/03/2019 11:22:22	Seq Line:	14
Sample Name:	1918260010	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.284	PBA	127410.9	1.7506	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.285	PBA	44045.2	1.8603	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.295	PBA	254426.4	5.0000	CLO4-89-ISTD

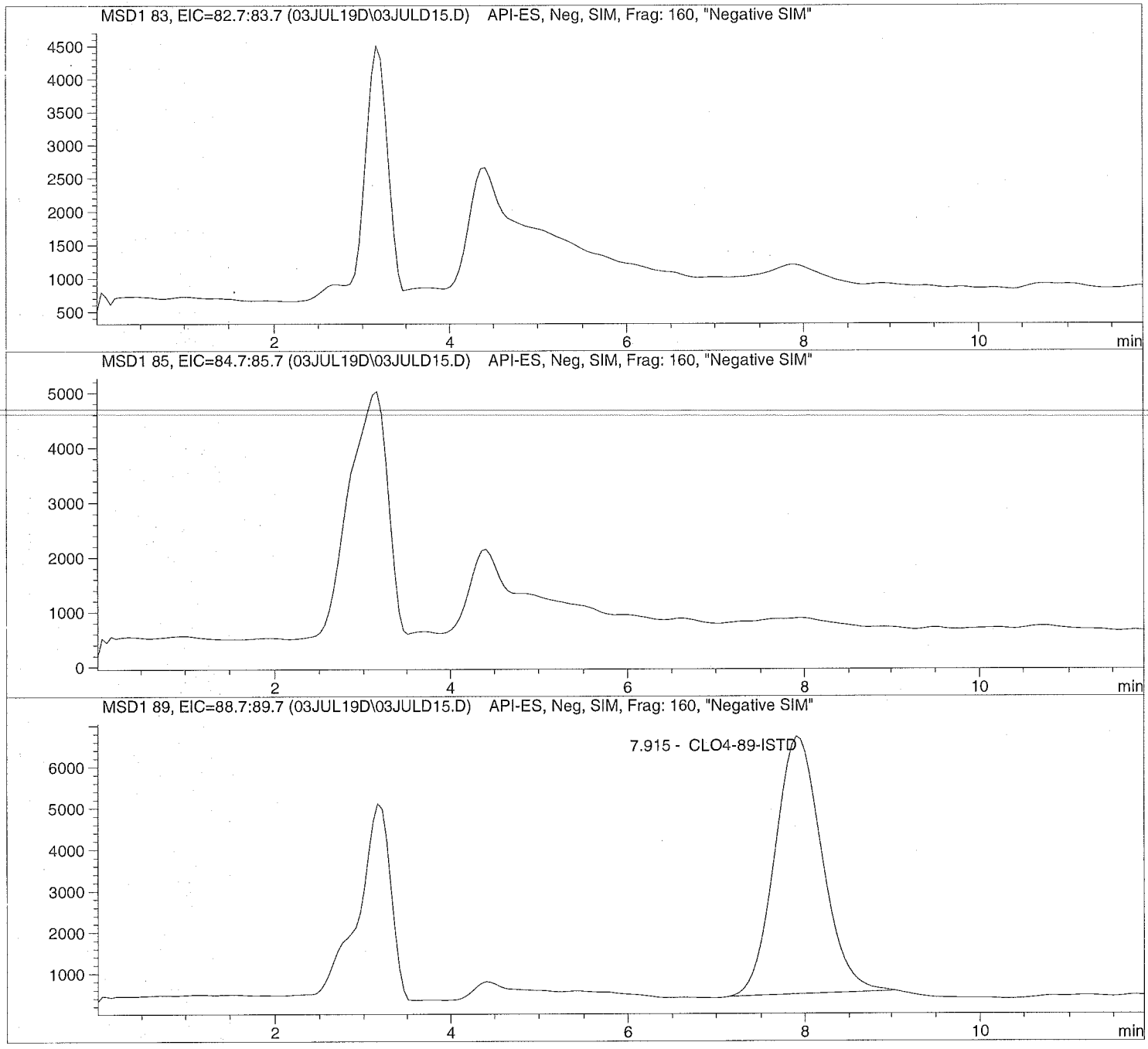
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD15.D Sample Name: 1918260011

Injection Date:	7/03/2019 11:36:14	Seq Line:	15
Sample Name:	1918260011	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD15.D Sample Name: 1918260011

Injection Date:	7/03/2019 11:36:14	Seq Line:	15
Sample Name:	1918260011	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.915	PBA	232350.5	5.0000	CLO4-89-ISTD

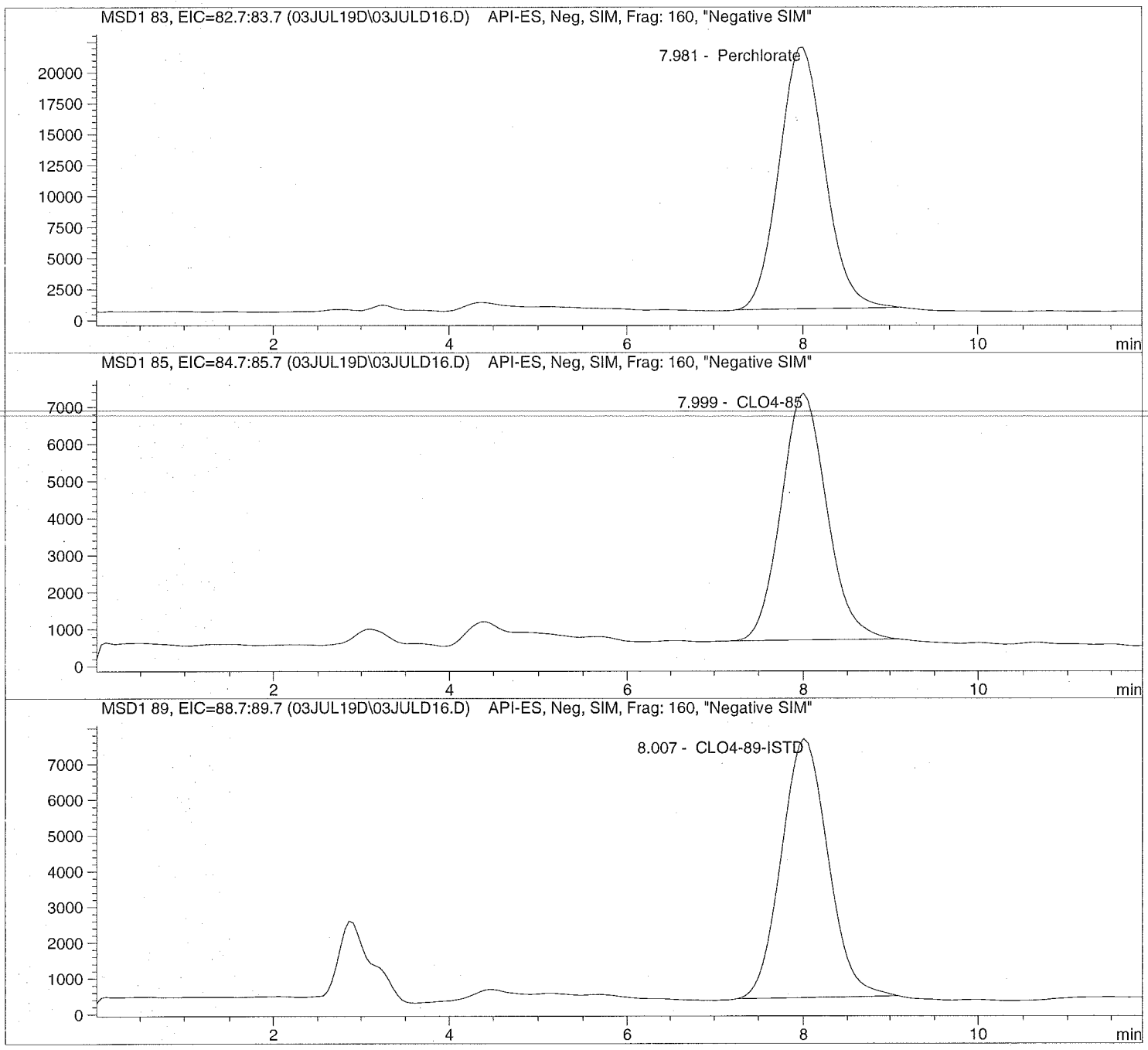
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD16.D Sample Name: 1918265001

Injection Date:	7/03/2019 11:50:13	Seq Line:	16
Sample Name:	1918265001	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD16.D Sample Name: 1918265001

Injection Date:	7/03/2019 11:50:13	Seq Line:	16
Sample Name:	1918265001	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.981	PBA	753597.0	9.0775	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.999	PBA	238015.1	9.5332	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.007	BBA	264420.9	5.0000	CLO4-89-ISTD

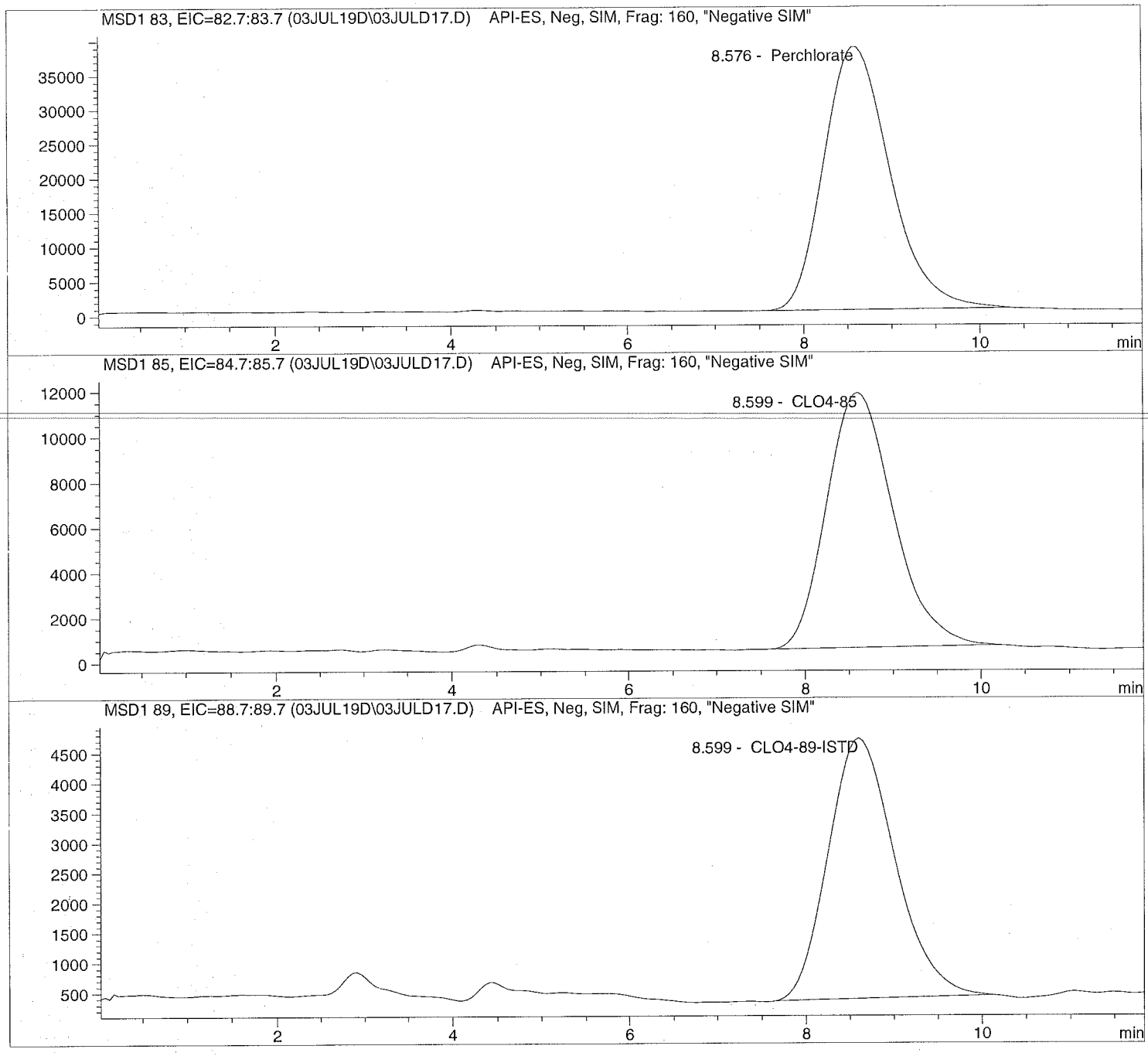
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD17.D Sample Name: 661794 CCV@25

Injection Date:	7/03/2019 12:04:07	Seq Line:	17
Sample Name:	661794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD17.D Sample Name: 661794 CCV@25

Injection Date:	7/03/2019 12:04:07	Seq Line:	17
Sample Name:	661794 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.576	PBA	1992507.0	26.3322	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.599	PBA	592974.3	26.4065	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.599	PBA	229484.4	5.0000	CLO4-89-ISTD

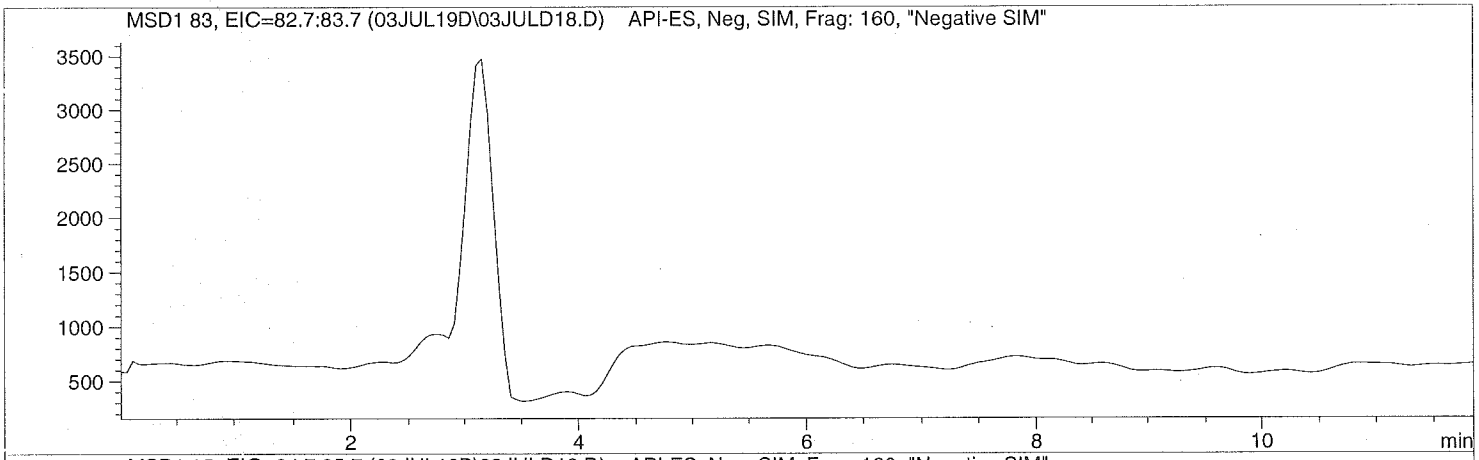
*** End of Report ***

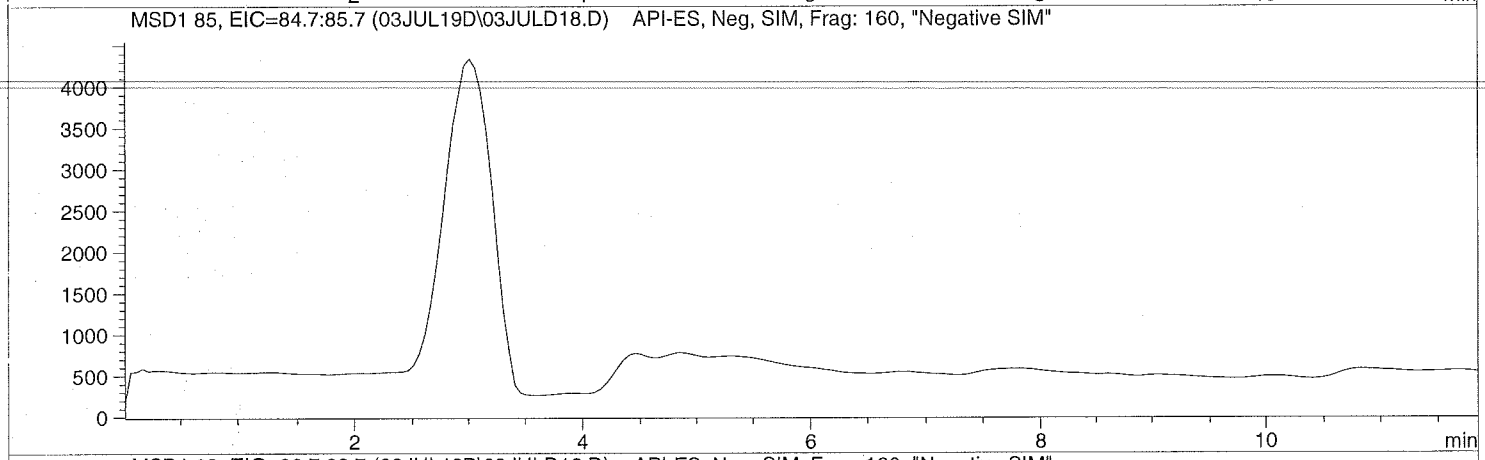
Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD18.D Sample Name: 1918265002

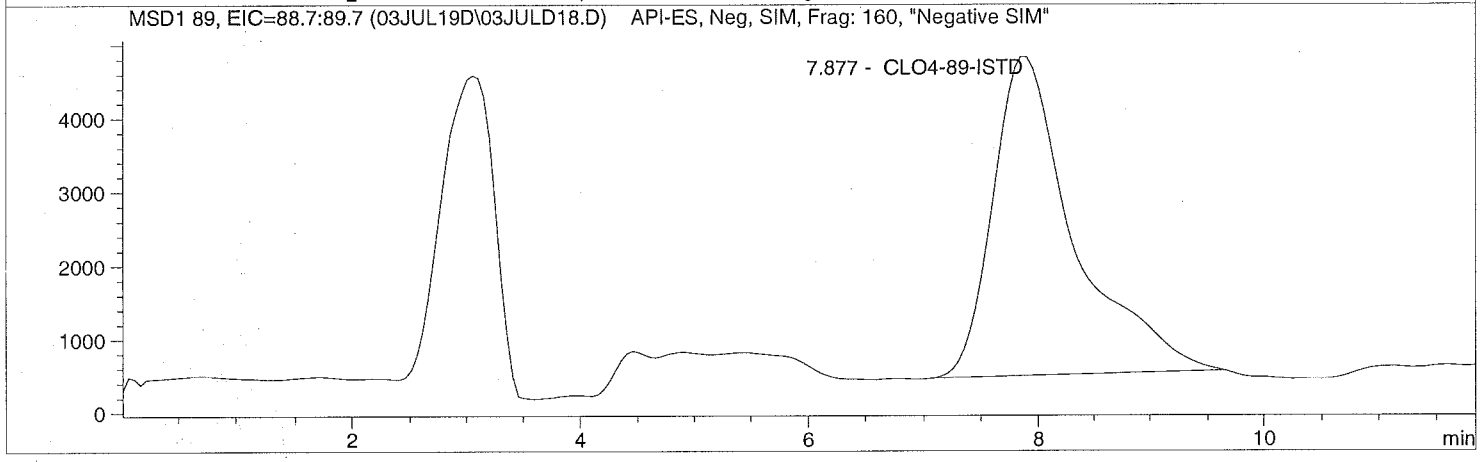
Injection Date:	7/03/2019 12:18:01	Seq Line:	18
Sample Name:	1918265002	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD18.D Sample Name: 1918265002

Injection Date:	7/03/2019 12:18:01	Seq Line:	18
Sample Name:	1918265002	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.877	PBA	214730.0	5.0000	CLO4-89-ISTD

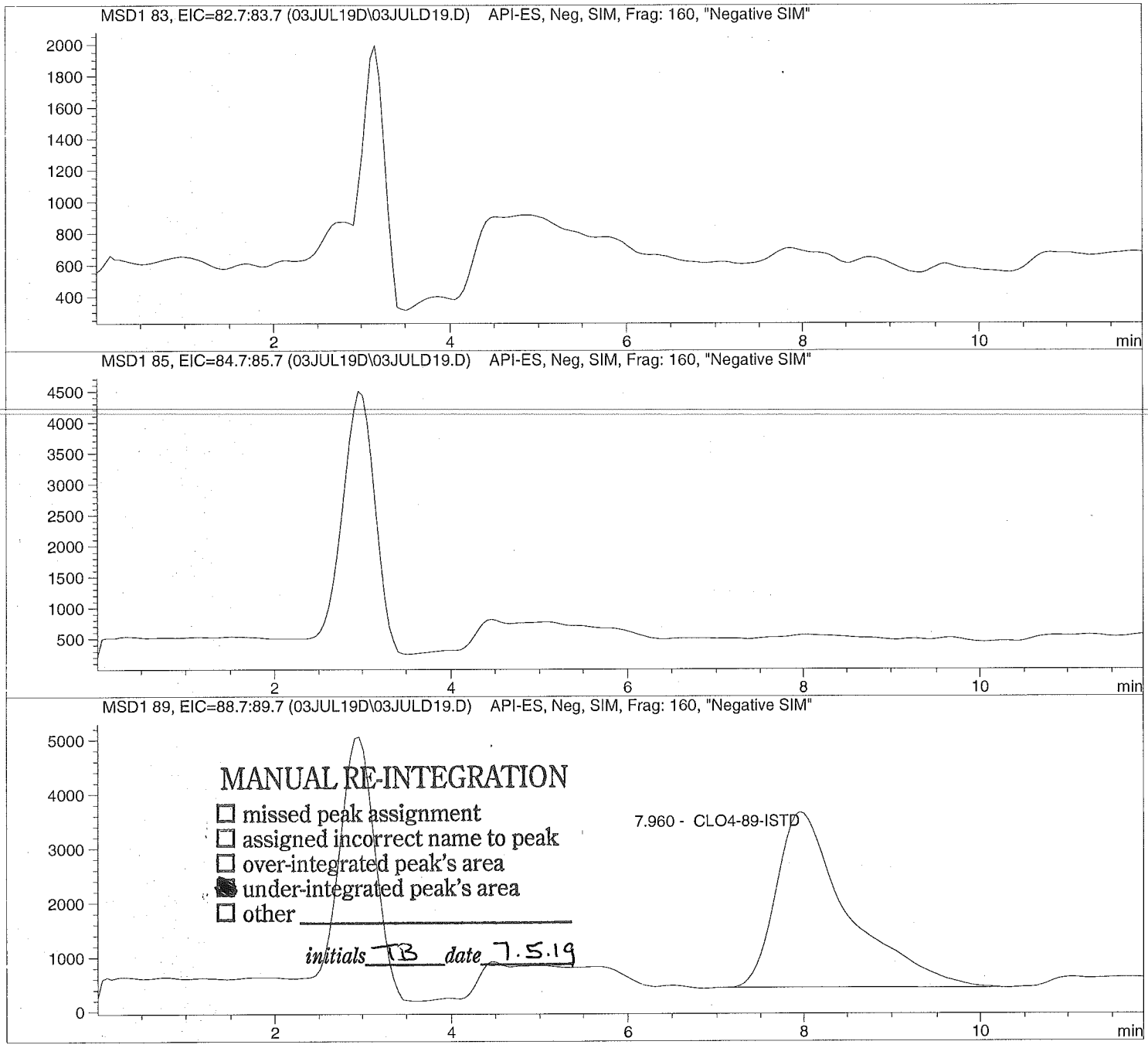
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD19.D Sample Name: 1918265003

Injection Date:	7/03/2019 12:31:53	Seq Line:	19
Sample Name:	1918265003	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD19.D Sample Name: 1918265003

Injection Date:	7/03/2019 12:31:53	Seq Line:	19
Sample Name:	1918265003	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.960	MM	183014.2	5.0000	CLO4-89-ISTD

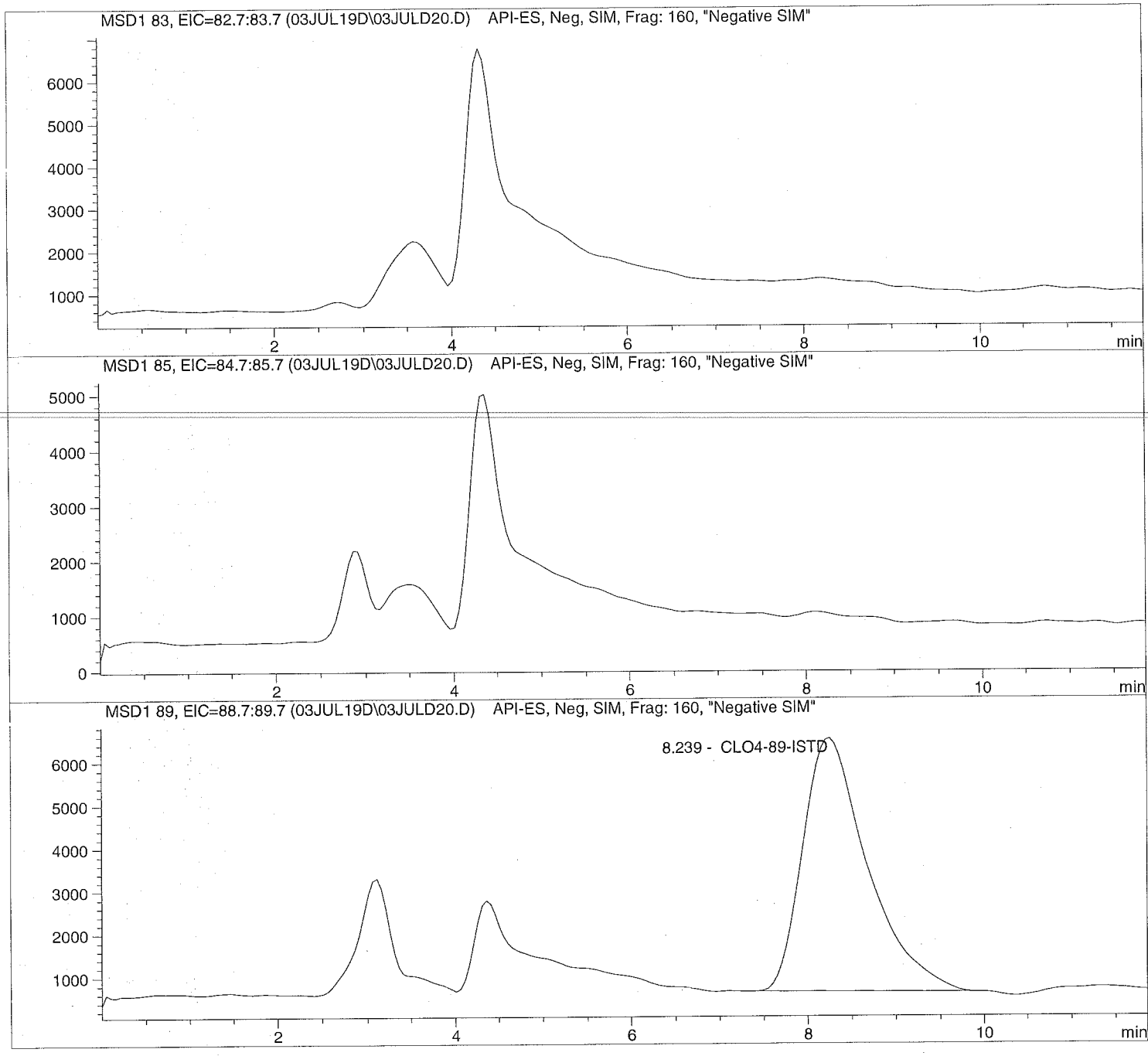
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD20.D Sample Name: 1918265004

Injection Date:	7/03/2019 12:45:47	Seq Line:	20
Sample Name:	1918265004	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD20.D Sample Name: 1918265004

Injection Date:	7/03/2019 12:45:47	Seq Line:	20
Sample Name:	1918265004	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.239	PBA	299495.5	5.0000	CLO4-89-ISTD

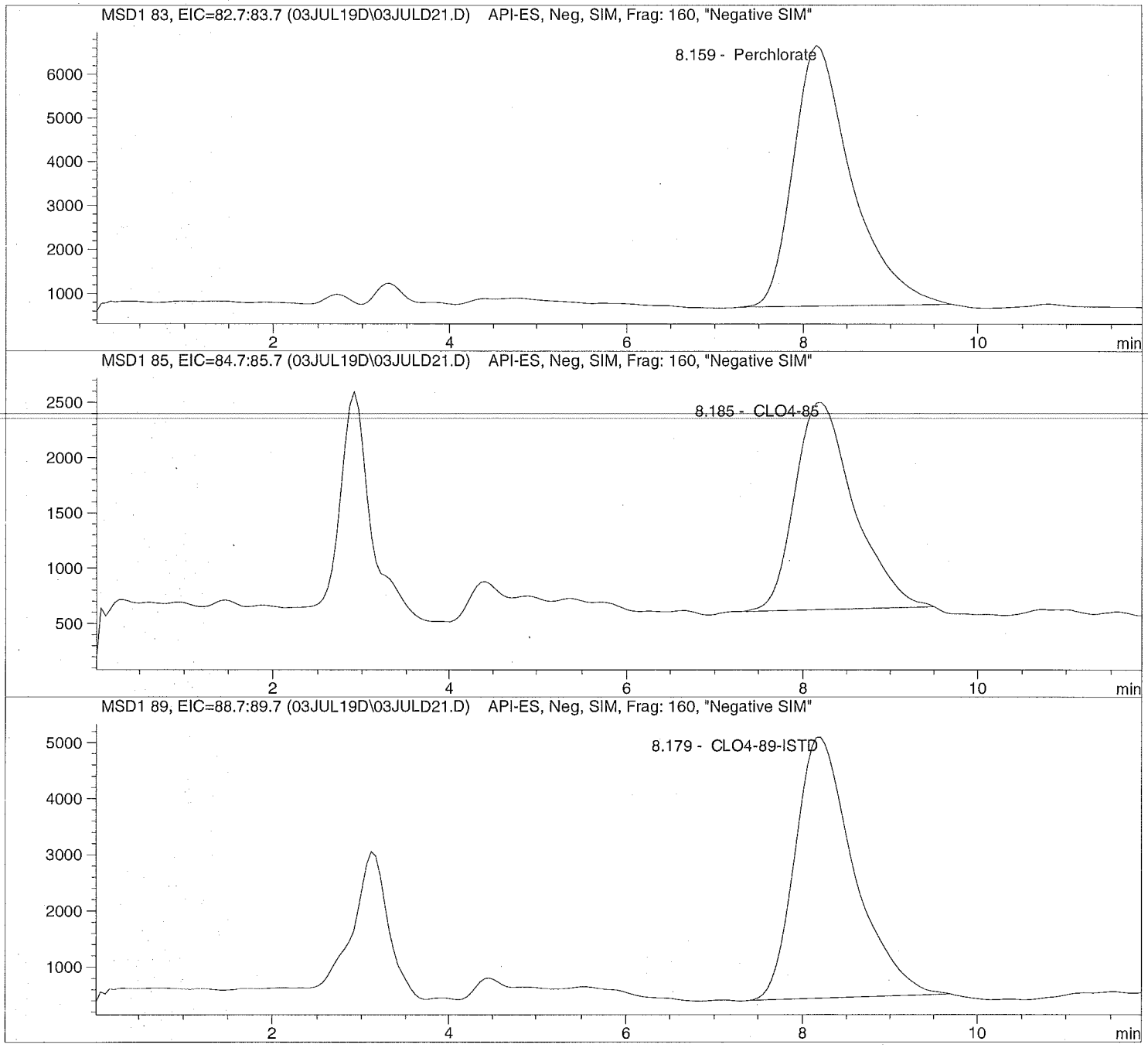
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD21.D Sample Name: 1918265005

Injection Date:	7/03/2019 12:59:40	Seq Line:	21
Sample Name:	1918265005	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD21.D Sample Name: 1918265005

Injection Date:	7/03/2019 12:59:40	Seq Line:	21
Sample Name:	1918265005	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.159	PBA	273037.3	4.1459	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.185	BBA	87704.6	4.3341	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.179	PBA	216624.0	5.0000	CLO4-89-ISTD

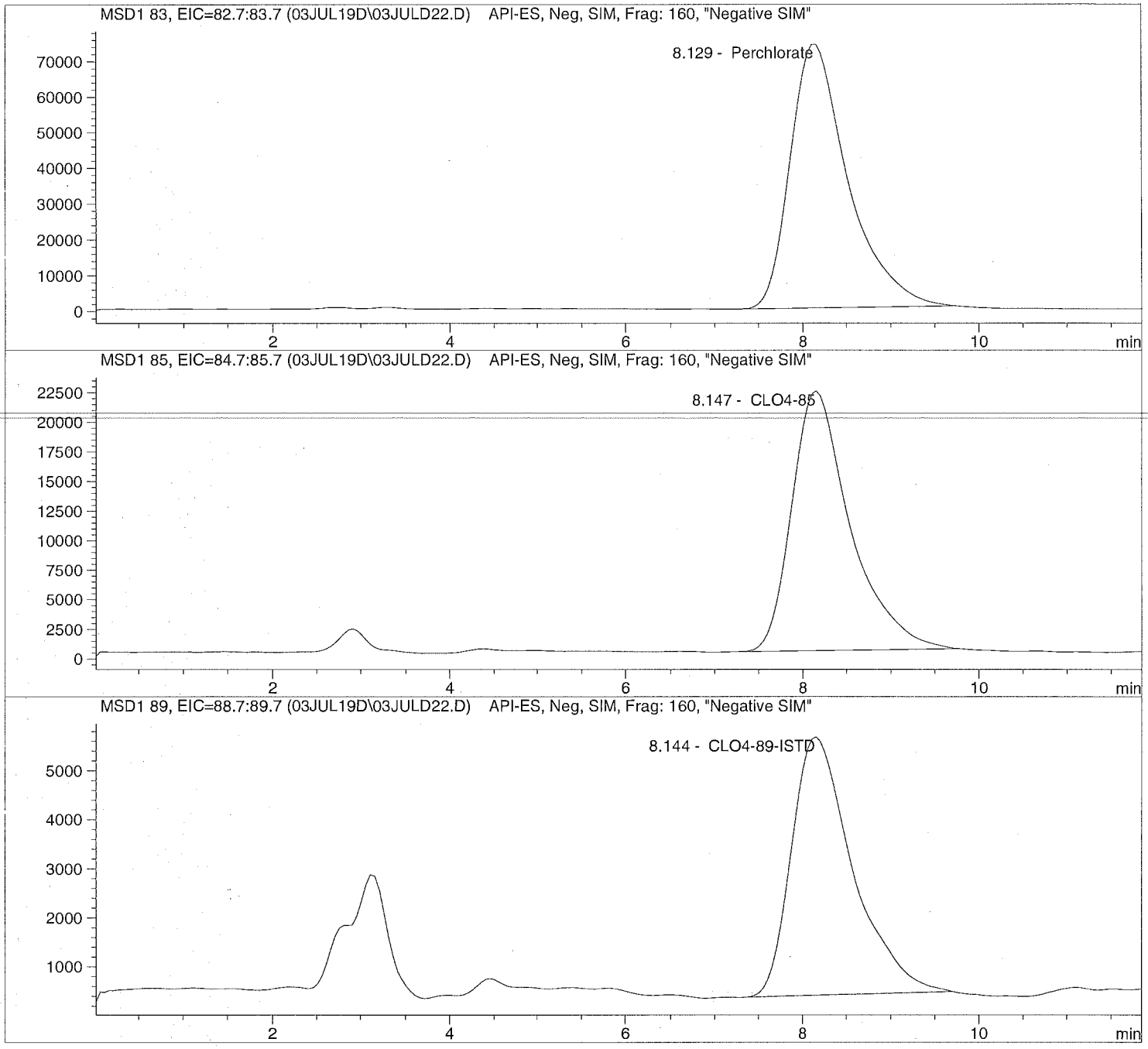
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD22.D Sample Name: 1918265006

Injection Date:	7/03/2019 13:13:42	Seq Line:	22
Sample Name:	1918265006	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD22.D Sample Name: 1918265006

Injection Date:	7/03/2019 13:13:42	Seq Line:	22
Sample Name:	1918265006	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.129	PBA	3362889.2	39.0365	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.147	PBA	1014205.1	39.7190	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.144	PBA	253872.0	5.0000	CLO4-89-ISTD

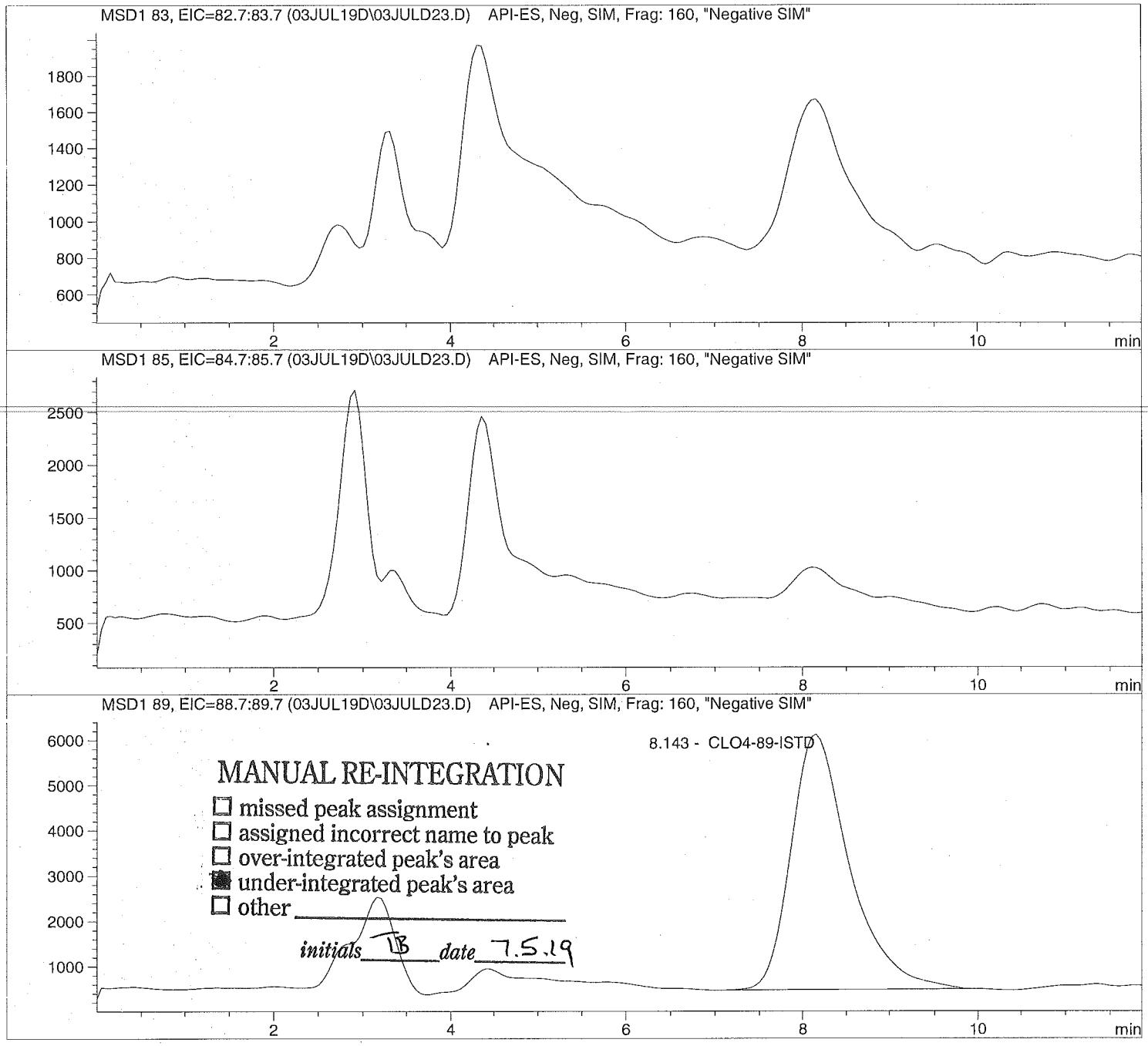
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD23.D Sample Name: 1918265007

Injection Date:	7/03/2019 13:27:36	Seq Line:	23
Sample Name:	1918265007	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



MANUAL RE-INTEGRATION
- ☐ missed peak assignment
- ☐ assigned incorrect name to peak
- ☐ over-integrated peak's area
- ■ under-integrated peak's area
- ☐ other _____

initials TB date 7.5.19

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD23.D Sample Name: 1918265007

Injection Date:	7/03/2019 13:27:36	Seq Line:	23
Sample Name:	1918265007	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.143	MM	263295.0	5.0000	CLO4-89-ISTD

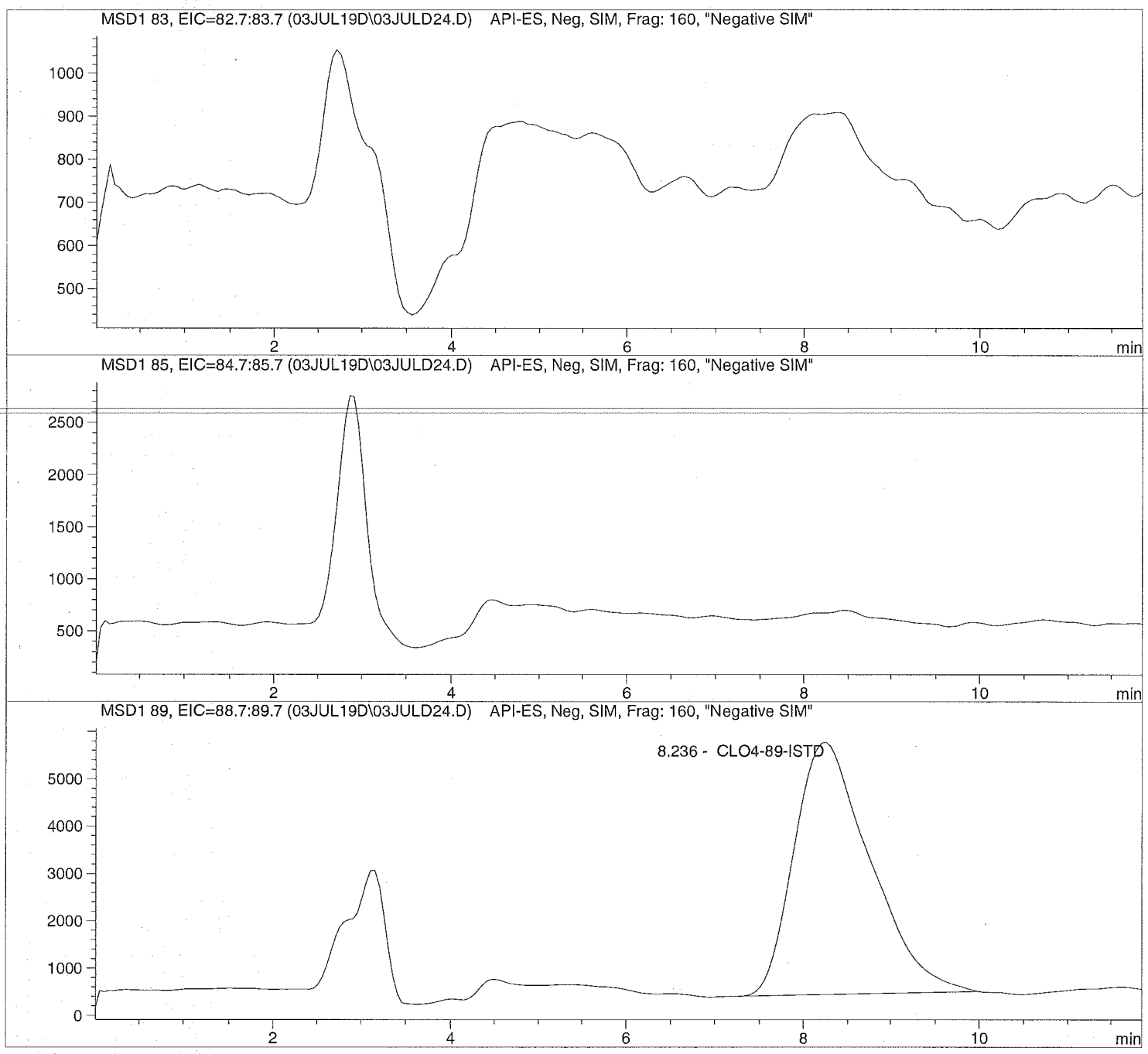
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD24.D Sample Name: 1918265008

Injection Date:	7/03/2019 13:41:31	Seq Line:	24
Sample Name:	1918265008	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD24.D Sample Name: 1918265008

Injection Date:	7/03/2019 13:41:31	Seq Line:	24
Sample Name:	1918265008	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.236	PBA	321651.0	5.0000	CLO4-89-ISTD

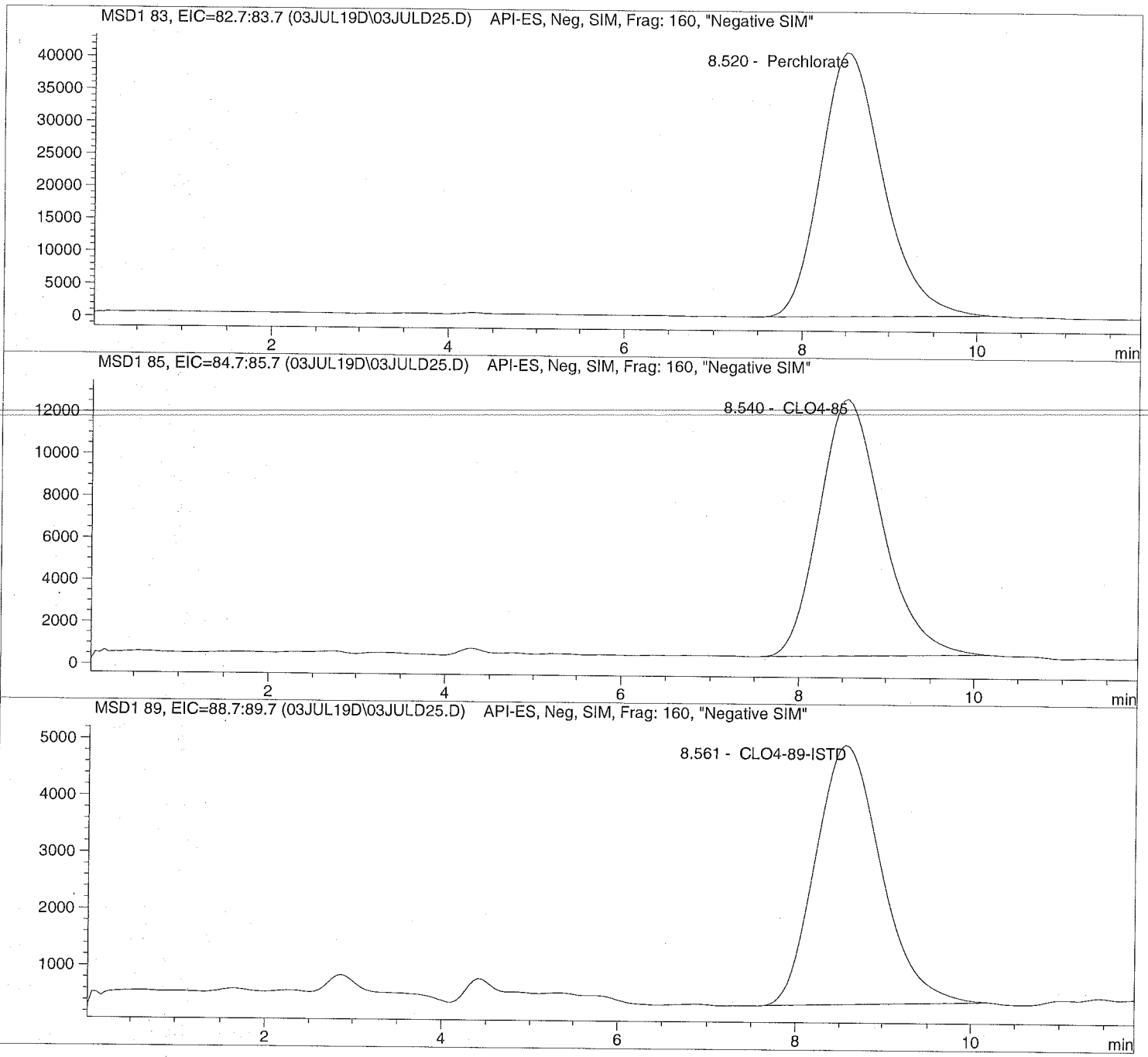
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD25.D Sample Name: 661795 CCV@25

Injection Date:	7/03/2019 13:55:26	Seq Line:	25
Sample Name:	661795 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD25.D Sample Name: 661795 CCV@25

Injection Date:	7/03/2019 13:55:26	Seq Line:	25
Sample Name:	661795 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.520	PBA	2028657.1	25.8170	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.540	PBA	616067.7	26.3876	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.561	PBA	238601.3	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

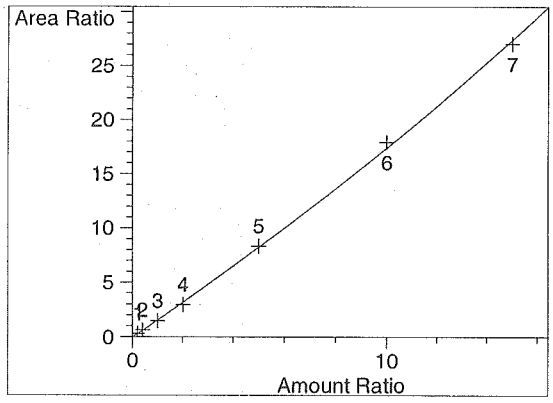
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

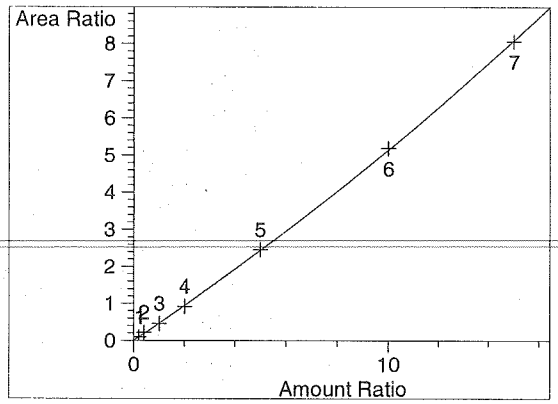
Peak Sum Table

No Entries in table

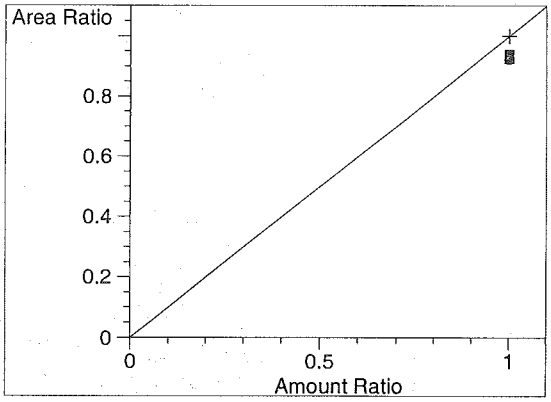
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

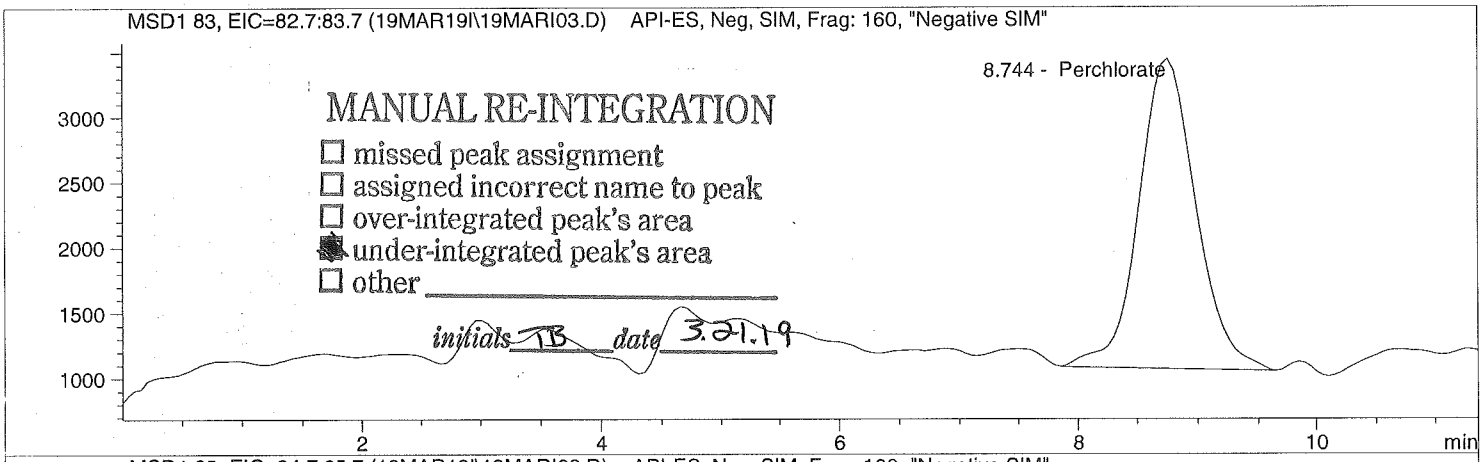
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

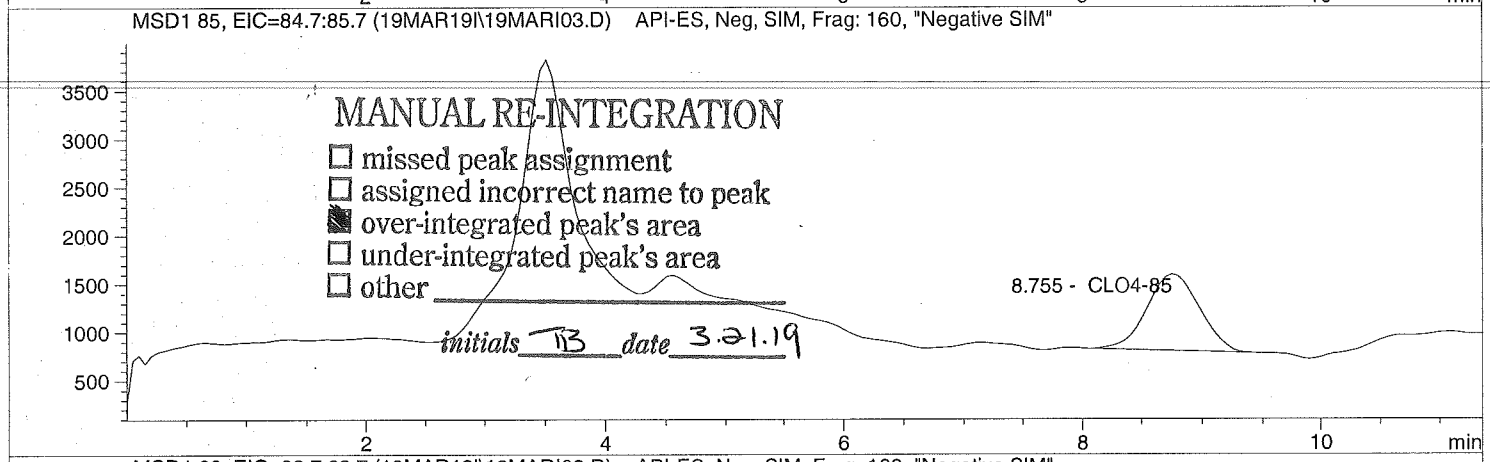
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

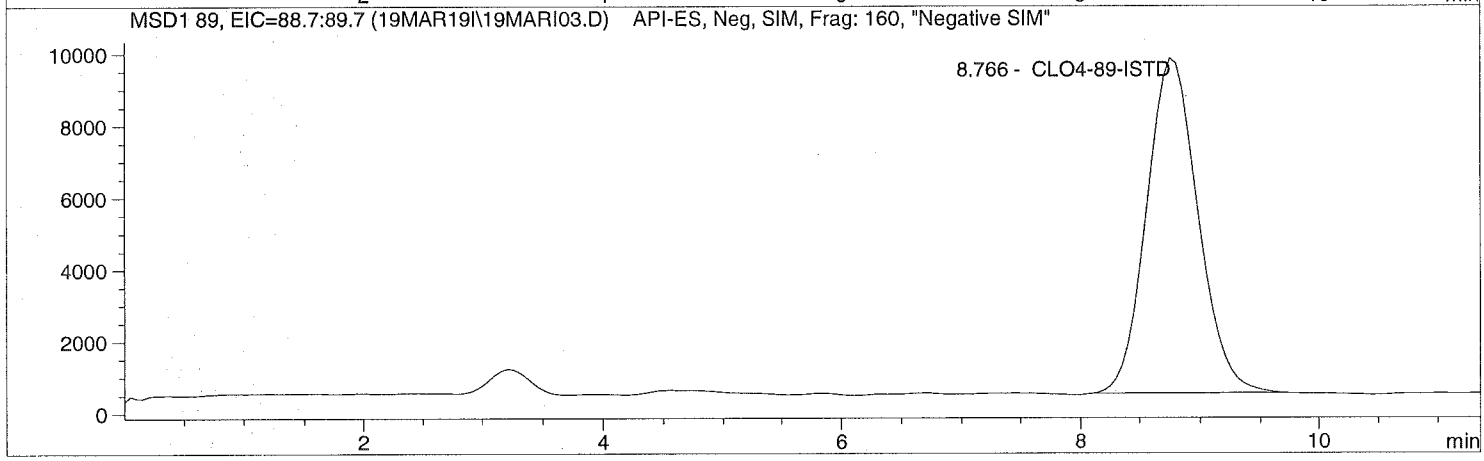
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

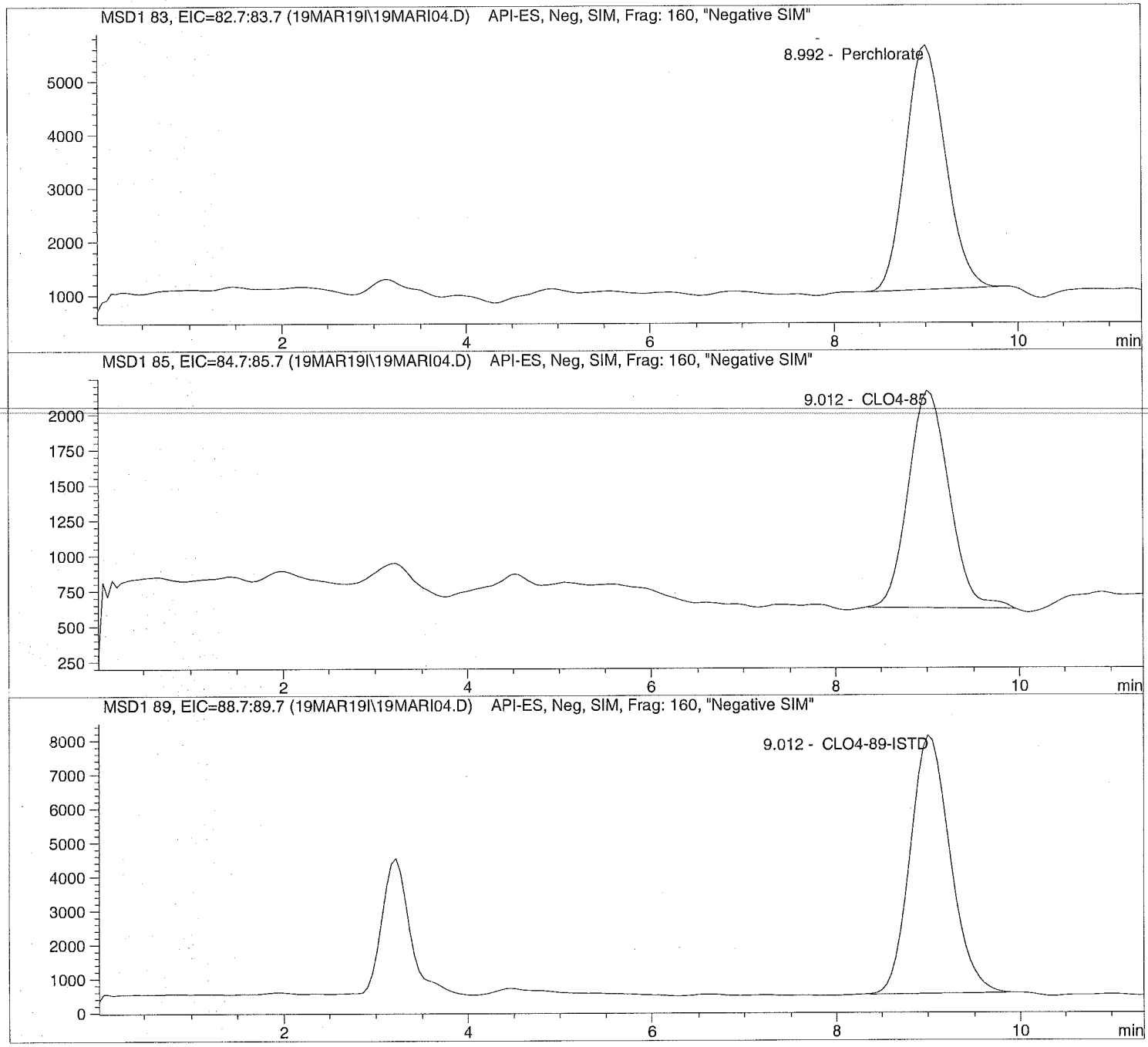
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

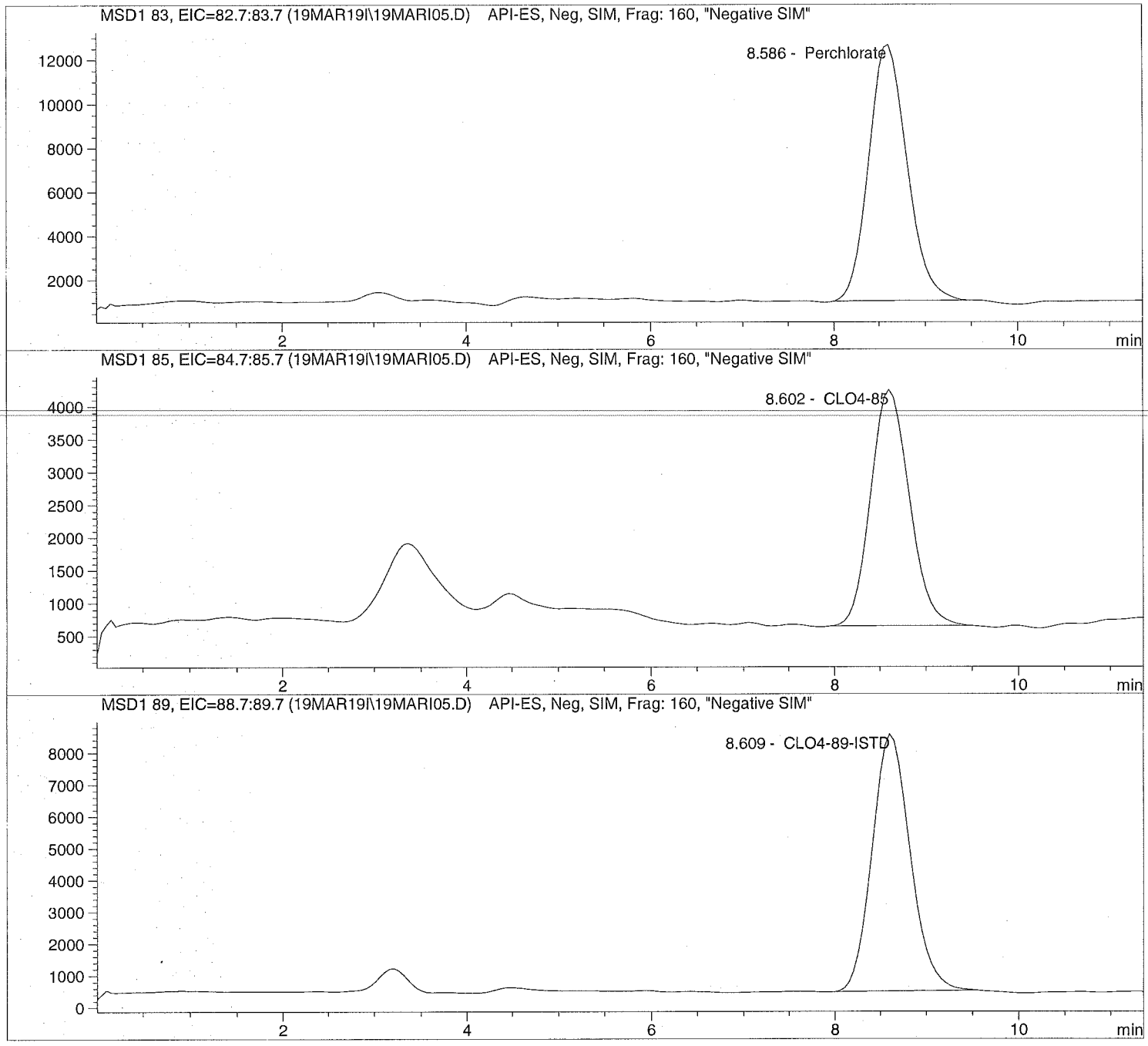
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

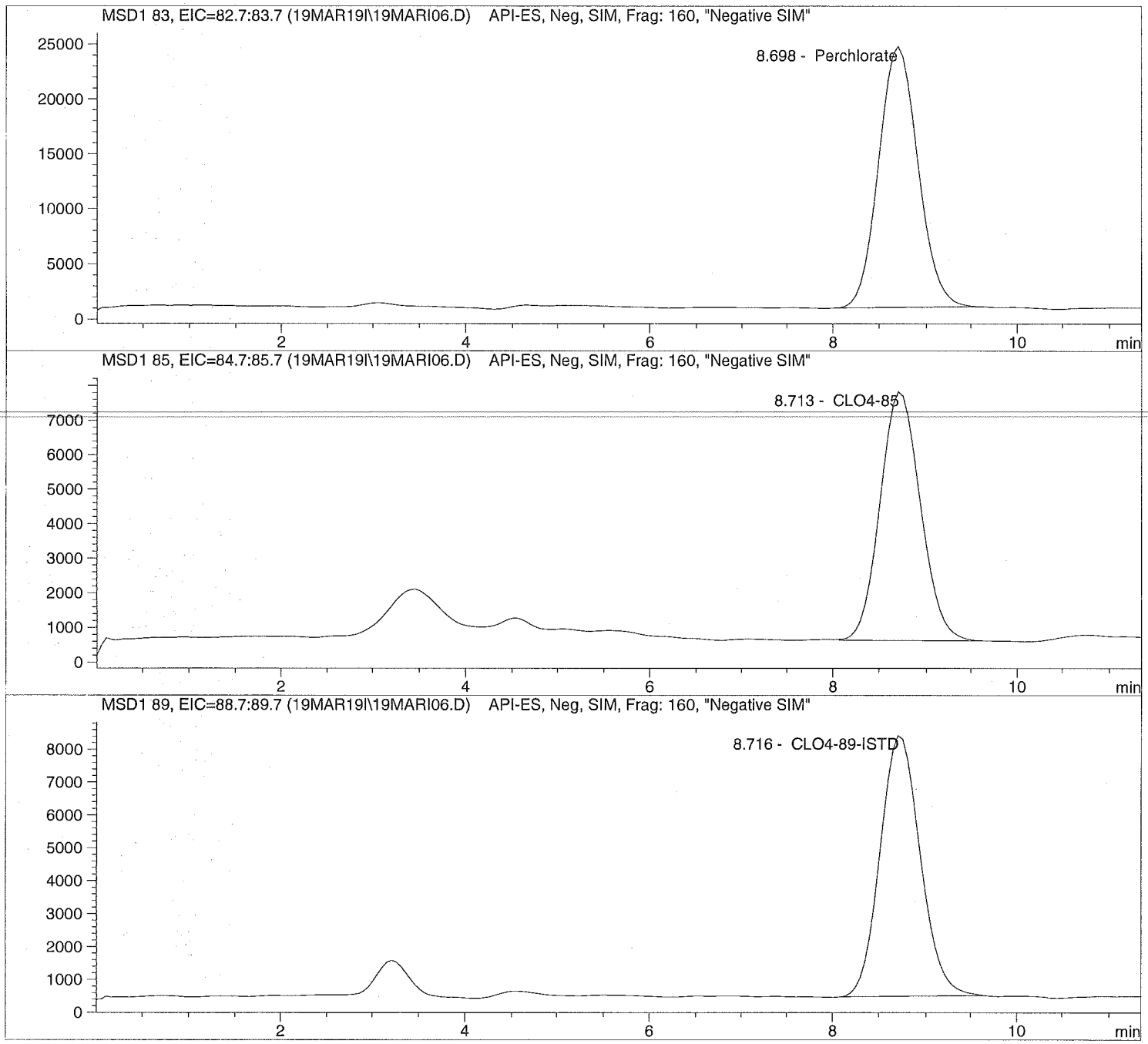
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

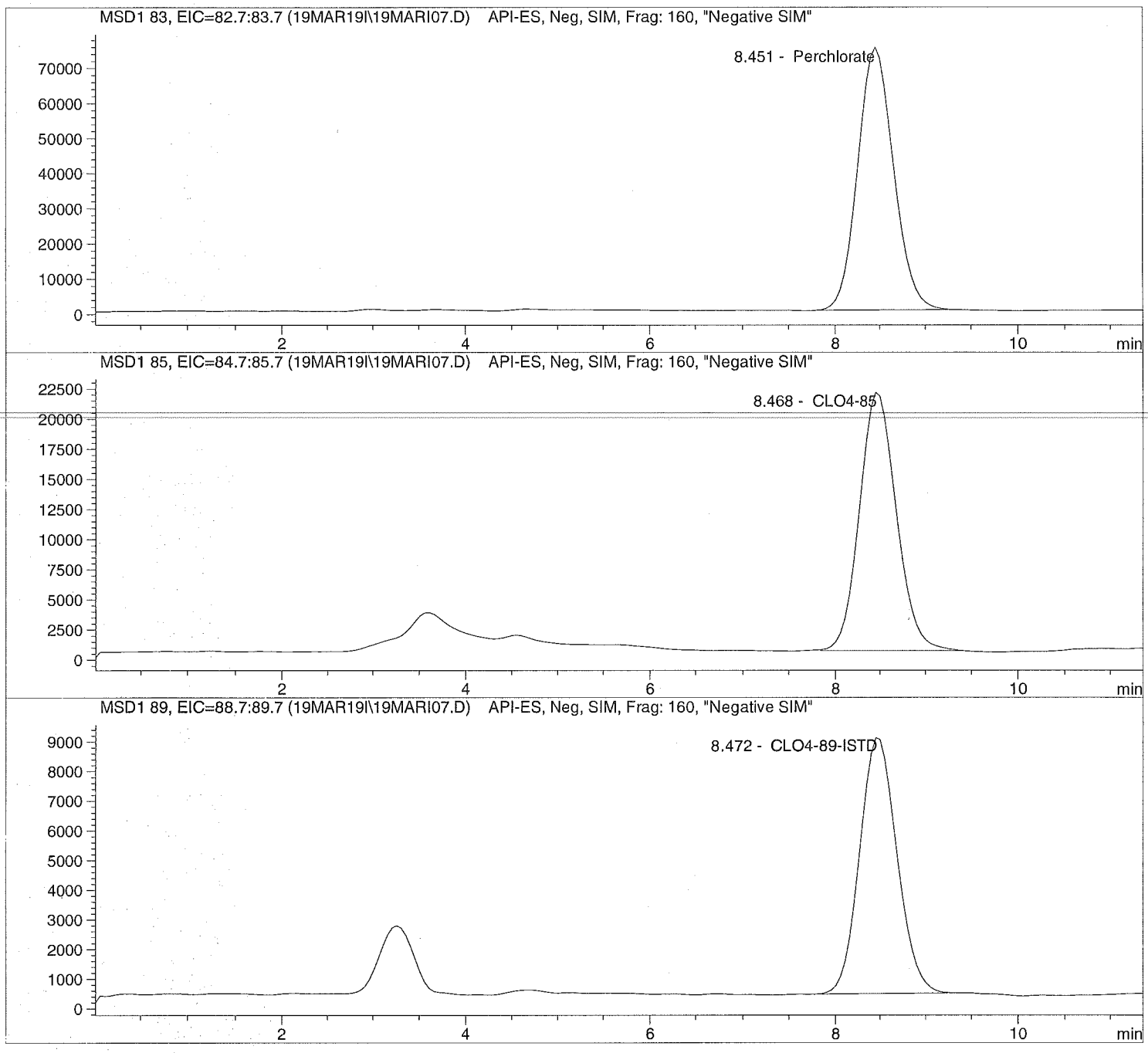
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

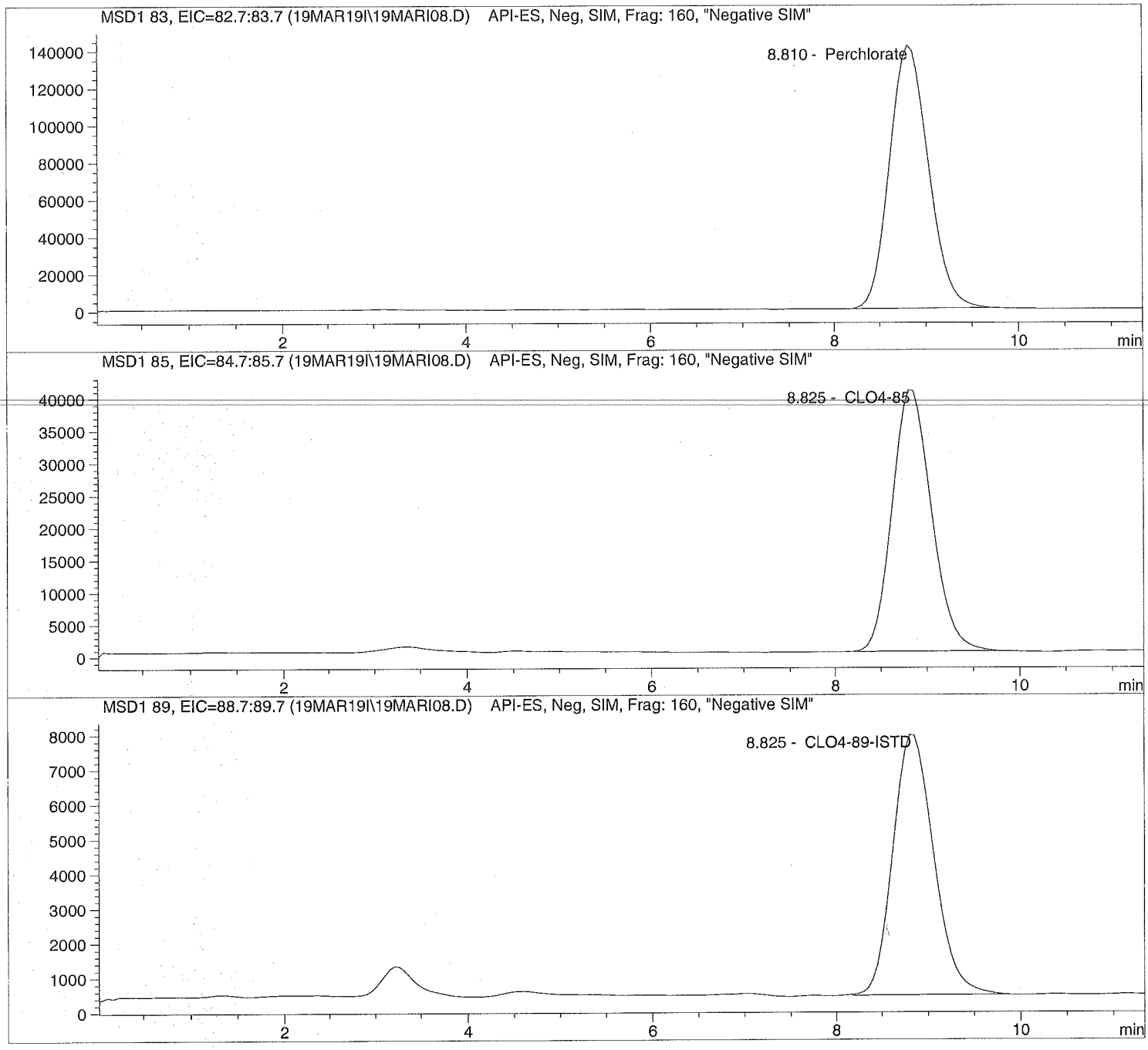
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

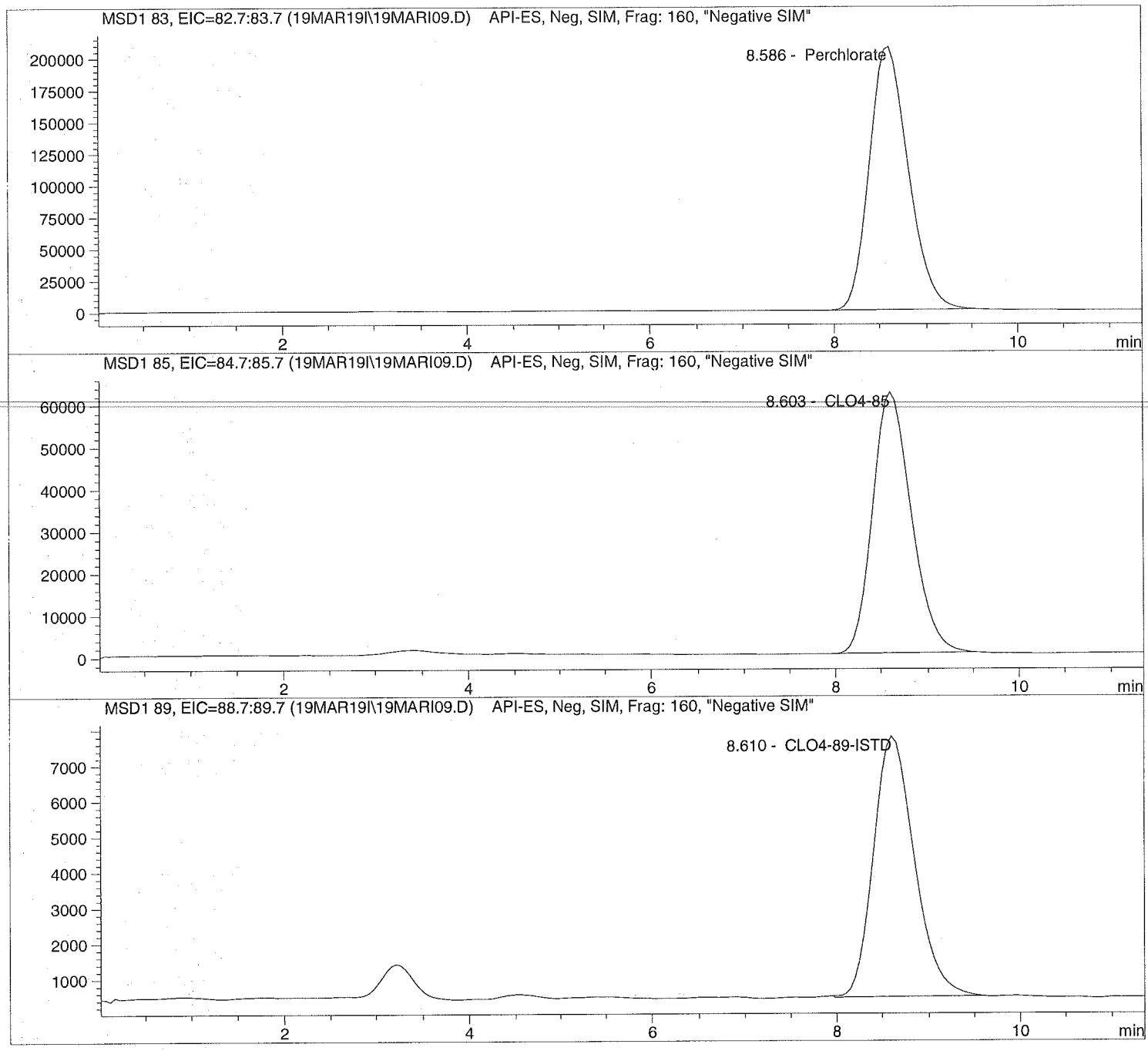
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

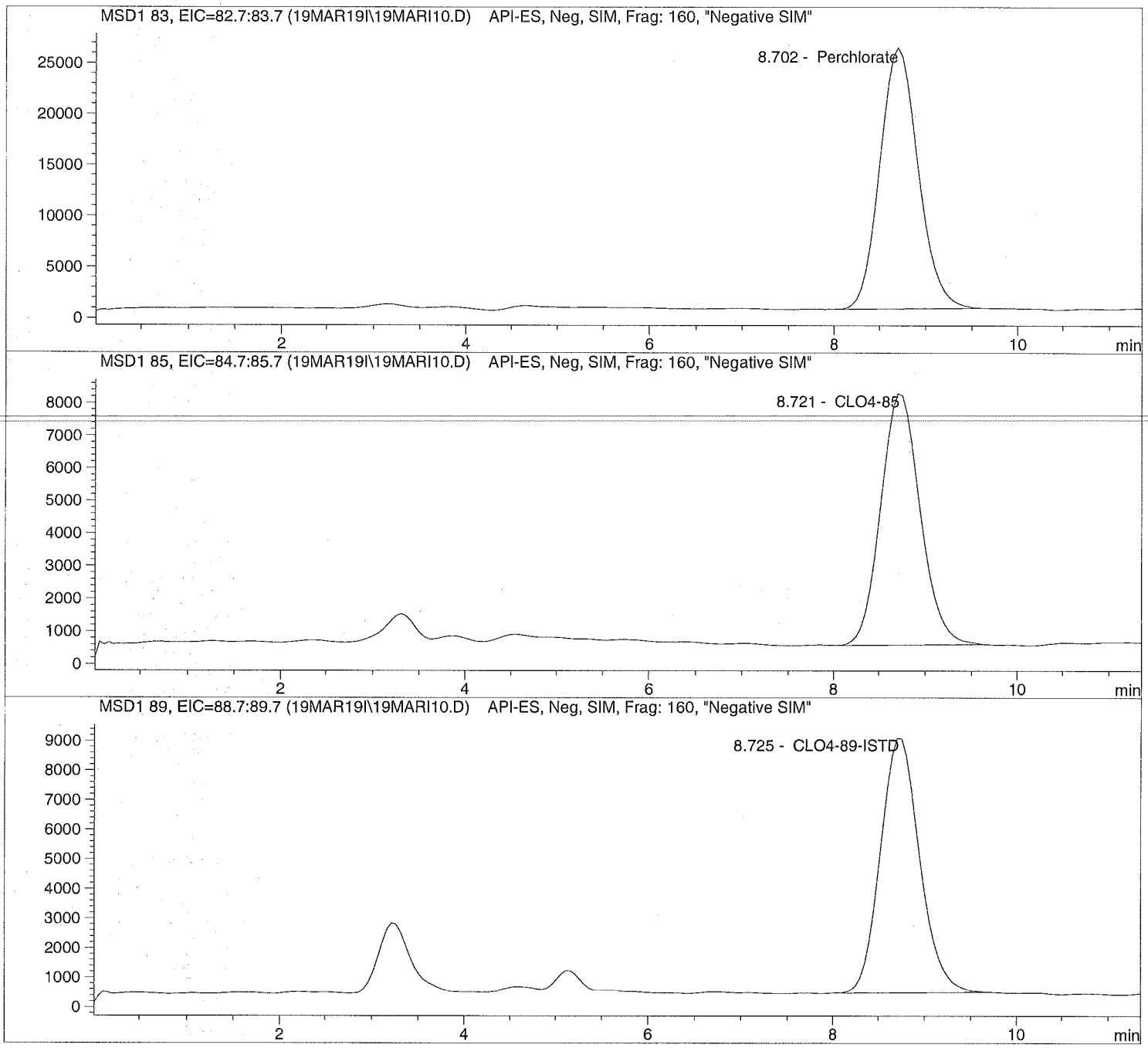
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

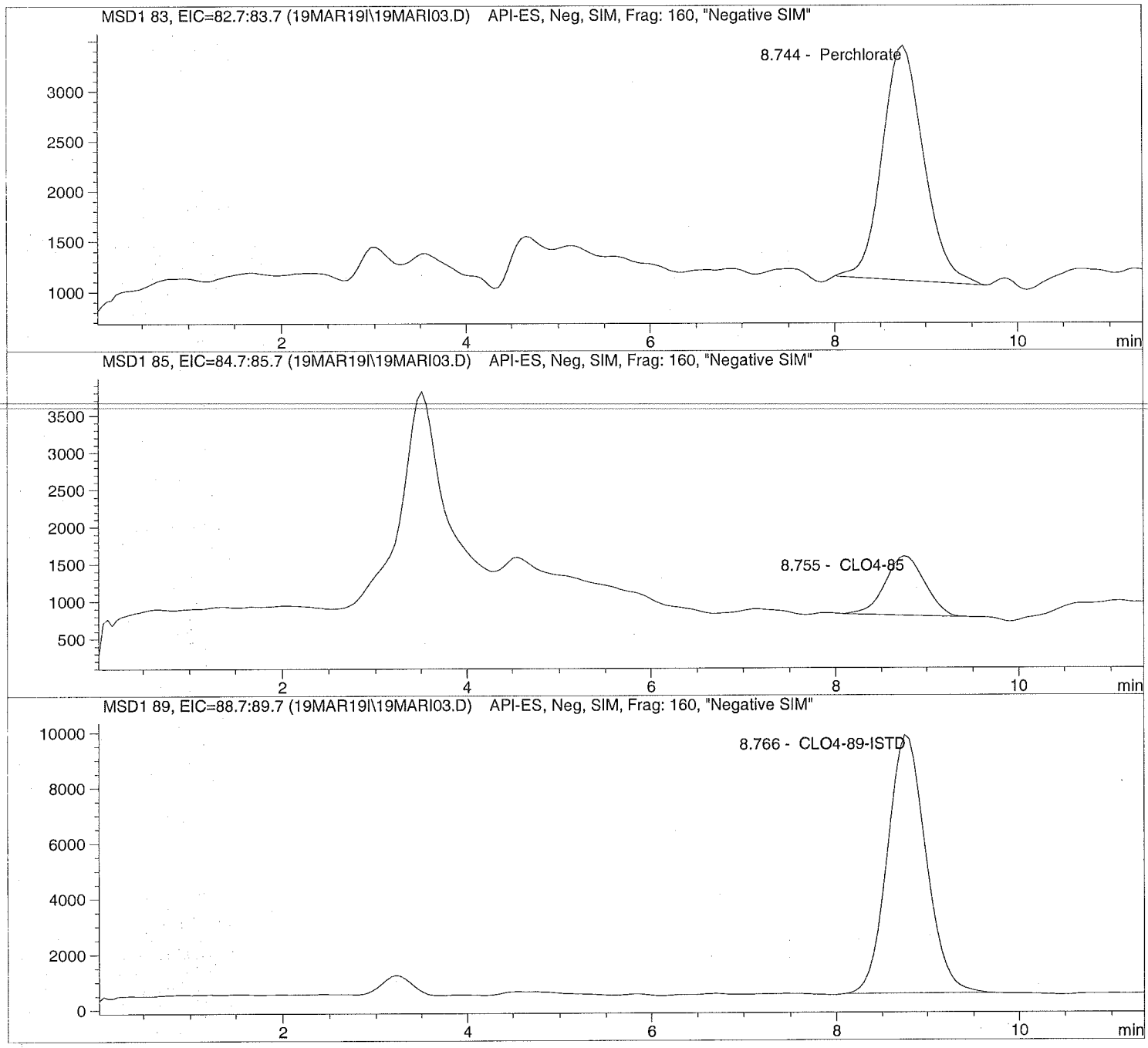
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

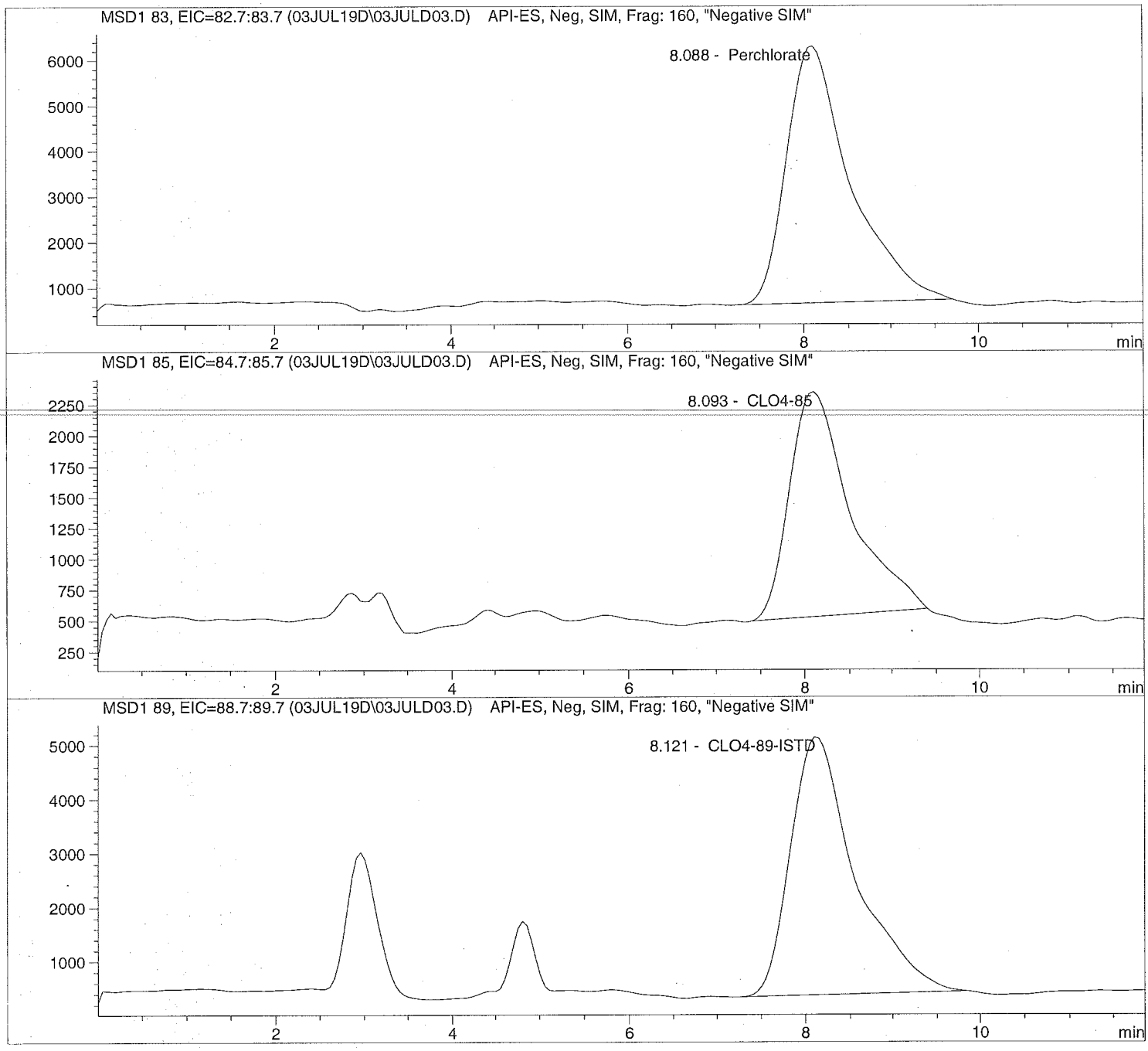
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD03.D Sample Name: 661791 ICS@4.0

Injection Date:	7/03/2019 08:49:21	Seq Line:	3
Sample Name:	661791 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD03.D Sample Name: 661791 ICS@4.0

Injection Date:	7/03/2019 08:49:21	Seq Line:	3
Sample Name:	661791 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.088	PBA	281076.3	3.8527	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.093	PBA	86599.9	3.8525	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.121	PBA	240851.1	5.0000	CLO4-89-ISTD

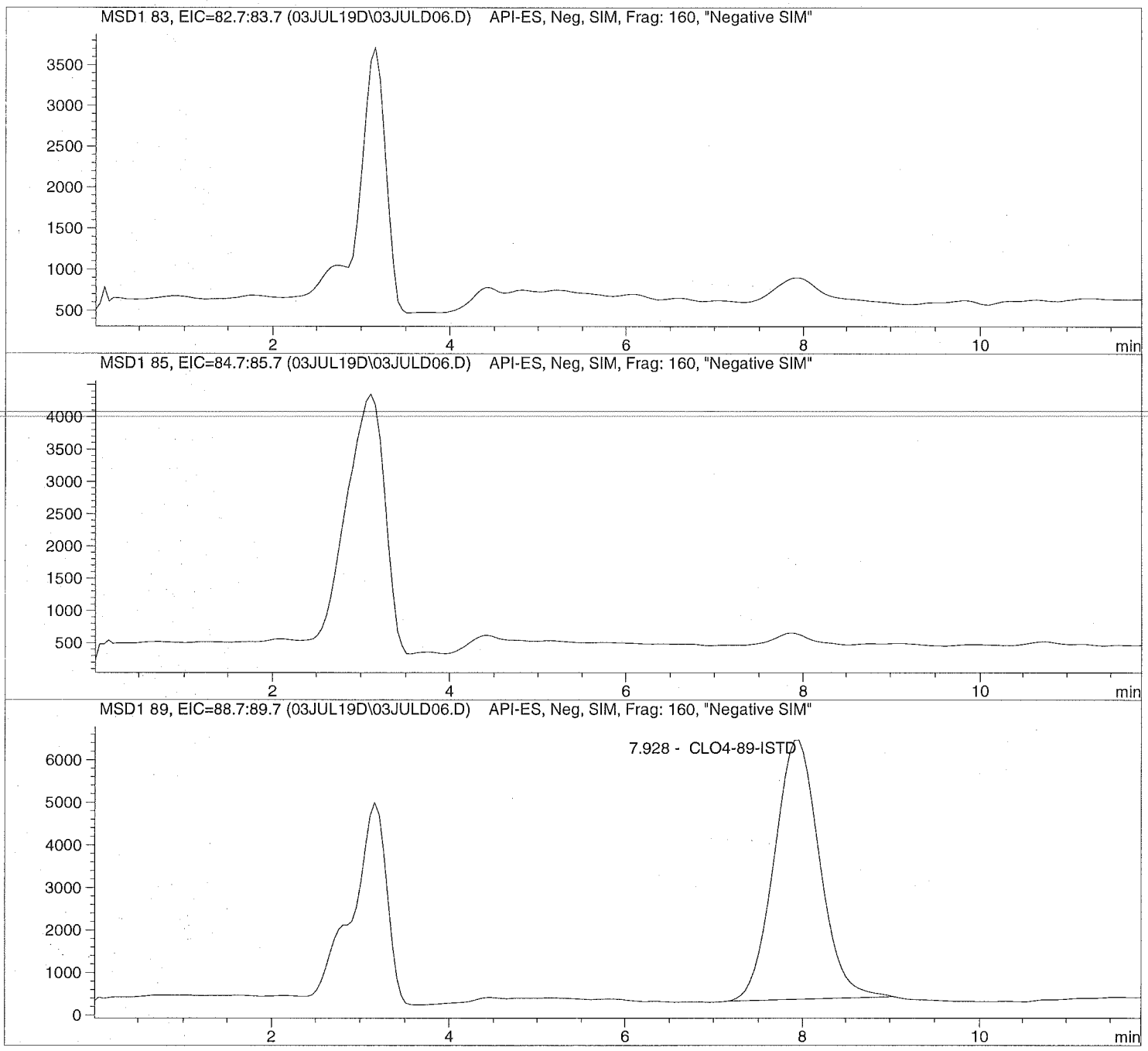
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD06.D Sample Name: 1918260002

Injection Date:	7/03/2019 09:31:06	Seq Line:	6
Sample Name:	1918260002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD06.D Sample Name: 1918260002

Injection Date:	7/03/2019 09:31:06	Seq Line:	6
Sample Name:	1918260002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.928	PBA	220839.0	5.0000	CLO4-89-ISTD

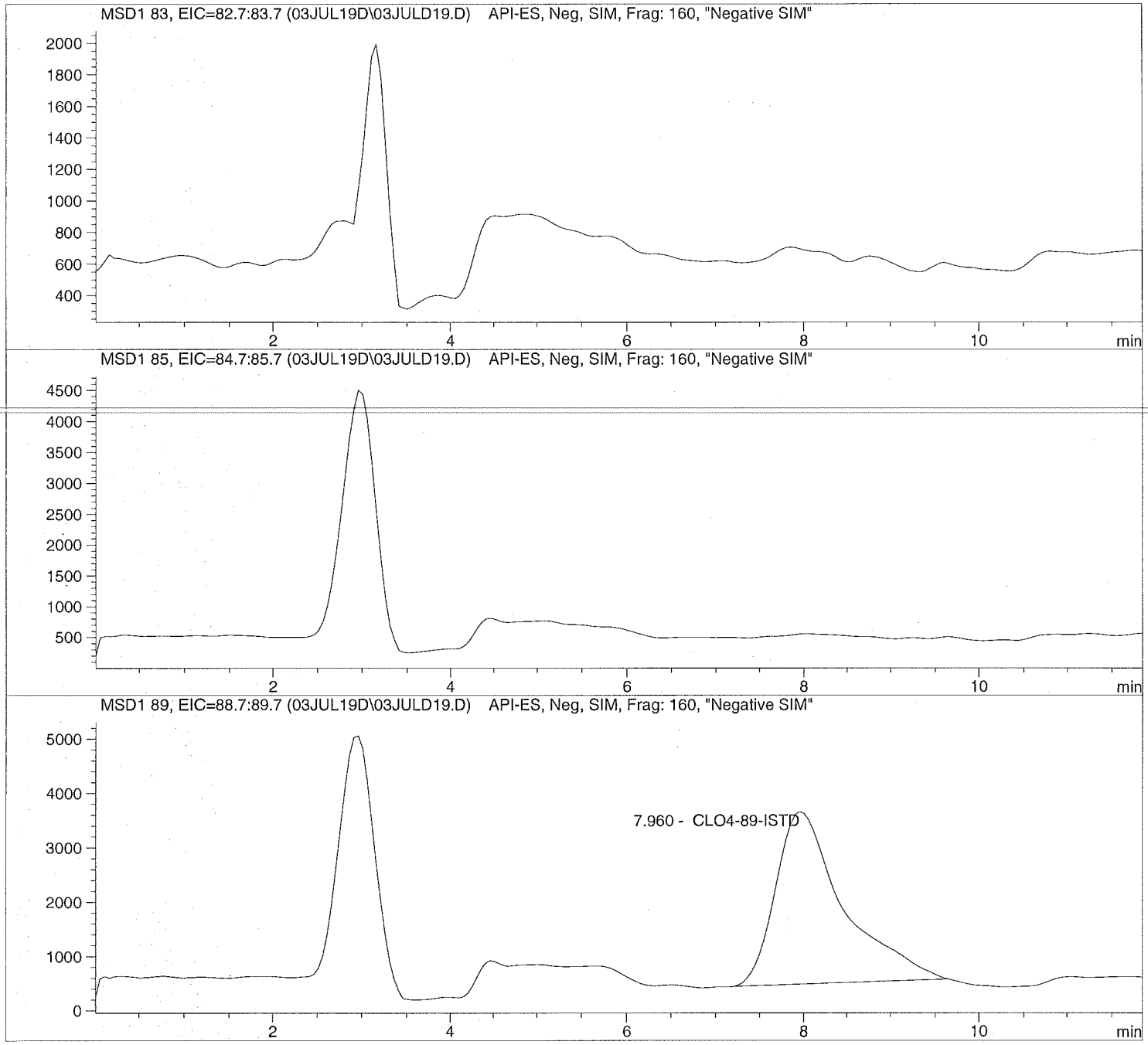
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD19.D Sample Name: 1918265003

Injection Date:	7/03/2019 12:31:53	Seq Line:	19
Sample Name:	1918265003	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD19.D Sample Name: 1918265003

Injection Date:	7/03/2019 12:31:53	Seq Line:	19
Sample Name:	1918265003	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.960	PBA	169691.9	5.0000	CLO4-89-ISTD

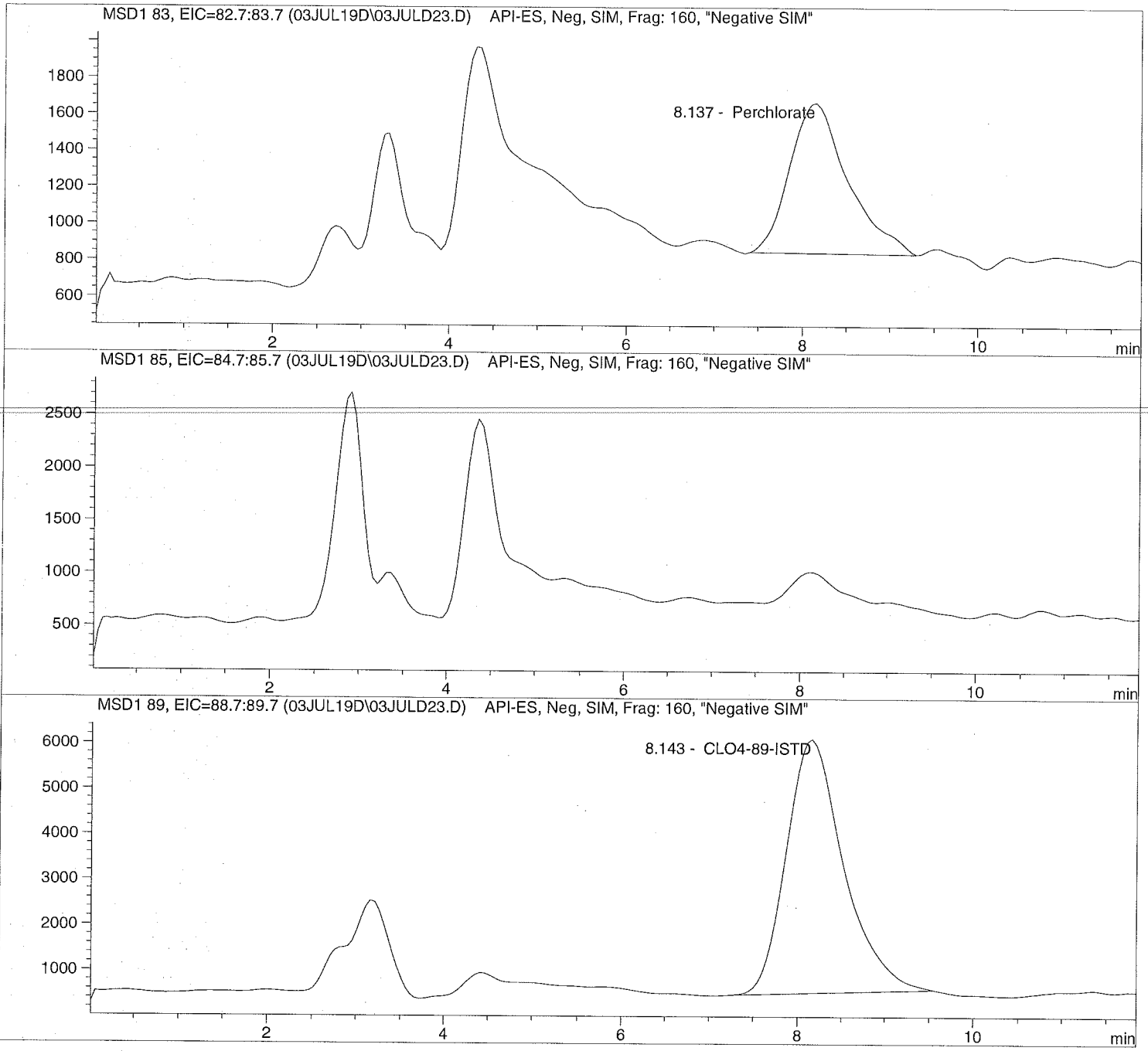
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD23.D Sample Name: 1918265007

Injection Date:	7/03/2019 13:27:36	Seq Line:	23
Sample Name:	1918265007	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\03JUL19D\03JULD23.D Sample Name: 1918265007

Injection Date:	7/03/2019 13:27:36	Seq Line:	23
Sample Name:	1918265007	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.137	PBA	37849.4	0.6340	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.143	PBA	253241.4	5.0000	CLO4-89-ISTD

*** End of Report ***

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

July 15, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19061279**

Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 10 sample(s) on Jun 25, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Houston, US Date: 15-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061279

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19061279-01	129_062419	Groundwater		24-Jun-2019 08:20	25-Jun-2019 09:00	☐
HS19061279-02	102_062419	Groundwater		24-Jun-2019 09:25	25-Jun-2019 09:00	☐
HS19061279-03	MW23_062419	Groundwater		24-Jun-2019 10:15	25-Jun-2019 09:00	☐
HS19061279-04	126_062419	Groundwater		24-Jun-2019 11:00	25-Jun-2019 09:00	☐
HS19061279-05	18ww03_062419	Groundwater		24-Jun-2019 12:00	25-Jun-2019 09:00	☐
HS19061279-06	18ww03_062419_a	Groundwater		24-Jun-2019 12:00	25-Jun-2019 09:00	☐
HS19061279-07	18ww18_062419	Groundwater		24-Jun-2019 13:00	25-Jun-2019 09:00	☐
HS19061279-08	18ww17_062419	Groundwater		24-Jun-2019 13:15	25-Jun-2019 09:00	☐
HS19061279-09	125_062419	Groundwater		24-Jun-2019 13:30	25-Jun-2019 09:00	☐
HS19061279-10	Trip Blank	Water	C&G-052219-08	24-Jun-2019 00:00	25-Jun-2019 09:00	☐

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061279

CASE NARRATIVE

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142510

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R341768

Sample ID: 125_062419 (HS19061279-09)

• Lowest practical dilution due to high concentration of non-target compound.

Sample ID: VLCSW-190702

• One sporadic marginal exceediance (Chloroform) for LCS. CCV is OK.

Metals by Method SW6020

Batch ID: 142750

Sample ID: HS19070016-05MS

• MS and MSD are for an unrelated sample

Metals by Method SW7470

Batch ID: 142615

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 129_062419
Collection Date: 24-Jun-2019 08:20

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,2-Dichloroethane	**15**		**0.20**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 13:38
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 13:38
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 13:38
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 13:38
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	02-Jul-2019 13:38
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 13:38
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	02-Jul-2019 13:38
Acetone	**4.0**		**0.40**	**1.0**	**2.0**	**UG/L**	1	02-Jul-2019 13:38
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	02-Jul-2019 13:38
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Chloroform	**1.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 13:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19061279
Sample ID: 129_062419
Lab ID:HS19061279-01
Collection Date: 24-Jun-2019 08:20
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 13:38
cis-1,2-Dichloroethene	**2.8**		**0.20**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 13:38
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	02-Jul-2019 13:38
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 13:38
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 13:38
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 13:38
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 13:38
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 13:38
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Trichloroethene	**820**		**5.0**	**12**	**25**	**UG/L**	25	02-Jul-2019 15:14
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 13:38
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*02-Jul-2019 13:38*
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*25*	*02-Jul-2019 15:14*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*25*	*02-Jul-2019 15:14*
Surr: 4-Bromofluorobenzene	*97.3*			**0**	*85-114*	*%REC*	*1*	*02-Jul-2019 13:38*
Surr: Dibromofluoromethane	*97.5*			**0**	*80-119*	*%REC*	*1*	*02-Jul-2019 13:38*
Surr: Dibromofluoromethane	*98.9*			**0**	*80-119*	*%REC*	*25*	*02-Jul-2019 15:14*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*02-Jul-2019 13:38*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*25*	*02-Jul-2019 15:14*
SEMIVOLATILES SIM	**Method:SW8270SIM**					Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	**1.2**		**0.10**	**0.10**	**0.10**	**ug/L**	10	28-Jun-2019 19:26
Surr: 2-Fluorobiphenyl	*85.6*			**0**	*40-140*	*%REC*	*10*	*28-Jun-2019 19:26*
Surr: 4-Terphenyl-d14	*94.0*			**0**	*40-140*	*%REC*	*10*	*28-Jun-2019 19:26*
Surr: Nitrobenzene-d5	*114*			**0**	*40-140*	*%REC*	*10*	*28-Jun-2019 19:26*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 129_062419
Collection Date: 24-Jun-2019 08:20

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**2.44**		**0.0180**	**0.0500**	**0.100**	**mg/L**	10	09-Jul-2019 17:47
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:50
Arsenic	**0.00120**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:50
Barium	**0.119**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:50
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:50
Cadmium	**0.000738**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:50
Calcium	**4.49**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:50
Chromium	**0.00567**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:50
Cobalt	**0.00936**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:50
Copper	**0.00326**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:50
Iron	**3.29**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:50
Lead	**0.00297**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:50
Magnesium	**3.31**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:50
Manganese	**0.176**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:50
Nickel	**0.00812**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:50
Potassium	**0.647**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:50
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:50
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 17:45
Sodium	**69.6**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:50
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:50
Vanadium	**0.00659**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:50
Zinc	**0.0356**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:50
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 01-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	01-Jul-2019 16:36
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	**See Attached**		**0**	**0**	**0**	**NA**	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 102_062419
Collection Date: 24-Jun-2019 09:25

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:26
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 12:26
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	02-Jul-2019 12:26
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:26
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	02-Jul-2019 12:26
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 12:26
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	02-Jul-2019 12:26
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 102_062419
Collection Date: 24-Jun-2019 09:25

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	02-Jul-2019 12:26
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 12:26
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 12:26
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:26
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:26
Surr: 1,2-Dichloroethane-d4	*99.6*			**0**	*81-118*	*%REC*	*1*	*02-Jul-2019 12:26*
Surr: 4-Bromofluorobenzene	*94.5*			**0**	*85-114*	*%REC*	*1*	*02-Jul-2019 12:26*
Surr: Dibromofluoromethane	*94.0*			**0**	*80-119*	*%REC*	*1*	*02-Jul-2019 12:26*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*02-Jul-2019 12:26*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 102_062419
Collection Date: 24-Jun-2019 09:25

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**10.3**		**0.0360**	**0.100**	**0.200**	**mg/L**	20	09-Jul-2019 17:51
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:57
Arsenic	**0.00262**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:57
Barium	**0.276**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:57
Beryllium	**0.00113**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:57
Cadmium	**0.000225**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:57
Calcium	**3.53**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:57
Chromium	**0.0141**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:57
Cobalt	**0.00925**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:57
Copper	**0.0139**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:57
Iron	**15.7**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:57
Lead	**0.0113**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:57
Magnesium	**3.81**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:57
Manganese	**0.0964**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:57
Nickel	**0.0255**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:57
Potassium	**1.73**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:57
Selenium	**0.00243**	J	**0.00110**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:57
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 17:49
Sodium	**17.0**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:57
Thallium	**0.000275**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:57
Vanadium	**0.0237**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:57
Zinc	**0.0748**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:57
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 01-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	01-Jul-2019 16:38
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	**See Attached**		**0**	**0**	**0**	**NA**	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW23_062419
Collection Date: 24-Jun-2019 10:15

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,1,1-Trichloroethane	2.5	U	1.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,1,2,2-Tetrachloroethane	2.5	U	2.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,1,2-Trichloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,1-Dichloroethane	2.5	U	1.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,1-Dichloroethene	2.5	U	1.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,1-Dichloropropene	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,2,3-Trichlorobenzene	2.5	U	2.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,2,3-Trichloropropane	2.5	U	2.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,2,4-Trichlorobenzene	2.5	U	2.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,2,4-Trimethylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,2-Dibromo-3-chloropropane	2.5	U	1.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,2-Dibromoethane	2.5	U	1.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,2-Dichlorobenzene	2.5	U	2.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,2-Dichloroethane	**66**		**1.0**	**2.5**	**5.0**	**UG/L**	5	02-Jul-2019 13:14
1,2-Dichloropropane	2.5	U	2.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,3,5-Trimethylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,3-Dichlorobenzene	2.5	U	2.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,3-Dichloropropane	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
1,4-Dichlorobenzene	2.5	U	2.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
2,2-Dichloropropane	2.5	U	1.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
2-Butanone	5.0	U	2.5	5.0	10	UG/L	5	02-Jul-2019 13:14
2-Chlorotoluene	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
2-Hexanone	5.0	U	5.0	5.0	10	UG/L	5	02-Jul-2019 13:14
4-Chlorotoluene	2.5	U	2.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
4-Isopropyltoluene	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
4-Methyl-2-pentanone	5.0	U	3.5	5.0	10	UG/L	5	02-Jul-2019 13:14
Acetone	5.0	U	2.0	5.0	10	UG/L	5	02-Jul-2019 13:14
Benzene	2.5	U	1.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Bromobenzene	2.5	U	2.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Bromochloromethane	2.5	U	1.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Bromodichloromethane	2.5	U	1.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Bromoform	2.5	U	2.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Bromomethane	2.5	U	2.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Carbon disulfide	5.0	U	3.0	5.0	10	UG/L	5	02-Jul-2019 13:14
Carbon tetrachloride	2.5	U	2.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Chlorobenzene	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Chloroethane	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Chloroform	**20**		**1.0**	**2.5**	**5.0**	**UG/L**	5	02-Jul-2019 13:14

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW23_062419
Collection Date: 24-Jun-2019 10:15

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	2.5	U	1.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
cis-1,2-Dichloroethene	**8.1**		**1.0**	**2.5**	**5.0**	**UG/L**	5	02-Jul-2019 13:14
cis-1,3-Dichloropropene	2.5	U	0.50	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Dibromochloromethane	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Dibromomethane	2.5	U	1.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Dichlorodifluoromethane	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Ethylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Hexachlorobutadiene	5.0	U	5.0	5.0	5.0	UG/L	5	02-Jul-2019 13:14
Isopropylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
m,p-Xylene	5.0	U	2.5	5.0	10	UG/L	5	02-Jul-2019 13:14
Methylene chloride	5.0	U	2.0	5.0	10	UG/L	5	02-Jul-2019 13:14
n-Butylbenzene	2.5	U	2.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
n-Propylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Naphthalene	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
o-Xylene	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
sec-Butylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Styrene	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
tert-Butylbenzene	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Tetrachloroethene	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Toluene	2.5	U	1.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
trans-1,2-Dichloroethene	2.5	U	1.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
trans-1,3-Dichloropropene	2.5	U	1.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Trichloroethene	**2,600**		**10**	**25**	**50**	**UG/L**	50	02-Jul-2019 15:37
Trichlorofluoromethane	2.5	U	1.5	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Vinyl chloride	2.5	U	1.0	2.5	5.0	UG/L	5	02-Jul-2019 13:14
Surr: 1,2-Dichloroethane-d4	*107*			**0**	*81-118*	*%REC*	*5*	*02-Jul-2019 13:14*
Surr: 1,2-Dichloroethane-d4	*100*			**0**	*81-118*	*%REC*	*50*	*02-Jul-2019 15:37*
Surr: 4-Bromofluorobenzene	*99.6*			**0**	*85-114*	*%REC*	*5*	*02-Jul-2019 13:14*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*85-114*	*%REC*	*50*	*02-Jul-2019 15:37*
Surr: Dibromofluoromethane	*99.8*			**0**	*80-119*	*%REC*	*5*	*02-Jul-2019 13:14*
Surr: Dibromofluoromethane	*97.0*			**0**	*80-119*	*%REC*	*50*	*02-Jul-2019 15:37*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*5*	*02-Jul-2019 13:14*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*50*	*02-Jul-2019 15:37*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	**See Attached**		**0**	**0**	**0**	**NA**	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 126_062419
Collection Date: 24-Jun-2019 11:00

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:25
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 16:25
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	02-Jul-2019 16:25
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:25
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	02-Jul-2019 16:25
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 16:25
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	02-Jul-2019 16:25
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 126_062419
Collection Date: 24-Jun-2019 11:00

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	02-Jul-2019 16:25
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 16:25
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 16:25
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:25
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:25
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*02-Jul-2019 16:25*
Surr: 4-Bromofluorobenzene	*95.0*			**0**	*85-114*	*%REC*	*1*	*02-Jul-2019 16:25*
Surr: Dibromofluoromethane	*95.9*			**0**	*80-119*	*%REC*	*1*	*02-Jul-2019 16:25*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*02-Jul-2019 16:25*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 07:36
Surr: 2-Fluorobiphenyl	*85.7*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 07:36*
Surr: 4-Terphenyl-d14	*98.5*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 07:36*
Surr: Nitrobenzene-d5	*98.3*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 07:36*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 126_062419
Collection Date: 24-Jun-2019 11:00

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.0917**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 17:56
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:59
Arsenic	**0.00462**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:59
Barium	**10.4**		**0.0380**	**0.0500**	**0.100**	**mg/L**	20	09-Jul-2019 18:28
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:59
Cadmium	**0.000370**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:59
Calcium	**344**		**0.680**	**1.00**	**10.0**	**mg/L**	20	09-Jul-2019 18:28
Chromium	**0.000825**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:59
Cobalt	**0.00777**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:59
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	09-Jul-2019 00:59
Iron	**4.05**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:59
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 00:59
Magnesium	**269**		**0.200**	**1.00**	**4.00**	**mg/L**	20	09-Jul-2019 18:28
Manganese	**0.150**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:59
Nickel	**0.0137**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:59
Potassium	**3.57**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:59
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:59
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 00:59
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 17:56
Sodium	**949**		**0.280**	**1.00**	**4.00**	**mg/L**	20	09-Jul-2019 18:28
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:59
Vanadium	**0.00257**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:59
Zinc	**0.0423**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:59
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 01-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	01-Jul-2019 16:39
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	**See Attached**		**0**	**0**	**0**	**NA**	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18ww03_062419
Collection Date: 24-Jun-2019 12:00

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 16:49
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	02-Jul-2019 16:49
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:49
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	02-Jul-2019 16:49
Acetone	**4.2**		**0.40**	**1.0**	**2.0**	**UG/L**	1	02-Jul-2019 16:49
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	02-Jul-2019 16:49
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18ww03_062419
Collection Date: 24-Jun-2019 12:00

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	02-Jul-2019 16:49
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 16:49
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 16:49
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:49
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:49
Surr: 1,2-Dichloroethane-d4	*100*			**0**	*81-118*	*%REC*	*1*	*02-Jul-2019 16:49*
Surr: 4-Bromofluorobenzene	*93.8*			**0**	*85-114*	*%REC*	*1*	*02-Jul-2019 16:49*
Surr: Dibromofluoromethane	*96.0*			**0**	*80-119*	*%REC*	*1*	*02-Jul-2019 16:49*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*02-Jul-2019 16:49*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 12:11
Surr: 2-Fluorobiphenyl	*102*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 12:11*
Surr: 4-Terphenyl-d14	*90.5*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 12:11*
Surr: Nitrobenzene-d5	*111*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 12:11*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18ww03_062419
Collection Date: 24-Jun-2019 12:00

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.0156**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 18:00
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 01:01
Arsenic	**0.000834**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:01
Barium	**0.194**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 01:01
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:01
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:01
Calcium	**8.98**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 01:01
Chromium	**0.0540**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:01
Cobalt	**0.000142**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:01
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	09-Jul-2019 01:01
Iron	**5.60**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:01
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 01:01
Magnesium	**6.34**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:01
Manganese	**0.117**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:01
Nickel	**0.00325**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:01
Potassium	**1.97**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:01
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 01:01
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 18:00
Sodium	**111**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:01
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:01
Vanadium	**0.00237**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:01
Zinc	**0.0171**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 01:01
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 01-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	01-Jul-2019 16:41
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	**See Attached**		**0**	**0**	**0**	**NA**	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18ww03_062419_a
Collection Date: 24-Jun-2019 12:00

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:13
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 17:13
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	02-Jul-2019 17:13
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:13
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	02-Jul-2019 17:13
Acetone	**2.4**		**0.40**	**1.0**	**2.0**	**UG/L**	1	02-Jul-2019 17:13
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	02-Jul-2019 17:13
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18ww03_062419_a
Collection Date: 24-Jun-2019 12:00

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	02-Jul-2019 17:13
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 17:13
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 17:13
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:13
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:13
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*02-Jul-2019 17:13*
Surr: 4-Bromofluorobenzene	*94.1*			**0**	*85-114*	*%REC*	*1*	*02-Jul-2019 17:13*
Surr: Dibromofluoromethane	*96.6*			**0**	*80-119*	*%REC*	*1*	*02-Jul-2019 17:13*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*02-Jul-2019 17:13*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 12:32
Surr: 2-Fluorobiphenyl	*123*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 12:32*
Surr: 4-Terphenyl-d14	*124*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 12:32*
Surr: Nitrobenzene-d5	*106*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 12:32*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18ww03_062419_a
Collection Date: 24-Jun-2019 12:00

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.0175**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 18:03
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 01:04
Arsenic	**0.000750**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:04
Barium	**0.185**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 01:04
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:04
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:04
Calcium	**8.70**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 01:04
Chromium	**0.0356**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:04
Cobalt	0.000500	U	0.000100	0.000500	0.00500	mg/L	1	09-Jul-2019 01:04
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	09-Jul-2019 01:04
Iron	**5.40**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:04
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 01:04
Magnesium	**6.12**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:04
Manganese	**0.112**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:04
Nickel	**0.00335**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:04
Potassium	**1.85**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:04
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 01:04
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 18:03
Sodium	**106**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:04
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:04
Vanadium	**0.00240**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:04
Zinc	**0.0163**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 01:04
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 01-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	01-Jul-2019 16:43
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	**See Attached**		**0**	**0**	**0**	**NA**	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18ww18_062419
Collection Date: 24-Jun-2019 13:00

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:37
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 17:37
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	02-Jul-2019 17:37
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:37
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	02-Jul-2019 17:37
Acetone	**2.4**		**0.40**	**1.0**	**2.0**	**UG/L**	1	02-Jul-2019 17:37
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	02-Jul-2019 17:37
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18ww18_062419
Collection Date: 24-Jun-2019 13:00

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	02-Jul-2019 17:37
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 17:37
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 17:37
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 17:37
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 17:37
Surr: 1,2-Dichloroethane-d4	*104*			**0**	*81-118*	*%REC*	*1*	*02-Jul-2019 17:37*
Surr: 4-Bromofluorobenzene	*95.7*			**0**	*85-114*	*%REC*	*1*	*02-Jul-2019 17:37*
Surr: Dibromofluoromethane	*97.8*			**0**	*80-119*	*%REC*	*1*	*02-Jul-2019 17:37*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*02-Jul-2019 17:37*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 12:53
Surr: 2-Fluorobiphenyl	*78.1*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 12:53*
Surr: 4-Terphenyl-d14	*106*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 12:53*
Surr: Nitrobenzene-d5	*110*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 12:53*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18ww18_062419
Collection Date: 24-Jun-2019 13:00

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.0389**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 18:30
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 01:06
Arsenic	**0.00567**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:06
Barium	**1.34**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 01:06
Beryllium	**0.000322**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 01:06
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:06
Calcium	**58.2**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 01:06
Chromium	**0.00520**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:06
Cobalt	**0.000122**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:06
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	09-Jul-2019 01:06
Iron	**113**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:06
Lead	**0.000647**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:06
Magnesium	**36.3**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:06
Manganese	**2.33**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	09-Jul-2019 18:05
Nickel	**0.00103**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:06
Potassium	**3.49**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:06
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 01:06
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 18:30
Sodium	**148**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:06
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:06
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 01:06
Zinc	**0.0145**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 01:06
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 01-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	01-Jul-2019 16:44
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	**See Attached**		**0**	**0**	**0**	**NA**	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18ww17_062419
Collection Date: 24-Jun-2019 13:15

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 14:02
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 14:02
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	02-Jul-2019 14:02
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 14:02
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	02-Jul-2019 14:02
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 14:02
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	02-Jul-2019 14:02
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18ww17_062419
Collection Date: 24-Jun-2019 13:15

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	02-Jul-2019 14:02
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 14:02
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 14:02
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 14:02
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Trichloroethene	**34**		**0.20**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 14:02
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 14:02
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*1*	*02-Jul-2019 14:02*
Surr: 4-Bromofluorobenzene	*97.0*			**0**	*85-114*	*%REC*	*1*	*02-Jul-2019 14:02*
Surr: Dibromofluoromethane	*97.0*			**0**	*80-119*	*%REC*	*1*	*02-Jul-2019 14:02*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*02-Jul-2019 14:02*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18ww17_062419
Collection Date: 24-Jun-2019 13:15

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.0219**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 18:33
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 01:08
Arsenic	**0.00328**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:08
Barium	**4.13**		**0.0380**	**0.0500**	**0.100**	**mg/L**	20	09-Jul-2019 18:46
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:08
Cadmium	**0.000710**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 01:08
Calcium	**371**		**0.680**	**1.00**	**10.0**	**mg/L**	20	09-Jul-2019 18:46
Chromium	**1.80**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:08
Cobalt	**0.0122**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:08
Copper	**0.109**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:08
Iron	**25.2**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:08
Lead	**0.00130**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:08
Magnesium	**249**		**0.200**	**1.00**	**4.00**	**mg/L**	20	09-Jul-2019 18:46
Manganese	**0.308**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:08
Nickel	**0.886**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:08
Potassium	**1.55**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:08
Selenium	**0.00181**	J	**0.00110**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 01:08
Silver	**0.000215**	J	**0.000200**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 18:33
Sodium	**1,270**		**0.280**	**1.00**	**4.00**	**mg/L**	20	09-Jul-2019 18:46
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:08
Vanadium	**0.0203**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:08
Zinc	**0.185**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 01:08
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 01-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	01-Jul-2019 16:46
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	**See Attached**		**0**	**0**	**0**	**NA**	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 125_062419
Collection Date: 24-Jun-2019 13:30

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,1-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,2-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	02-Jul-2019 12:50
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
2-Butanone	10	U	5.0	10	20	UG/L	10	02-Jul-2019 12:50
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
2-Hexanone	10	U	10	10	20	UG/L	10	02-Jul-2019 12:50
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	02-Jul-2019 12:50
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	02-Jul-2019 12:50
Acetone	10	U	4.0	10	20	UG/L	10	02-Jul-2019 12:50
Benzene	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Bromochloromethane	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Carbon disulfide	10	U	6.0	10	20	UG/L	10	02-Jul-2019 12:50
Carbon tetrachloride	5.0	U	5.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Chloroform	**26**		**2.0**	**5.0**	**10**	**UG/L**	10	02-Jul-2019 12:50

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 125_062419
Collection Date: 24-Jun-2019 13:30

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
cis-1,2-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Hexachlorobutadiene	10	U	10	10	10	UG/L	10	02-Jul-2019 12:50
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
m,p-Xylene	10	U	5.0	10	20	UG/L	10	02-Jul-2019 12:50
Methylene chloride	10	U	4.0	10	20	UG/L	10	02-Jul-2019 12:50
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	02-Jul-2019 12:50
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Styrene	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Tetrachloroethene	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Toluene	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
trans-1,2-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Trichloroethene	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Vinyl chloride	5.0	U	2.0	5.0	10	UG/L	10	02-Jul-2019 12:50
Surr: 1,2-Dichloroethane-d4	*98.8*			**0**	*81-118*	*%REC*	*10*	*02-Jul-2019 12:50*
Surr: 4-Bromofluorobenzene	*94.5*			**0**	*85-114*	*%REC*	*10*	*02-Jul-2019 12:50*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*10*	*02-Jul-2019 12:50*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*10*	*02-Jul-2019 12:50*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 125_062419
Collection Date: 24-Jun-2019 13:30

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.324**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 18:37
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 01:10
Arsenic	**0.000450**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:10
Barium	**0.0647**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 01:10
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:10
Cadmium	**0.000218**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 01:10
Calcium	**1.25**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 01:10
Chromium	**0.00412**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:10
Cobalt	**0.000344**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:10
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	09-Jul-2019 01:10
Iron	**0.466**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:10
Lead	**0.00128**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:10
Magnesium	**0.937**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:10
Manganese	**0.00625**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:10
Nickel	**0.00220**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:10
Potassium	**0.321**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:10
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 01:10
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 18:37
Sodium	**28.8**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:10
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:10
Vanadium	**0.00142**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:10
Zinc	**0.0207**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 01:10
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 01-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	01-Jul-2019 16:48
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	**See Attached**		**0**	**0**	**0**	**NA**	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 24-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-10
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:02
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 12:02
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	02-Jul-2019 12:02
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:02
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	02-Jul-2019 12:02
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 12:02
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	02-Jul-2019 12:02
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 24-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061279
Lab ID:HS19061279-10
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	02-Jul-2019 12:02
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 12:02
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 12:02
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 12:02
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 12:02
Surr: 1,2-Dichloroethane-d4	*99.3*			**0**	*81-118*	*%REC*	*1*	*02-Jul-2019 12:02*
Surr: 4-Bromofluorobenzene	*96.7*			**0**	*85-114*	*%REC*	*1*	*02-Jul-2019 12:02*
Surr: Dibromofluoromethane	*95.2*			**0**	*80-119*	*%REC*	*1*	*02-Jul-2019 12:02*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*02-Jul-2019 12:02*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

Batch ID: 142510 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061279-01	1	1000	1 (mL)	0.001
HS19061279-04	1	1000	1 (mL)	0.001
HS19061279-05	1	1000	1 (mL)	0.001
HS19061279-06	1	1000	1 (mL)	0.001
HS19061279-07	1	1000	1 (mL)	0.001

Batch ID: 142615 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061279-01	1	10 (mL)	10 (mL)	1
HS19061279-02	1	10 (mL)	10 (mL)	1
HS19061279-04	1	10 (mL)	10 (mL)	1
HS19061279-05	1	10 (mL)	10 (mL)	1
HS19061279-06	1	10 (mL)	10 (mL)	1
HS19061279-07	1	10 (mL)	10 (mL)	1
HS19061279-08	1	10 (mL)	10 (mL)	1
HS19061279-09	1	10 (mL)	10 (mL)	1

Batch ID: 142750 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061279-01	1	10	10 (mL)	1
HS19061279-02	1	10	10 (mL)	1
HS19061279-04	1	10	10 (mL)	1
HS19061279-05	1	10	10 (mL)	1
HS19061279-06	1	10	10 (mL)	1
HS19061279-07	1	10	10 (mL)	1
HS19061279-08	1	10	10 (mL)	1
HS19061279-09	1	10	10 (mL)	1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142510 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Groundwater	
HS19061279-01	129_062419	24 Jun 2019 08:20		27 Jun 2019 14:45	28 Jun 2019 19:26	10
HS19061279-04	126_062419	24 Jun 2019 11:00		27 Jun 2019 14:45	28 Jun 2019 07:36	1
HS19061279-05	18ww03_062419	24 Jun 2019 12:00		27 Jun 2019 14:45	28 Jun 2019 12:11	1
HS19061279-06	18ww03_062419_a	24 Jun 2019 12:00		27 Jun 2019 14:45	28 Jun 2019 12:32	1
HS19061279-07	18ww18_062419	24 Jun 2019 13:00		27 Jun 2019 14:45	28 Jun 2019 12:53	1
Batch ID: 142615 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19061279-01	129_062419	24 Jun 2019 08:20		01 Jul 2019 10:30	01 Jul 2019 16:36	1
HS19061279-02	102_062419	24 Jun 2019 09:25		01 Jul 2019 10:30	01 Jul 2019 16:38	1
HS19061279-04	126_062419	24 Jun 2019 11:00		01 Jul 2019 10:30	01 Jul 2019 16:39	1
HS19061279-05	18ww03_062419	24 Jun 2019 12:00		01 Jul 2019 10:30	01 Jul 2019 16:41	1
HS19061279-06	18ww03_062419_a	24 Jun 2019 12:00		01 Jul 2019 10:30	01 Jul 2019 16:43	1
HS19061279-07	18ww18_062419	24 Jun 2019 13:00		01 Jul 2019 10:30	01 Jul 2019 16:44	1
HS19061279-08	18ww17_062419	24 Jun 2019 13:15		01 Jul 2019 10:30	01 Jul 2019 16:46	1
HS19061279-09	125_062419	24 Jun 2019 13:30		01 Jul 2019 10:30	01 Jul 2019 16:48	1
Batch ID: 142750 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19061279-01	129_062419	24 Jun 2019 08:20		05 Jul 2019 10:03	09 Jul 2019 17:47	10
HS19061279-01	129_062419	24 Jun 2019 08:20		05 Jul 2019 10:03	09 Jul 2019 17:45	1
HS19061279-01	129_062419	24 Jun 2019 08:20		05 Jul 2019 10:03	09 Jul 2019 00:50	1
HS19061279-02	102_062419	24 Jun 2019 09:25		05 Jul 2019 10:03	09 Jul 2019 17:51	20
HS19061279-02	102_062419	24 Jun 2019 09:25		05 Jul 2019 10:03	09 Jul 2019 17:49	1
HS19061279-02	102_062419	24 Jun 2019 09:25		05 Jul 2019 10:03	09 Jul 2019 00:57	1
HS19061279-04	126_062419	24 Jun 2019 11:00		05 Jul 2019 10:03	09 Jul 2019 18:28	20
HS19061279-04	126_062419	24 Jun 2019 11:00		05 Jul 2019 10:03	09 Jul 2019 17:56	1
HS19061279-04	126_062419	24 Jun 2019 11:00		05 Jul 2019 10:03	09 Jul 2019 00:59	1
HS19061279-05	18ww03_062419	24 Jun 2019 12:00		05 Jul 2019 10:03	09 Jul 2019 18:00	1
HS19061279-05	18ww03_062419	24 Jun 2019 12:00		05 Jul 2019 10:03	09 Jul 2019 01:01	1
HS19061279-06	18ww03_062419_a	24 Jun 2019 12:00		05 Jul 2019 10:03	09 Jul 2019 18:03	1
HS19061279-06	18ww03_062419_a	24 Jun 2019 12:00		05 Jul 2019 10:03	09 Jul 2019 01:04	1
HS19061279-07	18ww18_062419	24 Jun 2019 13:00		05 Jul 2019 10:03	09 Jul 2019 18:30	1
HS19061279-07	18ww18_062419	24 Jun 2019 13:00		05 Jul 2019 10:03	09 Jul 2019 18:05	10
HS19061279-07	18ww18_062419	24 Jun 2019 13:00		05 Jul 2019 10:03	09 Jul 2019 01:06	1
HS19061279-08	18ww17_062419	24 Jun 2019 13:15		05 Jul 2019 10:03	09 Jul 2019 18:46	20
HS19061279-08	18ww17_062419	24 Jun 2019 13:15		05 Jul 2019 10:03	09 Jul 2019 18:33	1
HS19061279-08	18ww17_062419	24 Jun 2019 13:15		05 Jul 2019 10:03	09 Jul 2019 01:08	1
HS19061279-09	125_062419	24 Jun 2019 13:30		05 Jul 2019 10:03	09 Jul 2019 18:37	1
HS19061279-09	125_062419	24 Jun 2019 13:30		05 Jul 2019 10:03	09 Jul 2019 01:10	1
Batch ID: R341768 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19061279-10	Trip Blank	24 Jun 2019 00:00			02 Jul 2019 12:02	1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R341768 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19061279-01	129_062419	24 Jun 2019 08:20			02 Jul 2019 15:14	25
HS19061279-01	129_062419	24 Jun 2019 08:20			02 Jul 2019 13:38	1
HS19061279-02	102_062419	24 Jun 2019 09:25			02 Jul 2019 12:26	1
HS19061279-03	MW23_062419	24 Jun 2019 10:15			02 Jul 2019 15:37	50
HS19061279-03	MW23_062419	24 Jun 2019 10:15			02 Jul 2019 13:14	5
HS19061279-04	126_062419	24 Jun 2019 11:00			02 Jul 2019 16:25	1
HS19061279-05	18ww03_062419	24 Jun 2019 12:00			02 Jul 2019 16:49	1
HS19061279-06	18ww03_062419_a	24 Jun 2019 12:00			02 Jul 2019 17:13	1
HS19061279-07	18ww18_062419	24 Jun 2019 13:00			02 Jul 2019 17:37	1
HS19061279-08	18ww17_062419	24 Jun 2019 13:15			02 Jul 2019 14:02	1
HS19061279-09	125_062419	24 Jun 2019 13:30			02 Jul 2019 12:50	10
Batch ID: R342378 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19061279-01	129_062419	24 Jun 2019 08:20			12 Jul 2019 18:48	1
HS19061279-02	102_062419	24 Jun 2019 09:25			12 Jul 2019 18:48	1
HS19061279-03	MW23_062419	24 Jun 2019 10:15			12 Jul 2019 18:48	1
HS19061279-04	126_062419	24 Jun 2019 11:00			12 Jul 2019 18:48	1
HS19061279-05	18ww03_062419	24 Jun 2019 12:00			12 Jul 2019 18:48	1
HS19061279-06	18ww03_062419_a	24 Jun 2019 12:00			12 Jul 2019 18:48	1
HS19061279-07	18ww18_062419	24 Jun 2019 13:00			12 Jul 2019 18:48	1
HS19061279-08	18ww17_062419	24 Jun 2019 13:15			12 Jul 2019 18:48	1
HS19061279-09	125_062419	24 Jun 2019 13:30			12 Jul 2019 18:48	1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: 142615 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142615** Units: **mg/L** Analysis Date: **01-Jul-2019 16:21**
Client ID: Run ID: **HG03_341667** SeqNo: **5149453** PrepDate: **01-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142615** Units: **mg/L** Analysis Date: **01-Jul-2019 16:22**
Client ID: Run ID: **HG03_341667** SeqNo: **5149454** PrepDate: **01-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00513	0.000200	0.005	0	103	80 - 120				

MS Sample ID: **HS19061210-03MS** Units: **mg/L** Analysis Date: **01-Jul-2019 16:26**
Client ID: Run ID: **HG03_341667** SeqNo: **5149456** PrepDate: **01-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000504	0.000000200	5e-006	0.0000000070	101	75 - 125				

MSD Sample ID: **HS19061210-03MSD** Units: **mg/L** Analysis Date: **01-Jul-2019 16:27**
Client ID: Run ID: **HG03_341667** SeqNo: **5149457** PrepDate: **01-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000505	0.000000200	5e-006	0.0000000070	101	75 - 125	0.000005040	0.198	20	

The following samples were analyzed in this batch:

HS19061279-01	HS19061279-02	HS19061279-04	HS19061279-05
HS19061279-06	HS19061279-07	HS19061279-08	HS19061279-09

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 00:09**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157973** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.01569	0.0100								
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00100	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0188	0.200								J
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.01316	0.00500								

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 14:46**
Client ID: Run ID: **ICPMS05_342082** SeqNo: **5159142** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.00500	0.0100								U
Antimony	0.00078	0.00500								J
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00100	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.000871	0.00500								J
Zinc	0.00250	0.00500								U

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 00:11**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157974** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.105	0.0100	0.1	0	105	84 - 117				
Antimony	0.05026	0.00500	0.05	0	101	85 - 117				
Arsenic	0.05045	0.00500	0.05	0	101	84 - 116				
Barium	0.04898	0.00500	0.05	0	98.0	86 - 114				
Beryllium	0.0522	0.00200	0.05	0	104	83 - 121				
Cadmium	0.05062	0.00200	0.05	0	101	87 - 115				
Calcium	5.044	0.500	5	0	101	87 - 118				
Chromium	0.05022	0.00500	0.05	0	100	85 - 116				
Cobalt	0.05178	0.00500	0.05	0	104	86 - 115				
Copper	0.05054	0.00500	0.05	0	101	85 - 118				
Iron	5.157	0.200	5	0	103	87 - 118				
Lead	0.04892	0.00500	0.05	0	97.8	88 - 115				
Magnesium	5.207	0.200	5	0	104	83 - 118				
Manganese	0.05151	0.00500	0.05	0	103	87 - 115				
Nickel	0.05192	0.00500	0.05	0	104	85 - 117				
Potassium	5.01	0.200	5	0	100	87 - 115				
Selenium	0.05098	0.00500	0.05	0	102	80 - 120				
Sodium	5.131	0.200	5	0	103	85 - 117				
Thallium	0.04741	0.00200	0.05	0	94.8	82 - 116				
Vanadium	0.04942	0.00500	0.05	0	98.8	86 - 115				
Zinc	0.05405	0.00500	0.05	0	108	83 - 119				

LCS Sample ID: **LCS-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 16:22**
Client ID: Run ID: **ICPMS05_342082** SeqNo: **5159203** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Silver	0.05104	0.00500	0.05	0	102	85 - 116				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19070016-05MS** Units: **mg/L** Analysis Date: **09-Jul-2019 00:18**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157977** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09637	0.0100	0.1	0.008457	87.9	84 - 117				
Antimony	0.04754	0.00500	0.05	0.000233	94.6	85 - 117				
Arsenic	0.04735	0.00500	0.05	0.000332	94.0	84 - 116				
Barium	0.5018	0.00500	0.05	0.443	118	86 - 114				SO
Beryllium	0.05054	0.00200	0.05	0.000285	101	83 - 121				
Cadmium	0.04557	0.00200	0.05	0.000354	90.4	87 - 115				
Calcium	15.22	0.500	5	10.34	97.6	87 - 118				
Chromium	0.1883	0.00500	0.05	0.1422	92.1	85 - 116				
Cobalt	0.05284	0.00500	0.05	0.004809	96.1	86 - 115				
Copper	0.05149	0.00500	0.05	0.004724	93.5	85 - 118				
Iron	5.767	0.200	5	1.003	95.3	87 - 118				
Lead	0.04574	0.00500	0.05	0.000066	91.3	88 - 115				
Magnesium	11.72	0.200	5	7.041	93.6	83 - 118				
Manganese	0.255	0.00500	0.05	0.2048	100	87 - 115				O
Nickel	0.6207	0.00500	0.05	0.5635	114	85 - 117				O
Potassium	5.81	0.200	5	0.934	97.5	87 - 115				
Selenium	0.05067	0.00500	0.05	0.000254	101	80 - 120				
Silver	0.05394	0.00500	0.05	0.000034	108	85 - 116				
Sodium	70.47	0.200	5	64.83	113	85 - 117				O
Thallium	0.04418	0.00200	0.05	0.000618	87.1	82 - 116				
Vanadium	0.0472	0.00500	0.05	0.001088	92.2	86 - 115				
Zinc	0.1359	0.00500	0.05	0.09015	91.5	83 - 119				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19070016-05MSD** Units: **mg/L** Analysis Date: **09-Jul-2019 00:21**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157978** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.0988	0.0100	0.1	0.008457	90.3	84 - 117	0.09637	2.49	20	
Antimony	0.04561	0.00500	0.05	0.000233	90.8	85 - 117	0.04754	4.15	20	
Arsenic	0.0475	0.00500	0.05	0.000332	94.3	84 - 116	0.04735	0.314	20	
Barium	0.5084	0.00500	0.05	0.443	131	86 - 114	0.5018	1.3	20	SO
Beryllium	0.05016	0.00200	0.05	0.000285	99.8	83 - 121	0.05054	0.751	20	
Cadmium	0.04804	0.00200	0.05	0.000354	95.4	87 - 115	0.04557	5.28	20	
Calcium	14.79	0.500	5	10.34	89.1	87 - 118	15.22	2.83	20	
Chromium	0.1943	0.00500	0.05	0.1422	104	85 - 116	0.1883	3.17	20	
Cobalt	0.05273	0.00500	0.05	0.004809	95.8	86 - 115	0.05284	0.201	20	
Copper	0.05346	0.00500	0.05	0.004724	97.5	85 - 118	0.05149	3.75	20	
Iron	5.694	0.200	5	1.003	93.8	87 - 118	5.767	1.28	20	
Lead	0.04407	0.00500	0.05	0.000066	88.0	88 - 115	0.04574	3.72	20	
Magnesium	11.29	0.200	5	7.041	85.1	83 - 118	11.72	3.73	20	
Manganese	0.2539	0.00500	0.05	0.2048	98.1	87 - 115	0.255	0.456	20	O
Nickel	0.6206	0.00500	0.05	0.5635	114	85 - 117	0.6207	0.00725	20	O
Potassium	5.591	0.200	5	0.934	93.1	87 - 115	5.81	3.84	20	
Selenium	0.0495	0.00500	0.05	0.000254	98.5	80 - 120	0.05067	2.33	20	
Silver	0.05636	0.00500	0.05	0.000034	113	85 - 116	0.05394	4.39	20	
Sodium	68.43	0.200	5	64.83	71.9	85 - 117	70.47	2.94	20	SO
Thallium	0.04256	0.00200	0.05	0.000618	83.9	82 - 116	0.04418	3.74	20	
Vanadium	0.04785	0.00500	0.05	0.001088	93.5	86 - 115	0.0472	1.37	20	
Zinc	0.1384	0.00500	0.05	0.09015	96.5	83 - 119	0.1359	1.82	20	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19070016-05PDS** Units: **mg/L** Analysis Date: **09-Jul-2019 00:23**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157979** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1004	0.0100	0.1	0.008457	92.0	80 - 120				
Antimony	0.08827	0.00500	0.1	0.000233	88.0	80 - 120				
Arsenic	0.1014	0.00500	0.1	0.000332	101	80 - 120				
Barium	0.5467	0.00500	0.1	0.443	104	80 - 120				O
Beryllium	0.09789	0.00200	0.1	0.000285	97.6	80 - 120				
Cadmium	0.09739	0.00200	0.1	0.000354	97.0	80 - 120				
Calcium	19.93	0.500	10	10.34	96.0	80 - 120				
Chromium	0.2417	0.00500	0.1	0.1422	99.5	80 - 120				
Cobalt	0.1061	0.00500	0.1	0.004809	101	80 - 120				
Copper	0.1034	0.00500	0.1	0.004724	98.7	80 - 120				
Iron	11.04	0.200	10	1.003	100	80 - 120				
Lead	0.09432	0.00500	0.1	0.000066	94.2	80 - 120				
Magnesium	16.83	0.200	10	7.041	97.9	80 - 120				
Manganese	0.3036	0.00500	0.1	0.2048	98.8	80 - 120				
Nickel	0.652	0.00500	0.1	0.5635	88.5	80 - 120				O
Potassium	10.66	0.200	10	0.934	97.2	80 - 120				
Selenium	0.1067	0.00500	0.1	0.000254	106	80 - 120				
Silver	0.1124	0.00500	0.1	0.000034	112	80 - 120				
Sodium	73.52	0.200	10	64.83	86.9	80 - 120				O
Thallium	0.09198	0.00200	0.1	0.000618	91.4	80 - 120				
Vanadium	0.101	0.00500	0.1	0.001088	99.9	80 - 120				
Zinc	0.1865	0.00500	0.1	0.09015	96.3	80 - 120				

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ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19070016-05SD** Units: **mg/L** Analysis Date: **09-Jul-2019 00:16**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157976** PrepDate: **05-Jul-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.0250	0.0500					0.008457	0	10	U
Antimony	0.00250	0.0250					0.000233	0	10	U
Arsenic	0.00250	0.0250					0.000332	0	10	U
Barium	0.4183	0.0250					0.443	5.57	10	
Beryllium	0.00250	0.0100					0.000285	0	10	U
Cadmium	0.00250	0.0100					0.000354	0	10	U
Calcium	10.41	2.50					10.34	0.714	10	
Chromium	0.1432	0.0250					0.1422	0.69	10	
Cobalt	0.005021	0.0250					0.004809	0	10	J
Copper	0.00500	0.0250					0.004724	0	10	U
Iron	1.017	1.00					1.003	1.35	10	
Lead	0.00500	0.0250					0.000066	0	10	U
Magnesium	6.942	1.00					7.041	1.41	10	
Manganese	0.2079	0.0250					0.2048	1.52	10	
Nickel	0.5877	0.0250					0.5635	4.3	10	
Potassium	0.9174	1.00					0.934	0	10	J
Selenium	0.0125	0.0250					0.000254	0	10	U
Silver	0.00250	0.0250					0.000034	0	10	U
Sodium	66.24	1.00					64.83	2.17	10	
Thallium	0.00250	0.0100					0.000618	0	10	U
Vanadium	0.00500	0.0250					0.001088	0	10	U
Zinc	0.08743	0.0250					0.09015	3.02	10	

The following samples were analyzed in this batch:

HS19061279-01	HS19061279-02	HS19061279-04	HS19061279-05
HS19061279-06	HS19061279-07	HS19061279-08	HS19061279-09

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ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: 142510 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142510** Units: **ug/L** Analysis Date: **27-Jun-2019 22:37**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146408** PrepDate: **27-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.0594*	*0*	*0.08*	*0*	*74.3*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.08022*	*0*	*0.08*	*0*	*100*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07461*	*0*	*0.08*	*0*	*93.3*	*40 - 140*				

LCS Sample ID: **LCS-142510** Units: **ug/L** Analysis Date: **27-Jun-2019 22:58**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146409** PrepDate: **27-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08012	0.010	0.08	0	100	40 - 140				
Surr: 2-Fluorobiphenyl	*0.07847*	*0*	*0.08*	*0*	*98.1*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.08943*	*0*	*0.08*	*0*	*112*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08221*	*0*	*0.08*	*0*	*103*	*40 - 140*				

LCSD Sample ID: **LCSD-142510** Units: **ug/L** Analysis Date: **27-Jun-2019 23:19**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146410** PrepDate: **27-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07797	0.010	0.08	0	97.5	40 - 140	0.08012	2.72	20	
Surr: 2-Fluorobiphenyl	*0.07625*	*0*	*0.08*	*0*	*95.3*	*40 - 140*	*0.07847*	*2.86*	*20*	
Surr: 4-Terphenyl-d14	*0.09409*	*0*	*0.08*	*0*	*118*	*40 - 140*	*0.08943*	*5.08*	*20*	
Surr: Nitrobenzene-d5	*0.08067*	*0*	*0.08*	*0*	*101*	*40 - 140*	*0.08221*	*1.89*	*20*	

The following samples were analyzed in this batch: HS19061279-01 HS19061279-04 HS19061279-05 HS19061279-06 HS19061279-07

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ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190702** Units: **UG/L** Analysis Date: **02-Jul-2019 11:38**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151546** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

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ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190702** Units: **UG/L** Analysis Date: **02-Jul-2019 11:38**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151546** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*48.37*	*1.0*	*50*	*0*	*96.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.48*	*1.0*	*50*	*0*	*95.0*	*85 - 114*				
Surr: Dibromofluoromethane	*46.31*	*1.0*	*50*	*0*	*92.6*	*80 - 119*				
Surr: Toluene-d8	*50.22*	*1.0*	*50*	*0*	*100*	*89 - 112*				

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ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190702** Units: **UG/L** Analysis Date: **02-Jul-2019 10:26**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151545** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.88	1.0	20	0	99.4	78 - 124				
1,1,1-Trichloroethane	18.61	1.0	20	0	93.1	74 - 131				
1,1,2,2-Tetrachloroethane	21.7	1.0	20	0	108	71 - 121				
1,1,2-Trichloroethane	21.03	1.0	20	0	105	80 - 119				
1,1-Dichloroethane	19.31	1.0	20	0	96.5	77 - 125				
1,1-Dichloroethene	18.25	1.0	20	0	91.2	71 - 131				
1,1-Dichloropropene	18.58	1.0	20	0	92.9	78 - 125				
1,2,3-Trichlorobenzene	23.14	1.0	20	0	116	69 - 129				
1,2,3-Trichloropropane	18.92	1.0	20	0	94.6	73 - 122				
1,2,4-Trichlorobenzene	20.64	1.0	20	0	103	69 - 130				
1,2,4-Trimethylbenzene	17.82	1.0	20	0	89.1	76 - 124				
1,2-Dibromo-3-chloropropane	22.28	1.0	20	0	111	62 - 128				
1,2-Dibromoethane	20.44	1.0	20	0	102	77 - 121				
1,2-Dichlorobenzene	19.09	1.0	20	0	95.5	80 - 119				
1,2-Dichloroethane	18.92	1.0	20	0	94.6	73 - 128				
1,2-Dichloropropane	19.38	1.0	20	0	96.9	78 - 122				
1,3,5-Trimethylbenzene	17.15	1.0	20	0	85.8	75 - 124				
1,3-Dichlorobenzene	18.25	1.0	20	0	91.3	80 - 119				
1,3-Dichloropropane	20.81	1.0	20	0	104	80 - 119				
1,4-Dichlorobenzene	19.84	1.0	20	0	99.2	79 - 118				
2,2-Dichloropropane	19.77	1.0	20	0	98.8	60 - 139				
2-Butanone	44.92	2.0	40	0	112	56 - 143				
2-Chlorotoluene	19.2	1.0	20	0	96.0	79 - 122				
2-Hexanone	40.3	2.0	40	0	101	57 - 139				
4-Chlorotoluene	19.14	1.0	20	0	95.7	78 - 122				
4-Isopropyltoluene	16.8	1.0	20	0	84.0	77 - 127				
4-Methyl-2-pentanone	39.68	2.0	40	0	99.2	67 - 130				
Acetone	47.19	2.0	40	0	118	39 - 160				
Benzene	19.98	1.0	20	0	99.9	79 - 120				
Bromobenzene	18.71	1.0	20	0	93.6	80 - 120				
Bromochloromethane	19.36	1.0	20	0	96.8	78 - 123				
Bromodichloromethane	20.21	1.0	20	0	101	79 - 125				
Bromoform	21.67	1.0	20	0	108	66 - 130				
Bromomethane	20.75	1.0	20	0	104	53 - 141				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190702** Units: **UG/L** Analysis Date: **02-Jul-2019 10:26**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151545** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.79	2.0	40	0	89.5	64 - 133				
Carbon tetrachloride	18.07	1.0	20	0	90.3	72 - 136				
Chlorobenzene	19.29	1.0	20	0	96.5	82 - 118				
Chloroethane	18.27	1.0	20	0	91.4	60 - 138				
Chloroform	27.06	1.0	20	0	135	79 - 124				S
Chloromethane	17.7	1.0	20	0	88.5	50 - 139				
cis-1,2-Dichloroethene	20.04	1.0	20	0	100	78 - 123				
cis-1,3-Dichloropropene	19.46	1.0	20	0	97.3	75 - 124				
Dibromochloromethane	19.85	1.0	20	0	99.2	74 - 126				
Dibromomethane	20.01	1.0	20	0	100	79 - 123				
Dichlorodifluoromethane	18.31	1.0	20	0	91.5	32 - 152				
Ethylbenzene	18.31	1.0	20	0	91.5	79 - 121				
Hexachlorobutadiene	22.83	1.0	20	0	114	66 - 134				
Isopropylbenzene	17.5	1.0	20	0	87.5	72 - 131				
m,p-Xylene	37.16	2.0	40	0	92.9	80 - 121				
Methylene chloride	19.46	2.0	20	0	97.3	74 - 124				
Naphthalene	22.02	1.0	20	0	110	61 - 128				
n-Butylbenzene	17.1	1.0	20	0	85.5	75 - 128				
n-Propylbenzene	18.1	1.0	20	0	90.5	76 - 126				
o-Xylene	18.52	1.0	20	0	92.6	78 - 122				
sec-Butylbenzene	17.6	1.0	20	0	88.0	77 - 126				
Styrene	19.81	1.0	20	0	99.1	78 - 123				
tert-Butylbenzene	17.93	1.0	20	0	89.7	78 - 124				
Tetrachloroethene	17.9	1.0	20	0	89.5	74 - 129				
Toluene	19.07	1.0	20	0	95.4	80 - 121				
trans-1,2-Dichloroethene	19.56	1.0	20	0	97.8	75 - 124				
trans-1,3-Dichloropropene	20.02	1.0	20	0	100	73 - 127				
Trichloroethene	18.94	1.0	20	0	94.7	79 - 123				
Trichlorofluoromethane	17.56	1.0	20	0	87.8	65 - 141				
Vinyl chloride	17.16	1.0	20	0	85.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.7*	*1.0*	*50*	*0*	*103*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.55*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*50.71*	*1.0*	*50*	*0*	*101*	*80 - 119*				
Surr: Toluene-d8	*49.5*	*1.0*	*50*	*0*	*99.0*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061279-02MS** Units: **UG/L** Analysis Date: **02-Jul-2019 14:26**
Client ID: **102_062419** Run ID: **VOA6_341768** SeqNo: **5151553** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.03	1.0	20	0	90.2	78 - 124				
1,1,1-Trichloroethane	18.04	1.0	20	0	90.2	74 - 131				
1,1,2,2-Tetrachloroethane	17.83	1.0	20	0	89.1	71 - 121				
1,1,2-Trichloroethane	18.28	1.0	20	0	91.4	80 - 119				
1,1-Dichloroethane	16.8	1.0	20	0	84.0	77 - 125				
1,1-Dichloroethene	17.59	1.0	20	0	88.0	71 - 131				
1,1-Dichloropropene	19.29	1.0	20	0	96.5	78 - 125				
1,2,3-Trichlorobenzene	18.52	1.0	20	0	92.6	69 - 129				
1,2,3-Trichloropropane	18.32	1.0	20	0	91.6	73 - 122				
1,2,4-Trichlorobenzene	18.51	1.0	20	0	92.6	69 - 130				
1,2,4-Trimethylbenzene	18.55	1.0	20	0	92.7	76 - 124				
1,2-Dibromo-3-chloropropane	18.32	1.0	20	0	91.6	62 - 128				
1,2-Dibromoethane	17.49	1.0	20	0	87.4	77 - 121				
1,2-Dichlorobenzene	17.91	1.0	20	0	89.5	80 - 119				
1,2-Dichloroethane	16.42	1.0	20	0	82.1	73 - 128				
1,2-Dichloropropane	17.32	1.0	20	0	86.6	78 - 122				
1,3,5-Trimethylbenzene	18.27	1.0	20	0	91.4	75 - 124				
1,3-Dichlorobenzene	17.89	1.0	20	0	89.5	80 - 119				
1,3-Dichloropropane	17.94	1.0	20	0	89.7	80 - 119				
1,4-Dichlorobenzene	19.13	1.0	20	0	95.7	79 - 118				
2,2-Dichloropropane	18.56	1.0	20	0	92.8	60 - 139				
2-Butanone	34.72	2.0	40	0	86.8	56 - 143				
2-Chlorotoluene	19.37	1.0	20	0	96.9	79 - 122				
2-Hexanone	31.75	2.0	40	0	79.4	57 - 139				
4-Chlorotoluene	19.3	1.0	20	0	96.5	78 - 122				
4-Isopropyltoluene	19.37	1.0	20	0	96.8	77 - 127				
4-Methyl-2-pentanone	32.44	2.0	40	0	81.1	67 - 130				
Acetone	37.3	2.0	40	0	93.2	39 - 160				
Benzene	18.39	1.0	20	0	92.0	79 - 120				
Bromobenzene	17.14	1.0	20	0	85.7	80 - 120				
Bromochloromethane	16.05	1.0	20	0	80.2	78 - 123				
Bromodichloromethane	17.72	1.0	20	0	88.6	79 - 125				
Bromoform	17.73	1.0	20	0	88.6	66 - 130				
Bromomethane	17.74	1.0	20	0	88.7	53 - 141				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19061279-02MS** Units: **UG/L** Analysis Date: **02-Jul-2019 14:26**
Client ID: **102_062419** Run ID: **VOA6_341768** SeqNo: **5151553** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	33.1	2.0	40	0	82.8	64 - 133				
Carbon tetrachloride	19.3	1.0	20	0	96.5	72 - 136				
Chlorobenzene	17.94	1.0	20	0	89.7	82 - 118				
Chloroethane	16.25	1.0	20	0	81.3	60 - 138				
Chloroform	17.26	1.0	20	0	86.3	79 - 124				
Chloromethane	17.74	1.0	20	0	88.7	50 - 139				
cis-1,2-Dichloroethene	17.2	1.0	20	0	86.0	78 - 123				
cis-1,3-Dichloropropene	16.63	1.0	20	0	83.2	75 - 124				
Dibromochloromethane	17.38	1.0	20	0	86.9	74 - 126				
Dibromomethane	17.13	1.0	20	0	85.6	79 - 123				
Dichlorodifluoromethane	17.34	1.0	20	0	86.7	32 - 152				
Ethylbenzene	18.59	1.0	20	0	93.0	79 - 121				
Hexachlorobutadiene	21.22	1.0	20	0	106	66 - 134				
Isopropylbenzene	19.1	1.0	20	0	95.5	72 - 131				
m,p-Xylene	37.18	2.0	40	0	92.9	80 - 121				
Methylene chloride	15.9	2.0	20	0	79.5	74 - 124				
Naphthalene	17.16	1.0	20	0	85.8	61 - 128				
n-Butylbenzene	19.55	1.0	20	0	97.7	75 - 128				
n-Propylbenzene	20	1.0	20	0	100	76 - 126				
o-Xylene	17.95	1.0	20	0	89.8	78 - 122				
sec-Butylbenzene	20.61	1.0	20	0	103	77 - 126				
Styrene	18.46	1.0	20	0	92.3	78 - 123				
tert-Butylbenzene	20.24	1.0	20	0	101	78 - 124				
Tetrachloroethene	19.16	1.0	20	0	95.8	74 - 129				
Toluene	18.03	1.0	20	0	90.1	80 - 121				
trans-1,2-Dichloroethene	17.55	1.0	20	0	87.8	75 - 124				
trans-1,3-Dichloropropene	16.75	1.0	20	0	83.7	73 - 127				
Trichloroethene	18.63	1.0	20	0	93.1	79 - 123				
Trichlorofluoromethane	17.98	1.0	20	0	89.9	65 - 141				
Vinyl chloride	16.37	1.0	20	0	81.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.67*	*1.0*	*50*	*0*	*95.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.65*	*1.0*	*50*	*0*	*99.3*	*85 - 114*				
Surr: Dibromofluoromethane	*47.23*	*1.0*	*50*	*0*	*94.5*	*80 - 119*				
Surr: Toluene-d8	*48.99*	*1.0*	*50*	*0*	*98.0*	*89 - 112*				

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ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061279-02MSD** Units: **UG/L** Analysis Date: **02-Jul-2019 14:50**
Client ID: **102_062419** Run ID: **VOA6_341768** SeqNo: **5151554** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.01	1.0	20	0	90.1	78 - 124	18.03	0.0865	20	
1,1,1-Trichloroethane	18.39	1.0	20	0	92.0	74 - 131	18.04	1.93	20	
1,1,2,2-Tetrachloroethane	18.7	1.0	20	0	93.5	71 - 121	17.83	4.76	20	
1,1,2-Trichloroethane	18.66	1.0	20	0	93.3	80 - 119	18.28	2.05	20	
1,1-Dichloroethane	17.35	1.0	20	0	86.8	77 - 125	16.8	3.26	20	
1,1-Dichloroethene	17.79	1.0	20	0	89.0	71 - 131	17.59	1.14	20	
1,1-Dichloropropene	19.11	1.0	20	0	95.6	78 - 125	19.29	0.936	20	
1,2,3-Trichlorobenzene	20.01	1.0	20	0	100	69 - 129	18.52	7.74	20	
1,2,3-Trichloropropane	18.82	1.0	20	0	94.1	73 - 122	18.32	2.72	20	
1,2,4-Trichlorobenzene	19.44	1.0	20	0	97.2	69 - 130	18.51	4.86	20	
1,2,4-Trimethylbenzene	18.6	1.0	20	0	93.0	76 - 124	18.55	0.272	20	
1,2-Dibromo-3-chloropropane	19.01	1.0	20	0	95.1	62 - 128	18.32	3.69	20	
1,2-Dibromoethane	18.08	1.0	20	0	90.4	77 - 121	17.49	3.33	20	
1,2-Dichlorobenzene	18.35	1.0	20	0	91.8	80 - 119	17.91	2.45	20	
1,2-Dichloroethane	17.01	1.0	20	0	85.0	73 - 128	16.42	3.48	20	
1,2-Dichloropropane	17.17	1.0	20	0	85.9	78 - 122	17.32	0.85	20	
1,3,5-Trimethylbenzene	18.34	1.0	20	0	91.7	75 - 124	18.27	0.352	20	
1,3-Dichlorobenzene	18.32	1.0	20	0	91.6	80 - 119	17.89	2.37	20	
1,3-Dichloropropane	18.22	1.0	20	0	91.1	80 - 119	17.94	1.56	20	
1,4-Dichlorobenzene	19.85	1.0	20	0	99.3	79 - 118	19.13	3.69	20	
2,2-Dichloropropane	18.5	1.0	20	0	92.5	60 - 139	18.56	0.293	20	
2-Butanone	36.4	2.0	40	0	91.0	56 - 143	34.72	4.73	20	
2-Chlorotoluene	19.38	1.0	20	0	96.9	79 - 122	19.37	0.0148	20	
2-Hexanone	33.92	2.0	40	0	84.8	57 - 139	31.75	6.59	20	
4-Chlorotoluene	19.53	1.0	20	0	97.6	78 - 122	19.3	1.14	20	
4-Isopropyltoluene	19.16	1.0	20	0	95.8	77 - 127	19.37	1.05	20	
4-Methyl-2-pentanone	34.11	2.0	40	0	85.3	67 - 130	32.44	5.02	20	
Acetone	38.91	2.0	40	0	97.3	39 - 160	37.3	4.23	20	
Benzene	18.33	1.0	20	0	91.7	79 - 120	18.39	0.339	20	
Bromobenzene	17.11	1.0	20	0	85.5	80 - 120	17.14	0.209	20	
Bromochloromethane	16.97	1.0	20	0	84.9	78 - 123	16.05	5.62	20	
Bromodichloromethane	18.02	1.0	20	0	90.1	79 - 125	17.72	1.67	20	
Bromoform	18.17	1.0	20	0	90.9	66 - 130	17.73	2.47	20	
Bromomethane	17.59	1.0	20	0	88.0	53 - 141	17.74	0.834	20	

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ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061279-02MSD** Units: **UG/L** Analysis Date: **02-Jul-2019 14:50**
Client ID: **102_062419** Run ID: **VOA6_341768** SeqNo: **5151554** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	33.18	2.0	40	0	83.0	64 - 133	33.1	0.239	20	
Carbon tetrachloride	19.29	1.0	20	0	96.5	72 - 136	19.3	0.0519	20	
Chlorobenzene	18.04	1.0	20	0	90.2	82 - 118	17.94	0.592	20	
Chloroethane	17.66	1.0	20	0	88.3	60 - 138	16.25	8.29	20	
Chloroform	17.58	1.0	20	0	87.9	79 - 124	17.26	1.83	20	
Chloromethane	16.74	1.0	20	0	83.7	50 - 139	17.74	5.81	20	
cis-1,2-Dichloroethene	17.71	1.0	20	0	88.5	78 - 123	17.2	2.9	20	
cis-1,3-Dichloropropene	17.24	1.0	20	0	86.2	75 - 124	16.63	3.63	20	
Dibromochloromethane	17.51	1.0	20	0	87.6	74 - 126	17.38	0.749	20	
Dibromomethane	17.5	1.0	20	0	87.5	79 - 123	17.13	2.13	20	
Dichlorodifluoromethane	16.92	1.0	20	0	84.6	32 - 152	17.34	2.41	20	
Ethylbenzene	18.48	1.0	20	0	92.4	79 - 121	18.59	0.622	20	
Hexachlorobutadiene	21.2	1.0	20	0	106	66 - 134	21.22	0.0826	20	
Isopropylbenzene	19.21	1.0	20	0	96.1	72 - 131	19.1	0.57	20	
m,p-Xylene	36.92	2.0	40	0	92.3	80 - 121	37.18	0.695	20	
Methylene chloride	16.19	2.0	20	0	81.0	74 - 124	15.9	1.84	20	
Naphthalene	18.92	1.0	20	0	94.6	61 - 128	17.16	9.76	20	
n-Butylbenzene	19.36	1.0	20	0	96.8	75 - 128	19.55	0.956	20	
n-Propylbenzene	20.01	1.0	20	0	100	76 - 126	20	0.0421	20	
o-Xylene	18.32	1.0	20	0	91.6	78 - 122	17.95	2.02	20	
sec-Butylbenzene	20.38	1.0	20	0	102	77 - 126	20.61	1.12	20	
Styrene	18.72	1.0	20	0	93.6	78 - 123	18.46	1.41	20	
tert-Butylbenzene	20.29	1.0	20	0	101	78 - 124	20.24	0.291	20	
Tetrachloroethene	18.91	1.0	20	0	94.5	74 - 129	19.16	1.35	20	
Toluene	18	1.0	20	0	90.0	80 - 121	18.03	0.169	20	
trans-1,2-Dichloroethene	17.99	1.0	20	0	90.0	75 - 124	17.55	2.49	20	
trans-1,3-Dichloropropene	17.13	1.0	20	0	85.7	73 - 127	16.75	2.28	20	
Trichloroethene	18.32	1.0	20	0	91.6	79 - 123	18.63	1.68	20	
Trichlorofluoromethane	18	1.0	20	0	90.0	65 - 141	17.98	0.106	20	
Vinyl chloride	16.22	1.0	20	0	81.1	58 - 137	16.37	0.923	20	
Surr: 1,2-Dichloroethane-d4	*48.93*	*1.0*	*50*	*0*	*97.9*	*81 - 118*	*47.67*	*2.6*	*20*	
Surr: 4-Bromofluorobenzene	*49.69*	*1.0*	*50*	*0*	*99.4*	*85 - 114*	*49.65*	*0.063*	*20*	
Surr: Dibromofluoromethane	*48.03*	*1.0*	*50*	*0*	*96.1*	*80 - 119*	*47.23*	*1.66*	*20*	
Surr: Toluene-d8	*49.1*	*1.0*	*50*	*0*	*98.2*	*89 - 112*	*48.99*	*0.233*	*20*	

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ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061279

QC BATCH REPORT

Batch ID: R341768 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS19061279-01	HS19061279-02	HS19061279-03	HS19061279-04
HS19061279-05	HS19061279-06	HS19061279-07	HS19061279-08
HS19061279-09	HS19061279-10		

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ALS Houston, US Date: 15-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19061279**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

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ALS Houston, US Date: 15-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061279

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19061279-01	129_062419	Login	25/06/2019 11:07:19	NDR	MET100
HS19061279-01	129_062419	Login	25/06/2019 11:07:19	NDR	Sub
HS19061279-01	129_062419	Login	25/06/2019 11:07:19	NDR	VOA258

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ALS Houston, US Date: 15-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19061279
Date/Time Received: **25-Jun-2019 09:00**
Received by: **JRM**

Checklist completed by: *Nilesh D. Ranchod* eSignature — 25-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature — 25-Jun-2019 Date

Matrices: **Groundwater**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.3c U/c	IR25
Cooler(s)/Kit(s):	44534	
Date/Time sample(s) sent to storage:	06/25/2019 11:45am	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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bhate
ENVIRONMENTAL CONSTRUCTION LIMITED

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1,4 - DIOXANE	Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
129_062419		24-Jun-2019	0820	-	N		WG	6	X	X	X	X				
102_062419		24-Jun-2019	0925	-	N		WG	5	X	X	X					
DUW23_062419		24-Jun-2019	1015	-	N		WG	4	X	X						
126_062419		24-Jun-2019	1100		N		WG	6	X	X	X	X				
18WW23_062419		24-Jun-2019	1200		N		WG	6	X	X	X	X				
18WW23_062419_a		24-Jun-2019	1200	-	FD		WG	6	X	X	X	X				
18WW18_062419		24-Jun-2019	1300	-	N		WG	6	X	X	X	X				
18WW17_062419		24-Jun-2019	1315	-	N		WG	5	X	X	X					
125_062419		24-Jun-2019	1330	-	N		WG	5	X	X	X					
TRIP BLANK		24-Jun-2019		-	TB		W	2	X							
				-												

Sample Analysis Requested (5) | Quality Assurance Samples (6)

COMMENTS:
Cooler 49.535 1525
Temp 1.3 COC

HS19061279

Bhate Environmental Associates, Inc.
LHAAP 18 24

Custody Transfers Prior to Receipt by Laboratory

Relinquished by (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	6/24/19	1430	1. [illegible]	6/25/19	0715
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped

____ Method of Shipment: ____

____ Fed Ex ____ Airbill Number:

____ Analytical Lab: ALS 10450 Stanchff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number [e.g. 09-02-1999-01]

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

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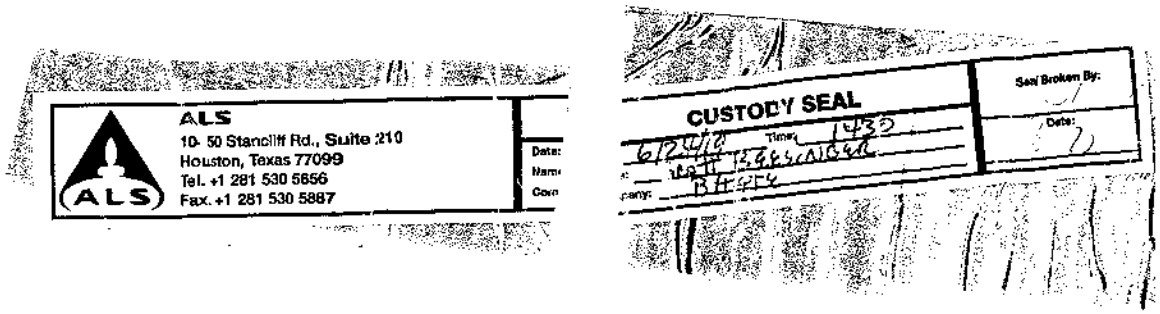
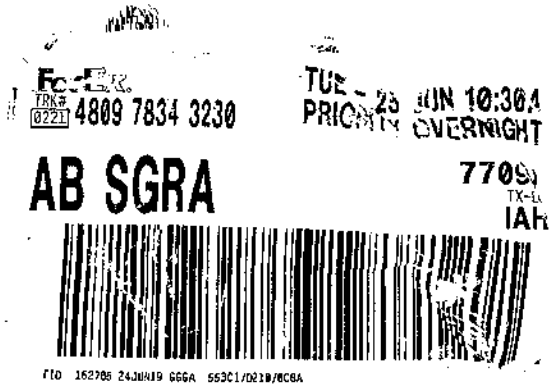
00941348





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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1918373, 1918525, 1918682

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2269 (243227)

General Set Information: There were eighteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1918373001 and 1918525004 were analyzed and reported from 1:1,000 dilutions. Field samples 1918373003/08 were analyzed and reported from 1:10,000 dilutions. Field samples 1918373009 and 1918525002 were analyzed and reported from 1:10 dilutions. Field samples 1918525001 and 1918682004 were analyzed and reported from 1:100 dilutions. Sample 1918373004 failed the 50-150% method requirement for ISTD recovery. This sample was re-analyzed and reported from a 1:4 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 662917) was less than 1/2 the CRDL. The recovery for the LCS (662918) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on sample 1918373005 (Client ID: 18WW03_062419). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The MS/MSD percent recoveries and relative percent difference were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 662915) is reported from the analysis of the Laboratory Control Sample (LCS – 662918) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafile 10JULD13.

Thomas Bosch — July 11, 2019
Analyst — Date

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ANALYTICAL REPORT
Amended-20190712

Report Date: July 12, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1918373**
Project ID: HS19061279
Purchase Order: HS19061279
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
129_062419	1918373001	06/24/19	06/26/19	
102_062419	1918373002	06/24/19	06/26/19	
MW23_062419	1918373003	06/24/19	06/26/19	
126_062419	1918373004	06/24/19	06/26/19	
18WW03_062419	1918373005	06/24/19	06/26/19	
18WW03_062419_a	1918373006	06/24/19	06/26/19	
18WW18_062419	1918373007	06/24/19	06/26/19	
18WW17_062419	1918373008	06/24/19	06/26/19	
125_062419	1918373009	06/24/19	06/26/19	

ANALYTICAL REPORT
Amended-20190712

Workorder: 34-1918373
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **129_062419** | Sampling Site: NA | Collected: 06/24/2019
Lab ID: 1918373001 | Media: 125 mL Nalgene | Received: 06/26/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 09:45 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**4200**	1000	2000	4000	1000	

Sample ID: **102_062419** | Sampling Site: NA | Collected: 06/24/2019
Lab ID: 1918373002 | Media: 125 mL Nalgene | Received: 06/26/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 09:59 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**33**	1.0	2.0	4.0	1	

Sample ID: **MW23_062419** | Sampling Site: NA | Collected: 06/24/2019
Lab ID: 1918373003 | Media: 125 mL Nalgene | Received: 06/26/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 10:13 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**67000**	10000	20000	40000	10000	

Sample ID: **126_062419** | Sampling Site: NA | Collected: 06/24/2019
Lab ID: 1918373004 | Media: 125 mL Nalgene | Received: 06/26/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 15:02 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	5.9	4.0	8.0	16	4	J

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ANALYTICAL REPORT
Amended-20190712

Workorder: 34-1918373
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18WW03_062419** | Sampling Site: NA | Collected: 06/24/2019
Lab ID: 1918373005 | Media: 125 mL Nalgene | Received: 06/26/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 10:41 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18WW03_062419_a** | Sampling Site: NA | Collected: 06/24/2019
Lab ID: 1918373006 | Media: 125 mL Nalgene | Received: 06/26/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 11:23 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18WW18_062419** | Sampling Site: NA | Collected: 06/24/2019
Lab ID: 1918373007 | Media: 125 mL Nalgene | Received: 06/26/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 11:36 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18WW17_062419** | Sampling Site: NA | Collected: 06/24/2019
Lab ID: 1918373008 | Media: 125 mL Nalgene | Received: 06/26/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 11:50 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**85000**	10000	20000	40000	10000	

ANALYTICAL REPORT
Amended-20190712

Workorder: 34-1918373
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **125_062419** | Sampling Site: NA | Collected: 06/24/2019
Lab ID: 1918373009 | Media: 125 mL Nalgene | Received: 06/26/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 12:04 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**260**	10	20	40	10	

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 243227)

Field samples 1918373001 and 1918525004 were analyzed and reported from 1:1,000 dilutions. Field samples 1918373003/08 were analyzed and reported from 1:10,000 dilutions. Field samples 1918373009 and 1918525002 were analyzed and reported from 1:10 dilutions. Field samples 1918525001 and 1918682004 were analyzed and reported from 1:100 dilutions. Sample 1918373004 failed the 50-150% method requirement for ISTD recovery. This sample was re-analyzed and reported from a 1:4 dilution. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/11/2019 10:28	/S/ Stephen Brose 07/11/2019 13:28

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT
Amended-20190712

Workorder: 34-1918373
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1918373

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2269 (HBN: 243227)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 662917
Analyzed: 07/10/2019 09:31
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 662918
Analyzed: 07/10/2019 09:03
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.25	4.00	106	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1918373005	**MS:**	662919	**MSD:**	662920
Analyzed:	07/10/2019 10:41	**Analyzed:**	07/10/2019 10:55	**Analyzed:**	07/10/2019 11:09
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.87	4	122	78.8	123.8	4.01	100	19.3	0.0	20.0

Comments

Field samples 1918373001 and 1918525004 were analyzed and reported from 1:1,000 dilutions. Field samples 1918373003/08 were analyzed and reported from 1:10,000 dilutions. Field samples 1918373009 and 1918525002 were analyzed and reported from 1:10 dilutions. Field samples 1918525001 and 1918682004 were analyzed and reported from 1:100 dilutions. Sample 1918373004 failed the 50-150% method requirement for ISTD recovery. This sample was re-analyzed and reported from a 1:4 dilution. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 07/11/2019 11:05	/S/ Stephen Brose 07/11/2019 13:28

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◓ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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ALS Environmental
CHAIN-OF-CUSTODY

Project / Job / Task: HS19061729	***Split:***	**Workorder ID:** 1918373	**Level:** ENV_LVL4	**Requested Analysis**
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly	
Comments:			**Preservatives**	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	EPA 6850_DoD QSM
1	06/24/2019 08:20	129_062419	1918373001		Water	A	1	A
2	06/24/2019 09:25	102_062419	1918373002		Water	A	1	A
3	06/24/2019 10:15	MW23_062419	1918373003		Water	A	1	A
4	06/24/2019 11:00	126_062419	1918373004		Water	A	1	A
5	06/24/2019 12:00	18WW03_062419	1918373005		Water	A	1	A
6	06/24/2019 12:00	18WW03_062419_a	1918373006		Water	A	1	A
7	06/24/2019 13:00	18WW18_062419	1918373007		Water	A	1	A
8	06/24/2019 13:15	18WW17_062419	1918373008		Water	A	1	A
9	06/24/2019 13:30	125_062419	1918373009		Water	A	1	A

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	06/26/2019 10:17	ALS Sample Receiving	Sample Login
[signature]	06/26/19 1400	4C	Storage
R.33.1	07.08.19/16:30	T. Bond	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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00941358

W 1918373

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID: 11663**

SUBCONTRACT TO:

1918373

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19061279
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19061279-01**	**129_062419**	**Groundwater**	**24 Jun 2019 08:20**
	SUB_Perch-6850			10 Jul 2019
2.	**HS19061279-02**	**102_062419**	**Groundwater**	**24 Jun 2019 09:25**
	SUB_Perch-6850			10 Jul 2019
3.	**HS19061279-03**	**MW23_062419**	**Groundwater**	**24 Jun 2019 10:15**
	SUB_Perch-6850			10 Jul 2019
4.	**HS19061279-04**	**126_062419**	**Groundwater**	**24 Jun 2019 11:00**
	SUB_Perch-6850			10 Jul 2019
5.	**HS19061279-05**	**18ww03_062419**	**Groundwater**	**24 Jun 2019 12:00**
	SUB_Perch-6850			10 Jul 2019
6.	**HS19061279-06**	**18ww03_062419_a**	**Groundwater**	**24 Jun 2019 12:00**
	SUB_Perch-6850			10 Jul 2019
7.	**HS19061279-07**	**18ww18_062419**	**Groundwater**	**24 Jun 2019 13:00**
	SUB_Perch-6850			10 Jul 2019
8.	**HS19061279-08**	**18ww17_062419**	**Groundwater**	**24 Jun 2019 13:15**
	SUB_Perch-6850			10 Jul 2019
9.	**HS19061279-09**	**125_062419**	**Groundwater**	**24 Jun 2019 13:30**

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Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11663**

LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
ANALYSIS REQUESTED			DUE DATE
SUB_Perch-6850			10 Jul 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: NR Date/Time: 6.25.19 18.00

Received By: Jennifer Fussell Date/Time: 06-26-19 10:17

Cooler ID(s): Temperature(s):

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ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site: 9118373

Date/Time of Receipt: 06-26-19 10:17

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Tamiya Tassell (Signature) T. Tantassell (Printed Name) 06-26-19 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc Revised 01/01/2018

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Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159469-434 RIT2 EXP 02/20

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 25JUN19
ACTWGT: 19.25 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19061279 - RJ

551C1/D210/104C

FedEx Express

J161113060501uv

TRK# 0201 4809 7835 3425

WED - 26 JUN 10:30A
PRIORITY OVERNIGHT

AX BTFA

84123
UT-US SLC

Seal Broken By:

Date:

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Batch Worklist

Batch: ELMS/ 2269 Created: 7/10/2019 08:39 Instrument: HBN: 243227

Rule: EPA 6850, DoD QSM Water Analyst: T. Bosch Status: WP

Workorder: 1918373 [ENV_LVL4]
Workorder: 1918525 [ENV_LVL4]
Workorder: 1918682 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	662914	CCV for HBN 243227 [ELMS/2269]				CCV	3		E685041C3Q	5311		7/10/2019	
2	662915	RLVS for HBN 243227 [ELMS/2269				RLVS	3		E685041C3Q	5311		7/10/2019	
3	662916	ICS for HBN 243227 [ELMS/2269]				ICS	3		E6850..D3Q	5311		7/10/2019	
4	662917	LMB for HBN 243227 [ELMS/2269]				LMB	3		E6850Q413Q	5311		7/10/2019	
5	662918	LCS for HBN 243227 [ELMS/2269]				LCS	3		E6850Q413Q	5311		7/10/2019	
6	1918373001	129_062419				SAMPLE	3	1918373001-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
	1918373002	102_062419				SAMPLE	3	1918373002-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
	1918373003	MW23_062419				SAMPLE	3	1918373003-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
	1918373004	126_062419				SAMPLE	3	1918373004-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
	1918373005	18WW03_062419				SAMPLE	3	1918373005-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
	662919	18WW03_062419(1918373005MS)				MS	3		E6850Q413Q	5311		7/10/2019	
12	662920	18WW03_062419(1918373005MSD)				MSD	3		E6850Q413Q	5311		7/10/2019	
13	1918373006	18WW03_062419_a				SAMPLE	3	1918373006-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
14	1918373007	18WW18_062419				SAMPLE	3	1918373007-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
15	1918373008	18WW17_062419				SAMPLE	3	1918373008-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
16	1918373009	125_062419				SAMPLE	3	1918373009-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
17	1918525001	18CPTMW14_062519				SAMPLE	3	1918525001-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
18	662921	CCV for HBN 243227 [ELMS/2269]				CCV	3		E685041C3Q	5311		7/10/2019	
19	1918525002	18CPTMW24_062519				SAMPLE	3	1918525002-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
20	1918525003	18CPTMW07_062519				SAMPLE	3	1918525003-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
21	1918525004	MW3_062519				SAMPLE	3	1918525004-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
22	1918682001	AW04_062619				SAMPLE	3	1918682001-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
23	1918682002	AW04_062619_a				SAMPLE	3	1918682002-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
24	1918682003	18WW24_062619				SAMPLE	3	1918682003-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
25	1918682004	MW16_062619				SAMPLE	3	1918682004-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
26	1918682005	MW19_062619				SAMPLE	3	1918682005-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
27	662922	CCV for HBN 243227 [ELMS/2269]				CCV	3		E685041C3Q	5311		7/10/2019	

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1918373 (001-09), 1918525 (001-04); 1918682 (001-05)
ELMS Batch/HBN ID: 2269 (243227)
Prep Date: 07/08/2019 Analysis Date: 07/10/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\10JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 662918; Target = 4.0µg/L. ASTM type II water was used for LMB 662917.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1918273005 (Client ID: 18WW03_062419). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1918373001 and 1918525004 were analyzed and reported from 1:1,000 dilutions. Field samples 1918373003/08 were analyzed and reported from 1:10,000 dilutions. Field samples 1918373009 and 1918525002 were analyzed and reported from 1:10 dilutions. Field samples 1918525001 and 1918682004 were analyzed and reported from 1:100 dilutions. Sample 1918373004 failed the 50-150% method requirement for ISTD recovery. This sample was re-analyzed and reported from a 1:4 dilution. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\243227-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 662915) is reported from the analysis of the Laboratory Control Sample (LCS – 662918) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 10JULD13.

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2269 HBN: 243227 Sample Set IDs if Applicable: 1918373/1918525/1918682	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SD
Standards traceability checked and meets criteria	TB	SD
Standard curve coefficients evaluated and meet criteria	TB	SD
ICVs analyzed and meet acceptance criteria	TB	SD
CCVs analyzed and meet acceptance criteria	TB	SD
Method Blanks analyzed and meet acceptance criteria	TB	SD
Retention Time Windows checked	TB	SD
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SD
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SD
RLVS analyzed	TB	SD
Preparation and analysis hold times met	TB	SD
Preparation deviations and re-preparations noted when performed	TB	SD
Analysis deviations and re-analyses noted when performed	TB	SD
Sample dilution factors noted on reports	TB	SD
Electronic records in HBN transcription accuracy and completeness checked	TB	SD
Preparation and analysis calculations checked	TB	SD
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SD
Manual integrations checked	TB	SD

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL
Standard: 43659	Created By: Thomas Bosch	Amount: 100 mL
MFG: AccuStandard	Create Date: 09/17/2018 09:09AM	Expires: 07/25/2020
MFG Lot: 218065075		Usable: No
Part ID: IC-PER-10X-1		Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
			1000 ug/mL
1	14797-73-0	Perchlorate	

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description - 6850 QC WKG STD 100ug/L

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK	Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ANAB ACCREDITED

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Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: JCC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

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125 Market Street
New Haven, CT 06513
USA

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

AccuStandard®

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

Page 1 of 1

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

OR-ORG/INO-001
Rev. 5/18

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Report: C:\HPCHEM\1\DATA\10JUL19D\10JUL19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	662914 CCV@25	Vial 71	1	Control	1	2.68575e6	8.115	26.05294
#*	662915 QC@4.0	Vial 72	1	Control	2	4.44100e5	7.955	4.24940
#*	662916 ICS@4.0	Vial 73	1	Control	3	3.60514e5	7.907	3.90243
#*	662917 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1918373001 1K	Vial 75	1	Sample	5	4.64595e5	8.475	4196.25594
#*	1918373002	Vial 76	1	Sample	6	2.67439e6	8.256	32.95864
#*	1918373003 10K	Vial 77	1	Sample	7	7.50173e5	8.471	6.69552e4
#*	1918373004	Vial 78	1	Sample	8	9.59698e4	7.479	3.07958 RERUN
#*	1918373005	Vial 79	1	Sample	9	0.00000	0.000	0.00000
#*	662919 183735S	Vial 80	1	Sample	10	3.55093e5	7.925	4.86521
#*	662920 183735D	Vial 81	1	Sample	11	3.66789e5	7.925	4.01055
#*	1918373006	Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1918373007	Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	1918373008 10K	Vial 84	1	Sample	14	7.80844e5	8.547	8.50126e4
#*	1918373009 10	Vial 85	1	Sample	15	2.50033e6	8.517	259.32134
#*	1918525001 100	Vial 86	1	Sample	16	1.50160e6	8.459	1335.16188
#*	1918525002 10	Vial 87	1	Sample	18	8.01472e5	7.834	89.40283
#*	1918525003	Vial 88	1	Sample	19	9.97190e4	7.920	1.35329
#*	662921 CCV@25	Vial 71	1	Control	20	2.50454e6	8.326	26.47813
#*	1918525004 1K	Vial 89	1	Sample	21	9.11871e5	8.541	1.14090e4
#*	1918682001	Vial 90	1	Sample	22	2.47257e6	7.964	22.97557
#*	1918682002	Vial 91	1	Sample	23	2.64966e6	7.956	27.09987
#*	1918682003	Vial 92	1	Sample	24	0.00000	0.000	0.00000
#*	1918682004 100	Vial 93	1	Sample	25	3.17764e6	8.495	2867.69131
#*	1918682005	Vial 94	1	Sample	26	0.00000	0.000	0.00000
#*	1918373004 4X	Vial 95	1	Sample	27	1.13898e5	7.615	5.92026
*	662922 CCV@25	Vial 71	1	Control	28	2.33580e6	8.325	25.58048

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	662914 CCV@25	Vial 71	1	Control	1	8.00069e5	8.120	26.14885
#*	662915 QC@4.0	Vial 72	1	Control	2	1.43143e5	7.988	4.46175
#*	662916 ICS@4.0	Vial 73	1	Control	3	1.13240e5	7.926	3.97989
#*	662917 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1918373001 1K	Vial 75	1	Sample	5	1.47350e5	8.502	4333.79914
#*	1918373002	Vial 76	1	Sample	6	8.00737e5	8.266	33.28426
#*	1918373003 10K	Vial 77	1	Sample	7	2.30473e5	8.475	6.80005e4
#*	1918373004	Vial 78	1	Sample	8	4.60480e4	7.515	4.72828
#*	1918373005	Vial 79	1	Sample	9	0.00000	0.000	0.00000
#*	662919 183735S	Vial 80	1	Sample	10	1.12035e5	7.945	5.02607
#*	662920 183735D	Vial 81	1	Sample	11	1.15347e5	7.933	4.09972
#*	1918373006	Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1918373007	Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	1918373008 10K	Vial 84	1	Sample	14	2.43153e5	8.561	8.79445e4
#*	1918373009 10	Vial 85	1	Sample	15	7.49555e5	8.537	261.83216
#*	1918525001 100	Vial 86	1	Sample	16	4.61812e5	8.478	1373.76036
#*	1918525002 10	Vial 87	1	Sample	18	2.59266e5	7.849	96.09405
#*	1918525003	Vial 88	1	Sample	19	3.44592e4	7.913	1.39474
#*	662921 CCV@25	Vial 71	1	Control	20	7.43673e5	8.350	26.49691
#*	1918525004 1K	Vial 89	1	Sample	21	2.92673e5	8.563	1.22133e4
#*	1918682001	Vial 90	1	Sample	22	7.38653e5	7.982	23.10212
#*	1918682002	Vial 91	1	Sample	23	7.84495e5	7.975	27.04927
#*	1918682003	Vial 92	1	Sample	24	0.00000	0.000	0.00000
#*	1918682004 100	Vial 93	1	Sample	25	9.49732e5	8.511	2888.99473
#*	1918682005	Vial 94	1	Sample	26	0.00000	0.000	0.00000
#*	1918373004 4X	Vial 95	1	Sample	27	4.50105e4	7.626	7.05823
*	662922 CCV@25	Vial 71	1	Control	28	6.93327e5	8.339	25.58423

RIGHT SOLUTIONS | RIGHT PARTNER

Batch Report: C:\HPCHEM\1\DATA\10JUL19D\10JUL19S.B

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	662914 CCV@25	Vial 71	1	Control	1	3.12850e5	8.129	5.00000
#*	662915 QC@4.0	Vial 72	1	Control	2	3.43351e5	7.987	5.00000
#*	662916 ICS@4.0	Vial 73	1	Control	3	3.04788e5	7.926	5.00000
#*	662917 LMB	Vial 74	1	Control	4	3.48541e5	8.334	5.00000
#*	1918373001 1K	Vial 75	1	Sample	5	3.63966e5	8.508	5000.00000
#*	1918373002	Vial 76	1	Sample	6	2.42366e5	8.286	5.00000
#*	1918373003 10K	Vial 77	1	Sample	7	3.61021e5	8.485	5.00000e4
#*	1918373004	Vial 78	1	Sample	8	1.04173e5	7.500	5.00000
#*	1918373005	Vial 79	1	Sample	9	2.68459e5	7.947	5.00000
#*	662919 183735S	Vial 80	1	Sample	10	2.38297e5	7.944	5.00000
#*	662920 183735D	Vial 81	1	Sample	11	3.01318e5	7.949	5.00000
#*	1918373006	Vial 82	1	Sample	12	2.95413e5	7.964	5.00000
#*	1918373007	Vial 83	1	Sample	13	2.56579e5	7.688	5.00000
#*	1918373008 10K	Vial 84	1	Sample	14	2.93278e5	8.572	5.00000e4
#*	1918373009 10	Vial 85	1	Sample	15	2.92692e5	8.542	50.00000
#*	1918525001 100	Vial 86	1	Sample	16	3.52862e5	8.475	500.00000
#*	1918525002 10	Vial 87	1	Sample	18	2.85701e5	7.853	50.00000
#*	1918525003	Vial 88	1	Sample	19	2.65508e5	7.924	5.00000
#*	662921 CCV@25	Vial 71	1	Control	20	2.86769e5	8.351	5.00000
#*	1918525004 1K	Vial 89	1	Sample	21	2.52353e5	8.562	5000.00000
#*	1918682001	Vial 90	1	Sample	22	3.29023e5	7.998	5.00000
#*	1918682002	Vial 91	1	Sample	23	2.95991e5	7.971	5.00000
#*	1918682003	Vial 92	1	Sample	24	3.47869e5	7.583	5.00000
#*	1918682004 100	Vial 93	1	Sample	25	3.34219e5	8.521	500.00000
#*	1918682005	Vial 94	1	Sample	26	2.68839e5	7.545	5.00000
#*	1918373004 4X	Vial 95	1	Sample	27	2.74118e5	7.639	20.00000
*	662922 CCV@25	Vial 71	1	Control	28	2.77422e5	8.334	5.00000

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\10JUL19D.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	662914 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	662915 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	662916 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	662917 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1918373001 1K	CLO4-AQN	1	Sample		
6	Vial 76	1918373002	CLO4-AQN	1	Sample		
7	Vial 77	1918373003 10K	CLO4-AQN	1	Sample		
8	Vial 78	1918373004	CLO4-AQN	1	Sample		
9	Vial 79	1918373005	CLO4-AQN	1	Sample		
10	Vial 80	662919 183735S	CLO4-AQN	1	Sample		
11	Vial 81	662920 183735D	CLO4-AQN	1	Sample		
12	Vial 82	1918373006	CLO4-AQN	1	Sample		
13	Vial 83	1918373007	CLO4-AQN	1	Sample		
14	Vial 84	1918373008 10K	CLO4-AQN	1	Sample		
15	Vial 85	1918373009 10	CLO4-AQN	1	Sample		
16	Vial 86	1918525001 100	CLO4-AQN	1	Sample		
17	Vial 71	662921 CCV@25	CLO4-AQN	1	Ctrl Samp		
18	Vial 87	1918525002 10	CLO4-AQN	1	Sample		
19	Vial 88	1918525003	CLO4-AQN	1	Sample		
20	Vial 71	662921 CCV@25	CLO4-AQN	1	Ctrl Samp		
21	Vial 89	1918525004 1K	CLO4-AQN	1	Sample		
22	Vial 90	1918682001	CLO4-AQN	1	Sample		
23	Vial 91	1918682002	CLO4-AQN	1	Sample		
24	Vial 92	1918682003	CLO4-AQN	1	Sample		
25	Vial 93	1918682004 100	CLO4-AQN	1	Sample		
26	Vial 94	1918682005	CLO4-AQN	1	Sample		
27	Vial 95	1918373004 4X	CLO4-AQN	1	Sample		
28	Vial 71	662922 CCV@25	CLO4-AQN	1	Ctrl Samp		

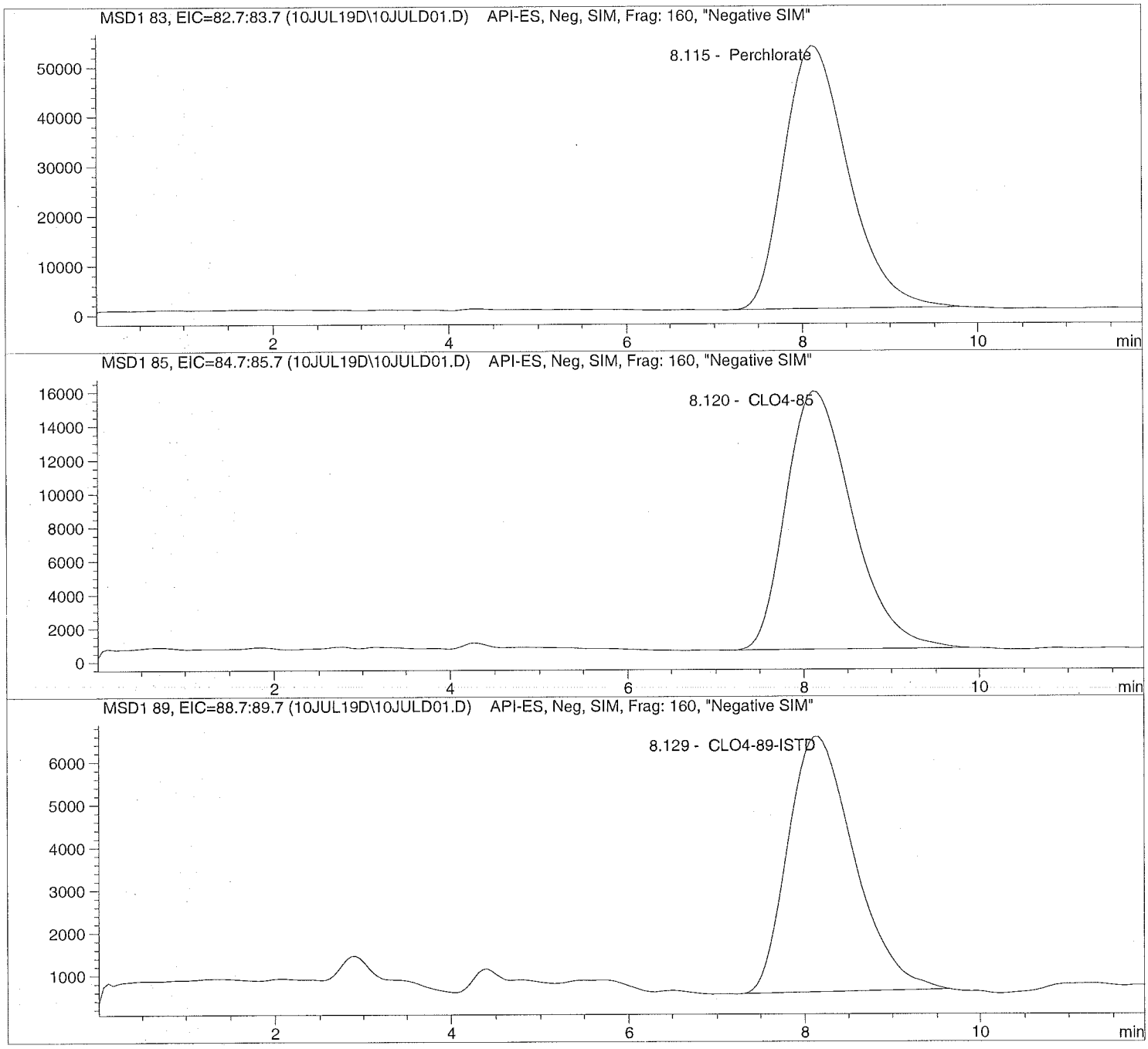
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD01.D Sample Name: 662914 CCV@25

Injection Date:	7/10/2019 08:48:22	Seq Line:	1
Sample Name:	662914 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD01.D Sample Name: 662914 CCV@25

Injection Date:	7/10/2019 08:48:22	Seq Line:	1
Sample Name:	662914 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.115	PBA	2685752.5	26.0529	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.120	PBA	800069.3	26.1488	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.129	PBA	312850.3	5.0000	CLO4-89-ISTD

*** End of Report ***

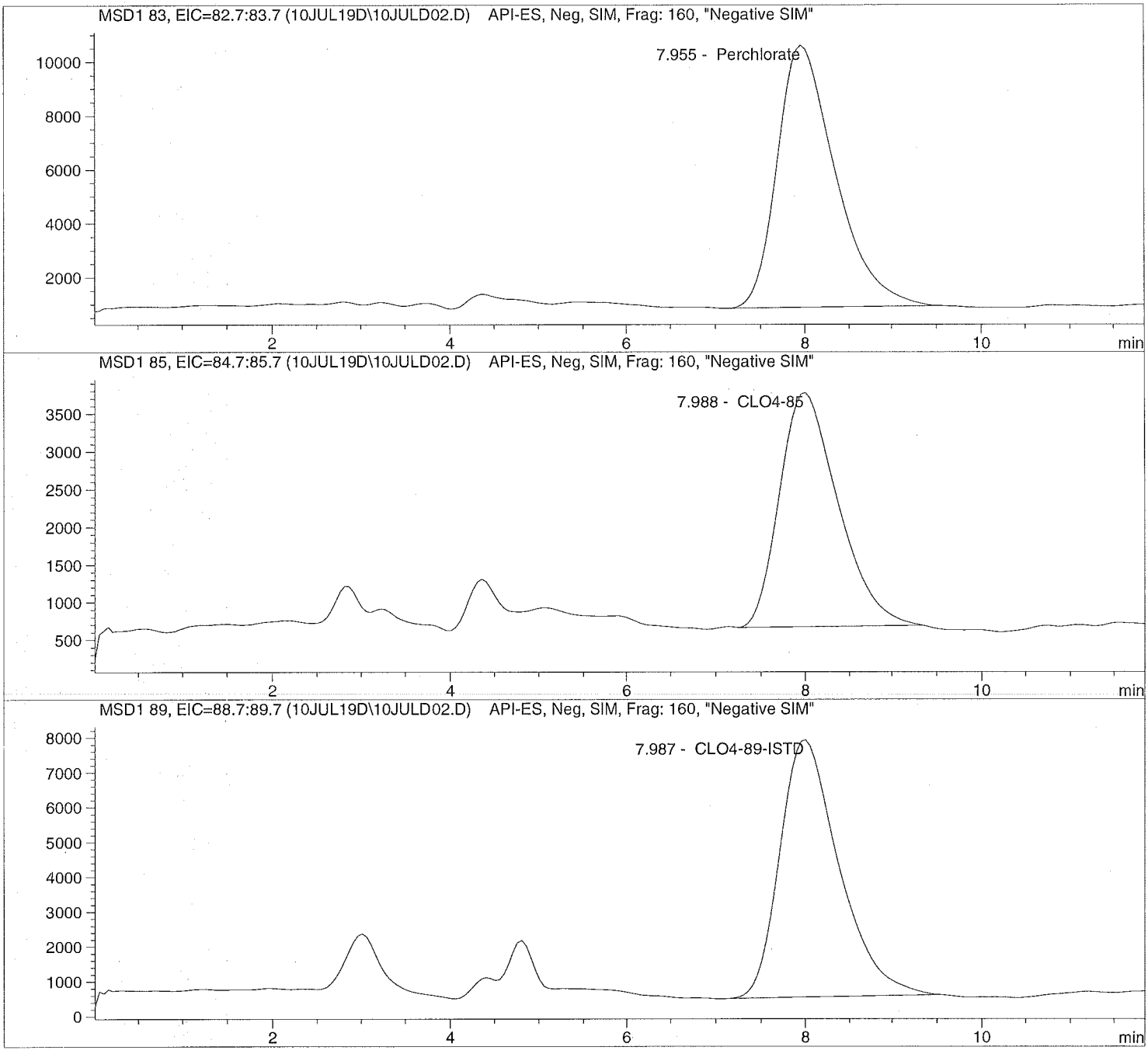
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD02.D Sample Name: 662915 QC@4.0

Injection Date:	7/10/2019 09:03:50	Seq Line:	2
Sample Name:	662915 QC@4.0	Location:	Vial 72
Acq Operator:	TNB RLVS	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD02.D Sample Name: 662915 QC@4.0

Injection Date:	7/10/2019 09:03:50	Seq Line:	2
Sample Name:	662915 QC@4.0	Location:	Vial 72
Acq Operator:	TNB RLVS	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.955	PBA	444100.1	4.2494	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.988	PBA	143143.3	4.4618	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.987	PBA	343351.4	5.0000	CLO4-89-ISTD

*** End of Report ***

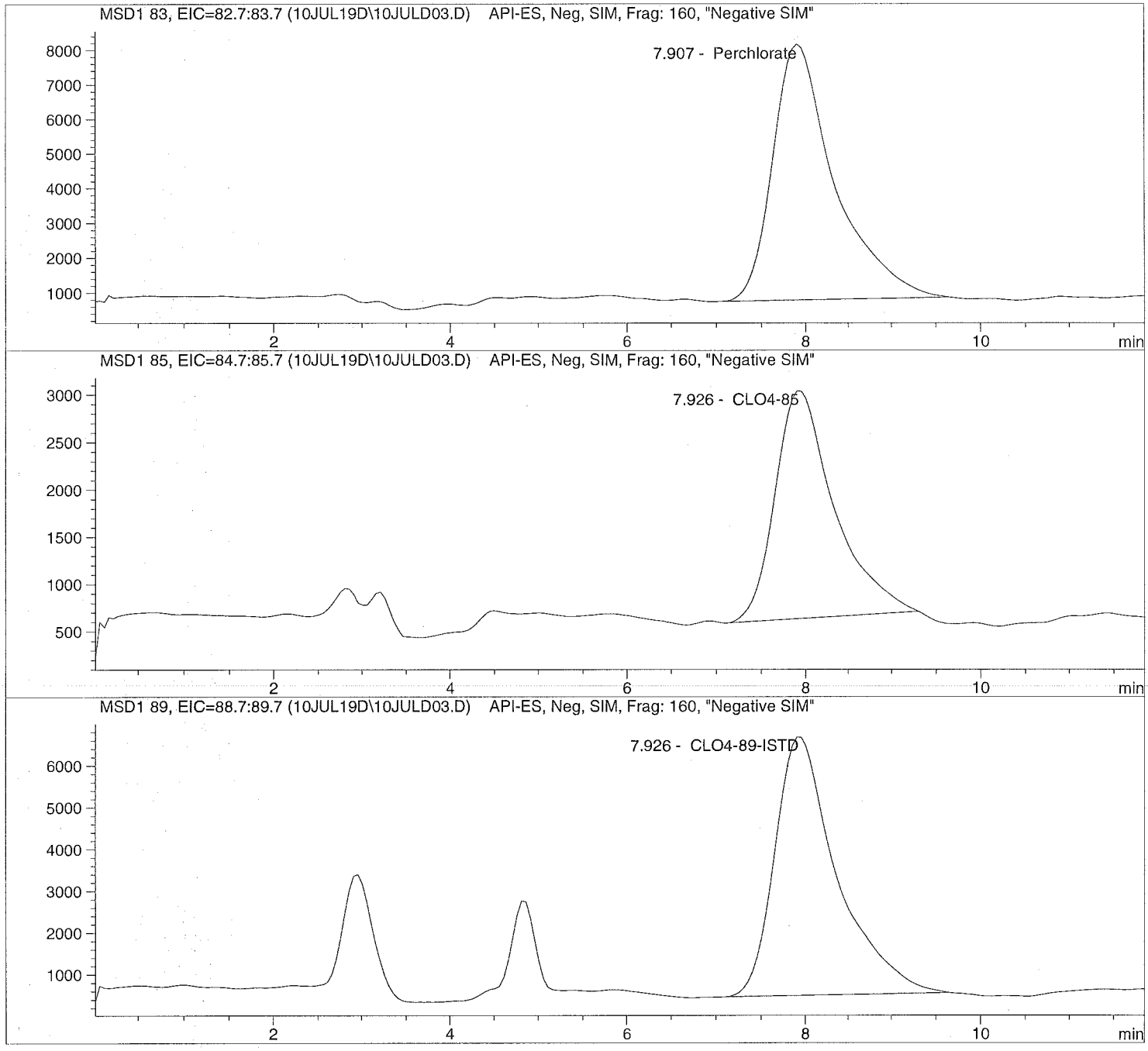
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD03.D Sample Name: 662916 ICS@4.0

Injection Date:	7/10/2019 09:17:42	Seq Line:	3
Sample Name:	662916 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD03.D Sample Name: 662916 ICS@4.0

Injection Date:	7/10/2019 09:17:42	Seq Line:	3
Sample Name:	662916 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.907	PBA	360514.4	3.9024	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.926	PBA	113239.5	3.9799	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.926	PBA	304787.5	5.0000	CLO4-89-ISTD

*** End of Report ***

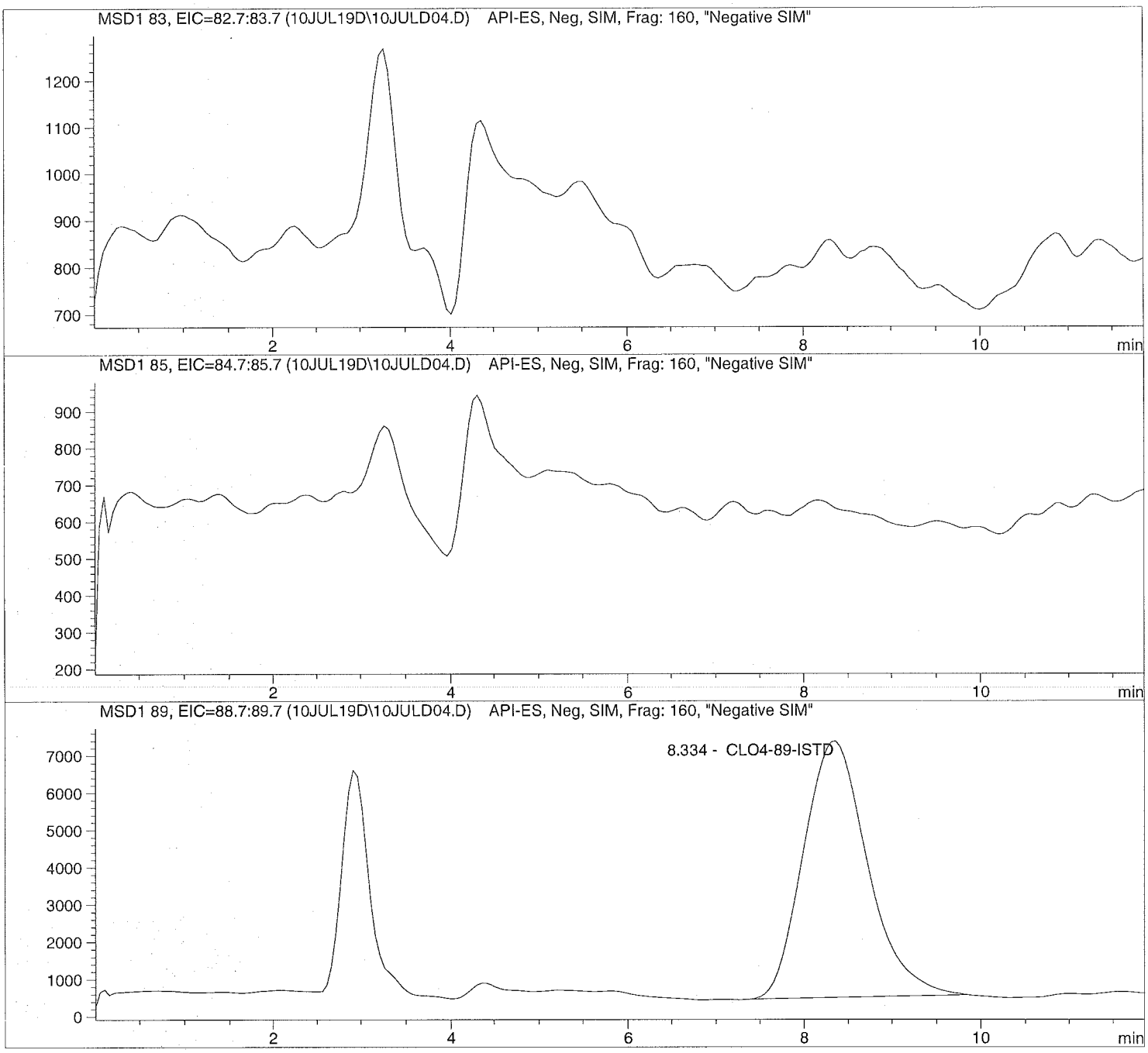
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD04.D Sample Name: 662917 LMB

Injection Date:	7/10/2019 09:31:38	Seq Line:	4
Sample Name:	662917 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD04.D Sample Name: 662917 LMB

Injection Date:	7/10/2019 09:31:38	Seq Line:	4
Sample Name:	662917 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.334	PBA	348541.0	5.0000	CLO4-89-ISTD

*** End of Report ***

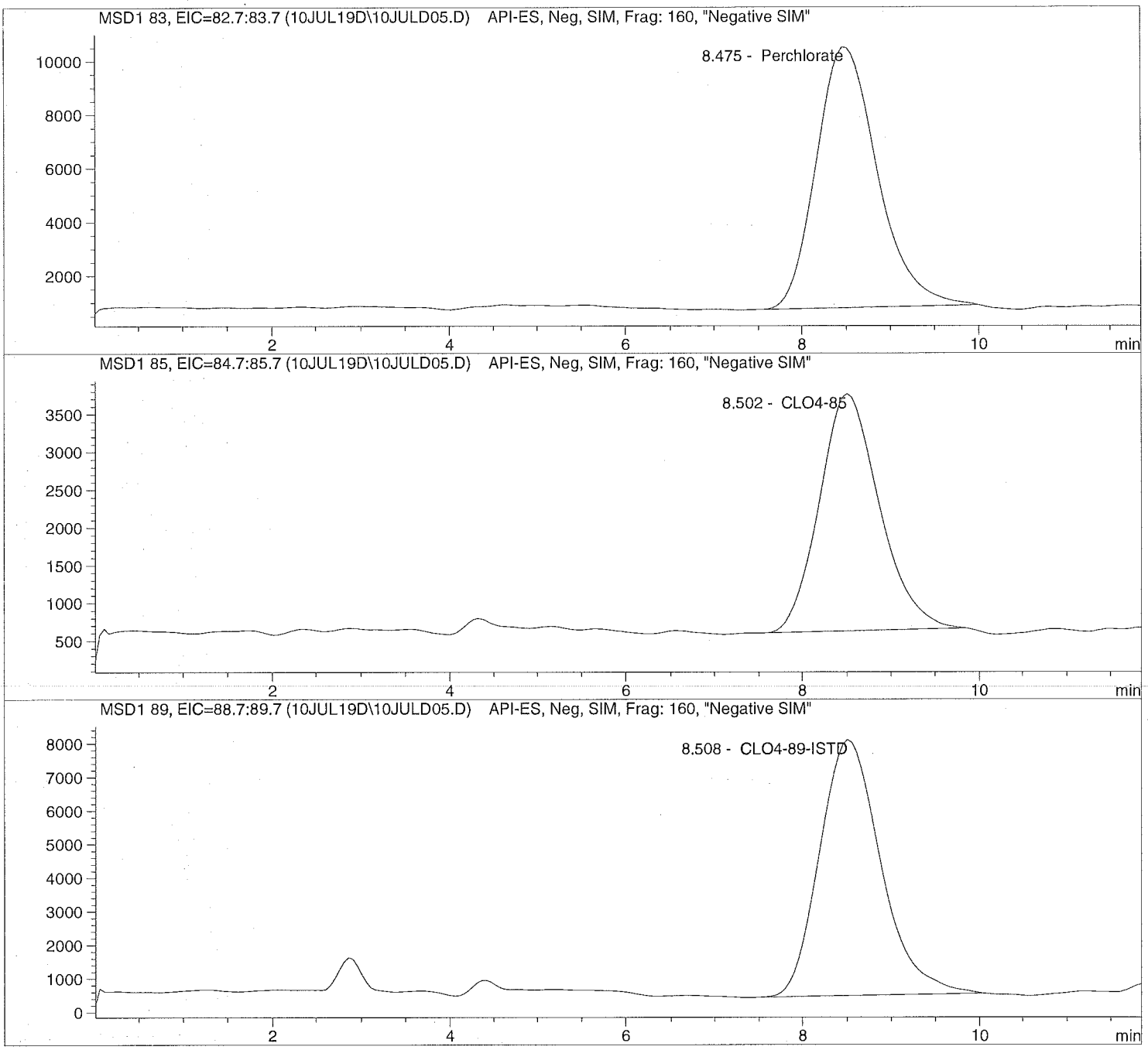
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD05.D Sample Name: 1918373001 1K

Injection Date:	7/10/2019 09:45:31	Seq Line:	5
Sample Name:	1918373001 1K	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD05.D Sample Name: 1918373001 1K

Injection Date:	7/10/2019 09:45:31	Seq Line:	5
Sample Name:	1918373001 1K	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.475	PBA	464595.3	4196.2559	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	PBA	147349.9	4333.7991	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.508	PBA	363966.2	5000.0000	CLO4-89-ISTD

*** End of Report ***

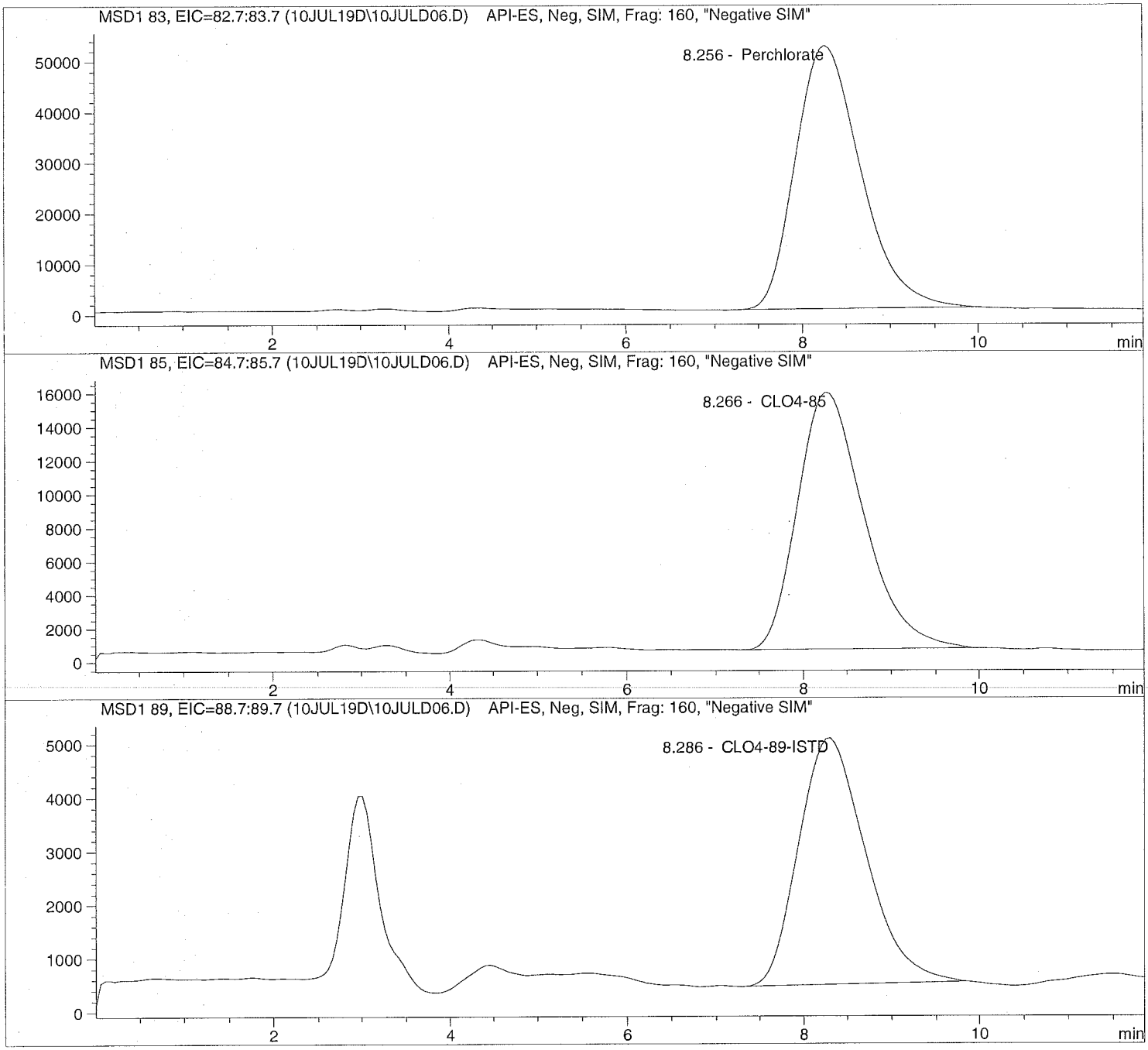
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD06.D Sample Name: 1918373002

Injection Date:	7/10/2019 09:59:30	Seq Line:	6
Sample Name:	1918373002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD06.D Sample Name: 1918373002

Injection Date:	7/10/2019 09:59:30	Seq Line:	6
Sample Name:	1918373002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.256	PBA	2674385.0	32.9586	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.266	PBA	800737.1	33.2843	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.286	PBA	242366.0	5.0000	CLO4-89-ISTD

*** End of Report ***

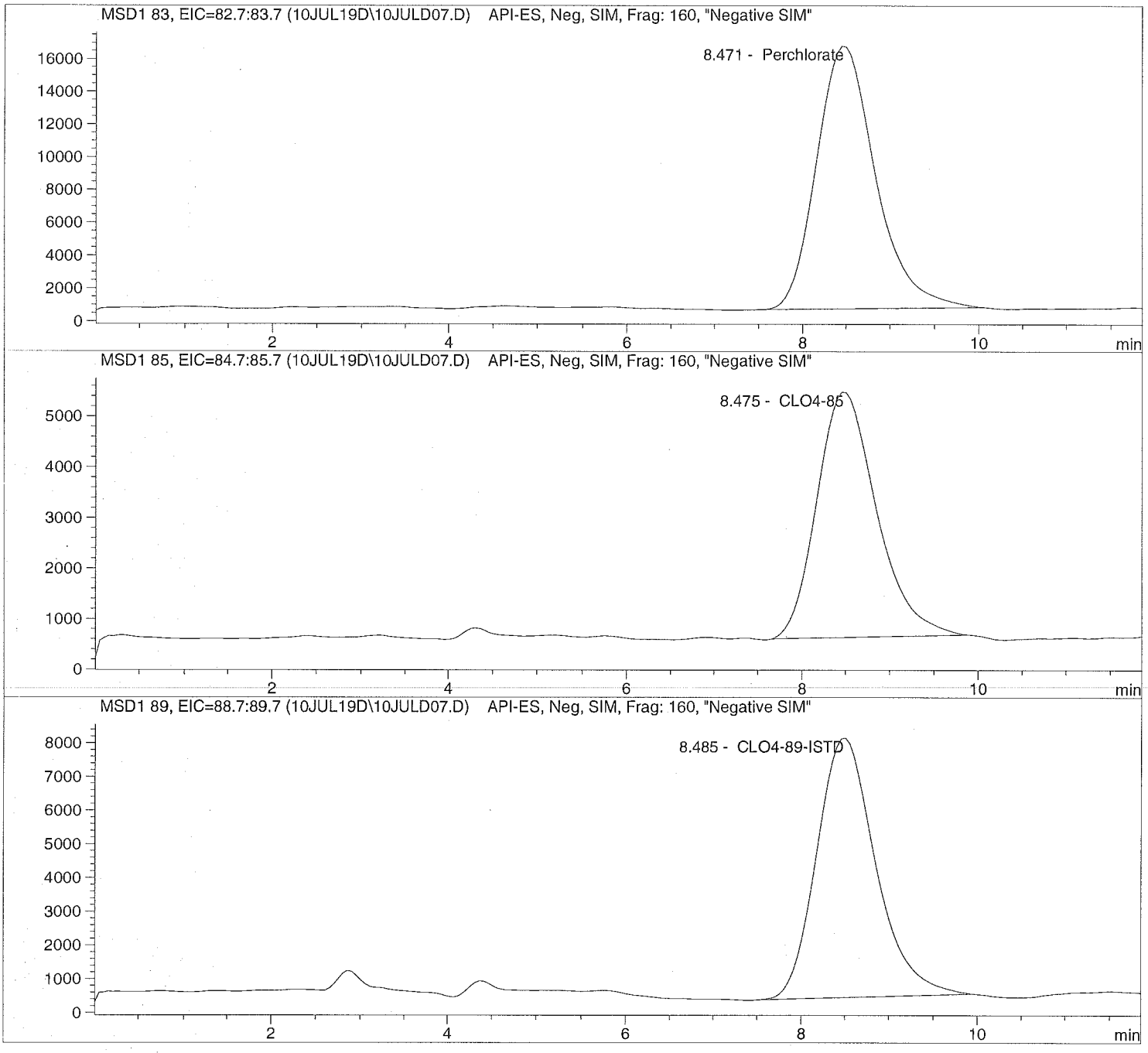
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD07.D Sample Name: 1918373003 10K

Injection Date:	7/10/2019 10:13:27	Seq Line:	7
Sample Name:	1918373003 10K	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD07.D Sample Name: 1918373003 10K

Injection Date:	7/10/2019 10:13:27	Seq Line:	7
Sample Name:	1918373003 10K	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.471	PBA	750172.8	66955.2143	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.475	PBA	230473.2	68000.4573	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.485	PBA	361021.3	50000.0000	CLO4-89-ISTD

*** End of Report ***

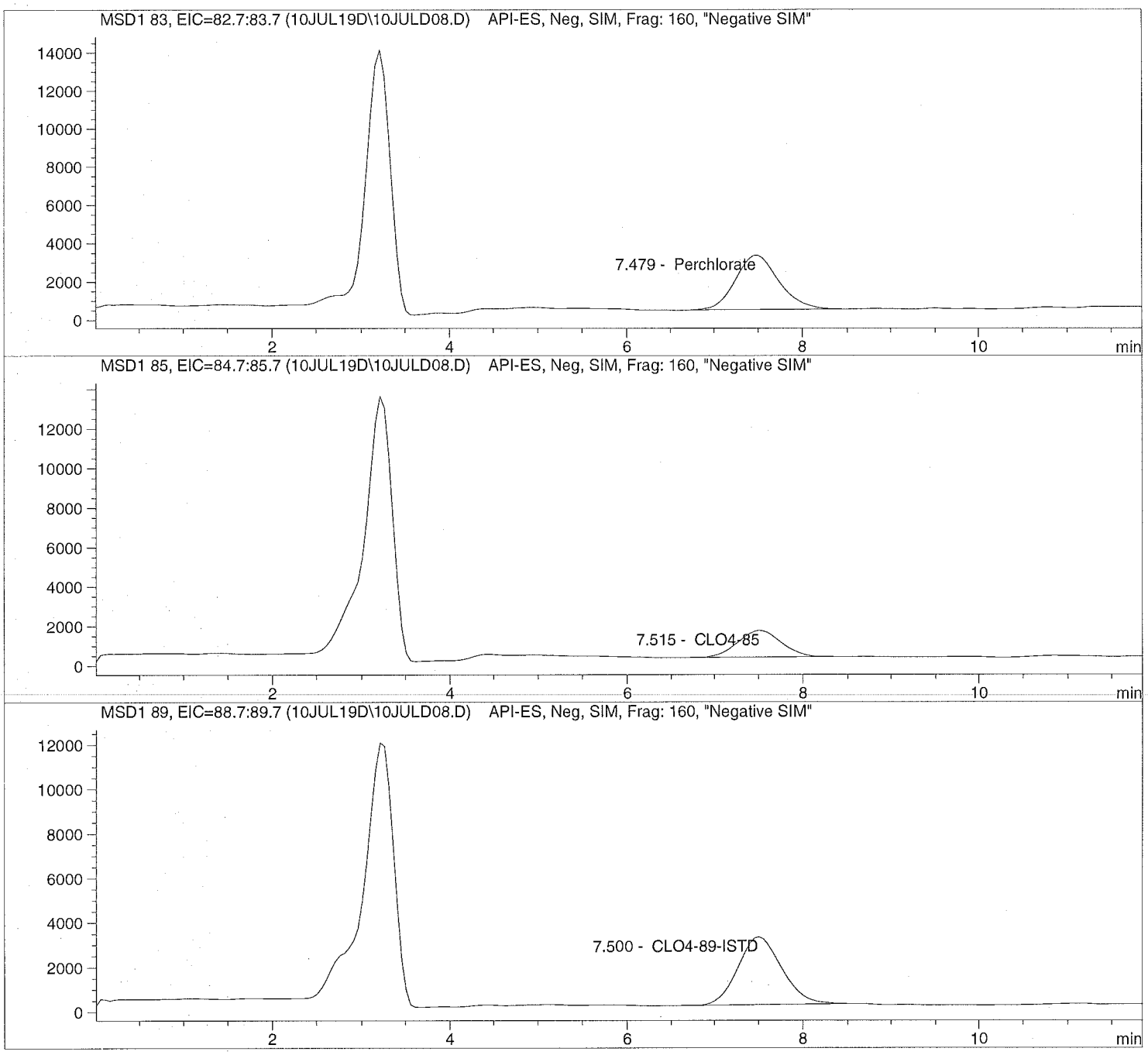
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD08.D Sample Name: 1918373004

Injection Date:	7/10/2019 10:27:21	Seq Line:	8
Sample Name:	1918373004	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD08.D Sample Name: 1918373004

Injection Date:	7/10/2019 10:27:21	Seq Line:	8
Sample Name:	1918373004	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.479	PBA	95969.8	3.0796	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.515	PBA	46048.0	4.7283	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.500	PBA	104173.2	5.0000	CLO4-89-ISTD

*** End of Report ***

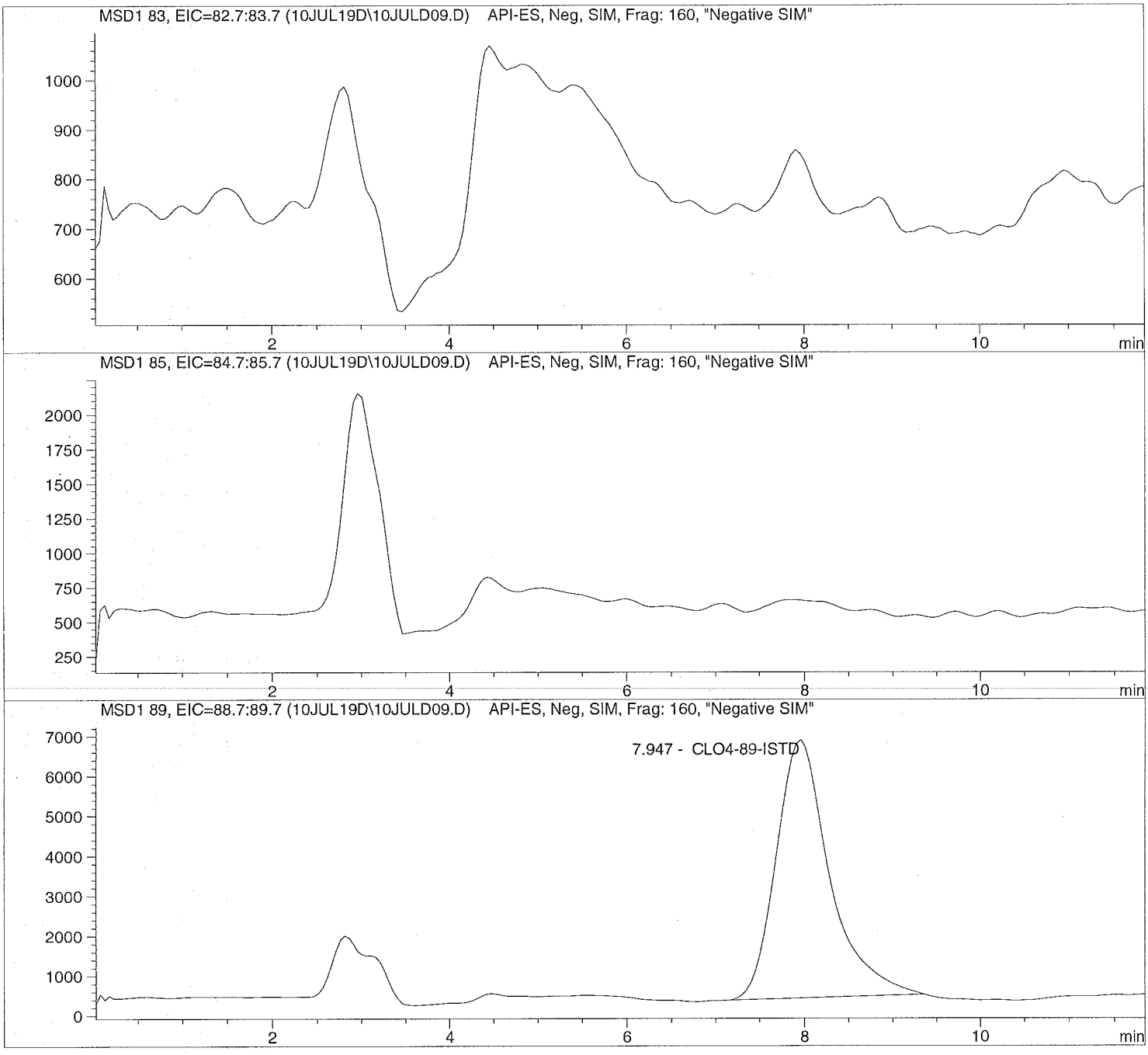
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD09.D Sample Name: 1918373005

Injection Date:	7/10/2019 10:41:15	Seq Line:	9
Sample Name:	1918373005	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD09.D Sample Name: 1918373005

Injection Date:	7/10/2019 10:41:15	Seq Line:	9
Sample Name:	1918373005	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.947	PBA	268458.6	5.0000	CLO4-89-ISTD

*** End of Report ***

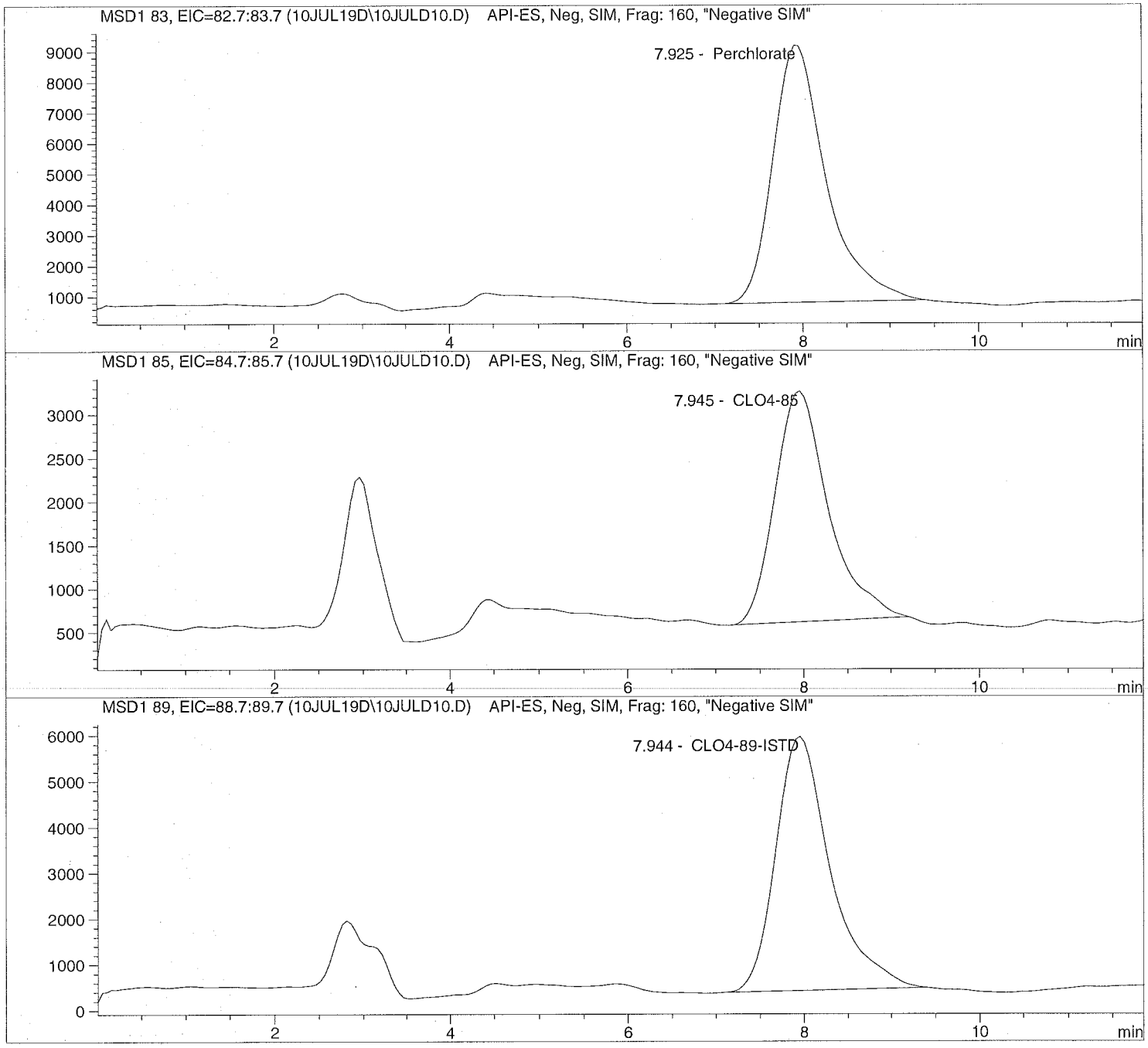
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD10.D Sample Name: 662919 183735S

Injection Date:	7/10/2019 10:55:10	Seq Line:	10
Sample Name:	662919 183735S	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD10.D Sample Name: 662919 183735S

Injection Date:	7/10/2019 10:55:10	Seq Line:	10
Sample Name:	662919 183735S	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.925	PBA	355093.0	4.8652	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.945	PBA	112035.2	5.0261	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.944	PBA	238297.3	5.0000	CLO4-89-ISTD

*** End of Report ***

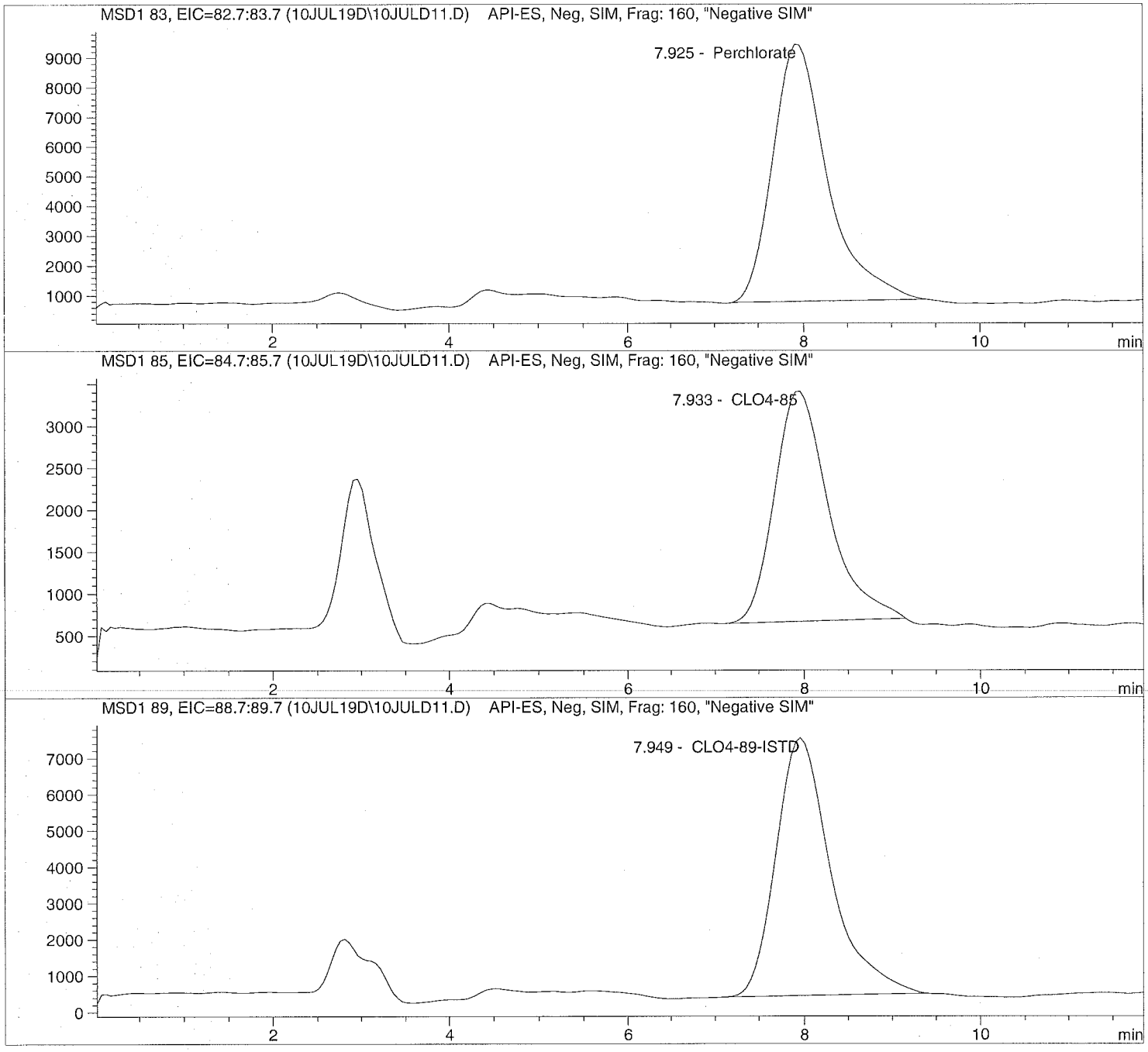
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD11.D Sample Name: 662920 183735D

Injection Date:	7/10/2019 11:09:12	Seq Line:	11
Sample Name:	662920 183735D	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD11.D Sample Name: 662920 183735D

Injection Date:	7/10/2019 11:09:12	Seq Line:	11
Sample Name:	662920 183735D	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.925	PBA	366789.0	4.0106	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.933	BBA	115346.9	4.0997	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.949	PBA	301317.7	5.0000	CLO4-89-ISTD

*** End of Report ***

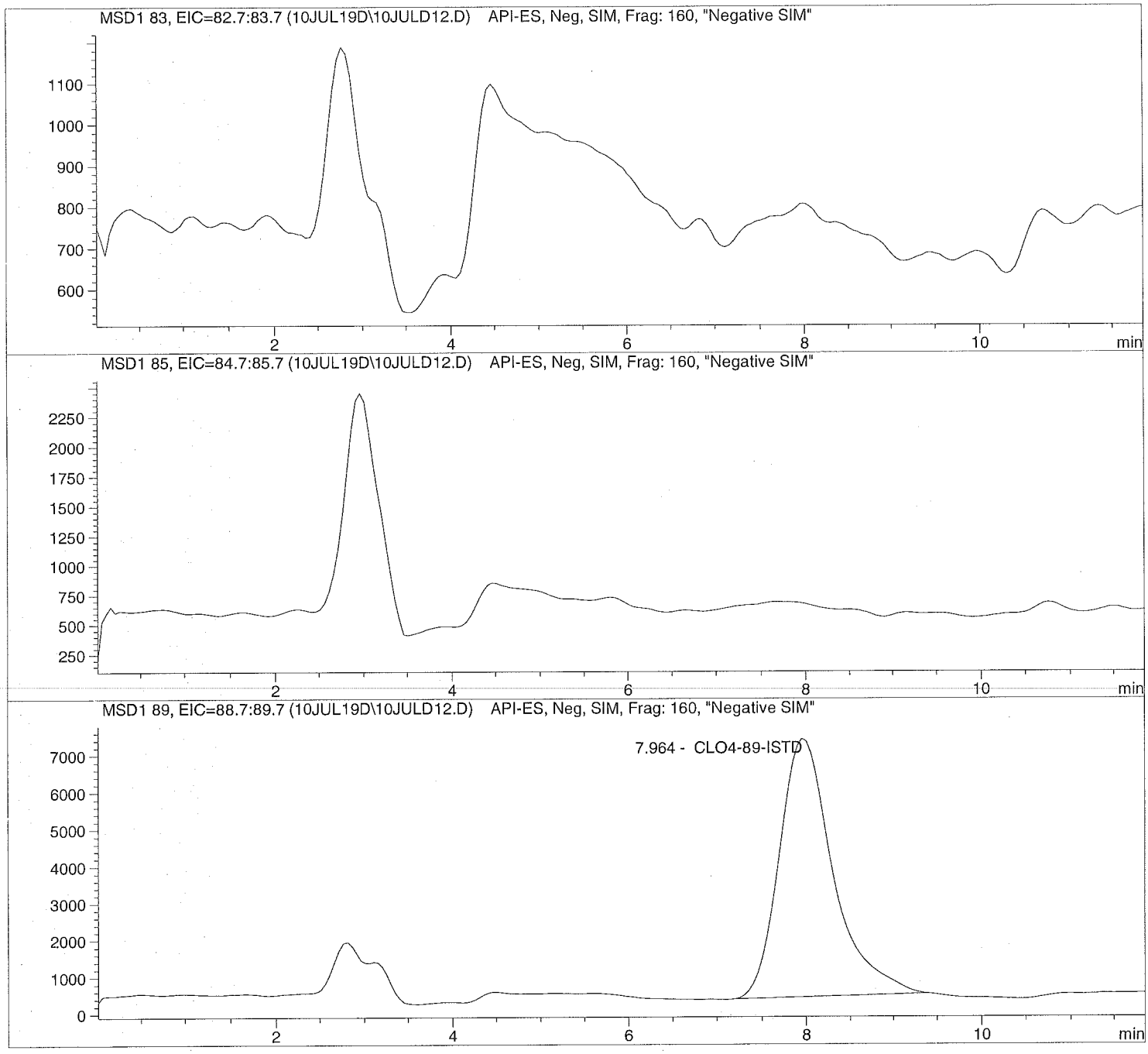
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD12.D Sample Name: 1918373006

Injection Date:	7/10/2019 11:23:04	Seq Line:	12
Sample Name:	1918373006	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD12.D Sample Name: 1918373006

Injection Date:	7/10/2019 11:23:04	Seq Line:	12
Sample Name:	1918373006	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.964	PBA	295412.9	5.0000	CLO4-89-ISTD

*** End of Report ***

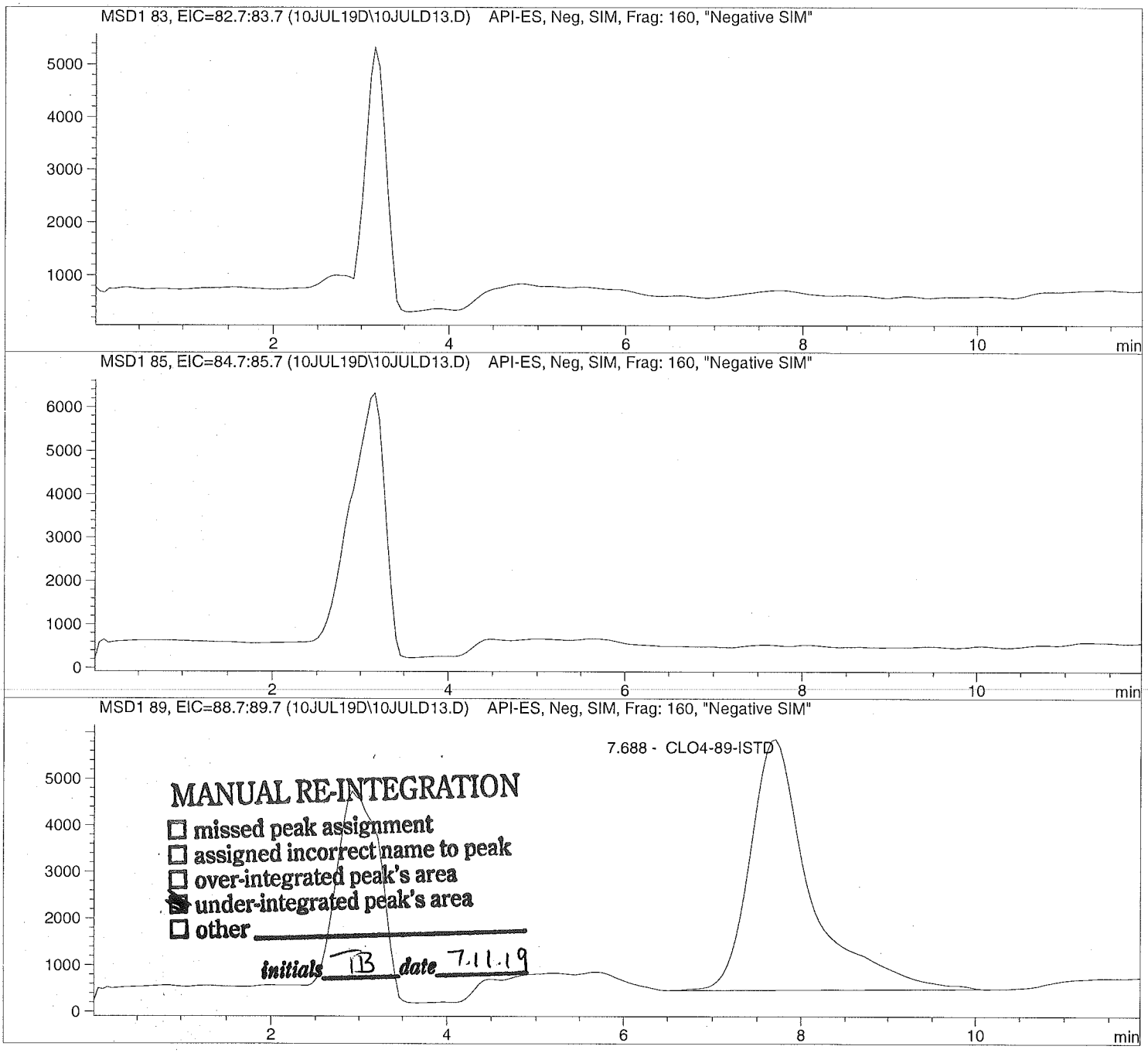
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD13.D Sample Name: 1918373007

Injection Date:	7/10/2019 11:36:55	Seq Line:	13
Sample Name:	1918373007	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD13.D Sample Name: 1918373007

Injection Date:	7/10/2019 11:36:55	Seq Line:	13
Sample Name:	1918373007	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.688	MM	256579.0	5.0000	CLO4-89-ISTD

*** End of Report ***

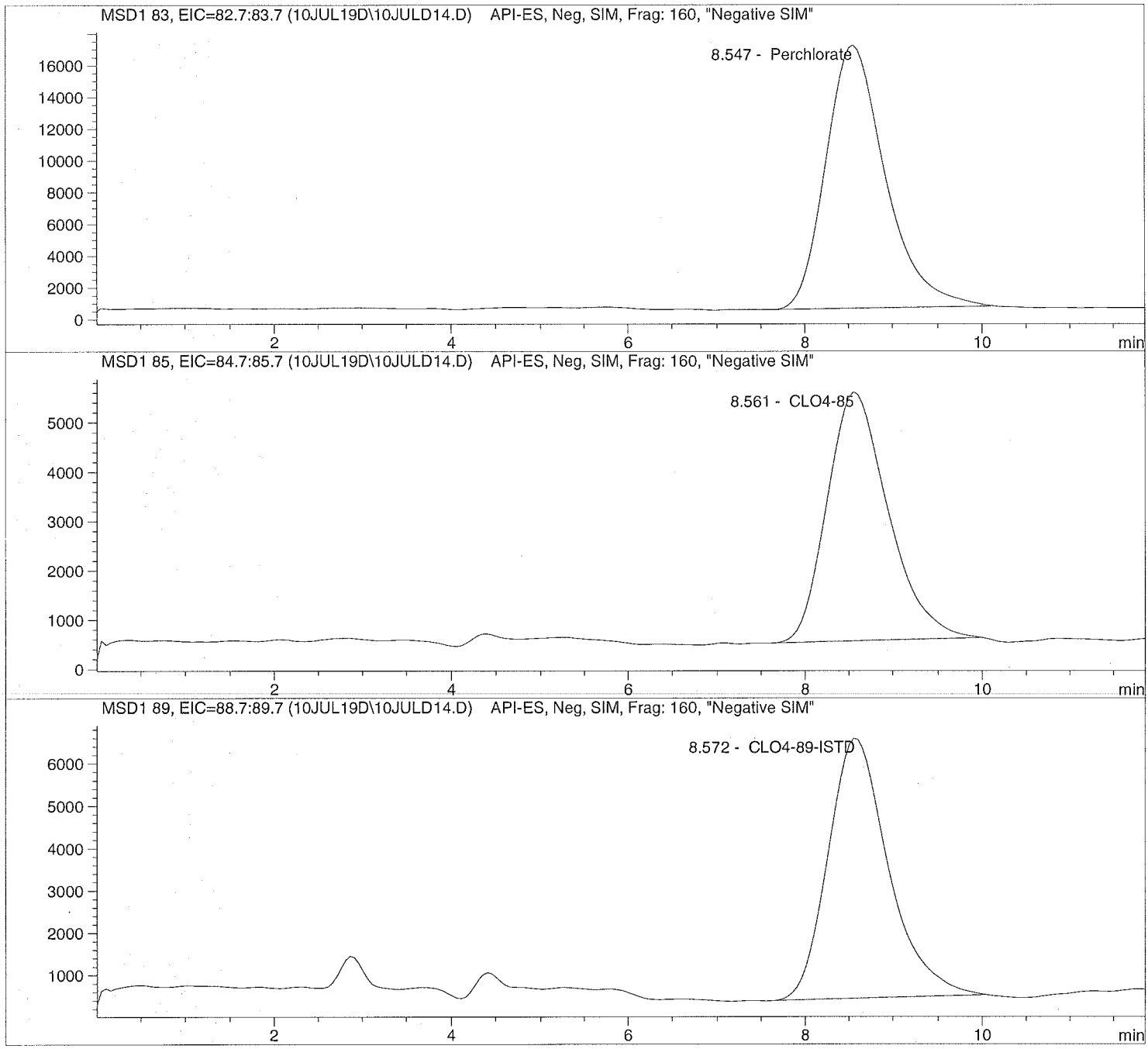
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD14.D Sample Name: 1918373008 10K

Injection Date:	7/10/2019 11:50:45	Seq Line:	14
Sample Name:	1918373008 10K	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD14.D Sample Name: 1918373008 10K

Injection Date:	7/10/2019 11:50:45	Seq Line:	14
Sample Name:	1918373008 10K	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.547	PBA	780844.1	85012.5764	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.561	PBA	243152.5	87944.5239	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.572	PBA	293278.4	50000.0000	CLO4-89-ISTD

*** End of Report ***

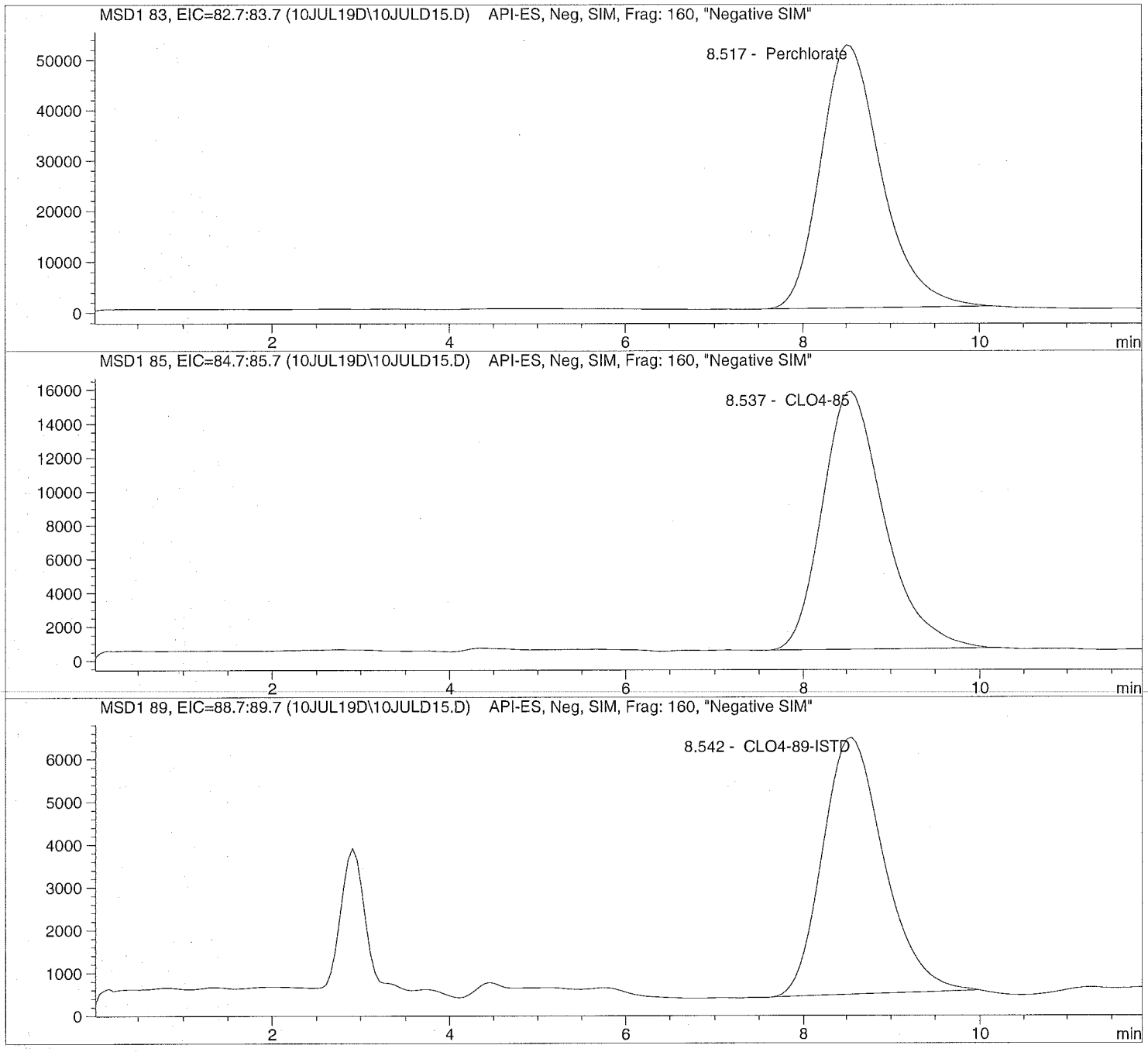
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD15.D Sample Name: 1918373009 10

Injection Date:	7/10/2019 12:04:37	Seq Line:	15
Sample Name:	1918373009 10	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD15.D Sample Name: 1918373009 10

Injection Date:	7/10/2019 12:04:37	Seq Line:	15
Sample Name:	1918373009 10	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.517	PBA	2500331.5	259.3213	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.537	PBA	749555.3	261.8322	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.542	PBA	292692.1	50.0000	CLO4-89-ISTD

*** End of Report ***

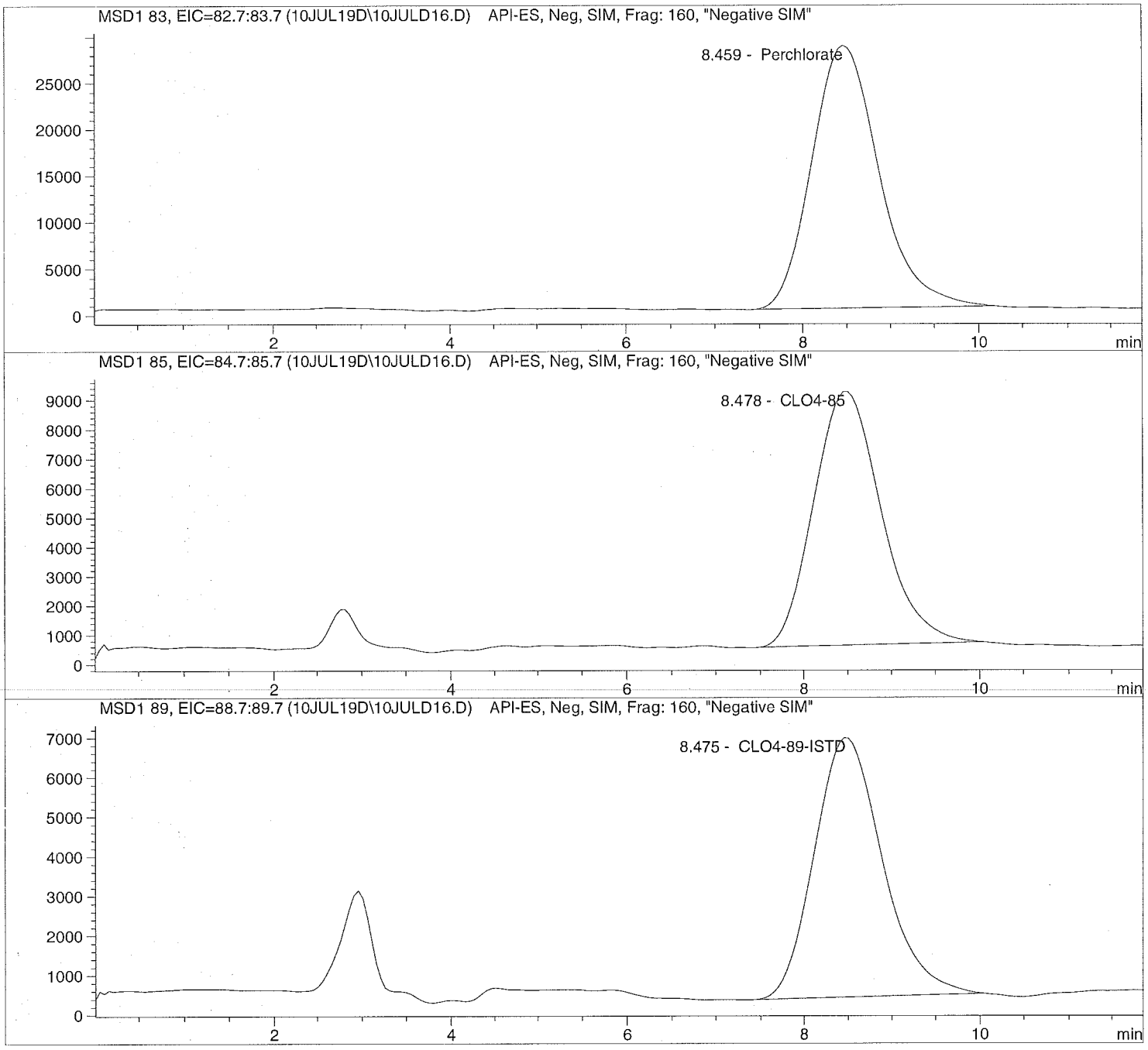
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD16.D Sample Name: 1918525001 100

Injection Date:	7/10/2019 12:18:38	Seq Line:	16
Sample Name:	1918525001 100	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD16.D Sample Name: 1918525001 100

Injection Date:	7/10/2019 12:18:38	Seq Line:	16
Sample Name:	1918525001 100	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.459	PBA	1501595.1	1335.1619	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.478	PBA	461811.6	1373.7604	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.475	PBA	352862.3	500.0000	CLO4-89-ISTD

*** End of Report ***

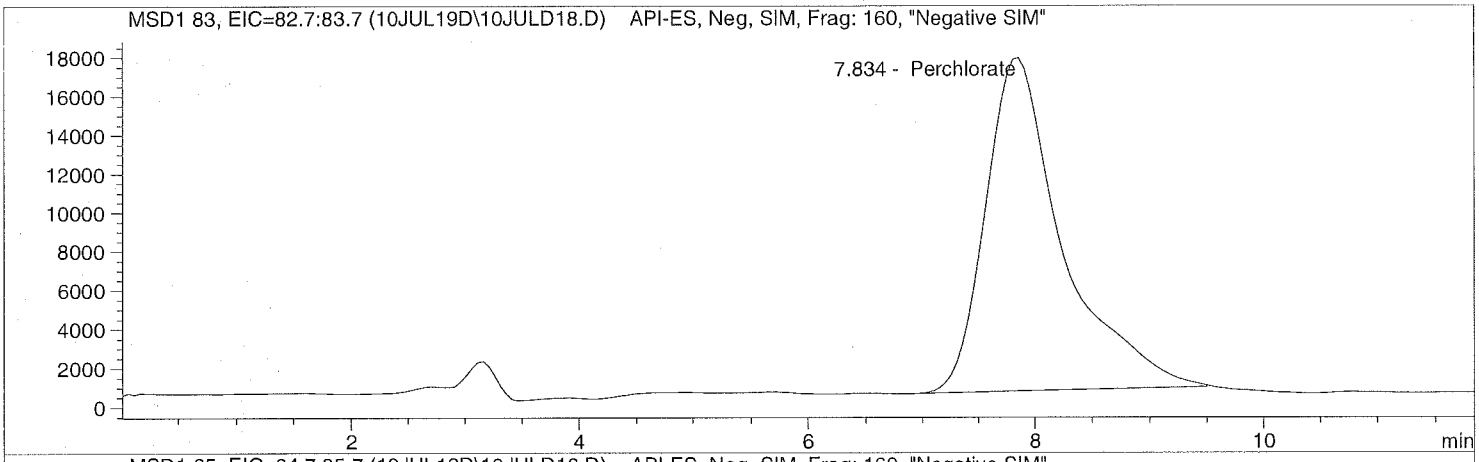
RIGHT SOLUTIONS | RIGHT PARTNER

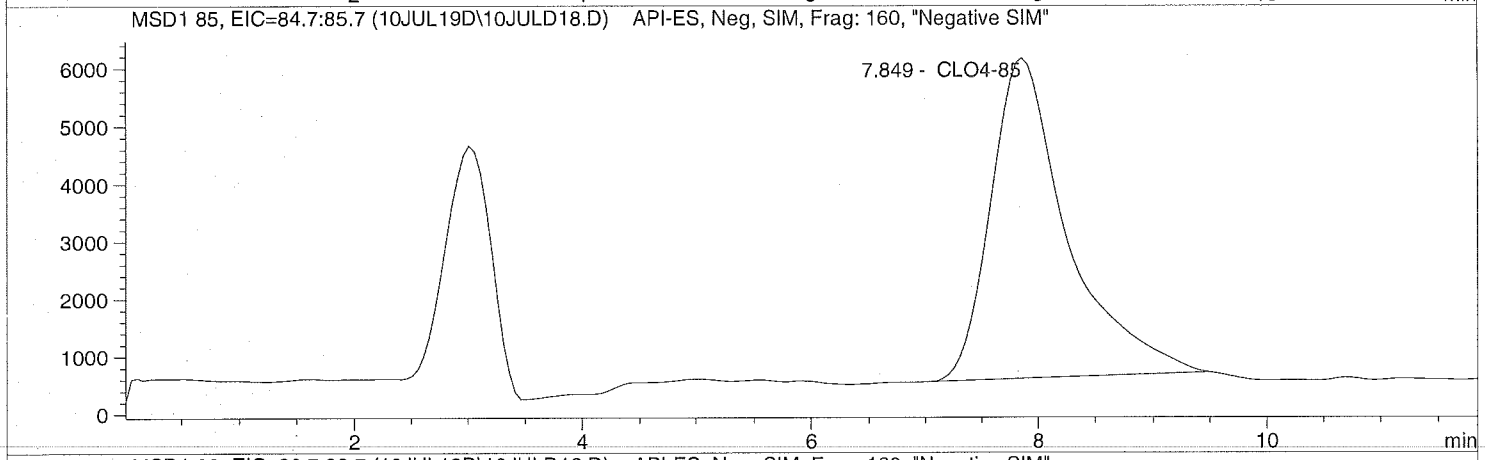
Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD18.D Sample Name: 1918525002 10

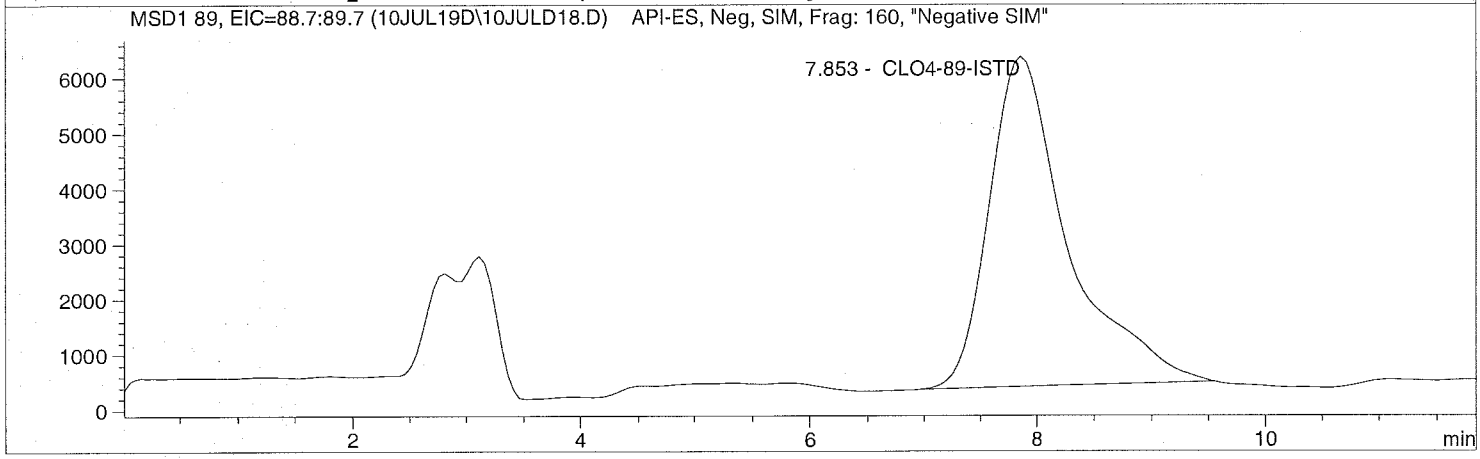
Injection Date:	7/10/2019 12:46:22	Seq Line:	18
Sample Name:	1918525002 10	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD18.D Sample Name: 1918525002 10

Injection Date:	7/10/2019 12:46:22	Seq Line:	18
Sample Name:	1918525002 10	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.834	PBA	801472.4	89.4028	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.849	PBA	259266.4	96.0941	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.853	PBA	285700.9	50.0000	CLO4-89-ISTD

*** End of Report ***

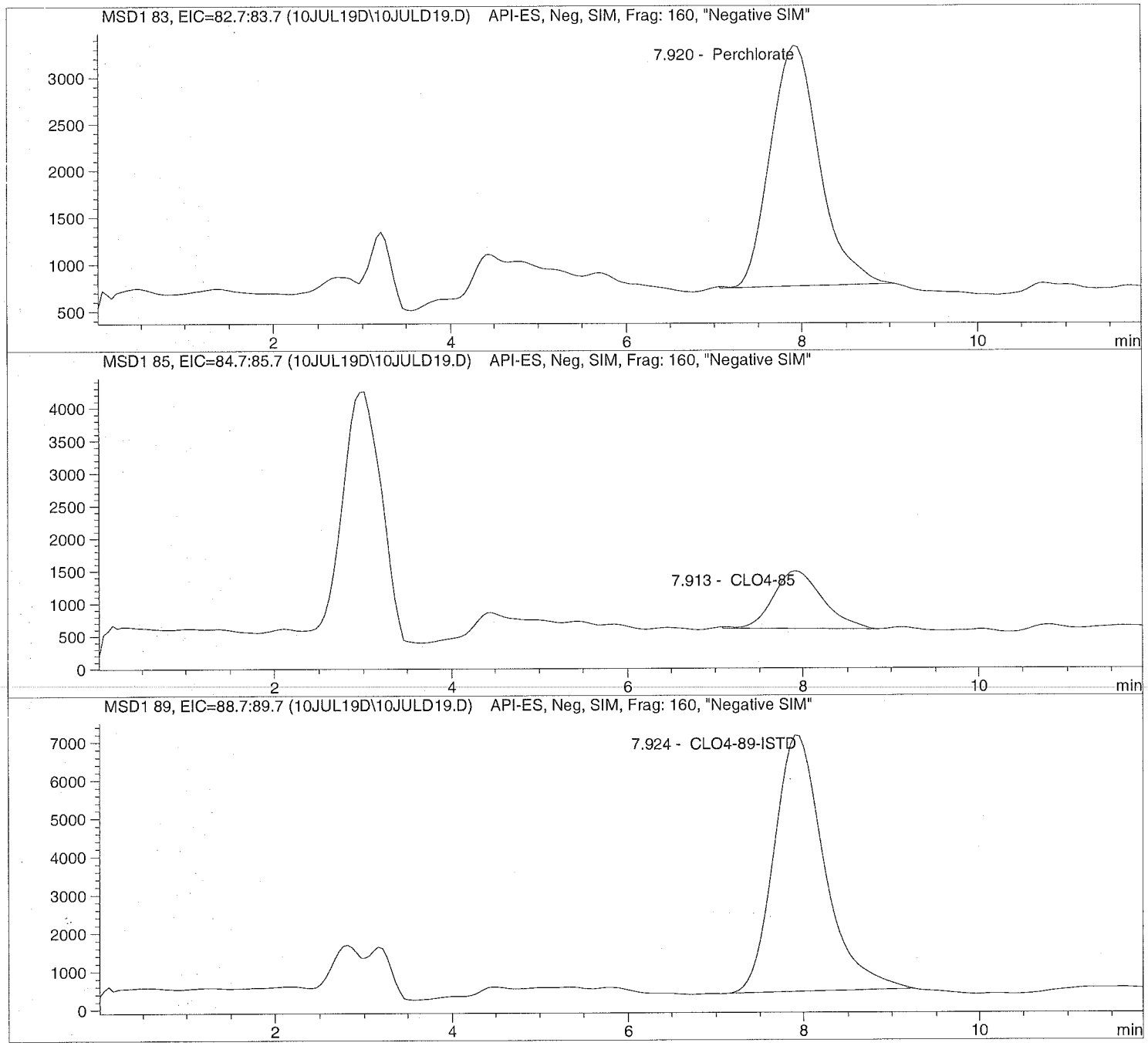
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD19.D Sample Name: 1918525003

Injection Date:	7/10/2019 13:00:15	Seq Line:	19
Sample Name:	1918525003	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD19.D Sample Name: 1918525003

Injection Date:	7/10/2019 13:00:15	Seq Line:	19
Sample Name:	1918525003	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.920	BBA	99719.0	1.3533	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.913	BBA	34459.2	1.3947	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.924	PBA	265508.1	5.0000	CLO4-89-ISTD

*** End of Report ***

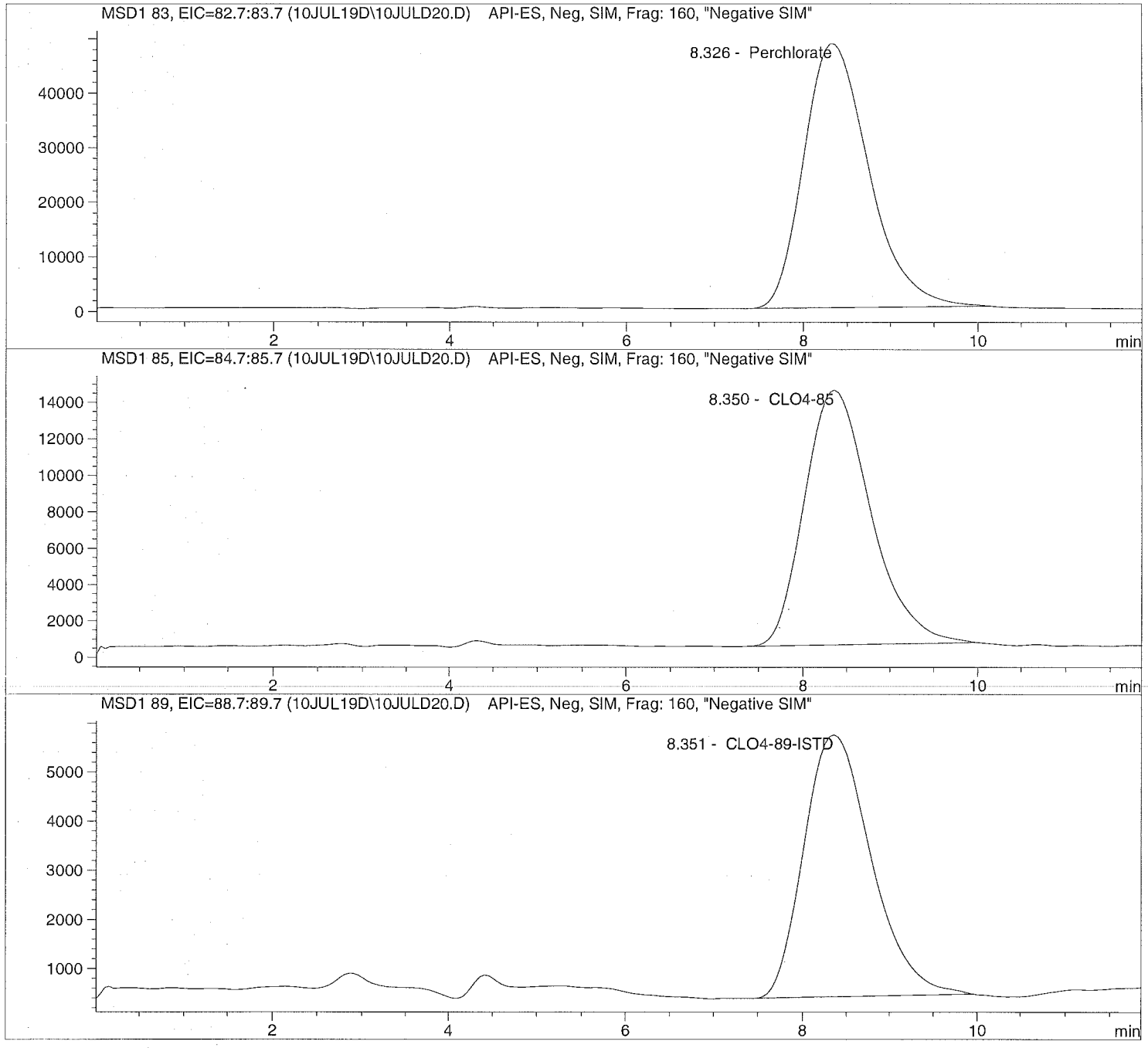
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD20.D Sample Name: 662921 CCV@25

Injection Date:	7/10/2019 13:15:33	Seq Line:	20
Sample Name:	662921 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD20.D Sample Name: 662921 CCV@25

Injection Date:	7/10/2019 13:15:33	Seq Line:	20
Sample Name:	662921 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.326	PBA	2504544.8	26.4781	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.350	PBA	743673.1	26.4969	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.351	PBA	286769.0	5.0000	CLO4-89-ISTD

*** End of Report ***

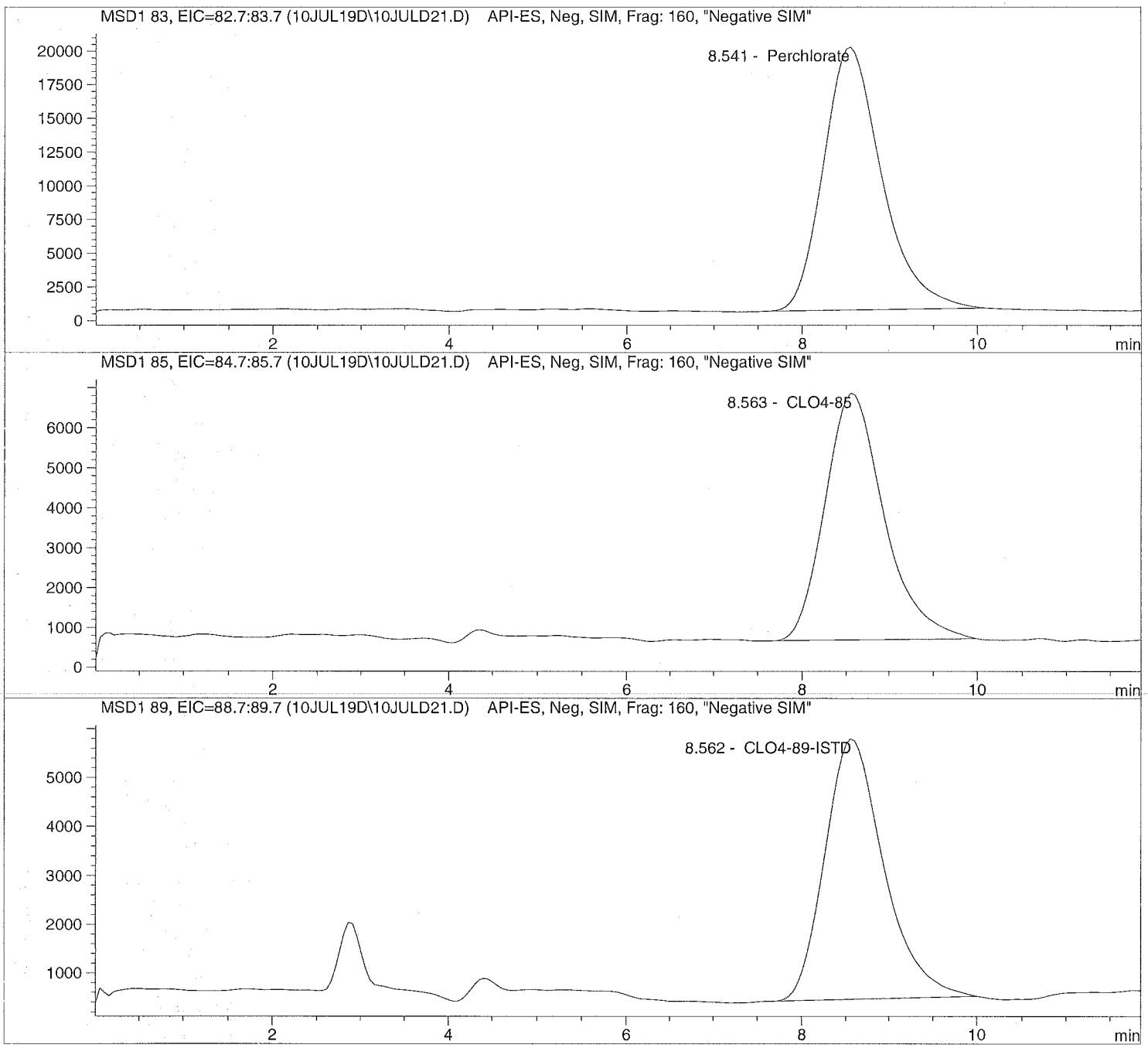
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD21.D Sample Name: 1918525004 1K

Injection Date:	7/10/2019 13:39:18	Seq Line:	21
Sample Name:	1918525004 1K	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD21.D Sample Name: 1918525004 1K

Injection Date:	7/10/2019 13:39:18	Seq Line:	21
Sample Name:	1918525004 1K	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.541	PBA	911870.8	11409.0284	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.563	PBA	292673.1	12213.3165	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.562	PBA	252353.5	5000.0000	CLO4-89-ISTD

*** End of Report ***

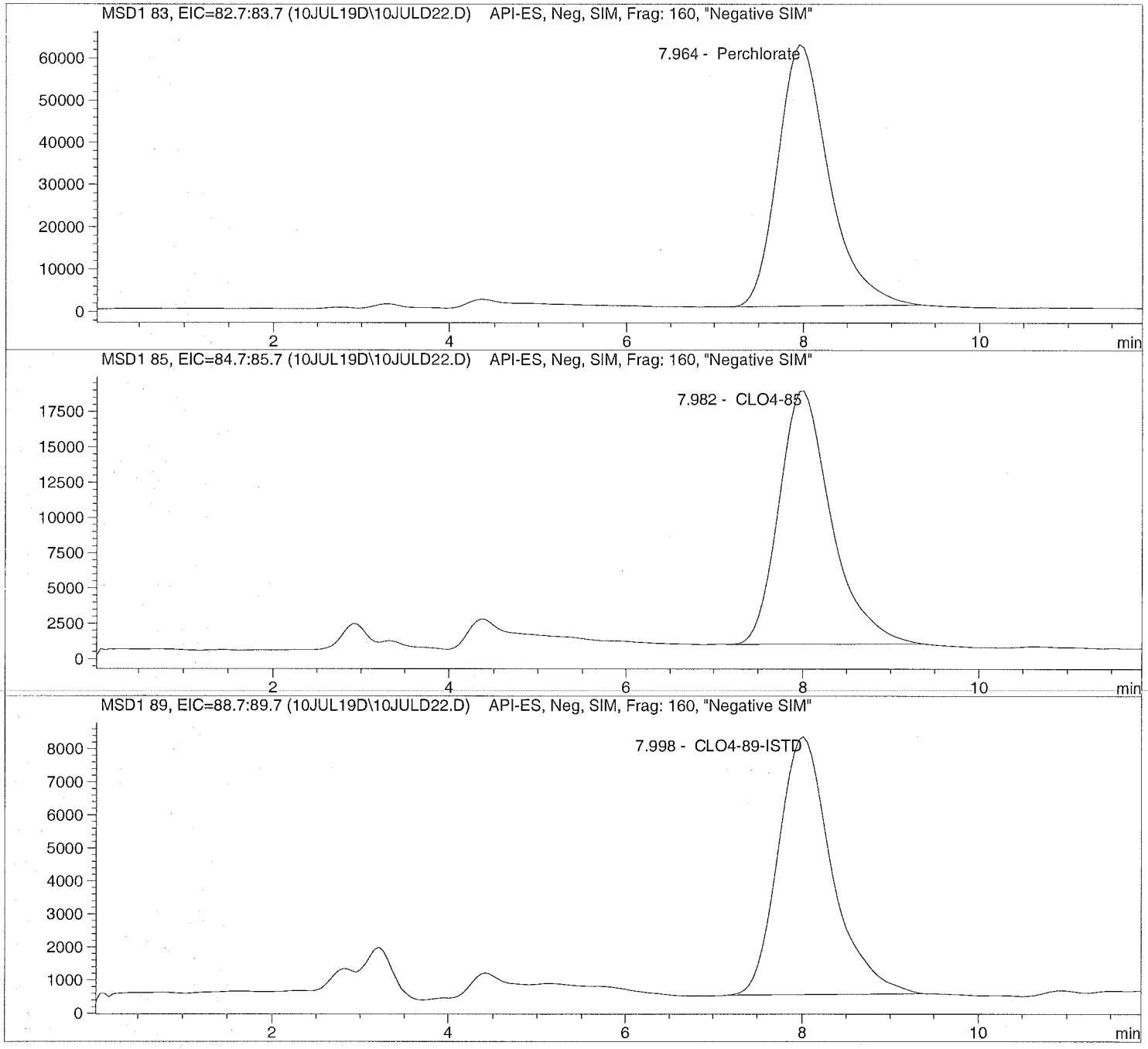
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD22.D Sample Name: 1918682001

Injection Date:	7/10/2019 13:53:14	Seq Line:	22
Sample Name:	1918682001	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD22.D Sample Name: 1918682001

Injection Date:	7/10/2019 13:53:14	Seq Line:	22
Sample Name:	1918682001	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.964	PBA	2472569.8	22.9756	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.982	PBA	738653.3	23.1021	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.998	PBA	329023.1	5.0000	CLO4-89-ISTD

*** End of Report ***

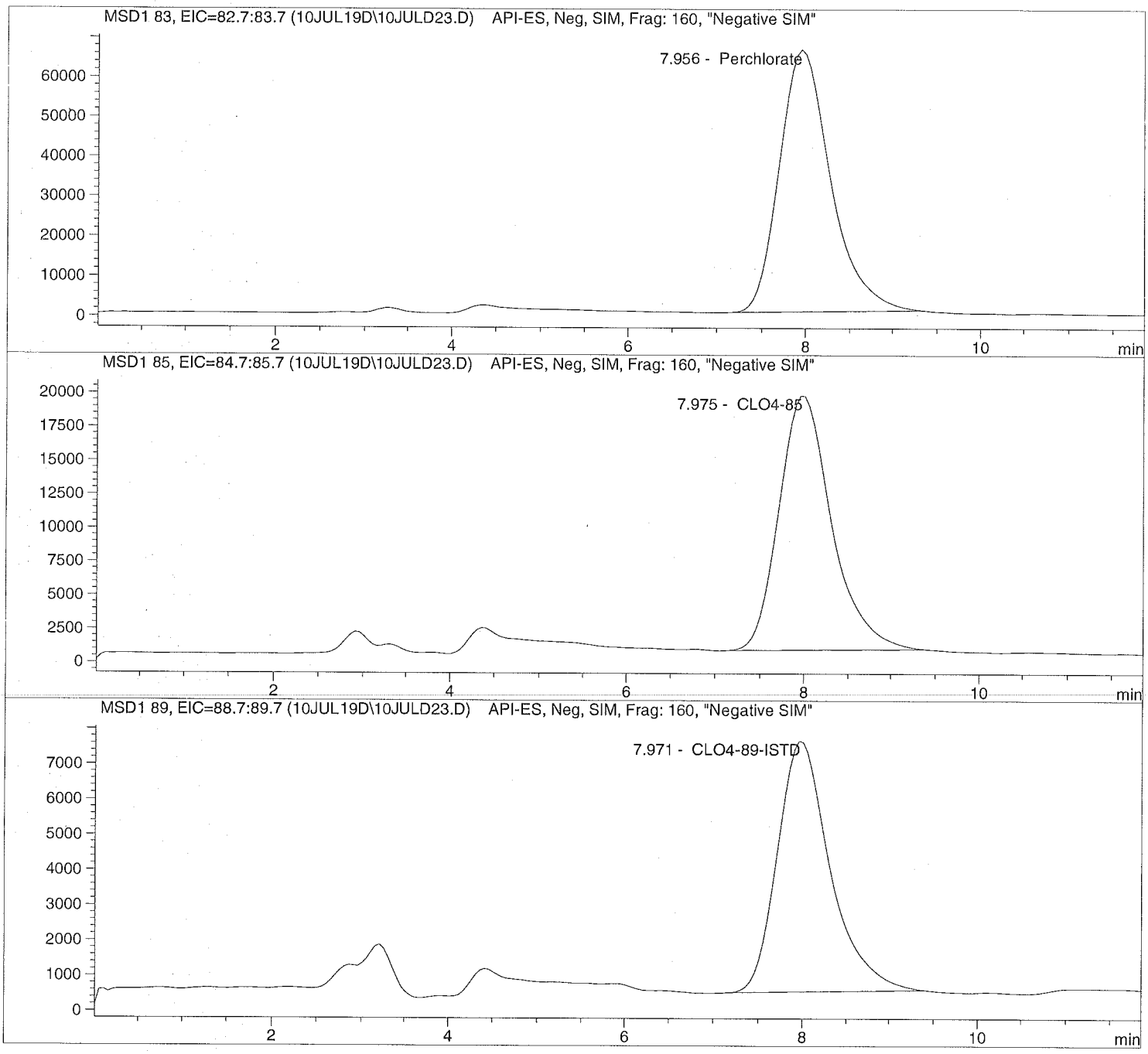
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD23.D Sample Name: 1918682002

Injection Date:	7/10/2019 14:07:09	Seq Line:	23
Sample Name:	1918682002	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD23.D Sample Name: 1918682002

Injection Date:	7/10/2019 14:07:09	Seq Line:	23
Sample Name:	1918682002	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.956	PBA	2649661.3	27.0999	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.975	PBA	784495.3	27.0493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.971	PBA	295991.2	5.0000	CLO4-89-ISTD

*** End of Report ***

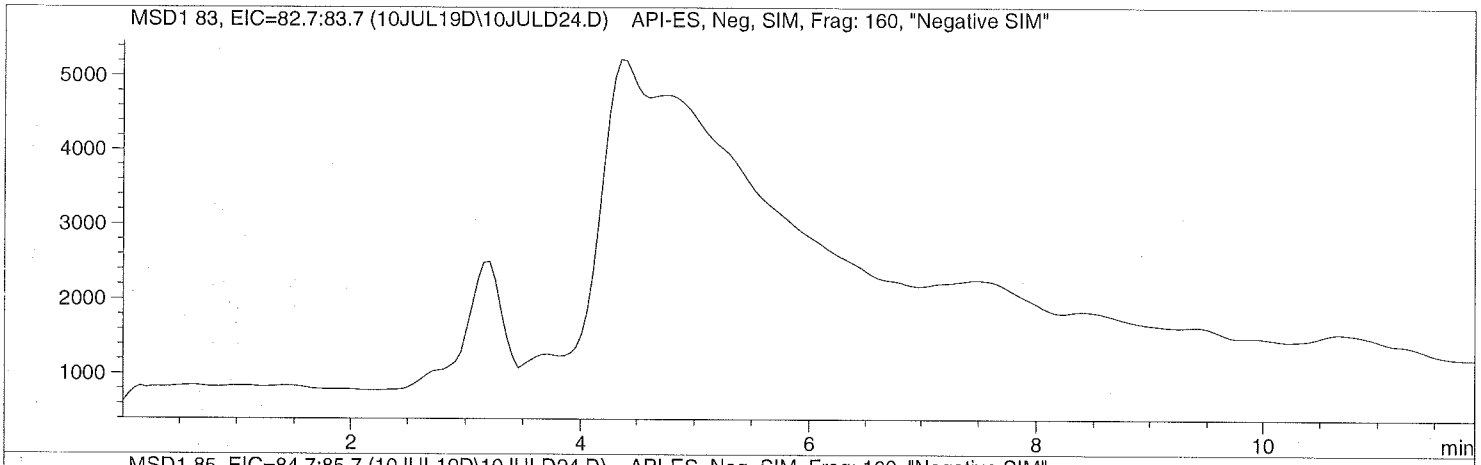
RIGHT SOLUTIONS | RIGHT PARTNER

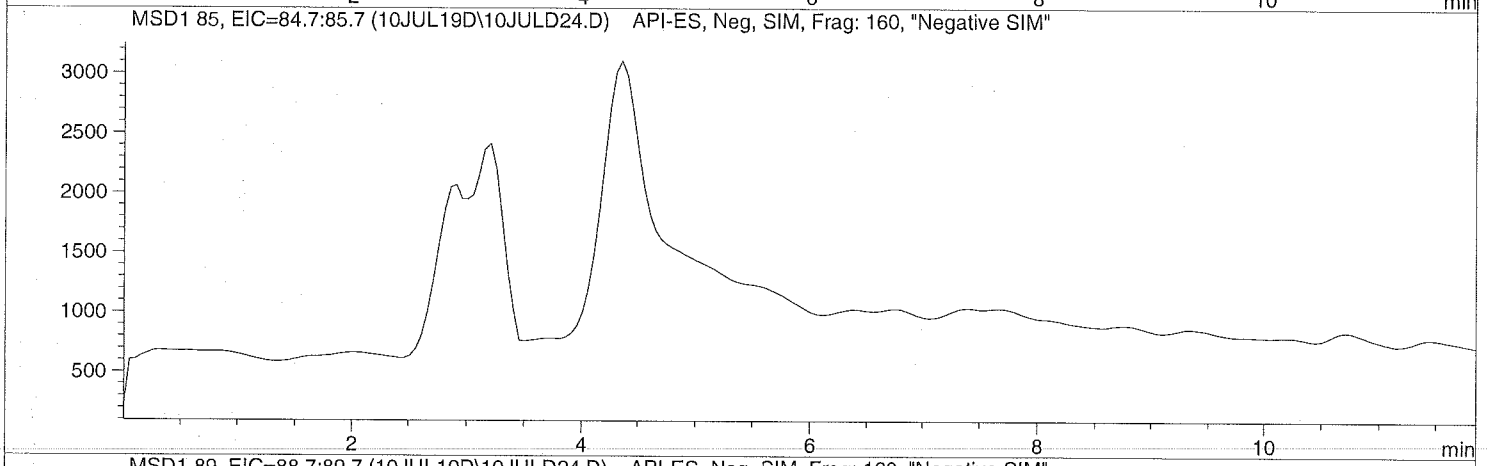
Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD24.D Sample Name: 1918682003

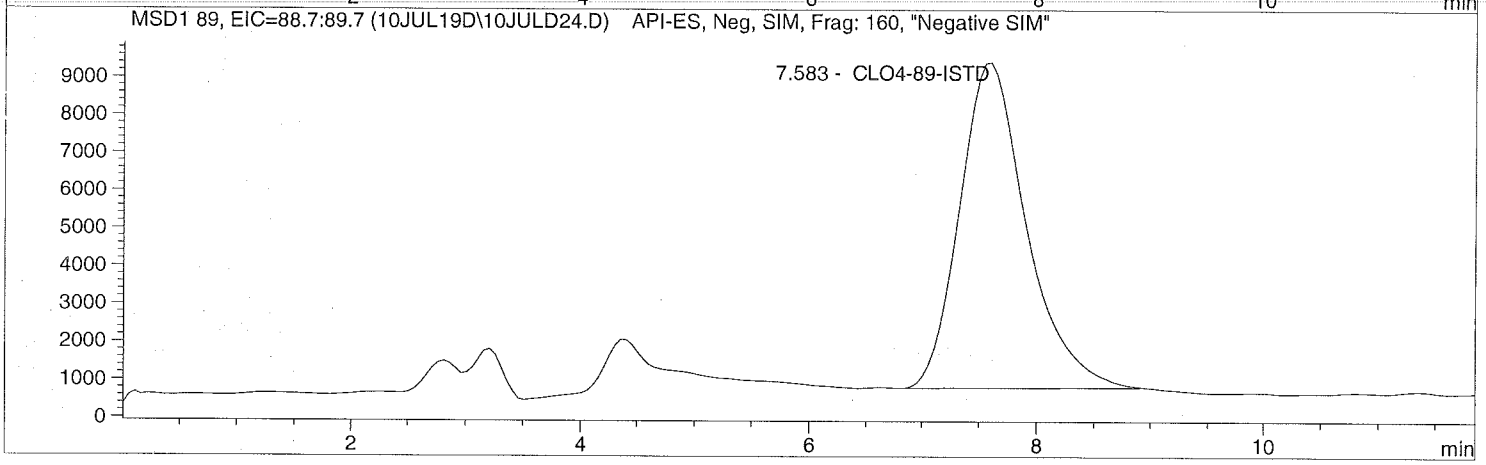
Injection Date:	7/10/2019 14:20:59	Seq Line:	24
Sample Name:	1918682003	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD24.D Sample Name: 1918682003

Injection Date:	7/10/2019 14:20:59	Seq Line:	24
Sample Name:	1918682003	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.583	PBA	347868.7	5.0000	CLO4-89-ISTD

*** End of Report ***

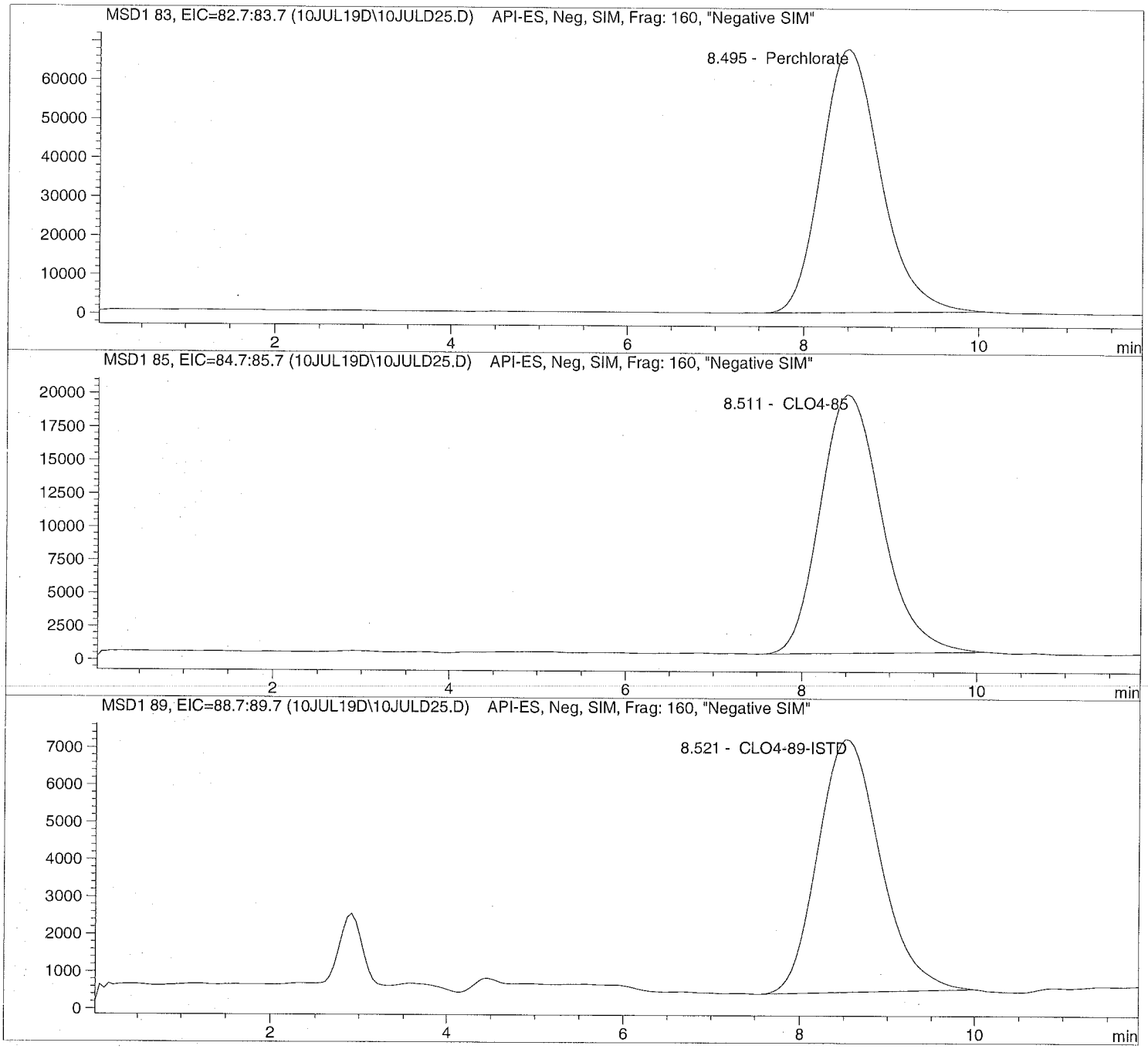
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD25.D Sample Name: 1918682004 100

Injection Date:	7/10/2019 14:34:49	Seq Line:	25
Sample Name:	1918682004 100	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD25.D Sample Name: 1918682004 100

Injection Date:	7/10/2019 14:34:49	Seq Line:	25
Sample Name:	1918682004 100	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.495	PBA	3177637.5	2867.6913	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.511	PBA	949731.6	2888.9947	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.521	PBA	334219.0	500.0000	CLO4-89-ISTD

*** End of Report ***

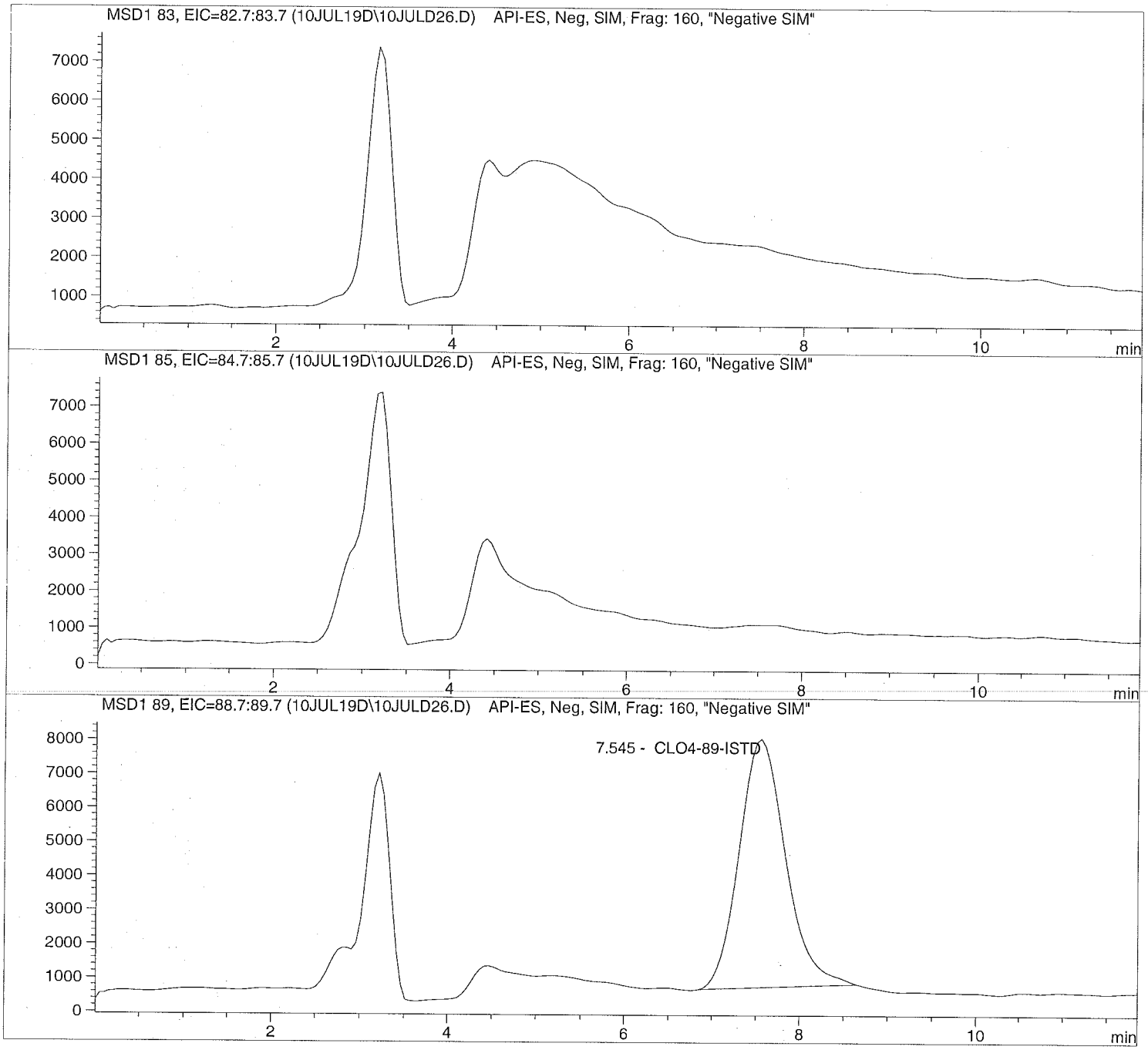
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD26.D Sample Name: 1918682005

Injection Date:	7/10/2019 14:48:53	Seq Line:	26
Sample Name:	1918682005	Location:	Vial 94
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD26.D Sample Name: 1918682005

Injection Date:	7/10/2019 14:48:53	Seq Line:	26
Sample Name:	1918682005	Location:	Vial 94
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.545	PBA	268838.9	5.0000	CLO4-89-ISTD

*** End of Report ***

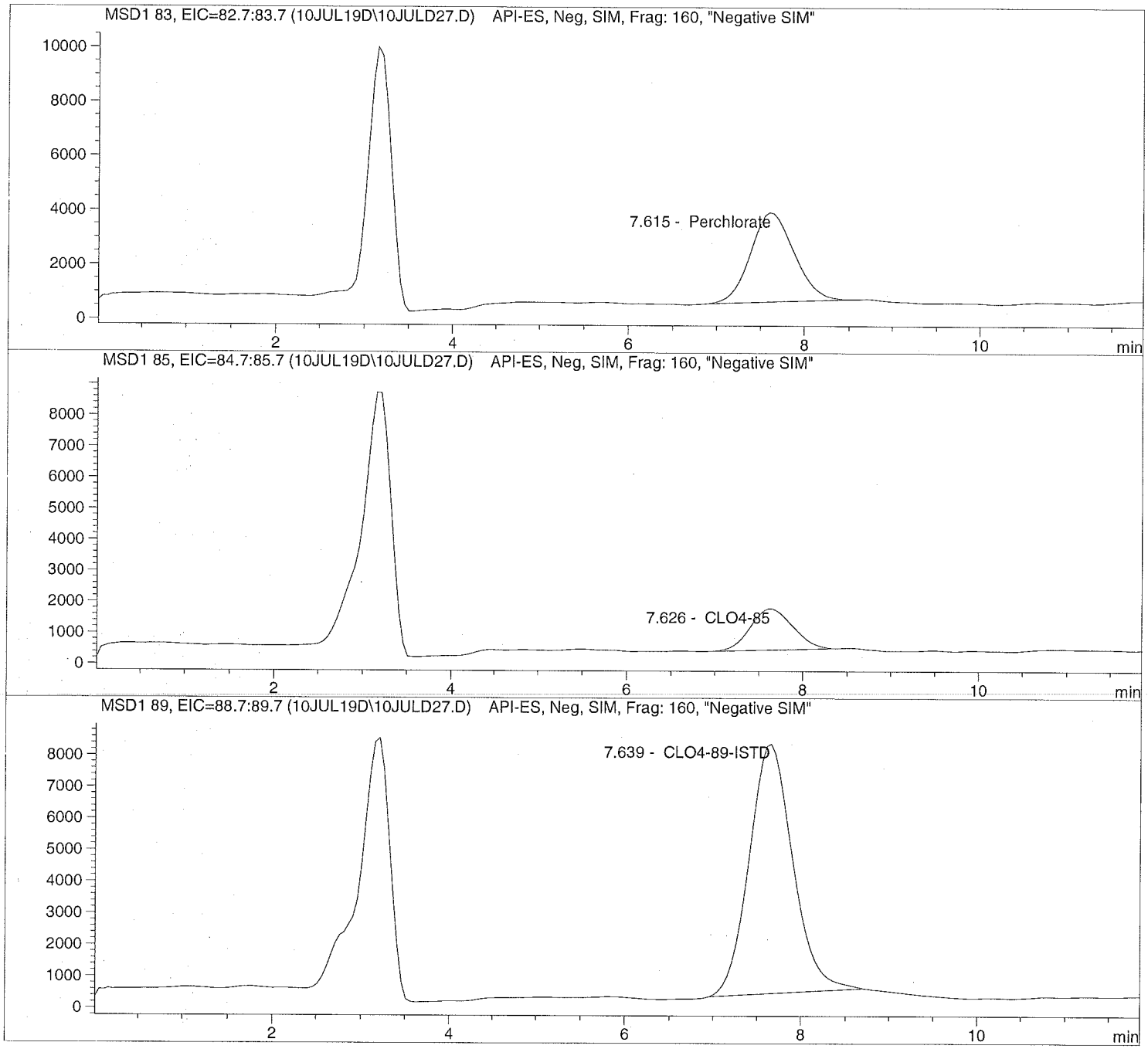
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD27.D Sample Name: 1918373004 4X

Injection Date:	7/10/2019 15:02:46	Seq Line:	27
Sample Name:	1918373004 4X	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD27.D Sample Name: 1918373004 4X

Injection Date:	7/10/2019 15:02:46	Seq Line:	27
Sample Name:	1918373004 4X	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	4.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.615	PBA	113897.9	5.9203	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.626	PBA	45010.5	7.0582	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.639	PBA	274117.7	20.0000	CLO4-89-ISTD

*** End of Report ***

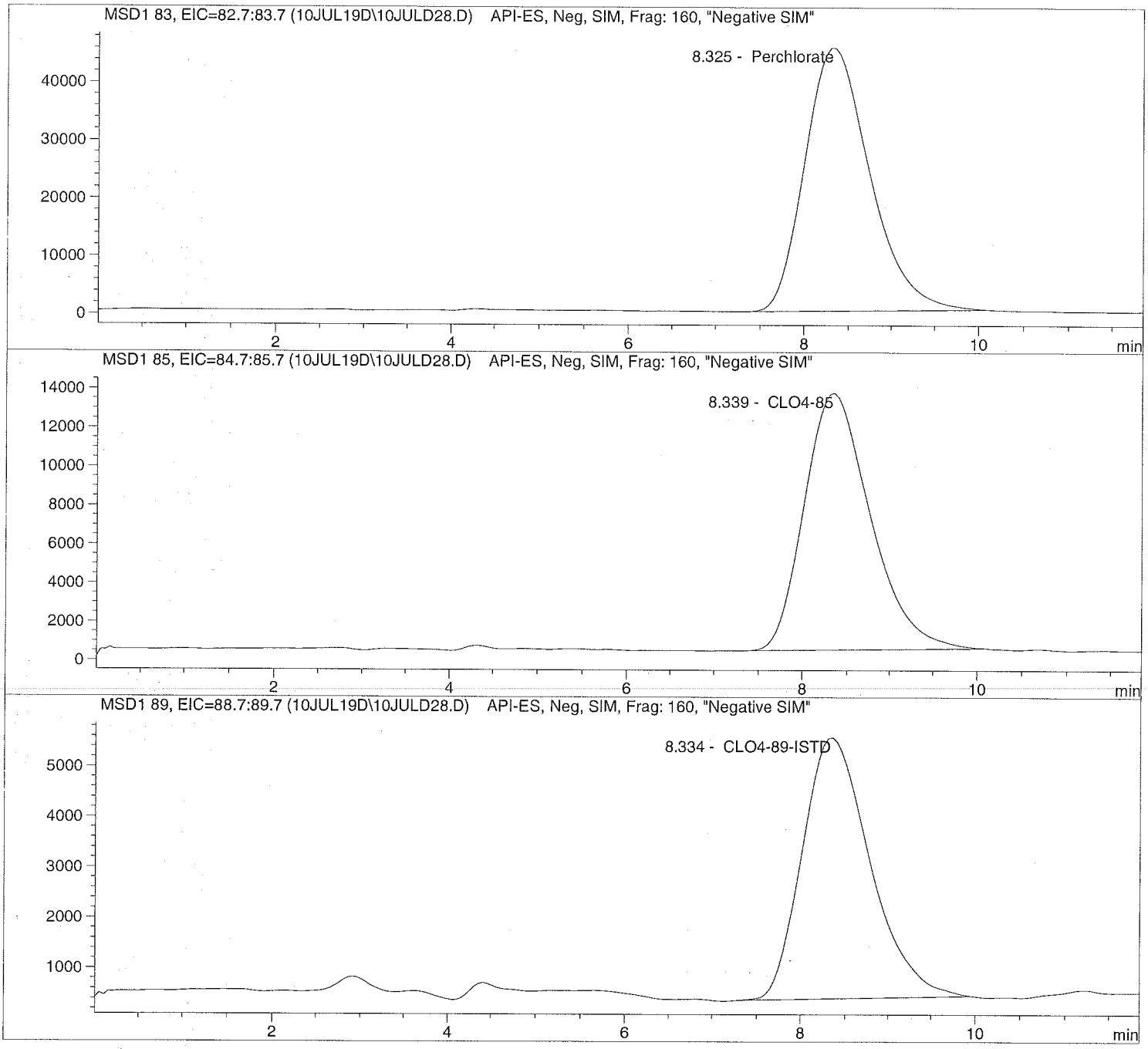
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD28.D Sample Name: 662922 CCV@25

Injection Date:	7/10/2019 15:16:39	Seq Line:	28
Sample Name:	662922 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD28.D Sample Name: 662922 CCV@25

Injection Date:	7/10/2019 15:16:39	Seq Line:	28
Sample Name:	662922 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.325	PBA	2335796.8	25.5805	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.339	PBA	693327.1	25.5842	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.334	PBA	277421.9	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

RIGHT SOLUTIONS | RIGHT PARTNER

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

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Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

Peak Sum Table

No Entries in table

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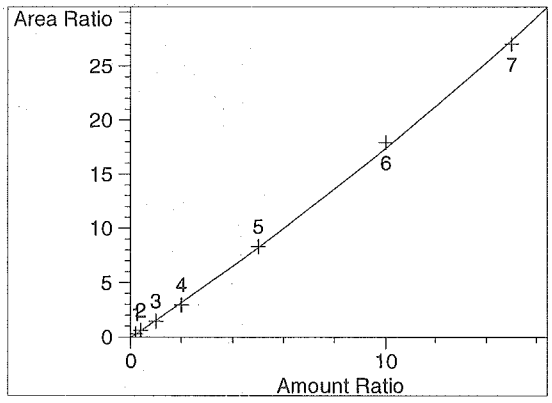
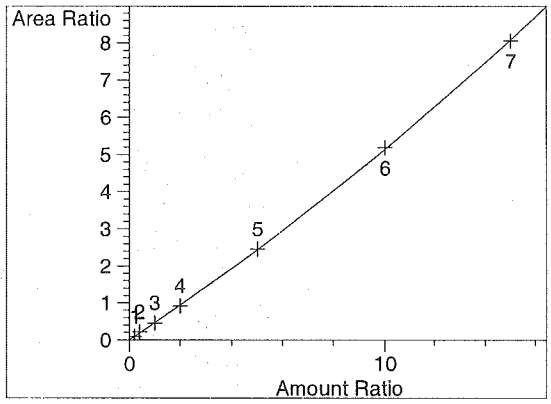
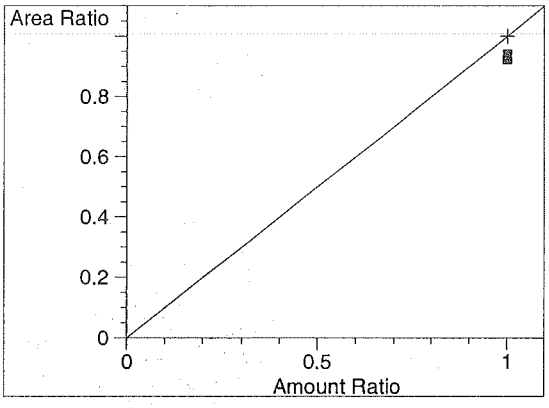
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

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Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

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Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

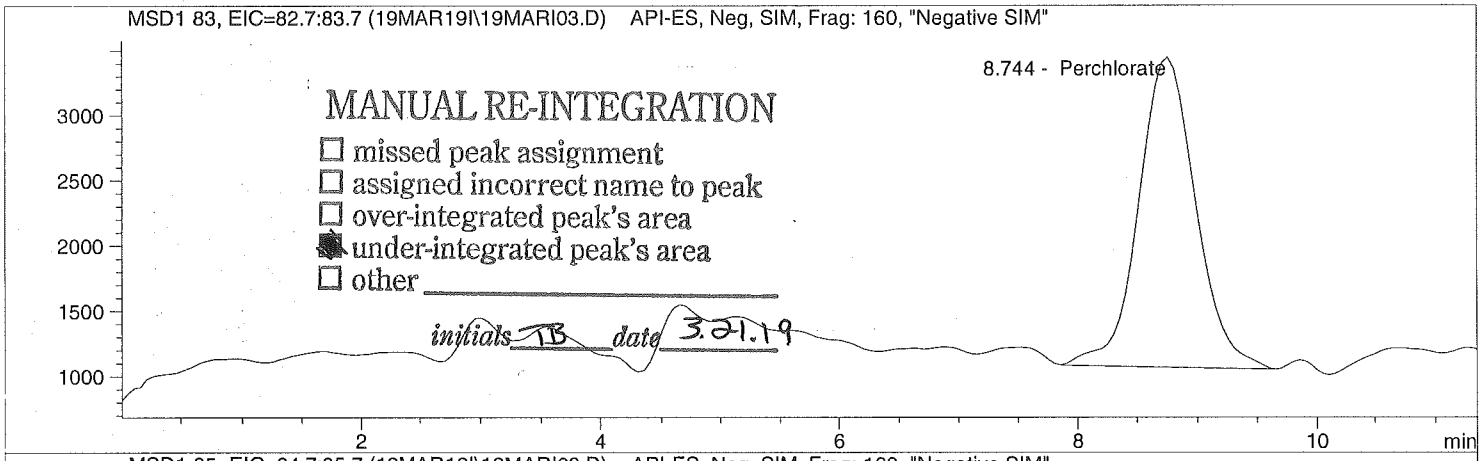
RIGHT SOLUTIONS | RIGHT PARTNER

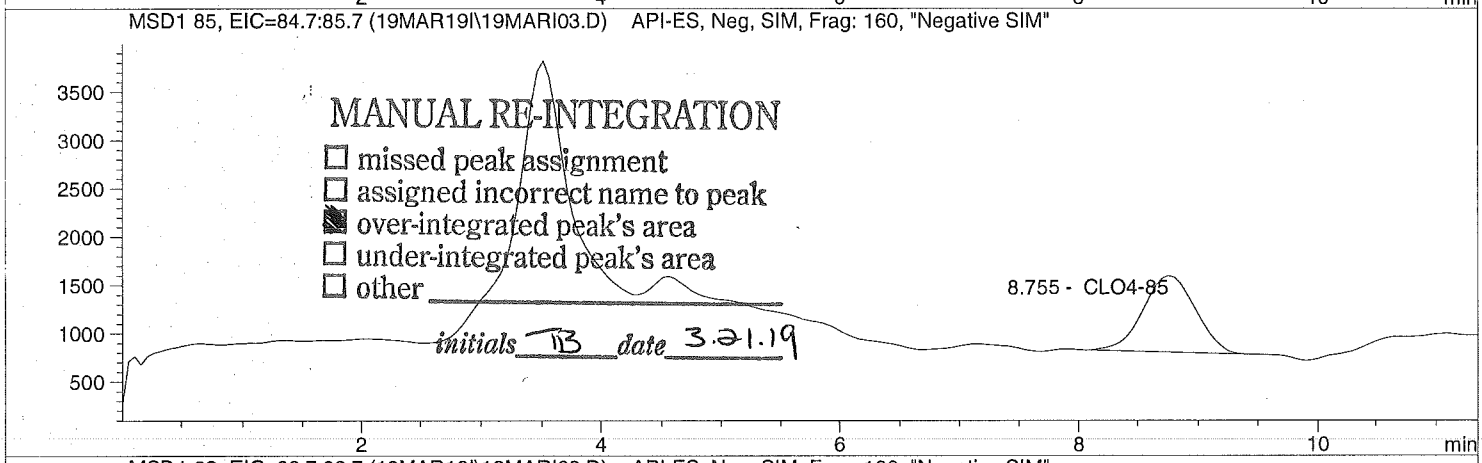
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

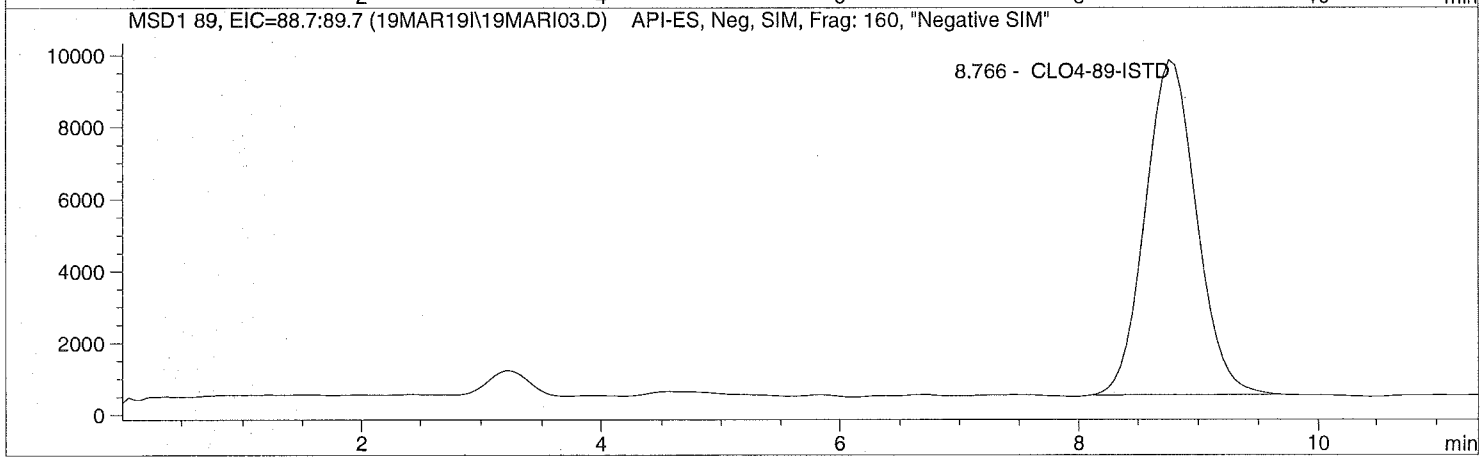
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

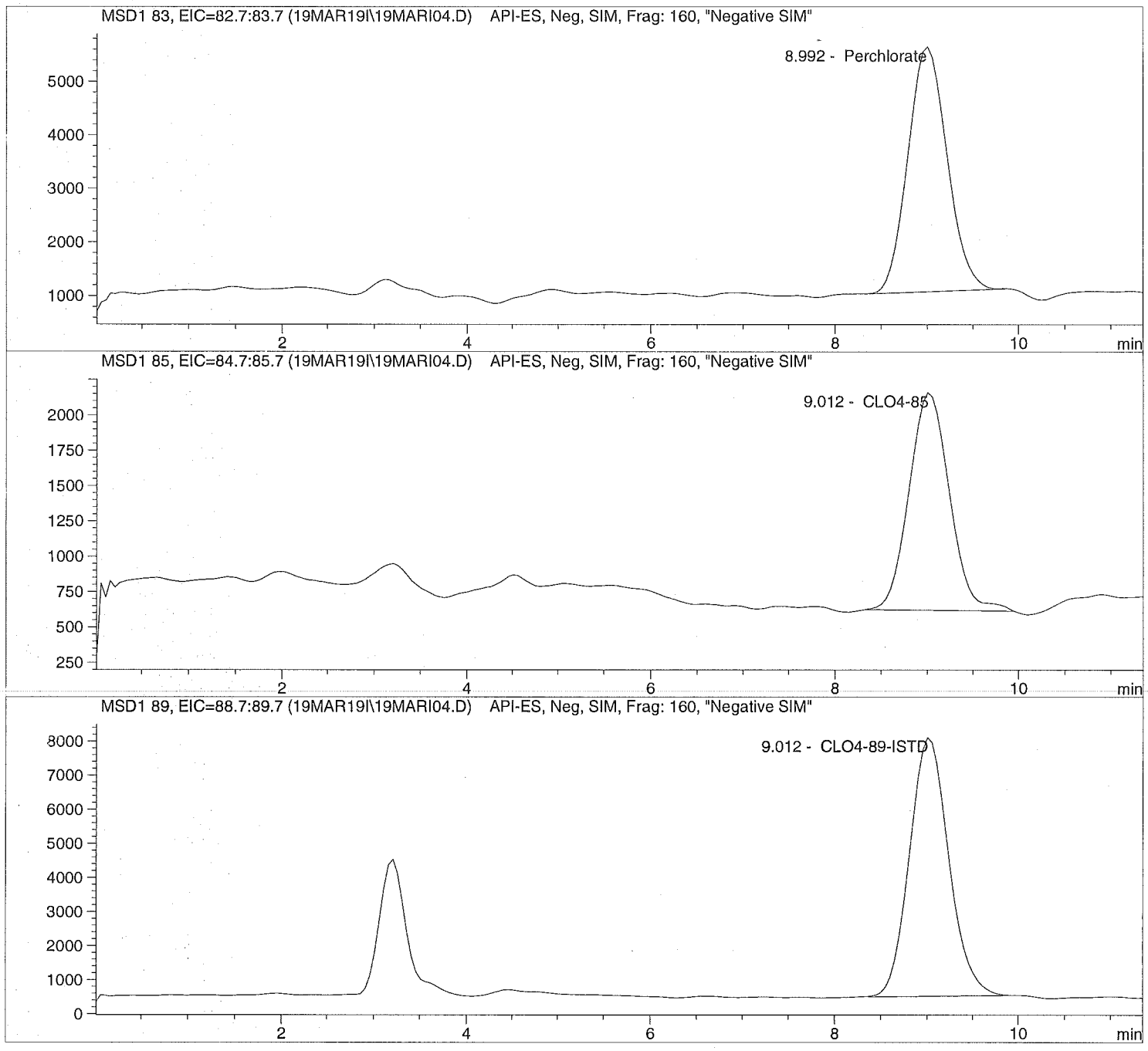
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

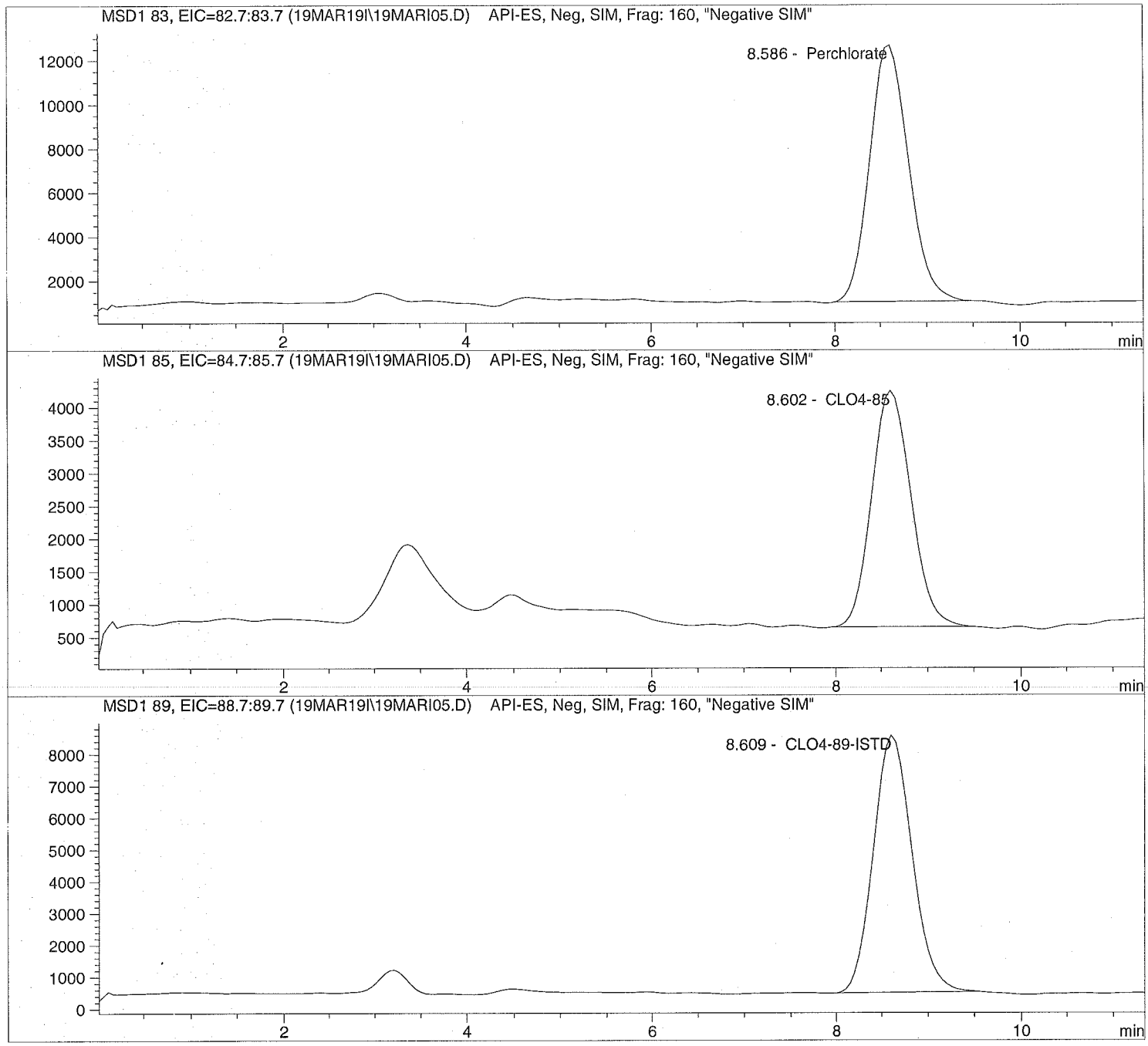
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

*** End of Report ***

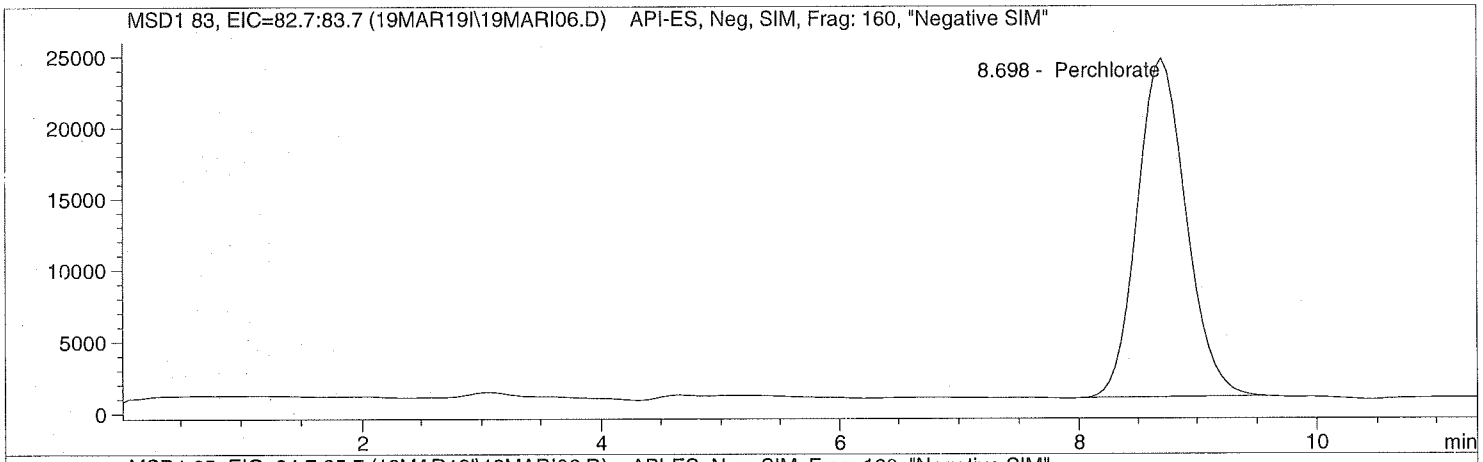
RIGHT SOLUTIONS | RIGHT PARTNER

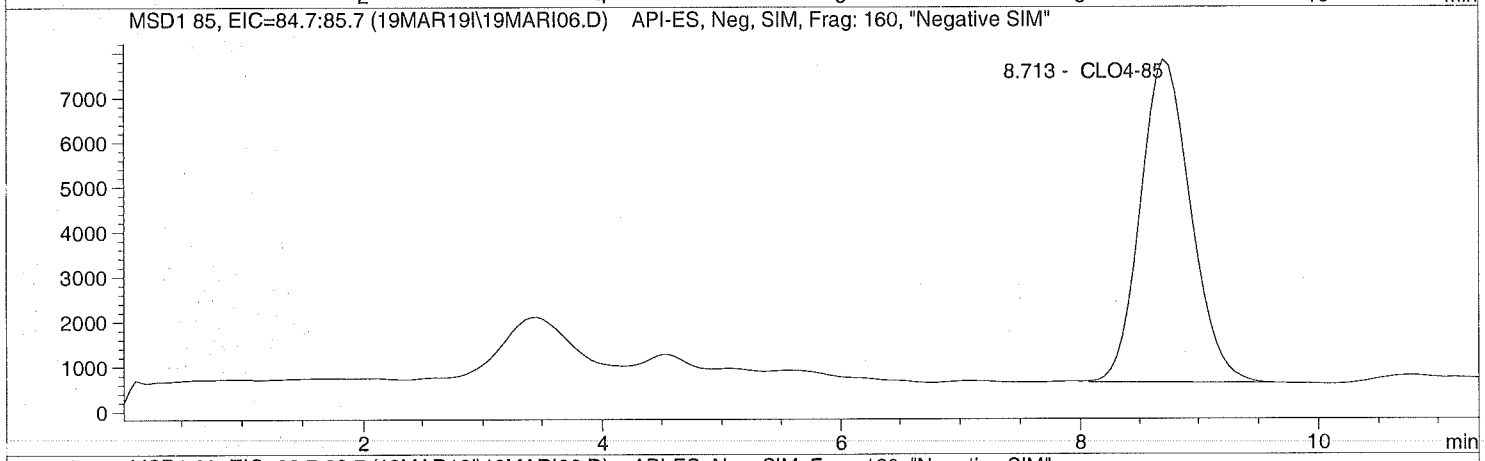
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

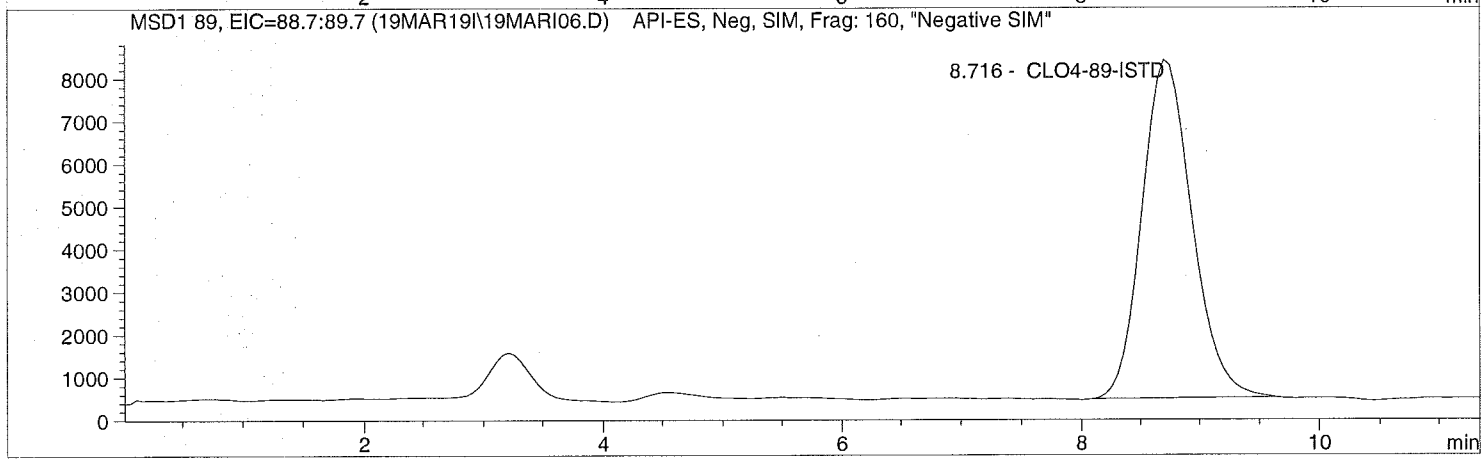
Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

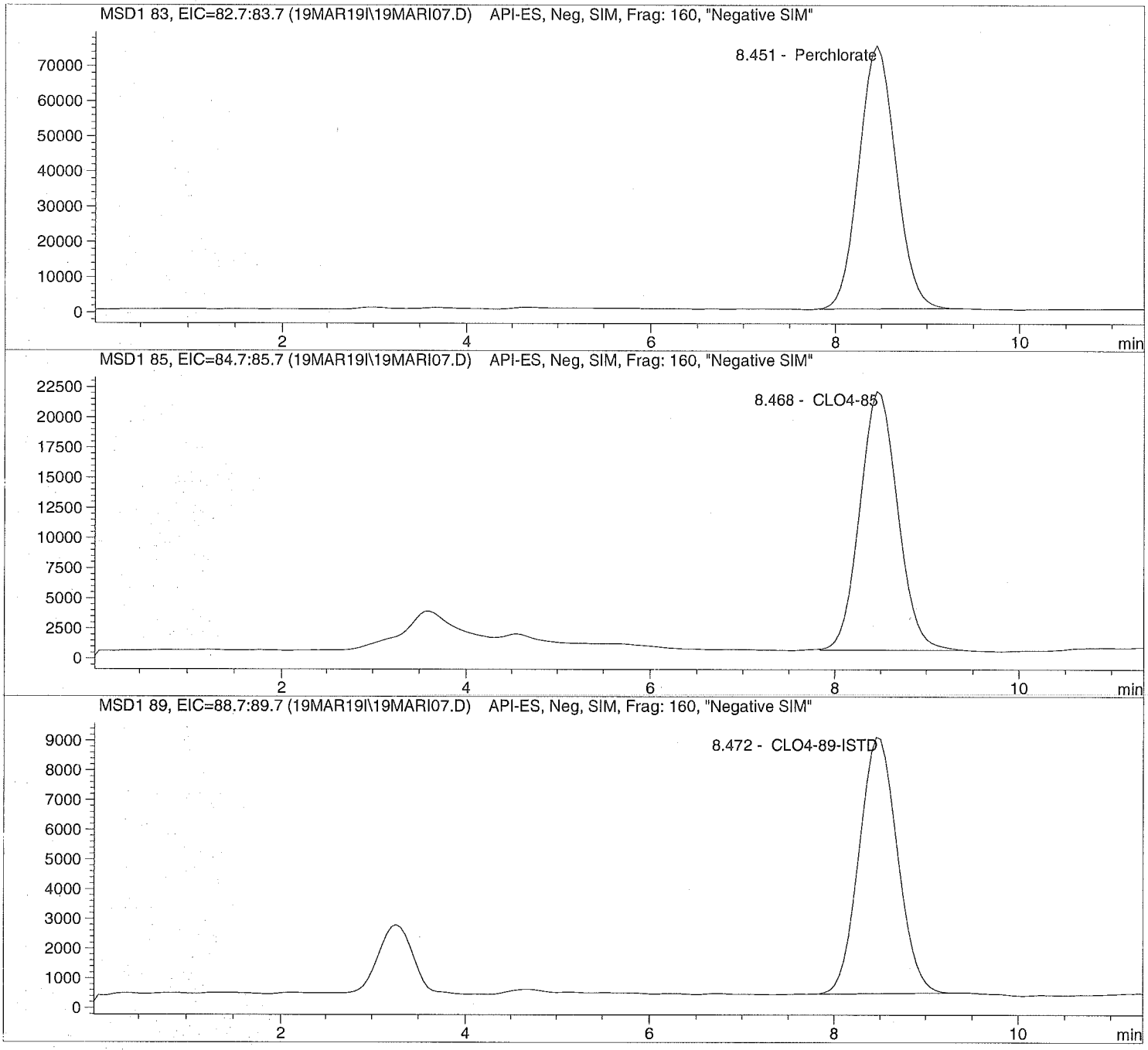
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

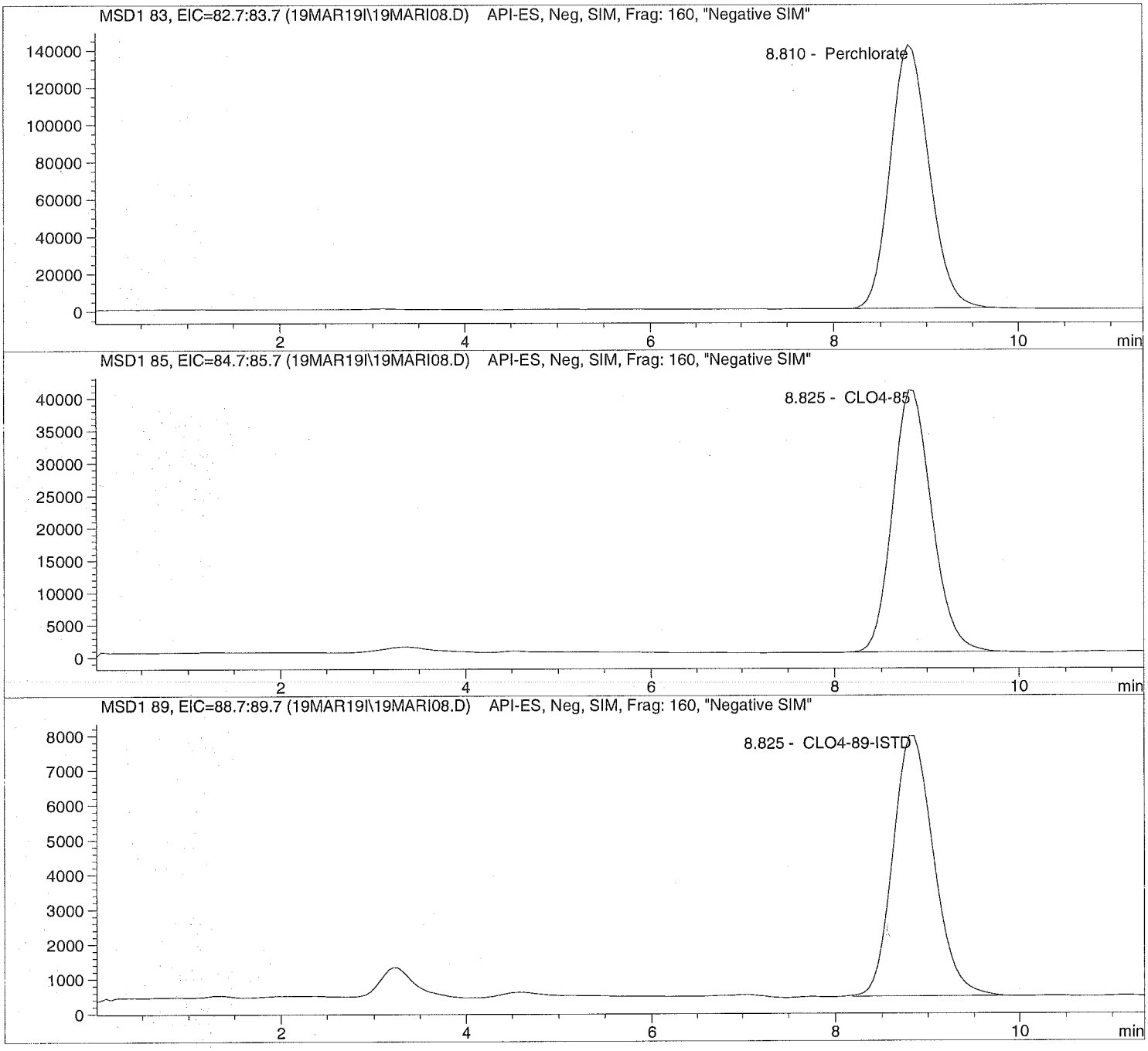
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

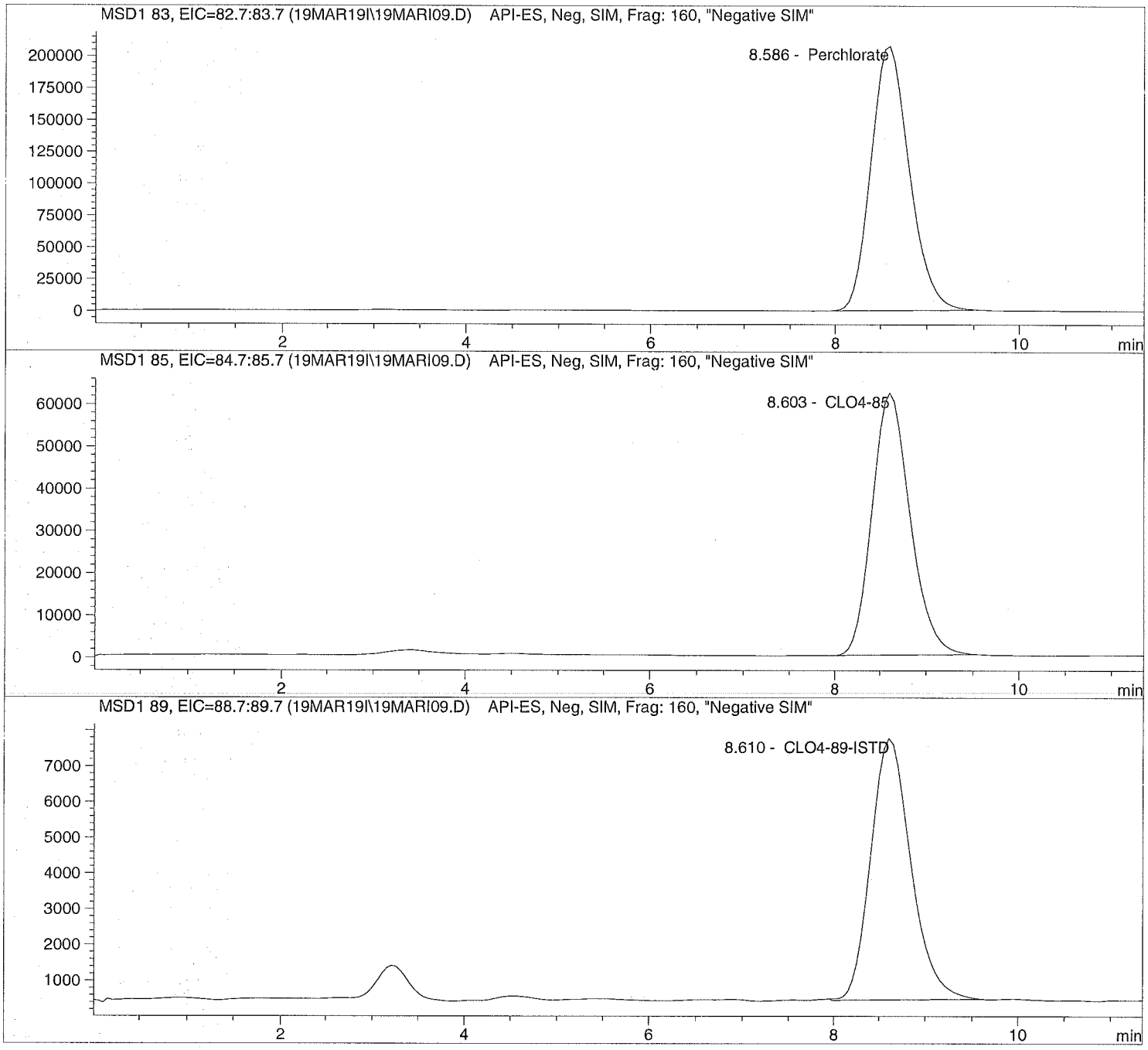
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

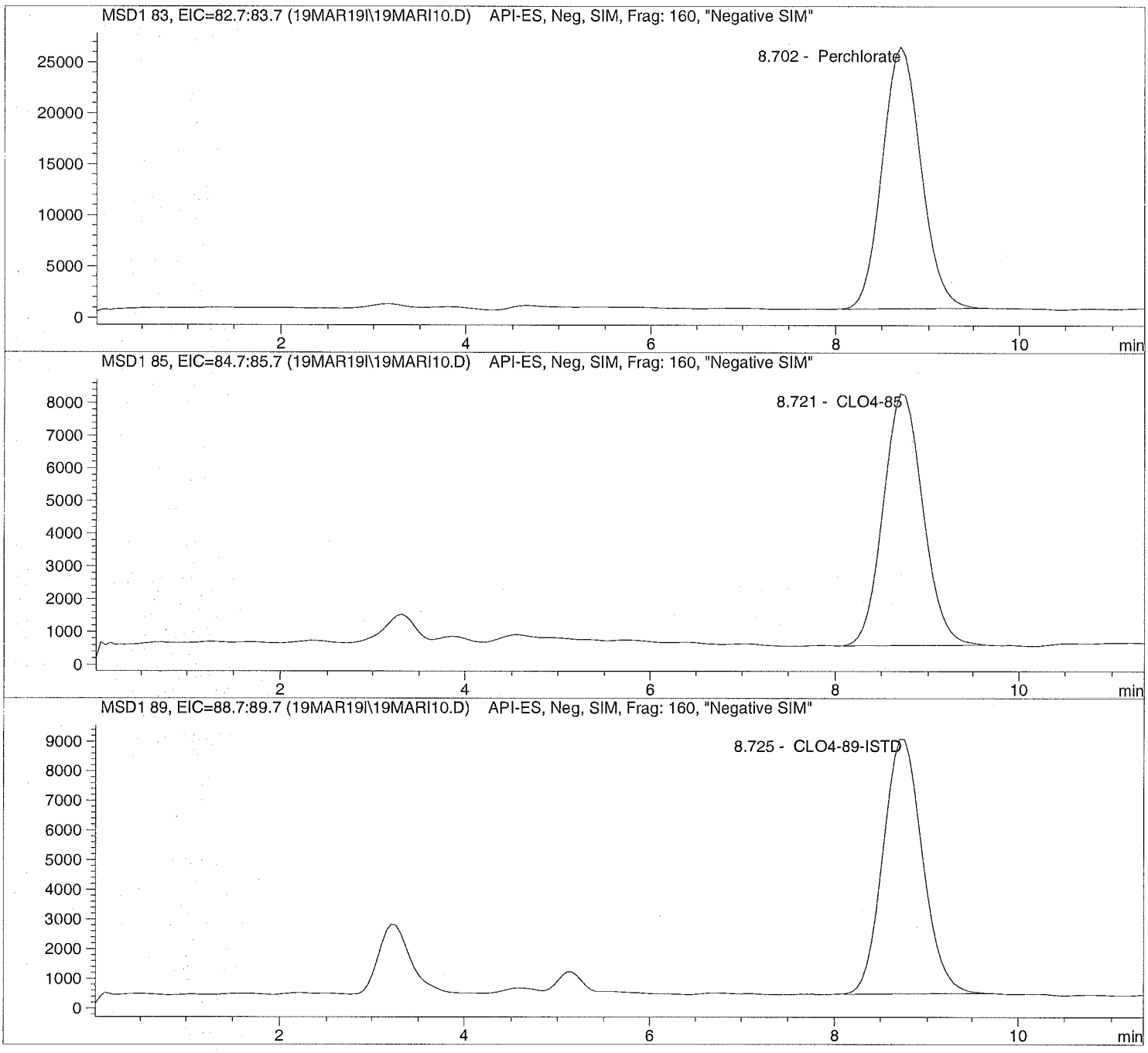
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

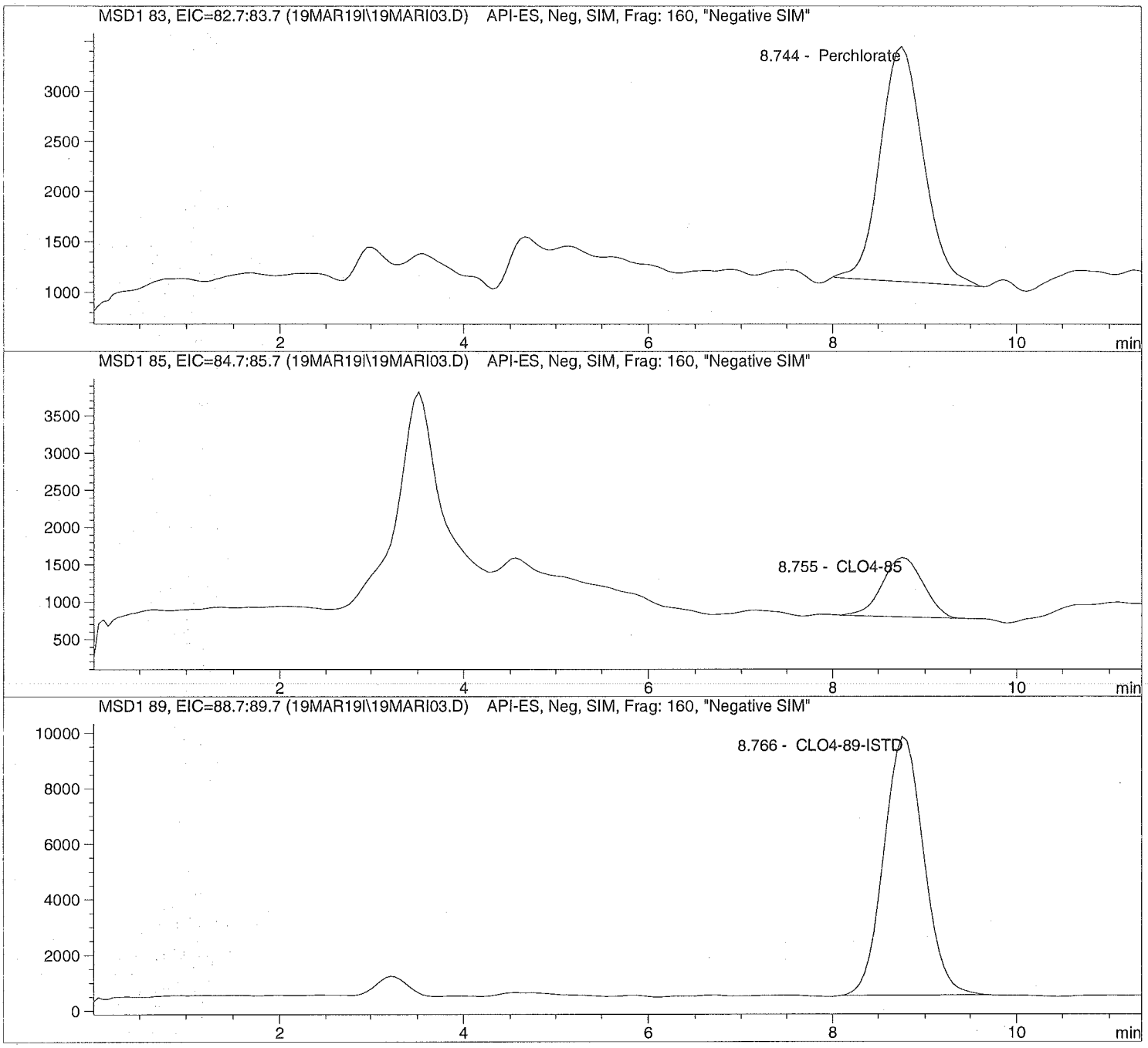
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

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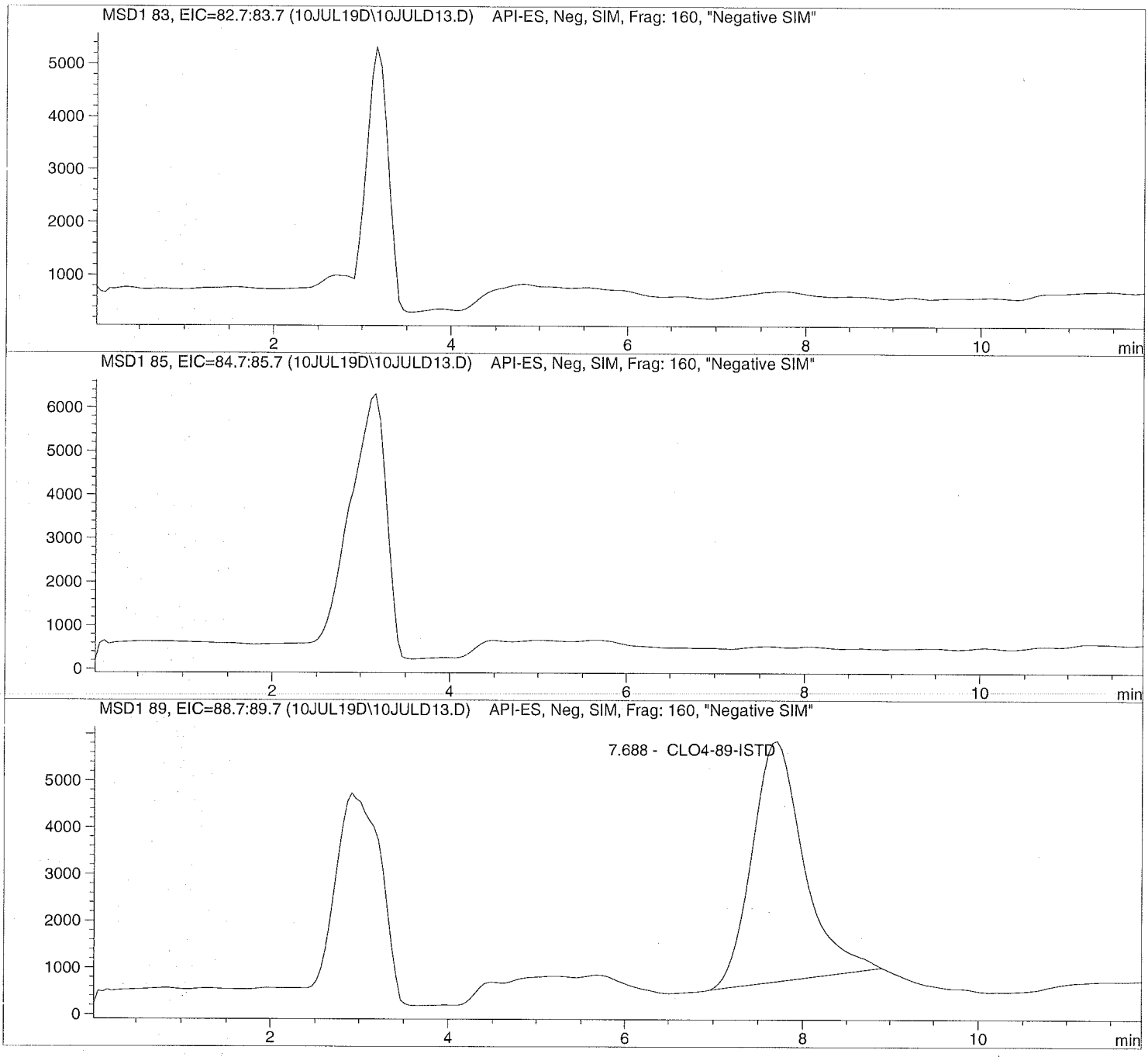
Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD13.D Sample Name: 1918373007

Injection Date:	7/10/2019 11:36:55	Seq Line:	13
Sample Name:	1918373007	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD13.D Sample Name: 1918373007

Injection Date:	7/10/2019 11:36:55	Seq Line:	13
Sample Name:	1918373007	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.688	PBA	206768.2	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

July 12, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19061383**

Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 5 sample(s) on Jun 26, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Houston, US Date: 12-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061383

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19061383-01	18CPTMW14_062519	Water		25-Jun-2019 07:40	26-Jun-2019 08:50	☐
HS19061383-02	18CPTMW24_062519	Water		25-Jun-2019 09:25	26-Jun-2019 08:50	☐
HS19061383-03	18CPTMW07_062519	Water		25-Jun-2019 10:45	26-Jun-2019 08:50	☐
HS19061383-04	MW3_062519	Water		25-Jun-2019 12:35	26-Jun-2019 08:50	☐
HS19061383-05	Trip Blank	Water		25-Jun-2019 00:00	26-Jun-2019 08:50	☐

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19061383

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142510

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R341869

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R341768

Sample ID: VLCSW-190702

• One sporadic marginal exceedance (Chloroform) for LCS. CCV is OK.

Metals by Method SW7470

Batch ID: 142558

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 142540

Sample ID: HS19061346-03MS

• MS/MSD and DUPs are for an unrelated sample

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19061383
Sample ID: 18CPTMW14_062519 Lab ID:HS19061383-01
Collection Date: 25-Jun-2019 07:40 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,2-Dichloroethane	**2.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 20:01
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 20:01
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 20:01
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 20:01
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	02-Jul-2019 20:01
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 20:01
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	02-Jul-2019 20:01
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 20:01
Benzene	**1.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 20:01
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	02-Jul-2019 20:01
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Chloroform	**6.7**		**0.20**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 20:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19061383
Sample ID: 18CPTMW14_062519 Lab ID:HS19061383-01
Collection Date: 25-Jun-2019 07:40 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 20:01
cis-1,2-Dichloroethene	**51**		**0.20**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 20:01
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	02-Jul-2019 20:01
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 20:01
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 20:01
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 20:01
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Tetrachloroethene	**1.1**		**0.30**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 20:01
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 20:01
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 20:01
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Trichloroethene	**700**		**5.0**	**12**	**25**	**UG/L**	25	02-Jul-2019 20:25
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 20:01
Surr: 1,2-Dichloroethane-d4	*95.7*			**0**	*81-118*	*%REC*	*1*	*02-Jul-2019 20:01*
Surr: 1,2-Dichloroethane-d4	*93.9*			**0**	*81-118*	*%REC*	*25*	*02-Jul-2019 20:25*
Surr: 4-Bromofluorobenzene	*92.7*			**0**	*85-114*	*%REC*	*1*	*02-Jul-2019 20:01*
Surr: 4-Bromofluorobenzene	*90.3*			**0**	*85-114*	*%REC*	*25*	*02-Jul-2019 20:25*
Surr: Dibromofluoromethane	*92.3*			**0**	*80-119*	*%REC*	*1*	*02-Jul-2019 20:01*
Surr: Dibromofluoromethane	*91.4*			**0**	*80-119*	*%REC*	*25*	*02-Jul-2019 20:25*
Surr: Toluene-d8	*98.1*			**0**	*89-112*	*%REC*	*1*	*02-Jul-2019 20:01*
Surr: Toluene-d8	*96.4*			**0**	*89-112*	*%REC*	*25*	*02-Jul-2019 20:25*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	**0.13**		**0.010**	**0.010**	**0.010**	**ug/L**	1	28-Jun-2019 13:13
Surr: 2-Fluorobiphenyl	*96.4*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 13:13*
Surr: 4-Terphenyl-d14	*104*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 13:13*
Surr: Nitrobenzene-d5	*107*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 13:13*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW14_062519
Collection Date: 25-Jun-2019 07:40

ANALYTICAL REPORT
WorkOrder:HS19061383
Lab ID:HS19061383-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**0.427**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	05-Jul-2019 15:27
Antimony	**0.000513**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 15:27
Arsenic	**0.00240**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 15:27
Barium	**6.03**		**0.0380**	**0.0500**	**0.100**	**mg/L**	20	05-Jul-2019 15:30
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 15:27
Cadmium	**0.000243**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	05-Jul-2019 15:27
Calcium	**466**		**0.680**	**1.00**	**10.0**	**mg/L**	20	05-Jul-2019 15:30
Chromium	**0.00598**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 15:27
Cobalt	**0.0142**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 15:27
Copper	**0.00130**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 15:27
Iron	**2.89**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 15:27
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	03-Jul-2019 23:27
Magnesium	**157**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 15:27
Manganese	**0.793**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 15:27
Nickel	**0.00836**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 15:27
Potassium	**17.5**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 15:27
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jul-2019 15:27
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jul-2019 15:27
Sodium	**605**		**0.280**	**1.00**	**4.00**	**mg/L**	20	05-Jul-2019 15:30
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jul-2019 23:27
Vanadium	**0.00212**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 15:27
Zinc	**0.0184**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 15:27
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 14:01
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Jul-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19061383
Sample ID: 18CPTMW24_062519 Lab ID:HS19061383-02
Collection Date: 25-Jun-2019 09:25 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:01
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 18:01
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	02-Jul-2019 18:01
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:01
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	02-Jul-2019 18:01
Acetone	**5.1**		**0.40**	**1.0**	**2.0**	**UG/L**	1	02-Jul-2019 18:01
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	02-Jul-2019 18:01
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19061383
Sample ID: 18CPTMW24_062519 Lab ID:HS19061383-02
Collection Date: 25-Jun-2019 09:25 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
cis-1,2-Dichloroethene	**26**		**0.20**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 18:01
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	02-Jul-2019 18:01
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 18:01
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 18:01
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:01
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Trichloroethene	**9.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 18:01
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:01
Surr: 1,2-Dichloroethane-d4	*97.8*			**0**	*81-118*	*%REC*	*1*	*02-Jul-2019 18:01*
Surr: 4-Bromofluorobenzene	*95.2*			**0**	*85-114*	*%REC*	*1*	*02-Jul-2019 18:01*
Surr: Dibromofluoromethane	*94.0*			**0**	*80-119*	*%REC*	*1*	*02-Jul-2019 18:01*
Surr: Toluene-d8	*99.3*			**0**	*89-112*	*%REC*	*1*	*02-Jul-2019 18:01*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 13:34
Surr: 2-Fluorobiphenyl	*82.5*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 13:34*
Surr: 4-Terphenyl-d14	*129*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 13:34*
Surr: Nitrobenzene-d5	*102*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 13:34*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Jul-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW07_062519
Collection Date: 25-Jun-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19061383
Lab ID:HS19061383-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:25
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 18:25
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	02-Jul-2019 18:25
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:25
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	02-Jul-2019 18:25
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 18:25
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	02-Jul-2019 18:25
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW07_062519
Collection Date: 25-Jun-2019 10:45

ANALYTICAL REPORT
WorkOrder:HS19061383
Lab ID:HS19061383-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	02-Jul-2019 18:25
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 18:25
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 18:25
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:25
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Trichloroethene	**0.66**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 18:25
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:25
Surr: 1,2-Dichloroethane-d4	*99.6*			**0**	*81-118*	*%REC*	*1*	*02-Jul-2019 18:25*
Surr: 4-Bromofluorobenzene	*96.3*			**0**	*85-114*	*%REC*	*1*	*02-Jul-2019 18:25*
Surr: Dibromofluoromethane	*94.2*			**0**	*80-119*	*%REC*	*1*	*02-Jul-2019 18:25*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*02-Jul-2019 18:25*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	**0.077**		**0.010**	**0.010**	**0.010**	**ug/L**	1	28-Jun-2019 13:55
Surr: 2-Fluorobiphenyl	*85.1*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 13:55*
Surr: 4-Terphenyl-d14	*137*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 13:55*
Surr: Nitrobenzene-d5	*101*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 13:55*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Jul-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW3_062519
Collection Date: 25-Jun-2019 12:35

ANALYTICAL REPORT
WorkOrder:HS19061383
Lab ID:HS19061383-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,1-Dichloroethane	**1.4**		**0.20**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 19:37
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:37
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:37
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 19:37
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	02-Jul-2019 19:37
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:37
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	02-Jul-2019 19:37
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 19:37
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	02-Jul-2019 19:37
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:37

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19061383
Sample ID: MW3_062519 Lab ID:HS19061383-04
Collection Date: 25-Jun-2019 12:35 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:37
cis-1,2-Dichloroethene	**52**		**0.20**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 19:37
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	02-Jul-2019 19:37
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 19:37
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 19:37
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:37
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Tetrachloroethene	**0.70**	J	**0.30**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 19:37
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:37
trans-1,2-Dichloroethene	**0.99**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 19:37
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Trichloroethene	**240**		**1.0**	**2.5**	**5.0**	**UG/L**	5	03-Jul-2019 18:56
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:37
Vinyl chloride	**3.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	02-Jul-2019 19:37
Surr: 1,2-Dichloroethane-d4	*96.2*			**0**	*81-118*	*%REC*	*1*	*02-Jul-2019 19:37*
Surr: 1,2-Dichloroethane-d4	*95.5*			**0**	*81-118*	*%REC*	*5*	*03-Jul-2019 18:56*
Surr: 4-Bromofluorobenzene	*93.2*			**0**	*85-114*	*%REC*	*1*	*02-Jul-2019 19:37*
Surr: 4-Bromofluorobenzene	*94.1*			**0**	*85-114*	*%REC*	*5*	*03-Jul-2019 18:56*
Surr: Dibromofluoromethane	*93.1*			**0**	*80-119*	*%REC*	*1*	*02-Jul-2019 19:37*
Surr: Dibromofluoromethane	*92.7*			**0**	*80-119*	*%REC*	*5*	*03-Jul-2019 18:56*
Surr: Toluene-d8	*98.8*			**0**	*89-112*	*%REC*	*1*	*02-Jul-2019 19:37*
Surr: Toluene-d8	*95.6*			**0**	*89-112*	*%REC*	*5*	*03-Jul-2019 18:56*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW3_062519
Collection Date: 25-Jun-2019 12:35

ANALYTICAL REPORT
WorkOrder:HS19061383
Lab ID:HS19061383-04
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**0.00644**	J	**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	05-Jul-2019 15:32
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 15:32
Arsenic	**0.000625**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 15:32
Barium	**0.370**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 15:32
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 15:32
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 15:32
Calcium	**26.5**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	05-Jul-2019 15:32
Chromium	**0.00222**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 15:32
Cobalt	**0.00313**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 15:32
Copper	**0.00658**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 15:32
Iron	**0.218**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 15:32
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	03-Jul-2019 23:29
Magnesium	**16.4**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 15:32
Manganese	**0.295**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 15:32
Nickel	**0.00306**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 15:32
Potassium	**1.56**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 15:32
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jul-2019 15:32
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jul-2019 15:32
Sodium	**254**		**0.140**	**0.500**	**2.00**	**mg/L**	10	05-Jul-2019 15:34
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	03-Jul-2019 23:29
Vanadium	**0.00152**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 15:32
Zinc	**0.0217**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 15:32
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 14:27
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Jul-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 25-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061383
Lab ID:HS19061383-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:01
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
2-Butanone	**2.4**		**0.50**	**1.0**	**2.0**	**UG/L**	1	02-Jul-2019 16:01
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	02-Jul-2019 16:01
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:01
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	02-Jul-2019 16:01
Acetone	**30**		**0.40**	**1.0**	**2.0**	**UG/L**	1	02-Jul-2019 16:01
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	02-Jul-2019 16:01
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 25-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061383
Lab ID:HS19061383-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	02-Jul-2019 16:01
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 16:01
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 16:01
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 16:01
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 16:01
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*1*	*02-Jul-2019 16:01*
Surr: 4-Bromofluorobenzene	*96.8*			**0**	*85-114*	*%REC*	*1*	*02-Jul-2019 16:01*
Surr: Dibromofluoromethane	*96.8*			**0**	*80-119*	*%REC*	*1*	*02-Jul-2019 16:01*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*02-Jul-2019 16:01*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

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WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

Batch ID: 142510 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061383-01	1	1000	1 (mL)	0.001
HS19061383-02	1	1000	1 (mL)	0.001
HS19061383-03	1	1000	1 (mL)	0.001

Batch ID: 142540 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061383-01	1	10	10 (mL)	1
HS19061383-04	1	10	10 (mL)	1

Batch ID: 142558 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061383-01	1	10 (mL)	10 (mL)	1
HS19061383-04	1	10 (mL)	10 (mL)	1

RIGHT SOLUTIONS | RIGHT PARTNER

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142510 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Water	
HS19061383-01	18CPTMW14_062519	25 Jun 2019 07:40		27 Jun 2019 14:45	28 Jun 2019 13:13	1
HS19061383-02	18CPTMW24_062519	25 Jun 2019 09:25		27 Jun 2019 14:45	28 Jun 2019 13:34	1
HS19061383-03	18CPTMW07_062519	25 Jun 2019 10:45		27 Jun 2019 14:45	28 Jun 2019 13:55	1
Batch ID: 142540 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Water	
HS19061383-01	18CPTMW14_062519	25 Jun 2019 07:40		28 Jun 2019 11:53	05 Jul 2019 15:30	20
HS19061383-01	18CPTMW14_062519	25 Jun 2019 07:40		28 Jun 2019 11:53	05 Jul 2019 15:27	1
HS19061383-01	18CPTMW14_062519	25 Jun 2019 07:40		28 Jun 2019 11:53	03 Jul 2019 23:27	1
HS19061383-04	MW3_062519	25 Jun 2019 12:35		28 Jun 2019 11:53	05 Jul 2019 15:34	10
HS19061383-04	MW3_062519	25 Jun 2019 12:35		28 Jun 2019 11:53	05 Jul 2019 15:32	1
HS19061383-04	MW3_062519	25 Jun 2019 12:35		28 Jun 2019 11:53	03 Jul 2019 23:29	1
Batch ID: 142558 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Water	
HS19061383-01	18CPTMW14_062519	25 Jun 2019 07:40		28 Jun 2019 09:30	28 Jun 2019 14:01	1
HS19061383-04	MW3_062519	25 Jun 2019 12:35		28 Jun 2019 09:30	28 Jun 2019 14:27	1
Batch ID: R341768 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19061383-01	18CPTMW14_062519	25 Jun 2019 07:40			02 Jul 2019 20:25	25
HS19061383-01	18CPTMW14_062519	25 Jun 2019 07:40			02 Jul 2019 20:01	1
HS19061383-02	18CPTMW24_062519	25 Jun 2019 09:25			02 Jul 2019 18:01	1
HS19061383-03	18CPTMW07_062519	25 Jun 2019 10:45			02 Jul 2019 18:25	1
HS19061383-04	MW3_062519	25 Jun 2019 12:35			02 Jul 2019 19:37	1
HS19061383-05	Trip Blank	25 Jun 2019 00:00			02 Jul 2019 16:01	1
Batch ID: R341869 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19061383-04	MW3_062519	25 Jun 2019 12:35			03 Jul 2019 18:56	5
Batch ID: R342274 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS19061383-01	18CPTMW14_062519	25 Jun 2019 07:40			11 Jul 2019 18:06	1
HS19061383-02	18CPTMW24_062519	25 Jun 2019 09:25			11 Jul 2019 18:06	1
HS19061383-03	18CPTMW07_062519	25 Jun 2019 10:45			11 Jul 2019 18:06	1
HS19061383-04	MW3_062519	25 Jun 2019 12:35			11 Jul 2019 18:06	1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: 142540 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142540** Units: **mg/L** Analysis Date: **03-Jul-2019 22:29**
Client ID: Run ID: **ICPMS04_341787** SeqNo: **5153505** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.00500	0.0100								U
Antimony	0.000681	0.00500								J
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00250	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.01186	0.200								J
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.001266	0.00500								J
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.0003	0.00200								J
Vanadium	0.00100	0.00500								U
Zinc	0.00250	0.00500								U

MBLK Sample ID: **MBLK-142540** Units: **mg/L** Analysis Date: **03-Jul-2019 22:29**
Client ID: Run ID: **ICPMS04_341787** SeqNo: **5153453** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.000500	0.00200								U

LCS Sample ID: **LCS-142540** Units: **mg/L** Analysis Date: **05-Jul-2019 15:15**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5154736** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09787	0.0100	0.1	0	97.9	84 - 117				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: 142540 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142540** Units: **mg/L** Analysis Date: **03-Jul-2019 22:32**
Client ID: Run ID: **ICPMS04_341787** SeqNo: **5153506** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05383	0.00500	0.05	0	108	85 - 117				
Arsenic	0.05245	0.00500	0.05	0	105	84 - 116				
Barium	0.05166	0.00500	0.05	0	103	86 - 114				
Beryllium	0.05496	0.00200	0.05	0	110	83 - 121				
Cadmium	0.05422	0.00200	0.05	0	108	87 - 115				
Calcium	5.105	0.500	5	0	102	87 - 118				
Chromium	0.05235	0.00500	0.05	0	105	85 - 116				
Cobalt	0.0512	0.00500	0.05	0	102	86 - 115				
Copper	0.05502	0.00500	0.05	0	110	85 - 118				
Iron	5.218	0.200	5	0	104	87 - 118				
Lead	0.05087	0.00500	0.05	0	102	88 - 115				
Magnesium	5.306	0.200	5	0	106	83 - 118				
Manganese	0.05361	0.00500	0.05	0	107	87 - 115				
Nickel	0.05543	0.00500	0.05	0	111	85 - 117				
Potassium	5.29	0.200	5	0	106	87 - 115				
Selenium	0.05674	0.00500	0.05	0	113	80 - 120				
Silver	0.05366	0.00500	0.05	0	107	85 - 116				
Sodium	5.269	0.200	5	0	105	85 - 117				
Thallium	0.0526	0.00200	0.05	0	105	82 - 116				
Vanadium	0.05232	0.00500	0.05	0	105	86 - 115				
Zinc	0.05604	0.00500	0.05	0	112	83 - 119				

LCS Sample ID: **LCS-142540** Units: **mg/L** Analysis Date: **03-Jul-2019 22:32**
Client ID: Run ID: **ICPMS04_341787** SeqNo: **5153454** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05245	0.00200	0.05	0	105	80 - 120				

MS Sample ID: **HS19061346-03MS** Units: **mg/L** Analysis Date: **05-Jul-2019 15:17**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5154737** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09696	0.0100	0.1	0.004265	92.7	84 - 117				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: 142540 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19061346-03MS** Units: **mg/L** Analysis Date: **03-Jul-2019 22:38**
Client ID: Run ID: **ICPMS04_341787** SeqNo: **5153509** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05305	0.00500	0.05	0.000547	105	85 - 117				
Arsenic	0.05351	0.00500	0.05	0.002199	103	84 - 116				
Barium	0.132	0.00500	0.05	0.08242	99.1	86 - 114				
Beryllium	0.05172	0.00200	0.05	0.000032	103	83 - 121				
Cadmium	0.05073	0.00200	0.05	0.000015	101	87 - 115				
Calcium	105.6	0.500	5	103.7	38.2	87 - 118				SO
Chromium	0.05009	0.00500	0.05	0.000152	99.9	85 - 116				
Cobalt	0.04814	0.00500	0.05	0.000118	96.1	86 - 115				
Copper	0.0518	0.00500	0.05	0.00062	102	85 - 118				
Iron	5	0.200	5	0.007949	99.8	87 - 118				
Lead	0.04926	0.00500	0.05	0.000075	98.4	88 - 115				
Magnesium	17.17	0.200	5	12.7	89.4	83 - 118				
Manganese	0.06308	0.00500	0.05	0.01279	101	87 - 115				
Nickel	0.05122	0.00500	0.05	0.000763	101	85 - 117				
Potassium	6.362	0.200	5	1.524	96.8	87 - 115				
Selenium	0.05509	0.00500	0.05	0.002461	105	80 - 120				
Silver	0.0494	0.00500	0.05	0.000025	98.7	85 - 116				
Sodium	123.1	0.200	5	122.2	18.9	85 - 117				SO
Thallium	0.05049	0.00200	0.05	0.000385	100	82 - 116				
Vanadium	0.07219	0.00500	0.05	0.02152	101	86 - 115				
Zinc	0.05497	0.00500	0.05	0.002648	105	83 - 119				

MS Sample ID: **HS19061346-03MS** Units: **mg/L** Analysis Date: **03-Jul-2019 22:38**
Client ID: Run ID: **ICPMS04_341787** SeqNo: **5153457** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05351	0.00200	0.05	0.002199	103	80 - 120				

MSD Sample ID: **HS19061346-03MSD** Units: **mg/L** Analysis Date: **05-Jul-2019 15:20**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5154738** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09273	0.0100	0.1	0.004265	88.5	84 - 117	0.09696	4.46	20	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: 142540 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19061346-03MSD** Units: **mg/L** Analysis Date: **03-Jul-2019 22:41**
Client ID: Run ID: **ICPMS04_341787** SeqNo: **5153510** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05259	0.00500	0.05	0.000547	104	85 - 117	0.05305	0.863	20	
Arsenic	0.05239	0.00500	0.05	0.002199	100	84 - 116	0.05351	2.11	20	
Barium	0.1313	0.00500	0.05	0.08242	97.7	86 - 114	0.132	0.552	20	
Beryllium	0.05022	0.00200	0.05	0.000032	100	83 - 121	0.05172	2.96	20	
Cadmium	0.0501	0.00200	0.05	0.000015	100	87 - 115	0.05073	1.25	20	
Calcium	103.6	0.500	5	103.7	-1.86	87 - 118	105.6	1.91	20	SO
Chromium	0.04984	0.00500	0.05	0.000152	99.4	85 - 116	0.05009	0.494	20	
Cobalt	0.04768	0.00500	0.05	0.000118	95.1	86 - 115	0.04814	0.958	20	
Copper	0.05103	0.00500	0.05	0.00062	101	85 - 118	0.0518	1.5	20	
Iron	4.893	0.200	5	0.007949	97.7	87 - 118	5	2.15	20	
Lead	0.04824	0.00500	0.05	0.000075	96.3	88 - 115	0.04926	2.1	20	
Magnesium	16.99	0.200	5	12.7	85.7	83 - 118	17.17	1.1	20	
Manganese	0.0616	0.00500	0.05	0.01279	97.6	87 - 115	0.06308	2.36	20	
Nickel	0.05005	0.00500	0.05	0.000763	98.6	85 - 117	0.05122	2.31	20	
Potassium	6.179	0.200	5	1.524	93.1	87 - 115	6.362	2.92	20	
Selenium	0.05339	0.00500	0.05	0.002461	102	80 - 120	0.05509	3.14	20	
Silver	0.04859	0.00500	0.05	0.000025	97.1	85 - 116	0.0494	1.65	20	
Sodium	121.7	0.200	5	122.2	-10.4	85 - 117	123.1	1.2	20	SO
Thallium	0.04892	0.00200	0.05	0.000385	97.1	82 - 116	0.05049	3.16	20	
Vanadium	0.07031	0.00500	0.05	0.02152	97.6	86 - 115	0.07219	2.64	20	
Zinc	0.0538	0.00500	0.05	0.002648	102	83 - 119	0.05497	2.15	20	

MSD Sample ID: **HS19061346-03MSD** Units: **mg/L** Analysis Date: **03-Jul-2019 22:41**
Client ID: Run ID: **ICPMS04_341787** SeqNo: **5153458** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.05239	0.00200	0.05	0.002199	100	80 - 120	0.05351	2.11	20	

PDS Sample ID: **HS19061346-03PDS** Units: **mg/L** Analysis Date: **05-Jul-2019 15:22**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5154739** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1056	0.0100	0.1	0.004265	101	80 - 120				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: 142540 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19061346-03PDS** Units: **mg/L** Analysis Date: **03-Jul-2019 22:43**
Client ID: Run ID: **ICPMS04_341787** SeqNo: **5153511** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09518	0.00500	0.1	0.000547	94.6	80 - 120				
Arsenic	0.1005	0.00500	0.1	0.002199	98.3	80 - 120				
Barium	0.1835	0.00500	0.1	0.08242	101	80 - 120				
Beryllium	0.1076	0.00200	0.1	0.000032	108	80 - 120				
Cadmium	0.1018	0.00200	0.1	0.000015	102	80 - 120				
Calcium	105.8	0.500	10	103.7	20.9	80 - 120				SO
Chromium	0.09688	0.00500	0.1	0.000152	96.7	80 - 120				
Cobalt	0.09239	0.00500	0.1	0.000118	92.3	80 - 120				
Copper	0.09686	0.00500	0.1	0.00062	96.2	80 - 120				
Iron	9.598	0.200	10	0.007949	95.9	80 - 120				
Lead	0.1026	0.00500	0.1	0.000075	103	80 - 120				
Magnesium	21.04	0.200	10	12.7	83.3	80 - 120				
Manganese	0.1093	0.00500	0.1	0.01279	96.5	80 - 120				
Nickel	0.09655	0.00500	0.1	0.000763	95.8	80 - 120				
Potassium	10.82	0.200	10	1.524	92.9	80 - 120				
Selenium	0.1031	0.00500	0.1	0.002461	101	80 - 120				
Silver	0.09983	0.00500	0.1	0.000025	99.8	80 - 120				
Sodium	121.6	0.200	10	122.2	-5.86	80 - 120				SO
Thallium	0.1024	0.00200	0.1	0.000385	102	80 - 120				
Vanadium	0.1173	0.00500	0.1	0.02152	95.7	80 - 120				
Zinc	0.1014	0.00500	0.1	0.002648	98.8	80 - 120				

PDS Sample ID: **HS19061346-03PDS** Units: **mg/L** Analysis Date: **03-Jul-2019 22:43**
Client ID: Run ID: **ICPMS04_341787** SeqNo: **5153459** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Arsenic	0.1005	0.00200	0.1	0.002199	98.3	75 - 125				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: 142540 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19061346-03SD** Units: **mg/L** Analysis Date: **03-Jul-2019 22:36**
Client ID: Run ID: **ICPMS04_341787** SeqNo: **5153508** PrepDate: **28-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.0250	0.0500					0.004265	0	10	U
Antimony	0.00250	0.0250					0.000547	0	10	U
Arsenic	0.00250	0.0250					0.002199	0	10	U
Barium	0.08319	0.0250					0.08242	0.932	10	
Beryllium	0.00250	0.0100					0.000032	0	10	U
Cadmium	0.00250	0.0100					0.000015	0	10	U
Calcium	102.1	2.50					103.7	1.6	10	
Chromium	0.00250	0.0250					0.000152	0	10	U
Cobalt	0.00250	0.0250					0.000118	0	10	U
Copper	0.0125	0.0250					0.00062	0	10	U
Iron	0.250	1.00					0.007949	0	10	U
Lead	0.00500	0.0250					0.000075	0	10	U
Magnesium	12.93	1.00					12.7	1.81	10	
Manganese	0.01238	0.0250					0.01279	0	10	J
Nickel	0.00500	0.0250					0.000763	0	10	U
Potassium	1.437	1.00					1.524	5.68	10	
Selenium	0.0125	0.0250					0.002461	0	10	U
Silver	0.00250	0.0250					0.000025	0	10	U
Sodium	119.6	1.00					122.2	2.1	10	
Thallium	0.00250	0.0100					0.000385	0	10	U
Vanadium	0.02088	0.0250					0.02152	0	10	J
Zinc	0.0125	0.0250					0.002648	0	10	U

SD Sample ID: **HS19061346-03SD** Units: **mg/L** Analysis Date: **03-Jul-2019 22:36**
Client ID: Run ID: **ICPMS04_341787** SeqNo: **5153456** PrepDate: **28-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Arsenic	0.00250	0.0100					0.002199	0	10	U

The following samples were analyzed in this batch: HS19061383-01 HS19061383-04

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ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: 142558 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142558** Units: **mg/L** Analysis Date: **28-Jun-2019 13:58**
Client ID: Run ID: **HG03_341562** SeqNo: **5146995** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142558** Units: **mg/L** Analysis Date: **28-Jun-2019 13:59**
Client ID: Run ID: **HG03_341562** SeqNo: **5146996** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00514	0.000200	0.005	0	103	80 - 120				

MS Sample ID: **HS19061383-01MS** Units: **mg/L** Analysis Date: **28-Jun-2019 14:03**
Client ID: **18CPTMW14_062519** Run ID: **HG03_341562** SeqNo: **5146998** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000517	0.000000200	5e-006	-0.0000000010	103	75 - 125				

MSD Sample ID: **HS19061383-01MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 14:05**
Client ID: **18CPTMW14_062519** Run ID: **HG03_341562** SeqNo: **5146999** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000514	0.000000200	5e-006	-0.0000000010	103	75 - 125	0.000005170	0.582	20	

The following samples were analyzed in this batch: HS19061383-01 HS19061383-04

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ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: 142510 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142510** Units: **ug/L** Analysis Date: **27-Jun-2019 22:37**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146408** PrepDate: **27-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.0594*	*0*	*0.08*	*0*	*74.3*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.08022*	*0*	*0.08*	*0*	*100*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07461*	*0*	*0.08*	*0*	*93.3*	*40 - 140*				

LCS Sample ID: **LCS-142510** Units: **ug/L** Analysis Date: **27-Jun-2019 22:58**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146409** PrepDate: **27-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08012	0.010	0.08	0	100	40 - 140				
Surr: 2-Fluorobiphenyl	*0.07847*	*0*	*0.08*	*0*	*98.1*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.08943*	*0*	*0.08*	*0*	*112*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08221*	*0*	*0.08*	*0*	*103*	*40 - 140*				

LCSD Sample ID: **LCSD-142510** Units: **ug/L** Analysis Date: **27-Jun-2019 23:19**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146410** PrepDate: **27-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07797	0.010	0.08	0	97.5	40 - 140	0.08012	2.72	20	
Surr: 2-Fluorobiphenyl	*0.07625*	*0*	*0.08*	*0*	*95.3*	*40 - 140*	*0.07847*	*2.86*	*20*	
Surr: 4-Terphenyl-d14	*0.09409*	*0*	*0.08*	*0*	*118*	*40 - 140*	*0.08943*	*5.08*	*20*	
Surr: Nitrobenzene-d5	*0.08067*	*0*	*0.08*	*0*	*101*	*40 - 140*	*0.08221*	*1.89*	*20*	

The following samples were analyzed in this batch: HS19061383-01 HS19061383-02 HS19061383-03

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ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190702** Units: **UG/L** Analysis Date: **02-Jul-2019 11:38**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151546** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190702** Units: **UG/L** Analysis Date: **02-Jul-2019 11:38**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151546** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*48.37*	*1.0*	*50*	*0*	*96.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.48*	*1.0*	*50*	*0*	*95.0*	*85 - 114*				
Surr: Dibromofluoromethane	*46.31*	*1.0*	*50*	*0*	*92.6*	*80 - 119*				
Surr: Toluene-d8	*50.22*	*1.0*	*50*	*0*	*100*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190702** Units: **UG/L** Analysis Date: **02-Jul-2019 10:26**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151545** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.88	1.0	20	0	99.4	78 - 124				
1,1,1-Trichloroethane	18.61	1.0	20	0	93.1	74 - 131				
1,1,2,2-Tetrachloroethane	21.7	1.0	20	0	108	71 - 121				
1,1,2-Trichloroethane	21.03	1.0	20	0	105	80 - 119				
1,1-Dichloroethane	19.31	1.0	20	0	96.5	77 - 125				
1,1-Dichloroethene	18.25	1.0	20	0	91.2	71 - 131				
1,1-Dichloropropene	18.58	1.0	20	0	92.9	78 - 125				
1,2,3-Trichlorobenzene	23.14	1.0	20	0	116	69 - 129				
1,2,3-Trichloropropane	18.92	1.0	20	0	94.6	73 - 122				
1,2,4-Trichlorobenzene	20.64	1.0	20	0	103	69 - 130				
1,2,4-Trimethylbenzene	17.82	1.0	20	0	89.1	76 - 124				
1,2-Dibromo-3-chloropropane	22.28	1.0	20	0	111	62 - 128				
1,2-Dibromoethane	20.44	1.0	20	0	102	77 - 121				
1,2-Dichlorobenzene	19.09	1.0	20	0	95.5	80 - 119				
1,2-Dichloroethane	18.92	1.0	20	0	94.6	73 - 128				
1,2-Dichloropropane	19.38	1.0	20	0	96.9	78 - 122				
1,3,5-Trimethylbenzene	17.15	1.0	20	0	85.8	75 - 124				
1,3-Dichlorobenzene	18.25	1.0	20	0	91.3	80 - 119				
1,3-Dichloropropane	20.81	1.0	20	0	104	80 - 119				
1,4-Dichlorobenzene	19.84	1.0	20	0	99.2	79 - 118				
2,2-Dichloropropane	19.77	1.0	20	0	98.8	60 - 139				
2-Butanone	44.92	2.0	40	0	112	56 - 143				
2-Chlorotoluene	19.2	1.0	20	0	96.0	79 - 122				
2-Hexanone	40.3	2.0	40	0	101	57 - 139				
4-Chlorotoluene	19.14	1.0	20	0	95.7	78 - 122				
4-Isopropyltoluene	16.8	1.0	20	0	84.0	77 - 127				
4-Methyl-2-pentanone	39.68	2.0	40	0	99.2	67 - 130				
Acetone	47.19	2.0	40	0	118	39 - 160				
Benzene	19.98	1.0	20	0	99.9	79 - 120				
Bromobenzene	18.71	1.0	20	0	93.6	80 - 120				
Bromochloromethane	19.36	1.0	20	0	96.8	78 - 123				
Bromodichloromethane	20.21	1.0	20	0	101	79 - 125				
Bromoform	21.67	1.0	20	0	108	66 - 130				
Bromomethane	20.75	1.0	20	0	104	53 - 141				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190702** Units: **UG/L** Analysis Date: **02-Jul-2019 10:26**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151545** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.79	2.0	40	0	89.5	64 - 133				
Carbon tetrachloride	18.07	1.0	20	0	90.3	72 - 136				
Chlorobenzene	19.29	1.0	20	0	96.5	82 - 118				
Chloroethane	18.27	1.0	20	0	91.4	60 - 138				
Chloroform	27.06	1.0	20	0	135	79 - 124				S
Chloromethane	17.7	1.0	20	0	88.5	50 - 139				
cis-1,2-Dichloroethene	20.04	1.0	20	0	100	78 - 123				
cis-1,3-Dichloropropene	19.46	1.0	20	0	97.3	75 - 124				
Dibromochloromethane	19.85	1.0	20	0	99.2	74 - 126				
Dibromomethane	20.01	1.0	20	0	100	79 - 123				
Dichlorodifluoromethane	18.31	1.0	20	0	91.5	32 - 152				
Ethylbenzene	18.31	1.0	20	0	91.5	79 - 121				
Hexachlorobutadiene	22.83	1.0	20	0	114	66 - 134				
Isopropylbenzene	17.5	1.0	20	0	87.5	72 - 131				
m,p-Xylene	37.16	2.0	40	0	92.9	80 - 121				
Methylene chloride	19.46	2.0	20	0	97.3	74 - 124				
Naphthalene	22.02	1.0	20	0	110	61 - 128				
n-Butylbenzene	17.1	1.0	20	0	85.5	75 - 128				
n-Propylbenzene	18.1	1.0	20	0	90.5	76 - 126				
o-Xylene	18.52	1.0	20	0	92.6	78 - 122				
sec-Butylbenzene	17.6	1.0	20	0	88.0	77 - 126				
Styrene	19.81	1.0	20	0	99.1	78 - 123				
tert-Butylbenzene	17.93	1.0	20	0	89.7	78 - 124				
Tetrachloroethene	17.9	1.0	20	0	89.5	74 - 129				
Toluene	19.07	1.0	20	0	95.4	80 - 121				
trans-1,2-Dichloroethene	19.56	1.0	20	0	97.8	75 - 124				
trans-1,3-Dichloropropene	20.02	1.0	20	0	100	73 - 127				
Trichloroethene	18.94	1.0	20	0	94.7	79 - 123				
Trichlorofluoromethane	17.56	1.0	20	0	87.8	65 - 141				
Vinyl chloride	17.16	1.0	20	0	85.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.7*	*1.0*	*50*	*0*	*103*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.55*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*50.71*	*1.0*	*50*	*0*	*101*	*80 - 119*				
Surr: Toluene-d8	*49.5*	*1.0*	*50*	*0*	*99.0*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061279-02MS** Units: **UG/L** Analysis Date: **02-Jul-2019 14:26**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151553** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.03	1.0	20	0	90.2	78 - 124				
1,1,1-Trichloroethane	18.04	1.0	20	0	90.2	74 - 131				
1,1,2,2-Tetrachloroethane	17.83	1.0	20	0	89.1	71 - 121				
1,1,2-Trichloroethane	18.28	1.0	20	0	91.4	80 - 119				
1,1-Dichloroethane	16.8	1.0	20	0	84.0	77 - 125				
1,1-Dichloroethene	17.59	1.0	20	0	88.0	71 - 131				
1,1-Dichloropropene	19.29	1.0	20	0	96.5	78 - 125				
1,2,3-Trichlorobenzene	18.52	1.0	20	0	92.6	69 - 129				
1,2,3-Trichloropropane	18.32	1.0	20	0	91.6	73 - 122				
1,2,4-Trichlorobenzene	18.51	1.0	20	0	92.6	69 - 130				
1,2,4-Trimethylbenzene	18.55	1.0	20	0	92.7	76 - 124				
1,2-Dibromo-3-chloropropane	18.32	1.0	20	0	91.6	62 - 128				
1,2-Dibromoethane	17.49	1.0	20	0	87.4	77 - 121				
1,2-Dichlorobenzene	17.91	1.0	20	0	89.5	80 - 119				
1,2-Dichloroethane	16.42	1.0	20	0	82.1	73 - 128				
1,2-Dichloropropane	17.32	1.0	20	0	86.6	78 - 122				
1,3,5-Trimethylbenzene	18.27	1.0	20	0	91.4	75 - 124				
1,3-Dichlorobenzene	17.89	1.0	20	0	89.5	80 - 119				
1,3-Dichloropropane	17.94	1.0	20	0	89.7	80 - 119				
1,4-Dichlorobenzene	19.13	1.0	20	0	95.7	79 - 118				
2,2-Dichloropropane	18.56	1.0	20	0	92.8	60 - 139				
2-Butanone	34.72	2.0	40	0	86.8	56 - 143				
2-Chlorotoluene	19.37	1.0	20	0	96.9	79 - 122				
2-Hexanone	31.75	2.0	40	0	79.4	57 - 139				
4-Chlorotoluene	19.3	1.0	20	0	96.5	78 - 122				
4-Isopropyltoluene	19.37	1.0	20	0	96.8	77 - 127				
4-Methyl-2-pentanone	32.44	2.0	40	0	81.1	67 - 130				
Acetone	37.3	2.0	40	0	93.2	39 - 160				
Benzene	18.39	1.0	20	0	92.0	79 - 120				
Bromobenzene	17.14	1.0	20	0	85.7	80 - 120				
Bromochloromethane	16.05	1.0	20	0	80.2	78 - 123				
Bromodichloromethane	17.72	1.0	20	0	88.6	79 - 125				
Bromoform	17.73	1.0	20	0	88.6	66 - 130				
Bromomethane	17.74	1.0	20	0	88.7	53 - 141				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061279-02MS** Units: **UG/L** Analysis Date: **02-Jul-2019 14:26**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151553** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	33.1	2.0	40	0	82.8	64 - 133				
Carbon tetrachloride	19.3	1.0	20	0	96.5	72 - 136				
Chlorobenzene	17.94	1.0	20	0	89.7	82 - 118				
Chloroethane	16.25	1.0	20	0	81.3	60 - 138				
Chloroform	17.26	1.0	20	0	86.3	79 - 124				
Chloromethane	17.74	1.0	20	0	88.7	50 - 139				
cis-1,2-Dichloroethene	17.2	1.0	20	0	86.0	78 - 123				
cis-1,3-Dichloropropene	16.63	1.0	20	0	83.2	75 - 124				
Dibromochloromethane	17.38	1.0	20	0	86.9	74 - 126				
Dibromomethane	17.13	1.0	20	0	85.6	79 - 123				
Dichlorodifluoromethane	17.34	1.0	20	0	86.7	32 - 152				
Ethylbenzene	18.59	1.0	20	0	93.0	79 - 121				
Hexachlorobutadiene	21.22	1.0	20	0	106	66 - 134				
Isopropylbenzene	19.1	1.0	20	0	95.5	72 - 131				
m,p-Xylene	37.18	2.0	40	0	92.9	80 - 121				
Methylene chloride	15.9	2.0	20	0	79.5	74 - 124				
Naphthalene	17.16	1.0	20	0	85.8	61 - 128				
n-Butylbenzene	19.55	1.0	20	0	97.7	75 - 128				
n-Propylbenzene	20	1.0	20	0	100	76 - 126				
o-Xylene	17.95	1.0	20	0	89.8	78 - 122				
sec-Butylbenzene	20.61	1.0	20	0	103	77 - 126				
Styrene	18.46	1.0	20	0	92.3	78 - 123				
tert-Butylbenzene	20.24	1.0	20	0	101	78 - 124				
Tetrachloroethene	19.16	1.0	20	0	95.8	74 - 129				
Toluene	18.03	1.0	20	0	90.1	80 - 121				
trans-1,2-Dichloroethene	17.55	1.0	20	0	87.8	75 - 124				
trans-1,3-Dichloropropene	16.75	1.0	20	0	83.7	73 - 127				
Trichloroethene	18.63	1.0	20	0	93.1	79 - 123				
Trichlorofluoromethane	17.98	1.0	20	0	89.9	65 - 141				
Vinyl chloride	16.37	1.0	20	0	81.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.67*	*1.0*	*50*	*0*	*95.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.65*	*1.0*	*50*	*0*	*99.3*	*85 - 114*				
Surr: Dibromofluoromethane	*47.23*	*1.0*	*50*	*0*	*94.5*	*80 - 119*				
Surr: Toluene-d8	*48.99*	*1.0*	*50*	*0*	*98.0*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19061279-02MSD** Units: **UG/L** Analysis Date: **02-Jul-2019 14:50**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151554** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.01	1.0	20	0	90.1	78 - 124	18.03	0.0865	20	
1,1,1-Trichloroethane	18.39	1.0	20	0	92.0	74 - 131	18.04	1.93	20	
1,1,2,2-Tetrachloroethane	18.7	1.0	20	0	93.5	71 - 121	17.83	4.76	20	
1,1,2-Trichloroethane	18.66	1.0	20	0	93.3	80 - 119	18.28	2.05	20	
1,1-Dichloroethane	17.35	1.0	20	0	86.8	77 - 125	16.8	3.26	20	
1,1-Dichloroethene	17.79	1.0	20	0	89.0	71 - 131	17.59	1.14	20	
1,1-Dichloropropene	19.11	1.0	20	0	95.6	78 - 125	19.29	0.936	20	
1,2,3-Trichlorobenzene	20.01	1.0	20	0	100	69 - 129	18.52	7.74	20	
1,2,3-Trichloropropane	18.82	1.0	20	0	94.1	73 - 122	18.32	2.72	20	
1,2,4-Trichlorobenzene	19.44	1.0	20	0	97.2	69 - 130	18.51	4.86	20	
1,2,4-Trimethylbenzene	18.6	1.0	20	0	93.0	76 - 124	18.55	0.272	20	
1,2-Dibromo-3-chloropropane	19.01	1.0	20	0	95.1	62 - 128	18.32	3.69	20	
1,2-Dibromoethane	18.08	1.0	20	0	90.4	77 - 121	17.49	3.33	20	
1,2-Dichlorobenzene	18.35	1.0	20	0	91.8	80 - 119	17.91	2.45	20	
1,2-Dichloroethane	17.01	1.0	20	0	85.0	73 - 128	16.42	3.48	20	
1,2-Dichloropropane	17.17	1.0	20	0	85.9	78 - 122	17.32	0.85	20	
1,3,5-Trimethylbenzene	18.34	1.0	20	0	91.7	75 - 124	18.27	0.352	20	
1,3-Dichlorobenzene	18.32	1.0	20	0	91.6	80 - 119	17.89	2.37	20	
1,3-Dichloropropane	18.22	1.0	20	0	91.1	80 - 119	17.94	1.56	20	
1,4-Dichlorobenzene	19.85	1.0	20	0	99.3	79 - 118	19.13	3.69	20	
2,2-Dichloropropane	18.5	1.0	20	0	92.5	60 - 139	18.56	0.293	20	
2-Butanone	36.4	2.0	40	0	91.0	56 - 143	34.72	4.73	20	
2-Chlorotoluene	19.38	1.0	20	0	96.9	79 - 122	19.37	0.0148	20	
2-Hexanone	33.92	2.0	40	0	84.8	57 - 139	31.75	6.59	20	
4-Chlorotoluene	19.53	1.0	20	0	97.6	78 - 122	19.3	1.14	20	
4-Isopropyltoluene	19.16	1.0	20	0	95.8	77 - 127	19.37	1.05	20	
4-Methyl-2-pentanone	34.11	2.0	40	0	85.3	67 - 130	32.44	5.02	20	
Acetone	38.91	2.0	40	0	97.3	39 - 160	37.3	4.23	20	
Benzene	18.33	1.0	20	0	91.7	79 - 120	18.39	0.339	20	
Bromobenzene	17.11	1.0	20	0	85.5	80 - 120	17.14	0.209	20	
Bromochloromethane	16.97	1.0	20	0	84.9	78 - 123	16.05	5.62	20	
Bromodichloromethane	18.02	1.0	20	0	90.1	79 - 125	17.72	1.67	20	
Bromoform	18.17	1.0	20	0	90.9	66 - 130	17.73	2.47	20	
Bromomethane	17.59	1.0	20	0	88.0	53 - 141	17.74	0.834	20	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19061279-02MSD** Units: **UG/L** Analysis Date: **02-Jul-2019 14:50**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151554** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	33.18	2.0	40	0	83.0	64 - 133	33.1	0.239	20	
Carbon tetrachloride	19.29	1.0	20	0	96.5	72 - 136	19.3	0.0519	20	
Chlorobenzene	18.04	1.0	20	0	90.2	82 - 118	17.94	0.592	20	
Chloroethane	17.66	1.0	20	0	88.3	60 - 138	16.25	8.29	20	
Chloroform	17.58	1.0	20	0	87.9	79 - 124	17.26	1.83	20	
Chloromethane	16.74	1.0	20	0	83.7	50 - 139	17.74	5.81	20	
cis-1,2-Dichloroethene	17.71	1.0	20	0	88.5	78 - 123	17.2	2.9	20	
cis-1,3-Dichloropropene	17.24	1.0	20	0	86.2	75 - 124	16.63	3.63	20	
Dibromochloromethane	17.51	1.0	20	0	87.6	74 - 126	17.38	0.749	20	
Dibromomethane	17.5	1.0	20	0	87.5	79 - 123	17.13	2.13	20	
Dichlorodifluoromethane	16.92	1.0	20	0	84.6	32 - 152	17.34	2.41	20	
Ethylbenzene	18.48	1.0	20	0	92.4	79 - 121	18.59	0.622	20	
Hexachlorobutadiene	21.2	1.0	20	0	106	66 - 134	21.22	0.0826	20	
Isopropylbenzene	19.21	1.0	20	0	96.1	72 - 131	19.1	0.57	20	
m,p-Xylene	36.92	2.0	40	0	92.3	80 - 121	37.18	0.695	20	
Methylene chloride	16.19	2.0	20	0	81.0	74 - 124	15.9	1.84	20	
Naphthalene	18.92	1.0	20	0	94.6	61 - 128	17.16	9.76	20	
n-Butylbenzene	19.36	1.0	20	0	96.8	75 - 128	19.55	0.956	20	
n-Propylbenzene	20.01	1.0	20	0	100	76 - 126	20	0.0421	20	
o-Xylene	18.32	1.0	20	0	91.6	78 - 122	17.95	2.02	20	
sec-Butylbenzene	20.38	1.0	20	0	102	77 - 126	20.61	1.12	20	
Styrene	18.72	1.0	20	0	93.6	78 - 123	18.46	1.41	20	
tert-Butylbenzene	20.29	1.0	20	0	101	78 - 124	20.24	0.291	20	
Tetrachloroethene	18.91	1.0	20	0	94.5	74 - 129	19.16	1.35	20	
Toluene	18	1.0	20	0	90.0	80 - 121	18.03	0.169	20	
trans-1,2-Dichloroethene	17.99	1.0	20	0	90.0	75 - 124	17.55	2.49	20	
trans-1,3-Dichloropropene	17.13	1.0	20	0	85.7	73 - 127	16.75	2.28	20	
Trichloroethene	18.32	1.0	20	0	91.6	79 - 123	18.63	1.68	20	
Trichlorofluoromethane	18	1.0	20	0	90.0	65 - 141	17.98	0.106	20	
Vinyl chloride	16.22	1.0	20	0	81.1	58 - 137	16.37	0.923	20	
Surr: 1,2-Dichloroethane-d4	*48.93*	*1.0*	*50*	*0*	*97.9*	*81 - 118*	*47.67*	*2.6*	*20*	
Surr: 4-Bromofluorobenzene	*49.69*	*1.0*	*50*	*0*	*99.4*	*85 - 114*	*49.65*	*0.063*	*20*	
Surr: Dibromofluoromethane	*48.03*	*1.0*	*50*	*0*	*96.1*	*80 - 119*	*47.23*	*1.66*	*20*	
Surr: Toluene-d8	*49.1*	*1.0*	*50*	*0*	*98.2*	*89 - 112*	*48.99*	*0.233*	*20*	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP 18 24
WorkOrder:	HS19061383

QC BATCH REPORT

Batch ID:	**R341768 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch:	HS19061383-01	HS19061383-02	HS19061383-03	HS19061383-04
	HS19061383-05			

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ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190703** Units: **UG/L** Analysis Date: **03-Jul-2019 15:45**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153631** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.09*	*1.0*	*50*	*0*	*92.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.05*	*1.0*	*50*	*0*	*96.1*	*85 - 114*				
Surr: Dibromofluoromethane	*44.95*	*1.0*	*50*	*0*	*89.9*	*80 - 119*				
Surr: Toluene-d8	*48.5*	*1.0*	*50*	*0*	*97.0*	*89 - 112*				

LCS Sample ID: **VLCSW-190703** Units: **UG/L** Analysis Date: **03-Jul-2019 14:57**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153630** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	17.79	1.0	20	0	89.0	79 - 123				
Surr: 1,2-Dichloroethane-d4	*49.62*	*1.0*	*50*	*0*	*99.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.98*	*1.0*	*50*	*0*	*96.0*	*85 - 114*				
Surr: Dibromofluoromethane	*49.25*	*1.0*	*50*	*0*	*98.5*	*80 - 119*				
Surr: Toluene-d8	*45.94*	*1.0*	*50*	*0*	*91.9*	*89 - 112*				

MS Sample ID: **HS19061486-01MS** Units: **UG/L** Analysis Date: **03-Jul-2019 18:08**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153637** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	19.25	1.0	20	0	96.3	79 - 123				
Surr: 1,2-Dichloroethane-d4	*45.86*	*1.0*	*50*	*0*	*91.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.41*	*1.0*	*50*	*0*	*96.8*	*85 - 114*				
Surr: Dibromofluoromethane	*45.73*	*1.0*	*50*	*0*	*91.5*	*80 - 119*				
Surr: Toluene-d8	*47.34*	*1.0*	*50*	*0*	*94.7*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061383

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061486-01MSD** Units: **UG/L** Analysis Date: **03-Jul-2019 18:32**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153638** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Trichloroethene	17.49	1.0	20	0	87.5	79 - 123	19.25	9.57	20	
Surr: 1,2-Dichloroethane-d4	*47.12*	*1.0*	*50*	*0*	*94.2*	*81 - 118*	*45.86*	*2.7*	*20*	
Surr: 4-Bromofluorobenzene	*48.48*	*1.0*	*50*	*0*	*97.0*	*85 - 114*	*48.41*	*0.13*	*20*	
Surr: Dibromofluoromethane	*46.14*	*1.0*	*50*	*0*	*92.3*	*80 - 119*	*45.73*	*0.893*	*20*	
Surr: Toluene-d8	*46.66*	*1.0*	*50*	*0*	*93.3*	*89 - 112*	*47.34*	*1.44*	*20*	

The following samples were analyzed in this batch: HS19061383-04

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ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19061383**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19061383
Date/Time Received: **26-Jun-2019 08:50**
Received by: **PMG**

Checklist completed by: *Paresh M. Giga* eSignature — 26-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature — 26-Jun-2019 Date

Matrices: **Water**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.7c U/C	IR11
Cooler(s)/Kit(s):	43642	
Date/Time sample(s) sent to storage:	6/26/19 16:10	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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bhate

Page: 1 of 1

Project/Phase No: NWQ1312.0150

COC Number(1):

LIMS Number:

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code [3]	Sample Number [3]	Sample Matrix [4]	Number of containers [5]	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE							Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
18-[illegible]-062519		25-Jun-2019	0740	-	N		WG	6	3	1	1	1										
[illegible]-062519		25-Jun-2019	0925	-	N		WG	5	3	1		1										
[illegible]-062519		25-Jun-2019	1045	-	N		WG	5	3	1		1										
MW3-062519		25-Jun-2019	1235		N		WG	6	3	1	1	1										
Trip Blank		25-Jun-2019			TB		WI	2														
				-																		
				-																		
				-																		
				-																		
				-																		
				-																		

Sample Analysis Requested [5] | Quality Assurance Samples [6]

HS19061383

Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS:

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Kenneth Moore	6/25/19	1430	1. [illegible]	06/26/19	0859
2.			2. [illegible]		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: [illegible] Shipped No.:

Method of Shipment: [illegible]

Fed Ex Airbill Number: [illegible]

Analytical Lab: ALS 10450 Stanciff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-t) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

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00941505

ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

43642

CUSTODY SEAL

Date: 6/25/19 Time: 1430
Name: Scott Beesinger
Company: BHATE

Seal Broken By: SM
Date: 06/26/19

43642

Must Deliver Next Business Day
Time and Tempature Sensitive!

43642

ORIGIN ID:SGRA (903) 930-8183
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202

MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 24MAY19
ACTWGT: 1.00 LB MAN
CAD: 3001907CAFE3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON 77099
(281) 530-5656
REF: LHAAP/10/24 & SURFACE WATER-RJ

RMA:

FedEx Express

FedEx
TRK# 0271 4809 7834 3273

WED - 26 JUN 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1918373, 1918525, 1918682

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2269 (243227)

General Set Information: There were eighteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1918373001 and 1918525004 were analyzed and reported from 1:1,000 dilutions. Field samples 1918373003/08 were analyzed and reported from 1:10,000 dilutions. Field samples 1918373009 and 1918525002 were analyzed and reported from 1:10 dilutions. Field samples 1918525001 and 1918682004 were analyzed and reported from 1:100 dilutions. Sample 1918373004 failed the 50-150% method requirement for ISTD recovery. This sample was re-analyzed and reported from a 1:4 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 662917) was less than 1/2 the CRDL. The recovery for the LCS (662918) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on sample 1918373005 (Client ID: 18WW03_062419). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The MS/MSD percent recoveries and relative percent difference were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 662915) is reported from the analysis of the Laboratory Control Sample (LCS – 662918) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafile 10JULD13.

Thomas Bosch — July 11, 2019
Analyst — Date

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ANALYTICAL REPORT

Report Date: July 11, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1918525**
Project ID: HS19061383
Purchase Order: HS19061383
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
18CPTMW14_062519	1918525001	06/25/19	06/27/19	
18CPTMW24_062519	1918525002	06/25/19	06/27/19	
18CPTMW07_062519	1918525003	06/25/19	06/27/19	
MW3_062519	1918525004	06/25/19	06/27/19	

ANALYTICAL REPORT

Workorder: 34-1918525
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18CPTMW14_062519** | Sampling Site: NA | Collected: 06/25/2019
Lab ID: 1918525001 | Media: 125 mL Nalgene | Received: 06/27/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 12:18 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**1300**	100	200	400	100	

Sample ID: **18CPTMW24_062519** | Sampling Site: NA | Collected: 06/25/2019
Lab ID: 1918525002 | Media: 125 mL Nalgene | Received: 06/27/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 12:46 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**89**	10	20	40	10	

Sample ID: **18CPTMW07_062519** | Sampling Site: NA | Collected: 06/25/2019
Lab ID: 1918525003 | Media: 125 mL Nalgene | Received: 06/27/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 13:00 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	1.4	1.0	2.0	4.0	1	J

Sample ID: **MW3_062519** | Sampling Site: NA | Collected: 06/25/2019
Lab ID: 1918525004 | Media: 125 mL Nalgene | Received: 06/27/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 13:39 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**11000**	1000	2000	4000	1000	

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ANALYTICAL REPORT

Workorder: 34-1918525
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 243227)**

Field samples 1918373001 and 1918525004 were analyzed and reported from 1:1,000 dilutions. Field samples 1918373003/08 were analyzed and reported from 1:10,000 dilutions. Field samples 1918373009 and 1918525002 were analyzed and reported from 1:10 dilutions. Field samples 1918525001 and 1918682004 were analyzed and reported from 1:100 dilutions. Sample 1918373004 failed the 50-150% method requirement for ISTD recovery. This sample was re-analyzed and reported from a 1:4 dilution. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/11/2019 10:28	/S/ Stephen Brose 07/11/2019 13:28

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1918525
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1918525

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2269 (HBN: 243227)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 662917
Analyzed: 07/10/2019 09:31
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 662918
Analyzed: 07/10/2019 09:03
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.25	4.00	106	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1918373005	**MS:**	662919	**MSD:**	662920
Analyzed:	07/10/2019 10:41	**Analyzed:**	07/10/2019 10:55	**Analyzed:**	07/10/2019 11:09
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.87	4	122	78.8	123.8	4.01	100	19.3	0.0	20.0

Comments

Field samples 1918373001 and 1918525004 were analyzed and reported from 1:1,000 dilutions. Field samples 1918373003/08 were analyzed and reported from 1:10,000 dilutions. Field samples 1918373009 and 1918525002 were analyzed and reported from 1:10 dilutions. Field samples 1918525001 and 1918682004 were analyzed and reported from 1:100 dilutions. Sample 1918373004 failed the 50-150% method requirement for ISTD recovery. This sample was re-analyzed and reported from a 1:4 dilution. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 07/11/2019 11:05	/S/ Stephen Brose 07/11/2019 13:28

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19061383	***Split:***	**Workorder ID:** 1918525	**Level:** ENV_LVL4	**Requested Analysis**
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly	
Comments:			**Preservatives**	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Preservatives COOL	Requested Analysis EPA 6850, DoD QSM
1	06/25/2019 07:40	18CPTMW14_062519	1918525001		Water	A	1		A
2	06/25/2019 09:25	18CPTMW24_062519	1918525002		Water	A	1		A
3	06/25/2019 10:45	18CPTMW07_062519	1918525003		Water	A	1		A
4	06/25/2019 12:25	MW3_062519	1918525004		Water	A	1		A
5									
6									
7									
8									
9									
10									

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Waratli, Julie	06/27/2019 09:07	ALS Sample Receiving	Sample Login
Julie Waratli 06/27/19 1400		LB	Storage
R-33.1	07-09.19/11:10	T.Bud	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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00941514

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

W 1918525

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11680**

1918525

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123 **Phone:** +1 801 266 7700

CUSTOMER INFORMATION:

Company: ALS Houston
Contact: RJ Modashia
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Email: RJ.Modashia@alsglobal.com
Alternate Contact:
Email:

INVOICE INFORMATION:

Company: ALS Houston
Contact: Accounts Payable
Address: 10450 Stancliff Rd, Ste 210
Phone: +1 281 530 5656
Reference: HS19061383
TSR: Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19061383-01**	**18CPTMW14_062519**	**Water**	**25 Jun 2019 07:40**
	SUB_Perch-6850			05 Jul 2019
2.	**HS19061383-02**	**18CPTMW24_062519**	**Water**	**25 Jun 2019 09:25**
	SUB_Perch-6850			05 Jul 2019
3.	**HS19061383-03**	**18CPTMW07_062519**	**Water**	**25 Jun 2019 10:45**
	SUB_Perch-6850			05 Jul 2019
4.	**HS19061383-04**	**MW3_062519**	**Water**	**25 Jun 2019 12:35**
	SUB_Perch-6850			05 Jul 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 6/26/19 1800.

Received By: _____ Date/Time: 06/27/19 0907

Cooler ID(s): _____ Temperature(s): _____

Custody Seal Intact RW

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ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

191525

Client Name: ASL Houston

Project/Task/Site:

Date/Time of Receipt: 062719 0907

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Location Temp Taken:	Cooler/Between Samples
Container Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA		
	Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9732	3 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: _____ (Signature) Rebecca Wise (Printed Name) 062719 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018

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Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 26JUN19
ACTWGT: 18.70 LB
CAD: 3001307CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19061383-RJ

FedEx Express

TRK# 0201 4809 7835 3973

THU - 27 JUN 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

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Batch Worklist

Batch: ELMS/ 2269 Created: 7/10/2019 08:39 Instrument: HBN: 243227

Rule: EPA 6850, DoD QSM Water Analyst: T. Bosch Status: WP

Workorder: 1918373 [ENV_LVL4]
Workorder: 1918525 [ENV_LVL4]
Workorder: 1918682 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	662914	CCV for HBN 243227 [ELMS/2269]				CCV	3		E685041C3Q	5311		7/10/2019	
2	662915	RLVS for HBN 243227 [ELMS/2269				RLVS	3		E685041C3Q	5311		7/10/2019	
3	662916	ICS for HBN 243227 [ELMS/2269]				ICS	3		E6850..D3Q	5311		7/10/2019	
4	662917	LMB for HBN 243227 [ELMS/2269]				LMB	3		E6850Q413Q	5311		7/10/2019	
5	662918	LCS for HBN 243227 [ELMS/2269]				LCS	3		E6850Q413Q	5311		7/10/2019	
6	1918373001	129_062419				SAMPLE	3	1918373001-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
7	1918373002	102_062419				SAMPLE	3	1918373002-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
8	1918373003	MW23_062419				SAMPLE	3	1918373003-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
9	1918373004	126_062419				SAMPLE	3	1918373004-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
10	1918373005	18WW03_062419				SAMPLE	3	1918373005-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
11	662919	18WW03_062419(1918373005MS)				MS	3		E6850Q413Q	5311		7/10/2019	
12	662920	18WW03_062419(1918373005MSD)				MSD	3		E6850Q413Q	5311		7/10/2019	
13	1918373006	18WW03_062419_a				SAMPLE	3	1918373006-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
14	1918373007	18WW18_062419				SAMPLE	3	1918373007-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
15	1918373008	18WW17_062419				SAMPLE	3	1918373008-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
16	1918373009	125_062419				SAMPLE	3	1918373009-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
17	1918525001	18CPTMW14_062519				SAMPLE	3	1918525001-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
18	662921	CCV for HBN 243227 [ELMS/2269]				CCV	3		E685041C3Q	5311		7/10/2019	
19	1918525002	18CPTMW24_062519				SAMPLE	3	1918525002-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
20	1918525003	18CPTMW07_062519				SAMPLE	3	1918525003-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
21	1918525004	MW3_062519				SAMPLE	3	1918525004-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
22	1918682001	AW04_062619				SAMPLE	3	1918682001-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
23	1918682002	AW04_062619_a				SAMPLE	3	1918682002-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
24	1918682003	18WW24_062619				SAMPLE	3	1918682003-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
25	1918682004	MW16_062619				SAMPLE	3	1918682004-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
26	1918682005	MW19_062619				SAMPLE	3	1918682005-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
27	662922	CCV for HBN 243227 [ELMS/2269]				CCV	3		E685041C3Q	5311		7/10/2019	

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1918373 (001-09), 1918525 (001-04); 1918682 (001-05)
ELMS Batch/HBN ID: 2269 (243227)
Prep Date: 07/08/2019 Analysis Date: 07/10/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\10JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 662918; Target = 4.0µg/L. ASTM type II water was used for LMB 662917.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1918273005 (Client ID: 18WW03_062419). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1918373001 and 1918525004 were analyzed and reported from 1:1,000 dilutions. Field samples 1918373003/08 were analyzed and reported from 1:10,000 dilutions. Field samples 1918373009 and 1918525002 were analyzed and reported from 1:10 dilutions. Field samples 1918525001 and 1918682004 were analyzed and reported from 1:100 dilutions. Sample 1918373004 failed the 50-150% method requirement for ISTD recovery. This sample was re-analyzed and reported from a 1:4 dilution. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\243227-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 662915) is reported from the analysis of the Laboratory Control Sample (LCS – 662918) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 10JULD13.

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2269 HBN: 243227 Sample Set IDs if Applicable: 1918373/1918525/1918682	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SD
Standards traceability checked and meets criteria	TB	SD
Standard curve coefficients evaluated and meet criteria	TB	SD
ICVs analyzed and meet acceptance criteria	TB	SD
CCVs analyzed and meet acceptance criteria	TB	SD
Method Blanks analyzed and meet acceptance criteria	TB	SD
Retention Time Windows checked	TB	SD
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SD
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SD
RLVS analyzed	TB	SD
Preparation and analysis hold times met	TB	SD
Preparation deviations and re-preparations noted when performed	TB	SD
Analysis deviations and re-analyses noted when performed	TB	SD
Sample dilution factors noted on reports	TB	SD
Electronic records in HBN transcription accuracy and completeness checked	TB	SD
Preparation and analysis calculations checked	TB	SD
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SD
Manual integrations checked	TB	SD

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
			1000 ug/mL
1	14797-73-0	Perchlorate	

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description - 6850 QC WKG STD 100ug/L

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK	Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ANAB ACCREDITED

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Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: JCC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

AccuStandard®

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

Not Standard

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

OR-ORG/INO-001
Rev. 5/18

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Report: C:\HPCHEM\1\DATA\10JUL19D\10JUL19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount	
#*	662914 CCV@25	Vial 71	1	Control	1	2.68575e6	8.115	26.05294	
#*	662915 QC@4.0	Vial 72	1	Control	2	4.44100e5	7.955	4.24940	
#*	662916 ICS@4.0	Vial 73	1	Control	3	3.60514e5	7.907	3.90243	
#*	662917 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000	
#*	1918373001 1K	Vial 75	1	Sample	5	4.64595e5	8.475	4196.25594	
#*	1918373002	Vial 76	1	Sample	6	2.67439e6	8.256	32.95864	
#*	1918373003 10K	Vial 77	1	Sample	7	7.50173e5	8.471	6.69552e4	
#*	1918373004	Vial 78	1	Sample	8	9.59698e4	7.479	3.07958	RERUN
#*	1918373005	Vial 79	1	Sample	9	0.00000	0.000	0.00000	
#*	662919 183735S	Vial 80	1	Sample	10	3.55093e5	7.925	4.86521	
#*	662920 183735D	Vial 81	1	Sample	11	3.66789e5	7.925	4.01055	
#*	1918373006	Vial 82	1	Sample	12	0.00000	0.000	0.00000	
#*	1918373007	Vial 83	1	Sample	13	0.00000	0.000	0.00000	
#*	1918373008 10K	Vial 84	1	Sample	14	7.80844e5	8.547	8.50126e4	
#*	1918373009 10	Vial 85	1	Sample	15	2.50033e6	8.517	259.32134	
#*	1918525001 100	Vial 86	1	Sample	16	1.50160e6	8.459	1335.16188	
#*	1918525002 10	Vial 87	1	Sample	18	8.01472e5	7.834	89.40283	
#*	1918525003	Vial 88	1	Sample	19	9.97190e4	7.920	1.35329	
#*	662921 CCV@25	Vial 71	1	Control	20	2.50454e6	8.326	26.47813	
#*	1918525004 1K	Vial 89	1	Sample	21	9.11871e5	8.541	1.14090e4	
#*	1918682001	Vial 90	1	Sample	22	2.47257e6	7.964	22.97557	
#*	1918682002	Vial 91	1	Sample	23	2.64966e6	7.956	27.09987	
#*	1918682003	Vial 92	1	Sample	24	0.00000	0.000	0.00000	
#*	1918682004 100	Vial 93	1	Sample	25	3.17764e6	8.495	2867.69131	
#*	1918682005	Vial 94	1	Sample	26	0.00000	0.000	0.00000	
#*	1918373004 4X	Vial 95	1	Sample	27	1.13898e5	7.615	5.92026	
*	662922 CCV@25	Vial 71	1	Control	28	2.33580e6	8.325	25.58048	

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	662914 CCV@25	Vial 71	1	Control	1	8.00069e5	8.120	26.14885
#*	662915 QC@4.0	Vial 72	1	Control	2	1.43143e5	7.988	4.46175
#*	662916 ICS@4.0	Vial 73	1	Control	3	1.13240e5	7.926	3.97989
#*	662917 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1918373001 1K	Vial 75	1	Sample	5	1.47350e5	8.502	4333.79914
#*	1918373002	Vial 76	1	Sample	6	8.00737e5	8.266	33.28426
#*	1918373003 10K	Vial 77	1	Sample	7	2.30473e5	8.475	6.80005e4
#*	1918373004	Vial 78	1	Sample	8	4.60480e4	7.515	4.72828
#*	1918373005	Vial 79	1	Sample	9	0.00000	0.000	0.00000
#*	662919 183735S	Vial 80	1	Sample	10	1.12035e5	7.945	5.02607
#*	662920 183735D	Vial 81	1	Sample	11	1.15347e5	7.933	4.09972
#*	1918373006	Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1918373007	Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	1918373008 10K	Vial 84	1	Sample	14	2.43153e5	8.561	8.79445e4
#*	1918373009 10	Vial 85	1	Sample	15	7.49555e5	8.537	261.83216
#*	1918525001 100	Vial 86	1	Sample	16	4.61812e5	8.478	1373.76036
#*	1918525002 10	Vial 87	1	Sample	18	2.59266e5	7.849	96.09405
#*	1918525003	Vial 88	1	Sample	19	3.44592e4	7.913	1.39474
#*	662921 CCV@25	Vial 71	1	Control	20	7.43673e5	8.350	26.49691
#*	1918525004 1K	Vial 89	1	Sample	21	2.92673e5	8.563	1.22133e4
#*	1918682001	Vial 90	1	Sample	22	7.38653e5	7.982	23.10212
#*	1918682002	Vial 91	1	Sample	23	7.84495e5	7.975	27.04927
#*	1918682003	Vial 92	1	Sample	24	0.00000	0.000	0.00000
#*	1918682004 100	Vial 93	1	Sample	25	9.49732e5	8.511	2888.99473
#*	1918682005	Vial 94	1	Sample	26	0.00000	0.000	0.00000
#*	1918373004 4X	Vial 95	1	Sample	27	4.50105e4	7.626	7.05823
*	662922 CCV@25	Vial 71	1	Control	28	6.93327e5	8.339	25.58423

RIGHT SOLUTIONS | RIGHT PARTNER

Batch Report: C:\HPCHEM\1\DATA\10JUL19D\10JUL19S.B

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	662914 CCV@25	Vial 71	1	Control	1	3.12850e5	8.129	5.00000
#*	662915 QC@4.0	Vial 72	1	Control	2	3.43351e5	7.987	5.00000
#*	662916 ICS@4.0	Vial 73	1	Control	3	3.04788e5	7.926	5.00000
#*	662917 LMB	Vial 74	1	Control	4	3.48541e5	8.334	5.00000
#*	1918373001 1K	Vial 75	1	Sample	5	3.63966e5	8.508	5000.00000
#*	1918373002	Vial 76	1	Sample	6	2.42366e5	8.286	5.00000
#*	1918373003 10K	Vial 77	1	Sample	7	3.61021e5	8.485	5.00000e4
#*	1918373004	Vial 78	1	Sample	8	1.04173e5	7.500	5.00000
#*	1918373005	Vial 79	1	Sample	9	2.68459e5	7.947	5.00000
#*	662919 183735S	Vial 80	1	Sample	10	2.38297e5	7.944	5.00000
#*	662920 183735D	Vial 81	1	Sample	11	3.01318e5	7.949	5.00000
#*	1918373006	Vial 82	1	Sample	12	2.95413e5	7.964	5.00000
#*	1918373007	Vial 83	1	Sample	13	2.56579e5	7.688	5.00000
#*	1918373008 10K	Vial 84	1	Sample	14	2.93278e5	8.572	5.00000e4
#*	1918373009 10	Vial 85	1	Sample	15	2.92692e5	8.542	50.00000
#*	1918525001 100	Vial 86	1	Sample	16	3.52862e5	8.475	500.00000
#*	1918525002 10	Vial 87	1	Sample	18	2.85701e5	7.853	50.00000
#*	1918525003	Vial 88	1	Sample	19	2.65508e5	7.924	5.00000
#*	662921 CCV@25	Vial 71	1	Control	20	2.86769e5	8.351	5.00000
#*	1918525004 1K	Vial 89	1	Sample	21	2.52353e5	8.562	5000.00000
#*	1918682001	Vial 90	1	Sample	22	3.29023e5	7.998	5.00000
#*	1918682002	Vial 91	1	Sample	23	2.95991e5	7.971	5.00000
#*	1918682003	Vial 92	1	Sample	24	3.47869e5	7.583	5.00000
#*	1918682004 100	Vial 93	1	Sample	25	3.34219e5	8.521	500.00000
#*	1918682005	Vial 94	1	Sample	26	2.68839e5	7.545	5.00000
#*	1918373004 4X	Vial 95	1	Sample	27	2.74118e5	7.639	20.00000
*	662922 CCV@25	Vial 71	1	Control	28	2.77422e5	8.334	5.00000

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	662914 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	662915 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	662916 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	662917 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1918373001 1K	CLO4-AQN	1	Sample		
6	Vial 76	1918373002	CLO4-AQN	1	Sample		
7	Vial 77	1918373003 10K	CLO4-AQN	1	Sample		
8	Vial 78	1918373004	CLO4-AQN	1	Sample		
9	Vial 79	1918373005	CLO4-AQN	1	Sample		
10	Vial 80	662919 183735S	CLO4-AQN	1	Sample		
11	Vial 81	662920 183735D	CLO4-AQN	1	Sample		
12	Vial 82	1918373006	CLO4-AQN	1	Sample		
13	Vial 83	1918373007	CLO4-AQN	1	Sample		
14	Vial 84	1918373008 10K	CLO4-AQN	1	Sample		
15	Vial 85	1918373009 10	CLO4-AQN	1	Sample		
16	Vial 86	1918525001 100	CLO4-AQN	1	Sample		
17	Vial 71	662921 CCV@25	CLO4-AQN	1	Ctrl Samp		
18	Vial 87	1918525002 10	CLO4-AQN	1	Sample		
19	Vial 88	1918525003	CLO4-AQN	1	Sample		
20	Vial 71	662921 CCV@25	CLO4-AQN	1	Ctrl Samp		
21	Vial 89	1918525004 1K	CLO4-AQN	1	Sample		
22	Vial 90	1918682001	CLO4-AQN	1	Sample		
23	Vial 91	1918682002	CLO4-AQN	1	Sample		
24	Vial 92	1918682003	CLO4-AQN	1	Sample		
25	Vial 93	1918682004 100	CLO4-AQN	1	Sample		
26	Vial 94	1918682005	CLO4-AQN	1	Sample		
27	Vial 95	1918373004 4X	CLO4-AQN	1	Sample		
28	Vial 71	662922 CCV@25	CLO4-AQN	1	Ctrl Samp		

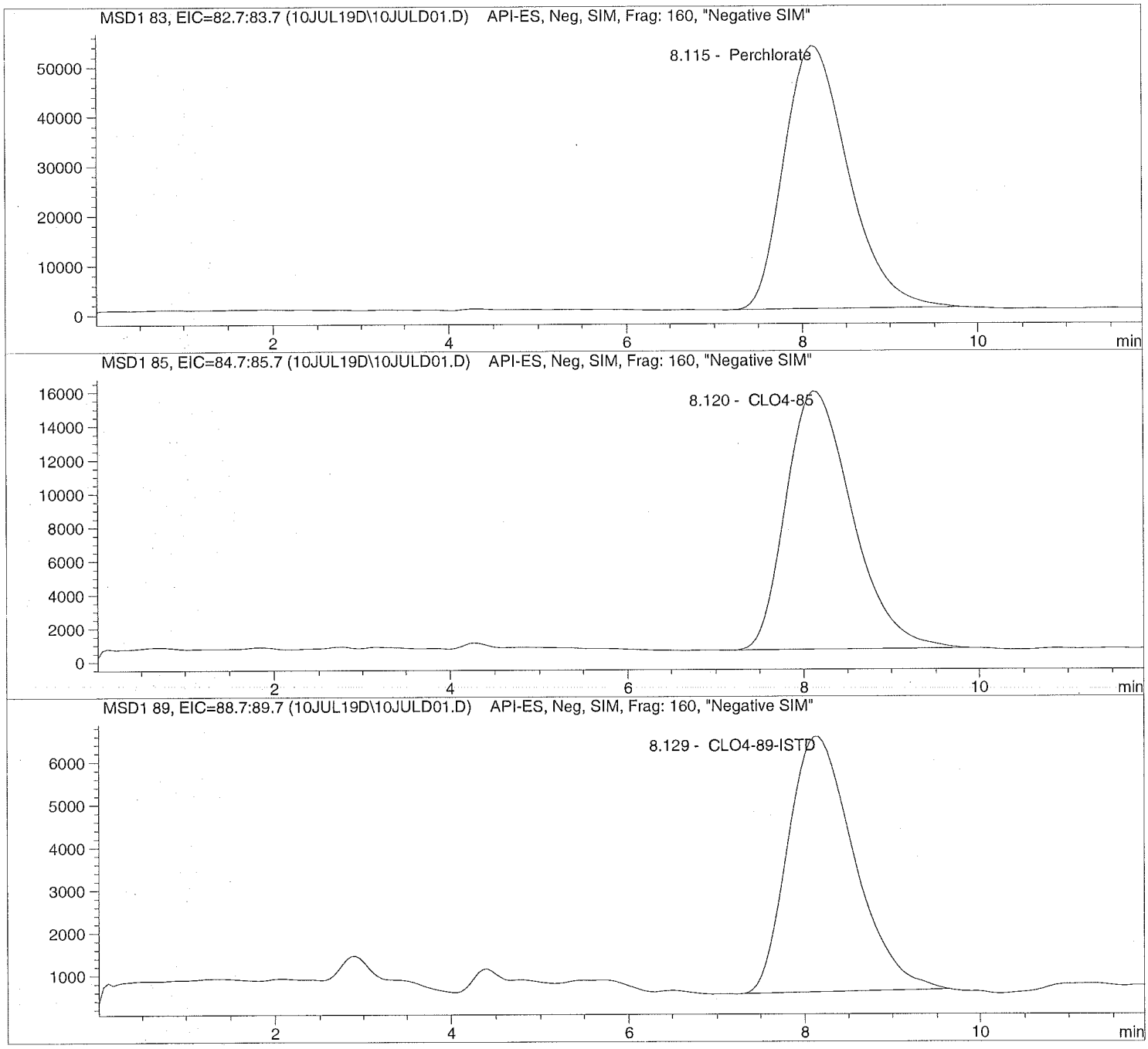
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD01.D Sample Name: 662914 CCV@25

Injection Date:	7/10/2019 08:48:22	Seq Line:	1
Sample Name:	662914 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD01.D Sample Name: 662914 CCV@25

Injection Date:	7/10/2019 08:48:22	Seq Line:	1
Sample Name:	662914 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.115	PBA	2685752.5	26.0529	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.120	PBA	800069.3	26.1488	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.129	PBA	312850.3	5.0000	CLO4-89-ISTD

*** End of Report ***

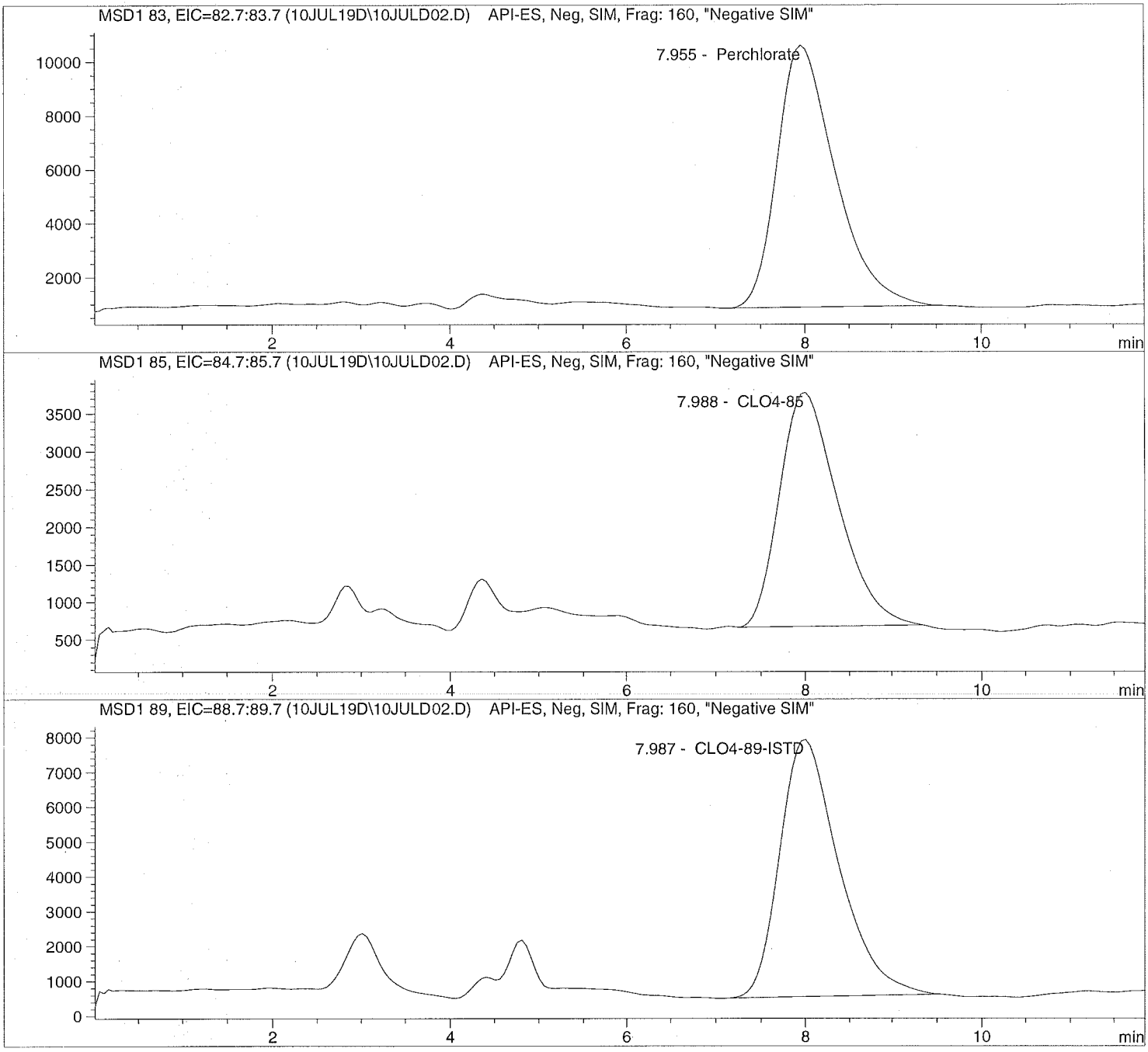
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD02.D Sample Name: 662915 QC@4.0

Injection Date:	7/10/2019 09:03:50	Seq Line:	2
Sample Name:	662915 QC@4.0	Location:	Vial 72
Acq Operator:	TNB RLVS	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD02.D Sample Name: 662915 QC@4.0

Injection Date:	7/10/2019 09:03:50	Seq Line:	2
Sample Name:	662915 QC@4.0	Location:	Vial 72
Acq Operator:	TNB RLVS	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.955	PBA	444100.1	4.2494	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.988	PBA	143143.3	4.4618	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.987	PBA	343351.4	5.0000	CLO4-89-ISTD

*** End of Report ***

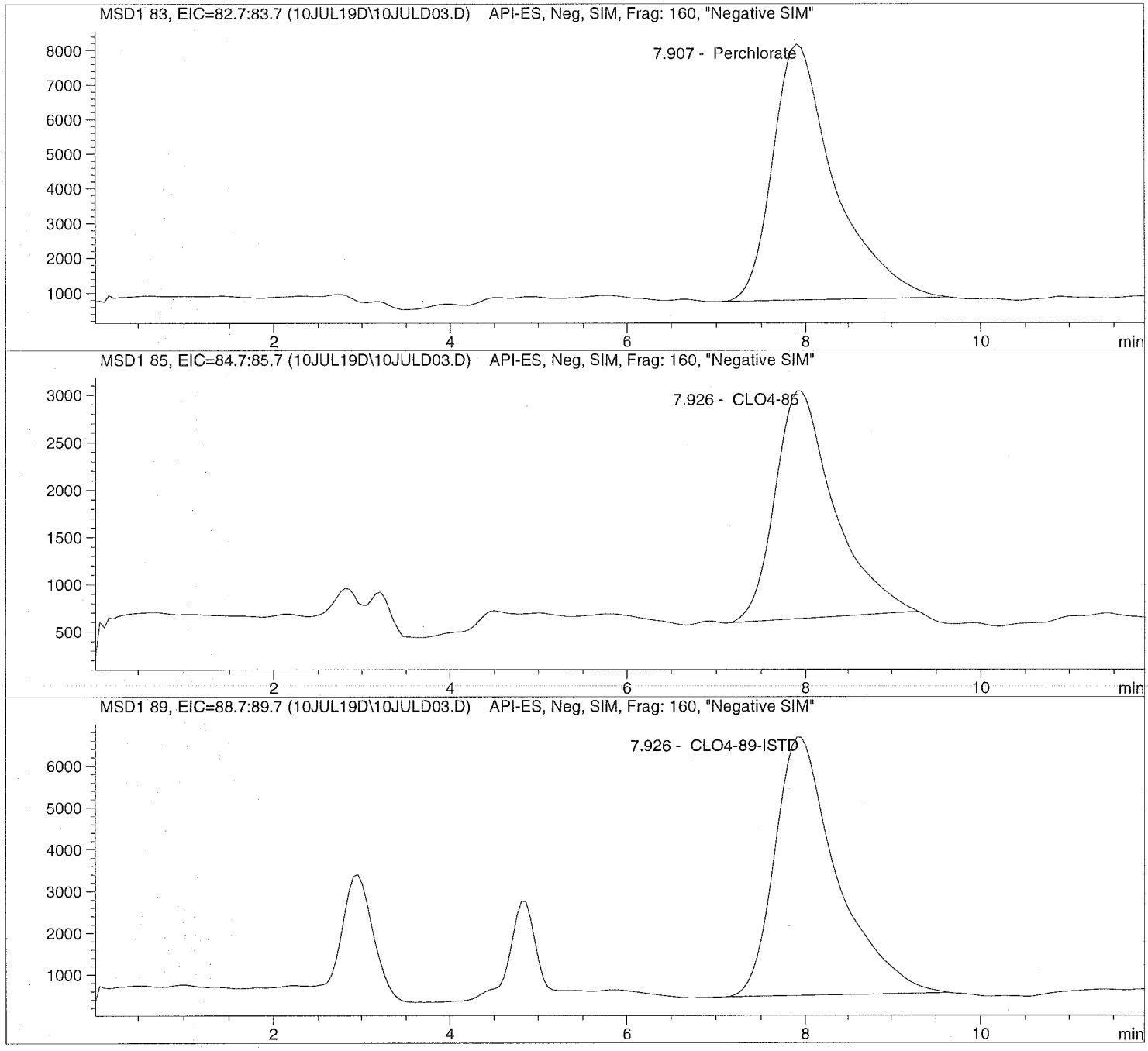
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD03.D Sample Name: 662916 ICS@4.0

Injection Date:	7/10/2019 09:17:42	Seq Line:	3
Sample Name:	662916 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD03.D Sample Name: 662916 ICS@4.0

Injection Date:	7/10/2019 09:17:42	Seq Line:	3
Sample Name:	662916 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.907	PBA	360514.4	3.9024	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.926	PBA	113239.5	3.9799	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.926	PBA	304787.5	5.0000	CLO4-89-ISTD

*** End of Report ***

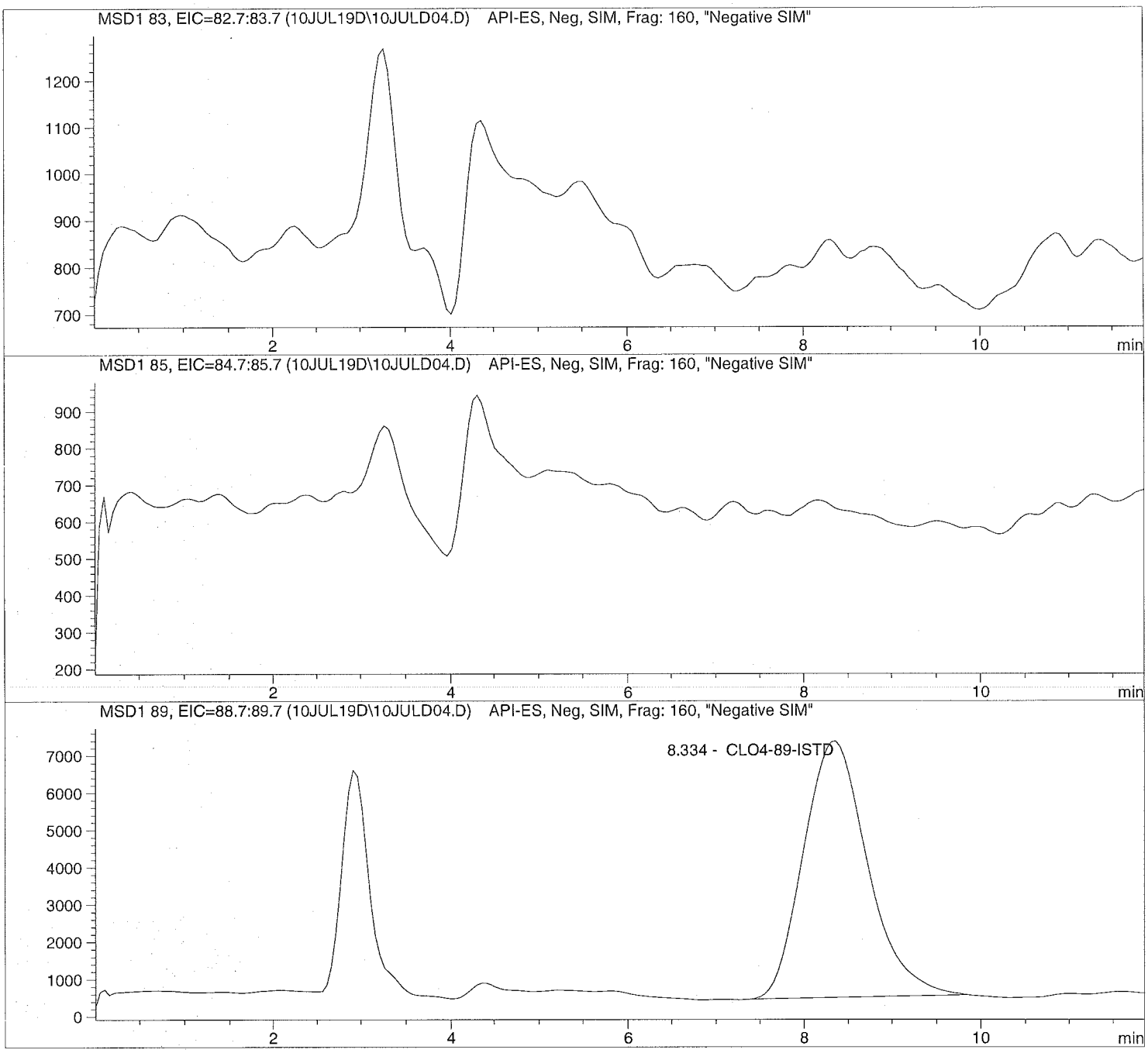
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD04.D Sample Name: 662917 LMB

Injection Date:	7/10/2019 09:31:38	Seq Line:	4
Sample Name:	662917 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD04.D Sample Name: 662917 LMB

Injection Date:	7/10/2019 09:31:38	Seq Line:	4
Sample Name:	662917 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.334	PBA	348541.0	5.0000	CLO4-89-ISTD

*** End of Report ***

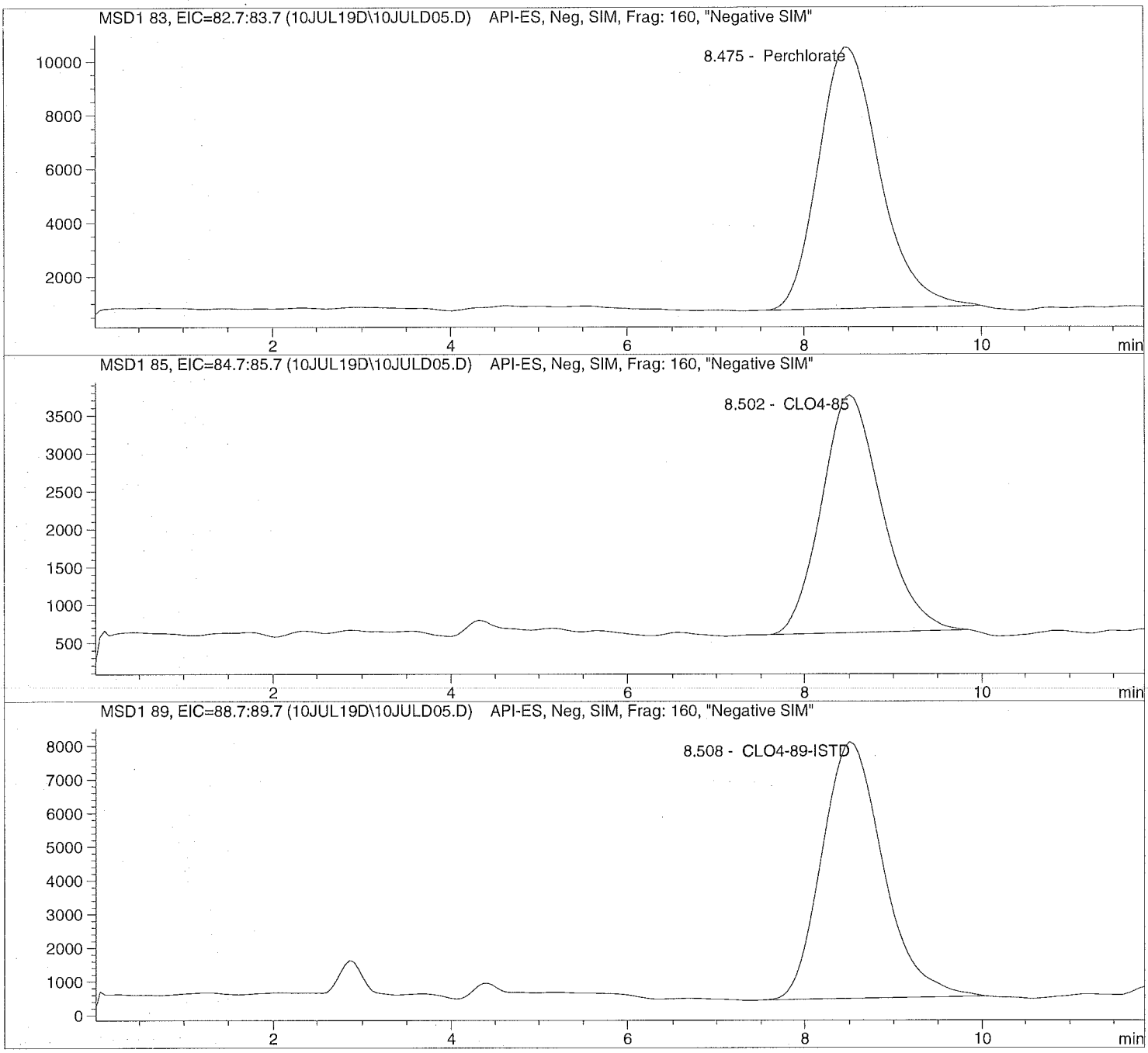
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD05.D Sample Name: 1918373001 1K

Injection Date:	7/10/2019 09:45:31	Seq Line:	5
Sample Name:	1918373001 1K	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD05.D Sample Name: 1918373001 1K

Injection Date:	7/10/2019 09:45:31	Seq Line:	5
Sample Name:	1918373001 1K	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.475	PBA	464595.3	4196.2559	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	PBA	147349.9	4333.7991	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.508	PBA	363966.2	5000.0000	CLO4-89-ISTD

*** End of Report ***

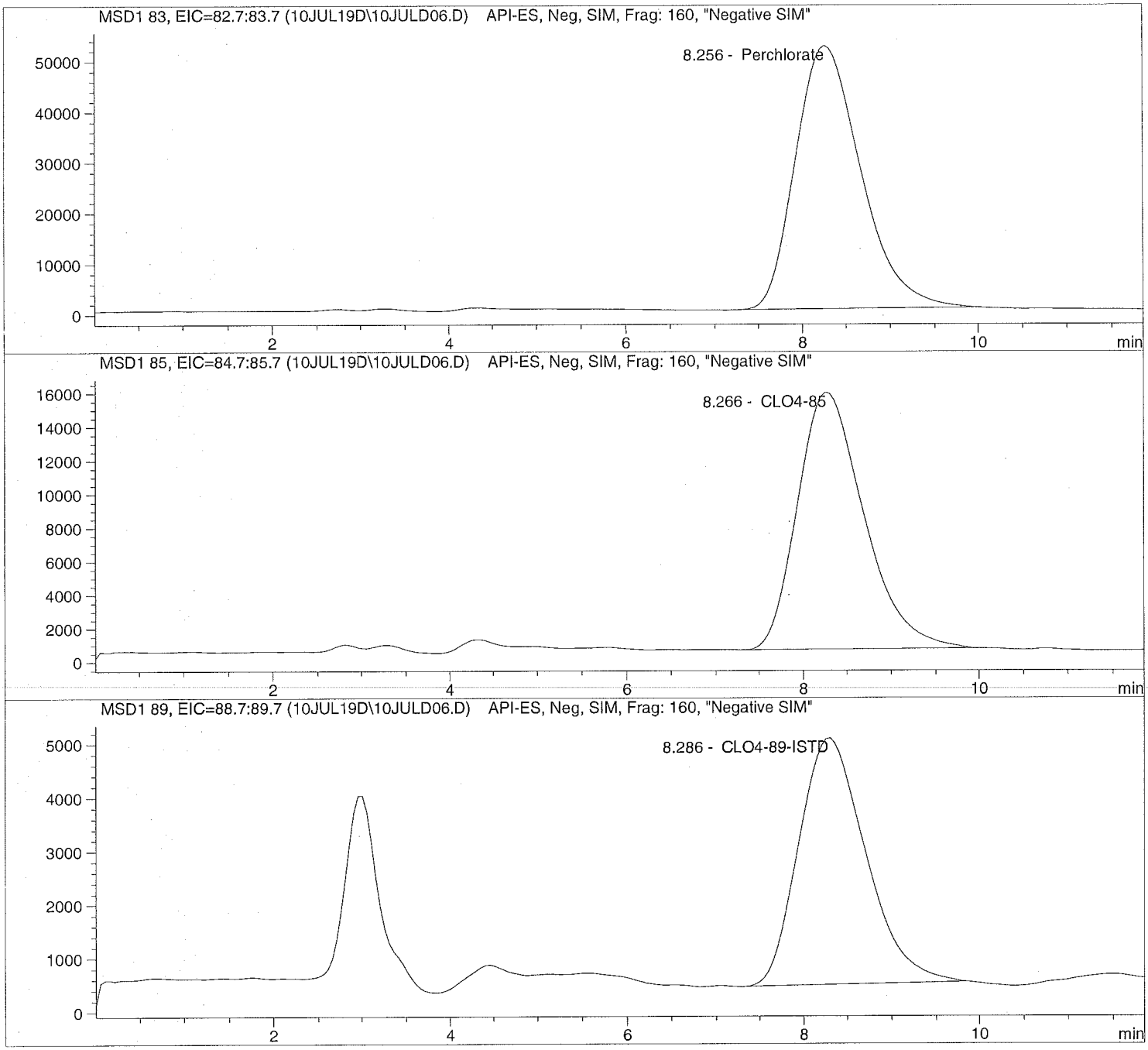
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD06.D Sample Name: 1918373002

Injection Date:	7/10/2019 09:59:30	Seq Line:	6
Sample Name:	1918373002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD06.D Sample Name: 1918373002

Injection Date:	7/10/2019 09:59:30	Seq Line:	6
Sample Name:	1918373002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.256	PBA	2674385.0	32.9586	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.266	PBA	800737.1	33.2843	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.286	PBA	242366.0	5.0000	CLO4-89-ISTD

*** End of Report ***

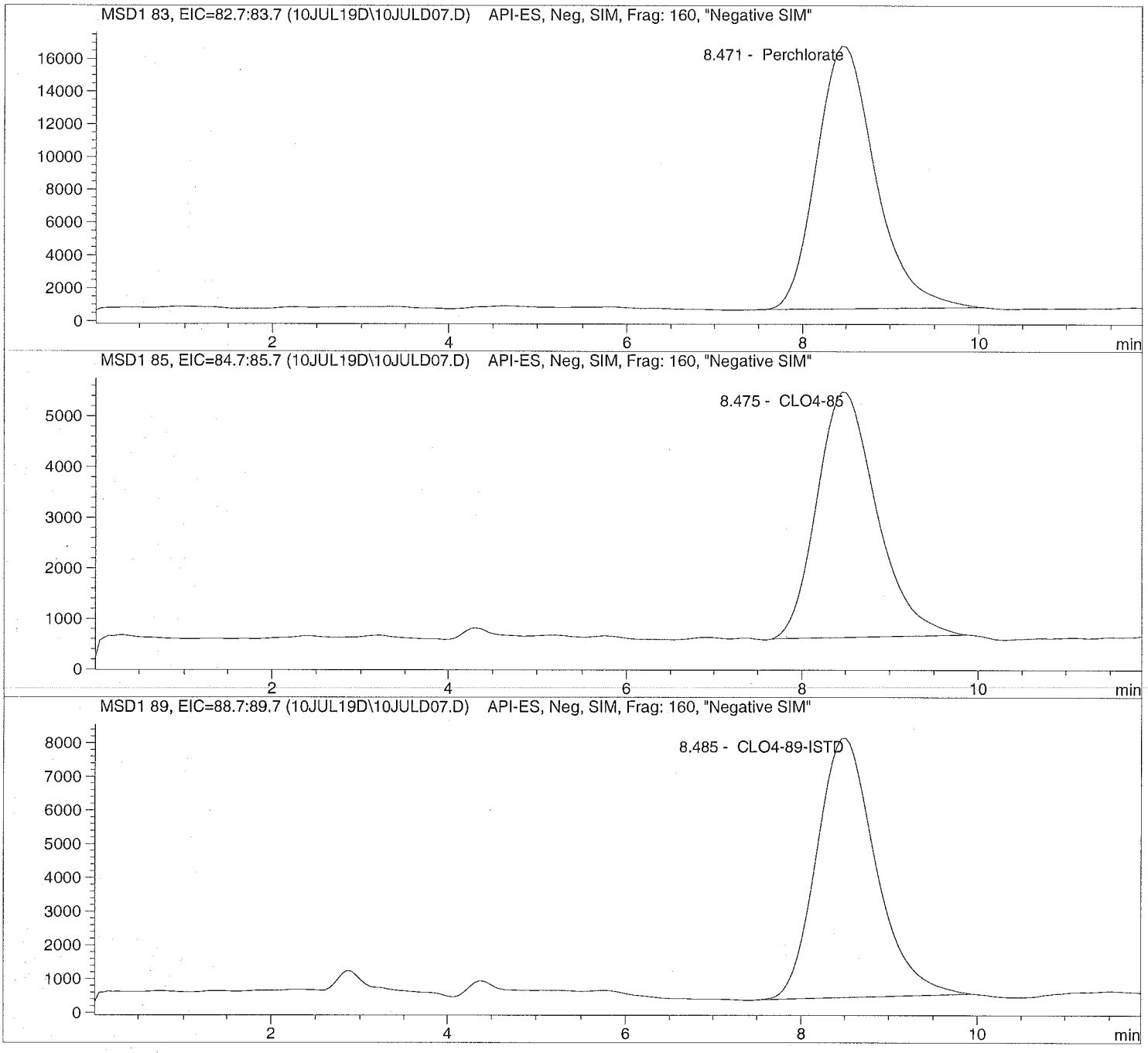
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD07.D Sample Name: 1918373003 10K

Injection Date:	7/10/2019 10:13:27	Seq Line:	7
Sample Name:	1918373003 10K	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD07.D Sample Name: 1918373003 10K

Injection Date:	7/10/2019 10:13:27	Seq Line:	7
Sample Name:	1918373003 10K	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.471	PBA	750172.8	66955.2143	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.475	PBA	230473.2	68000.4573	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.485	PBA	361021.3	50000.0000	CLO4-89-ISTD

*** End of Report ***

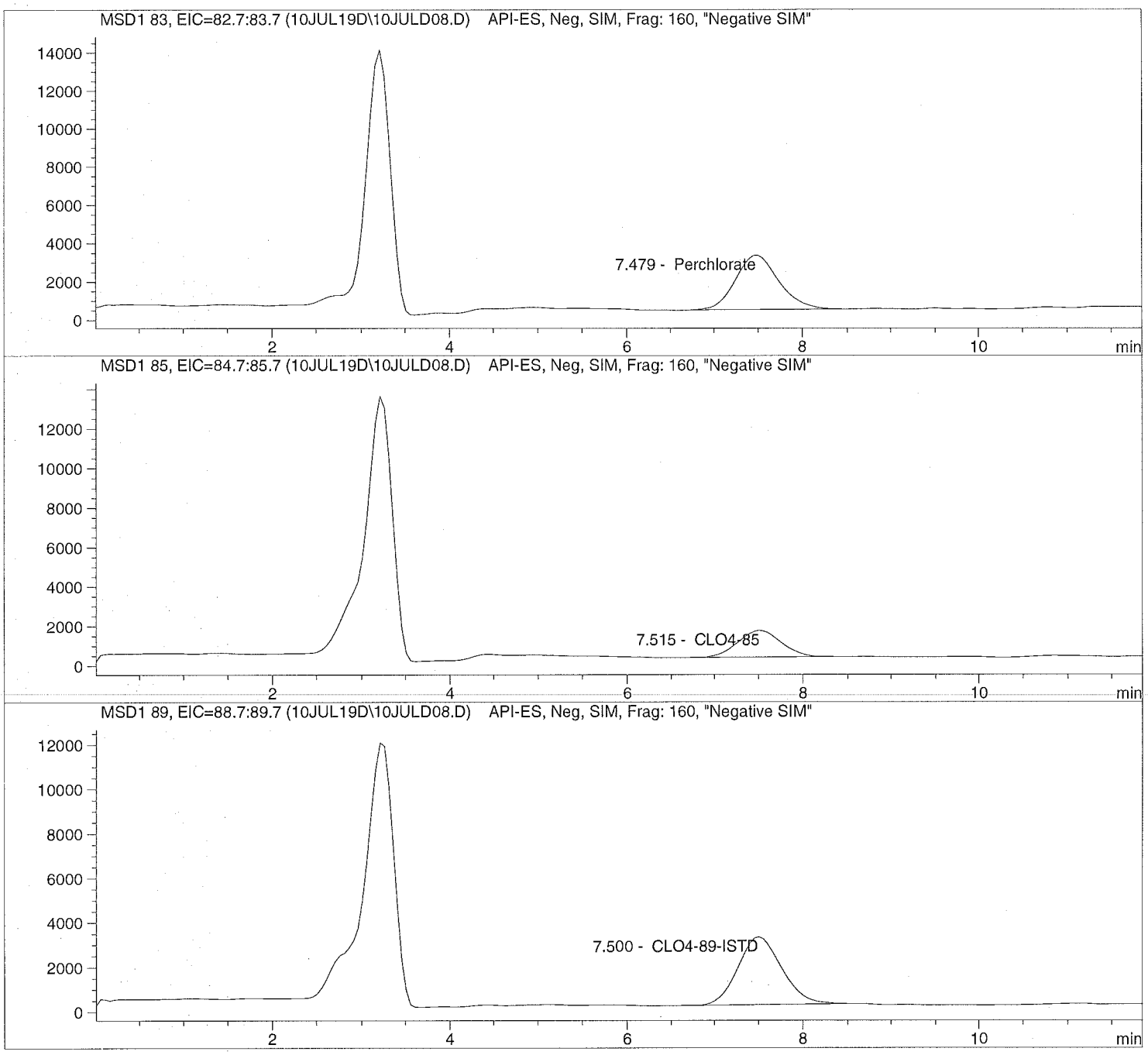
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD08.D Sample Name: 1918373004

Injection Date:	7/10/2019 10:27:21	Seq Line:	8
Sample Name:	1918373004	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD08.D Sample Name: 1918373004

Injection Date:	7/10/2019 10:27:21	Seq Line:	8
Sample Name:	1918373004	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.479	PBA	95969.8	3.0796	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.515	PBA	46048.0	4.7283	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.500	PBA	104173.2	5.0000	CLO4-89-ISTD

*** End of Report ***

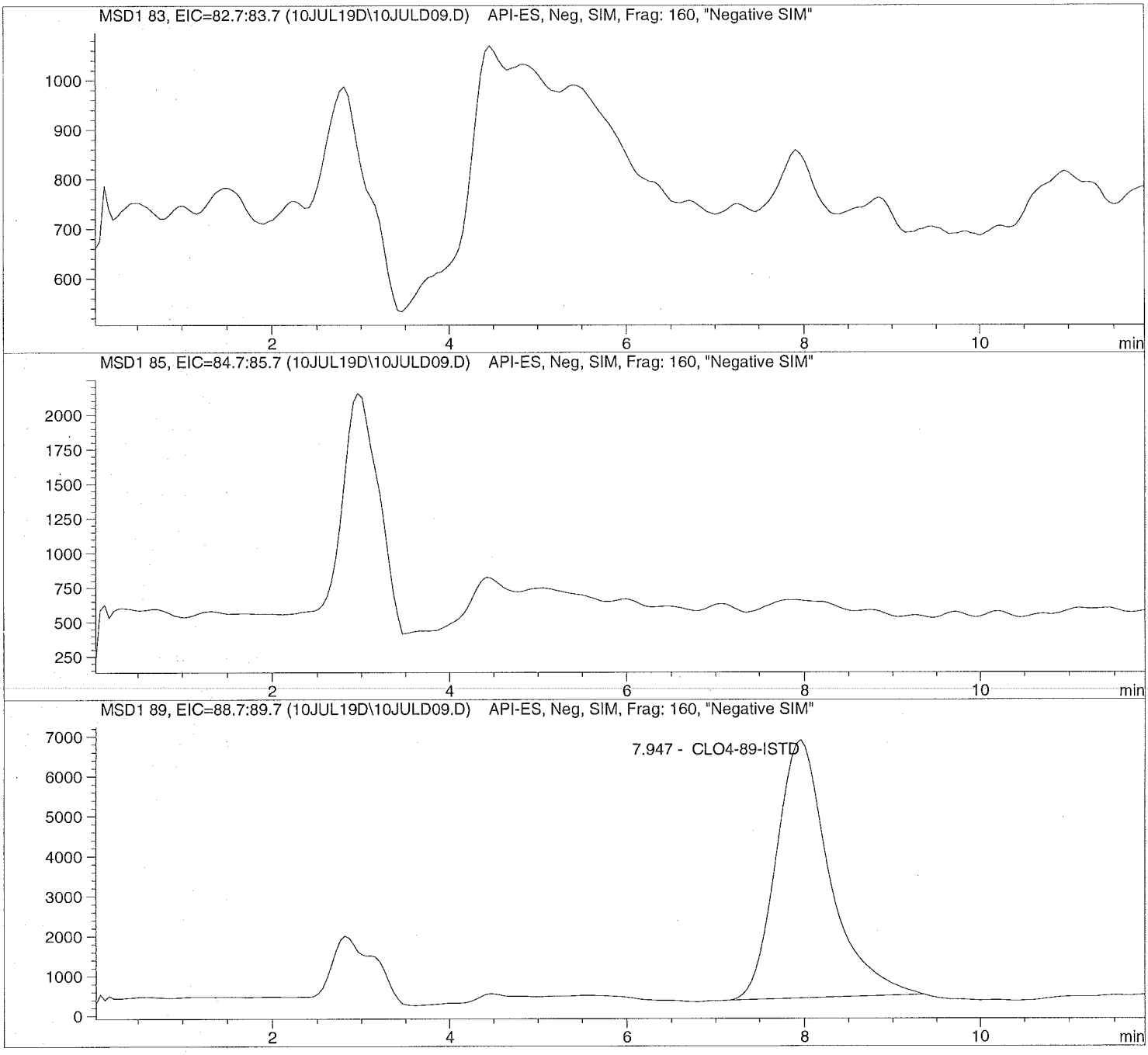
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD09.D Sample Name: 1918373005

Injection Date:	7/10/2019 10:41:15	Seq Line:	9
Sample Name:	1918373005	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD09.D Sample Name: 1918373005

Injection Date:	7/10/2019 10:41:15	Seq Line:	9
Sample Name:	1918373005	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.947	PBA	268458.6	5.0000	CLO4-89-ISTD

*** End of Report ***

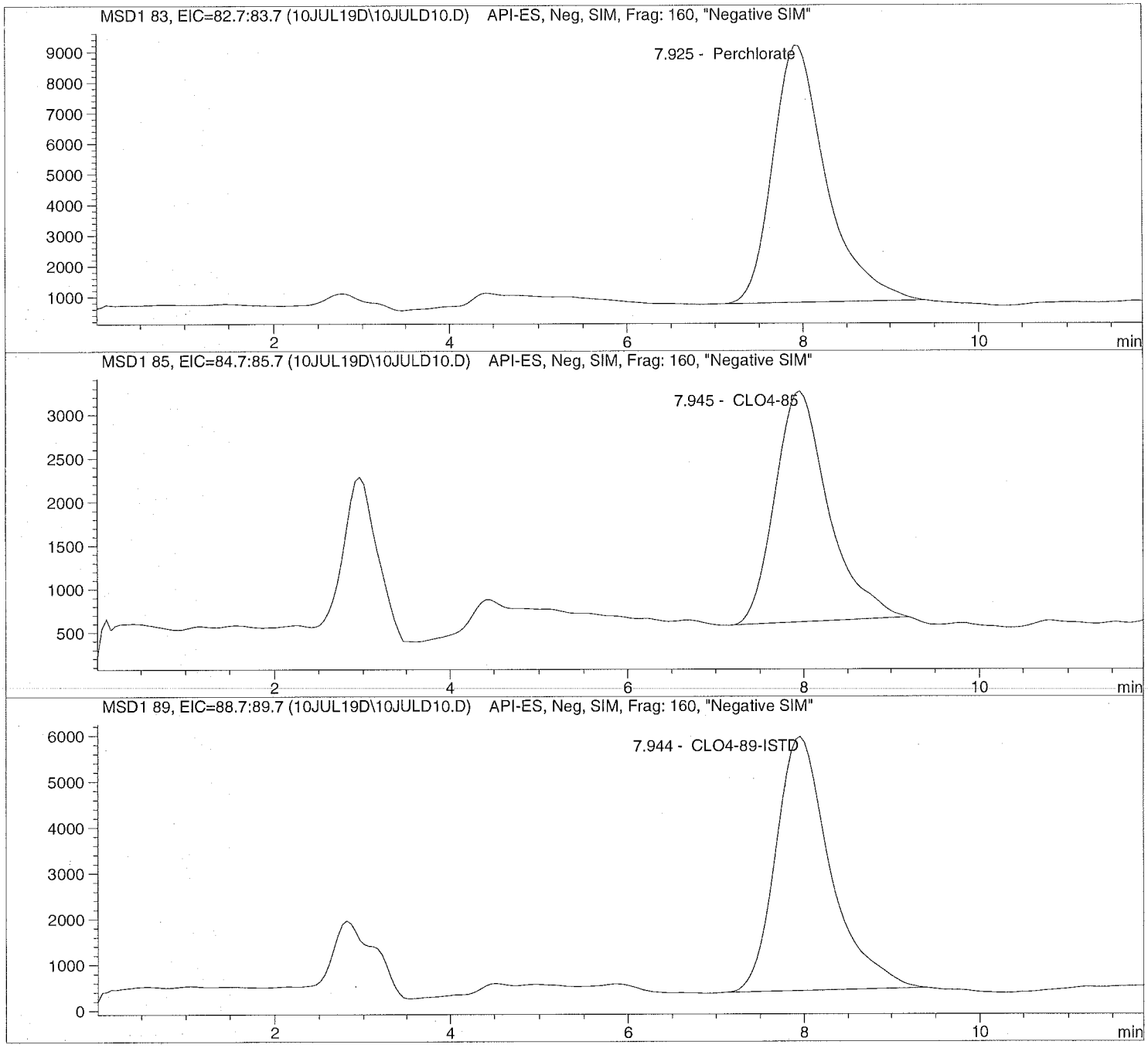
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD10.D Sample Name: 662919 183735S

Injection Date:	7/10/2019 10:55:10	Seq Line:	10
Sample Name:	662919 183735S	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD10.D Sample Name: 662919 183735S

Injection Date:	7/10/2019 10:55:10	Seq Line:	10
Sample Name:	662919 183735S	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.925	PBA	355093.0	4.8652	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.945	PBA	112035.2	5.0261	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.944	PBA	238297.3	5.0000	CLO4-89-ISTD

*** End of Report ***

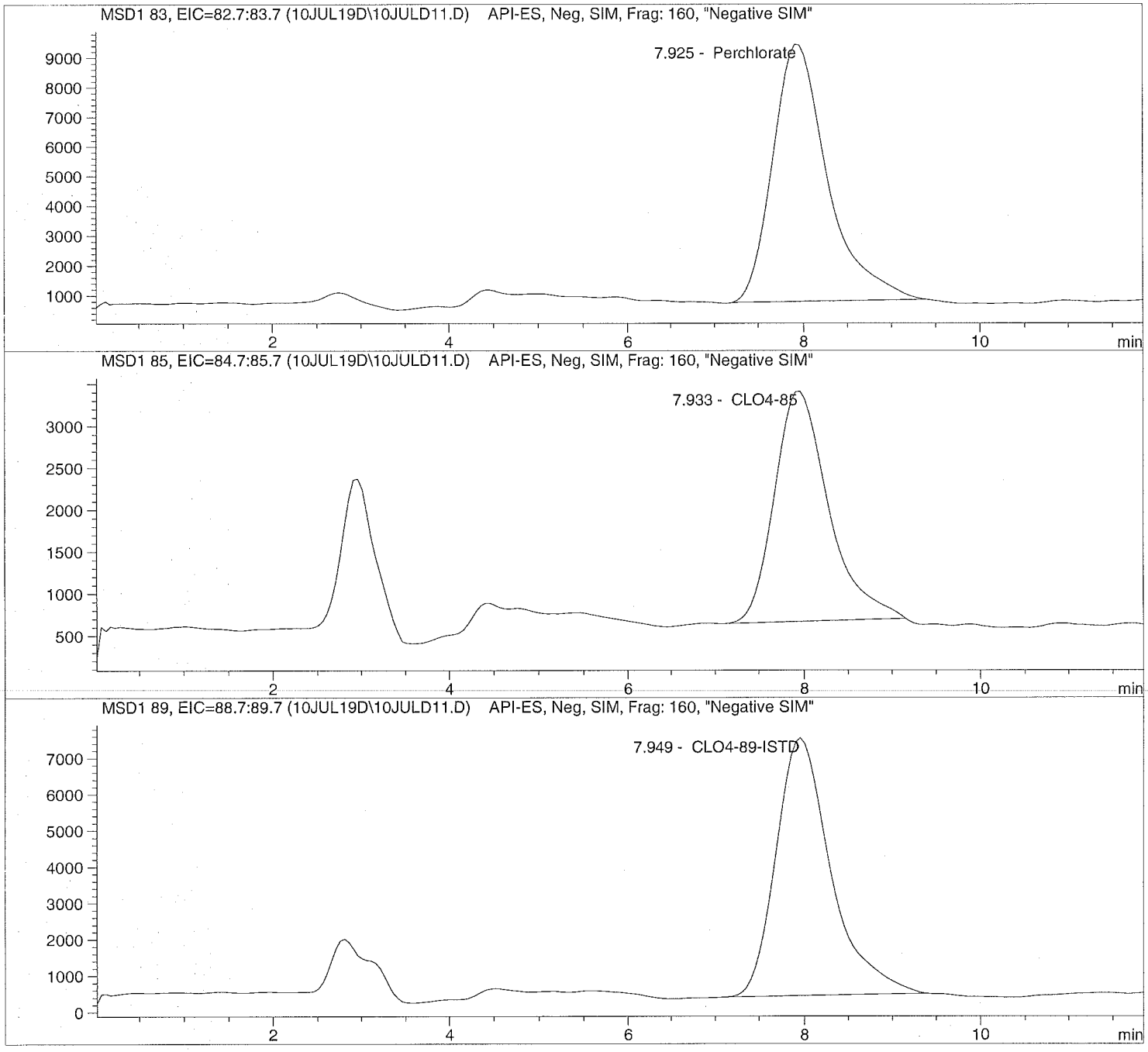
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD11.D Sample Name: 662920 183735D

Injection Date:	7/10/2019 11:09:12	Seq Line:	11
Sample Name:	662920 183735D	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD11.D Sample Name: 662920 183735D

Injection Date:	7/10/2019 11:09:12	Seq Line:	11
Sample Name:	662920 183735D	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.925	PBA	366789.0	4.0106	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.933	BBA	115346.9	4.0997	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.949	PBA	301317.7	5.0000	CLO4-89-ISTD

*** End of Report ***

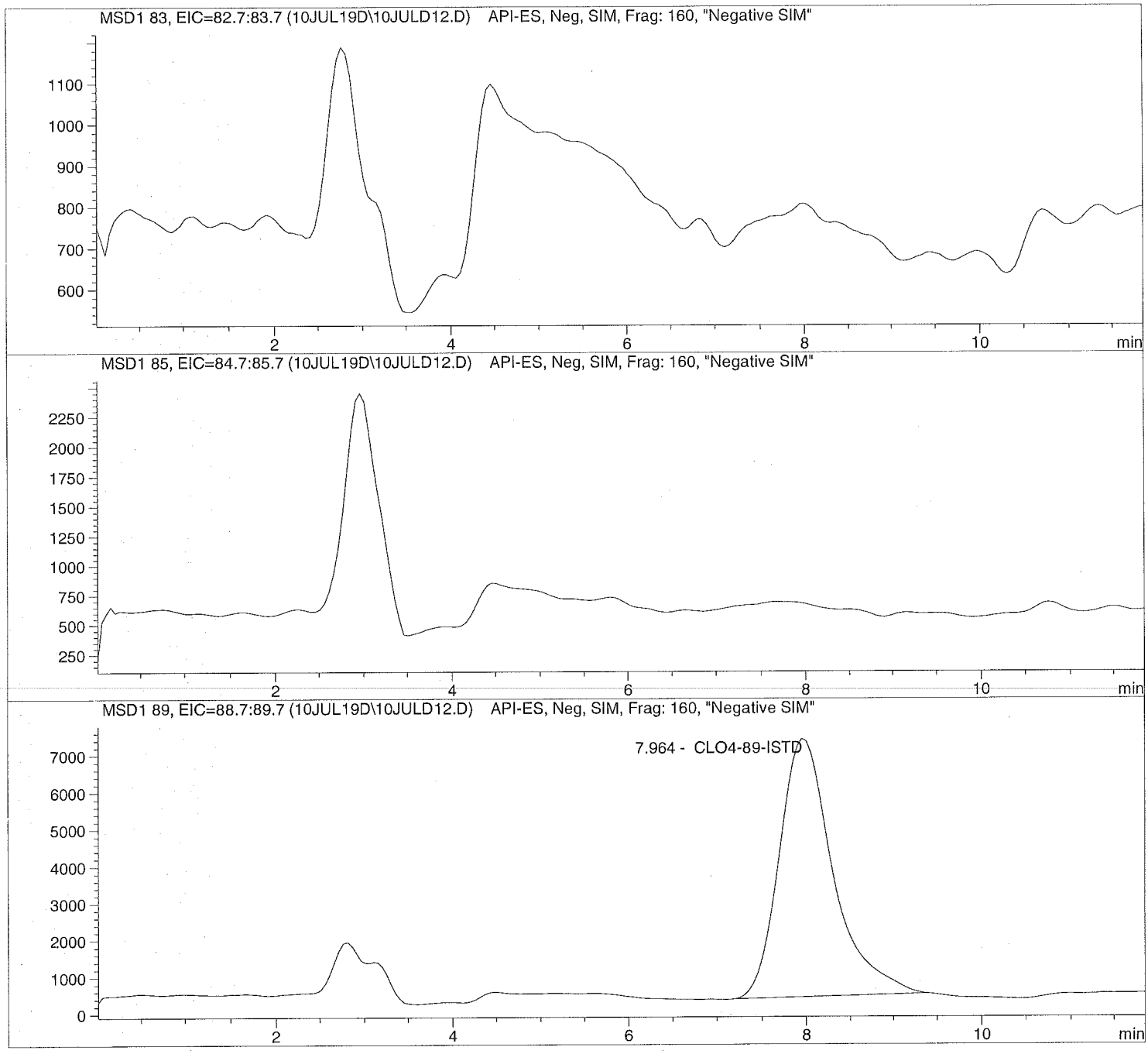
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD12.D Sample Name: 1918373006

Injection Date:	7/10/2019 11:23:04	Seq Line:	12
Sample Name:	1918373006	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD12.D Sample Name: 1918373006

Injection Date:	7/10/2019 11:23:04	Seq Line:	12
Sample Name:	1918373006	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.964	PBA	295412.9	5.0000	CLO4-89-ISTD

*** End of Report ***

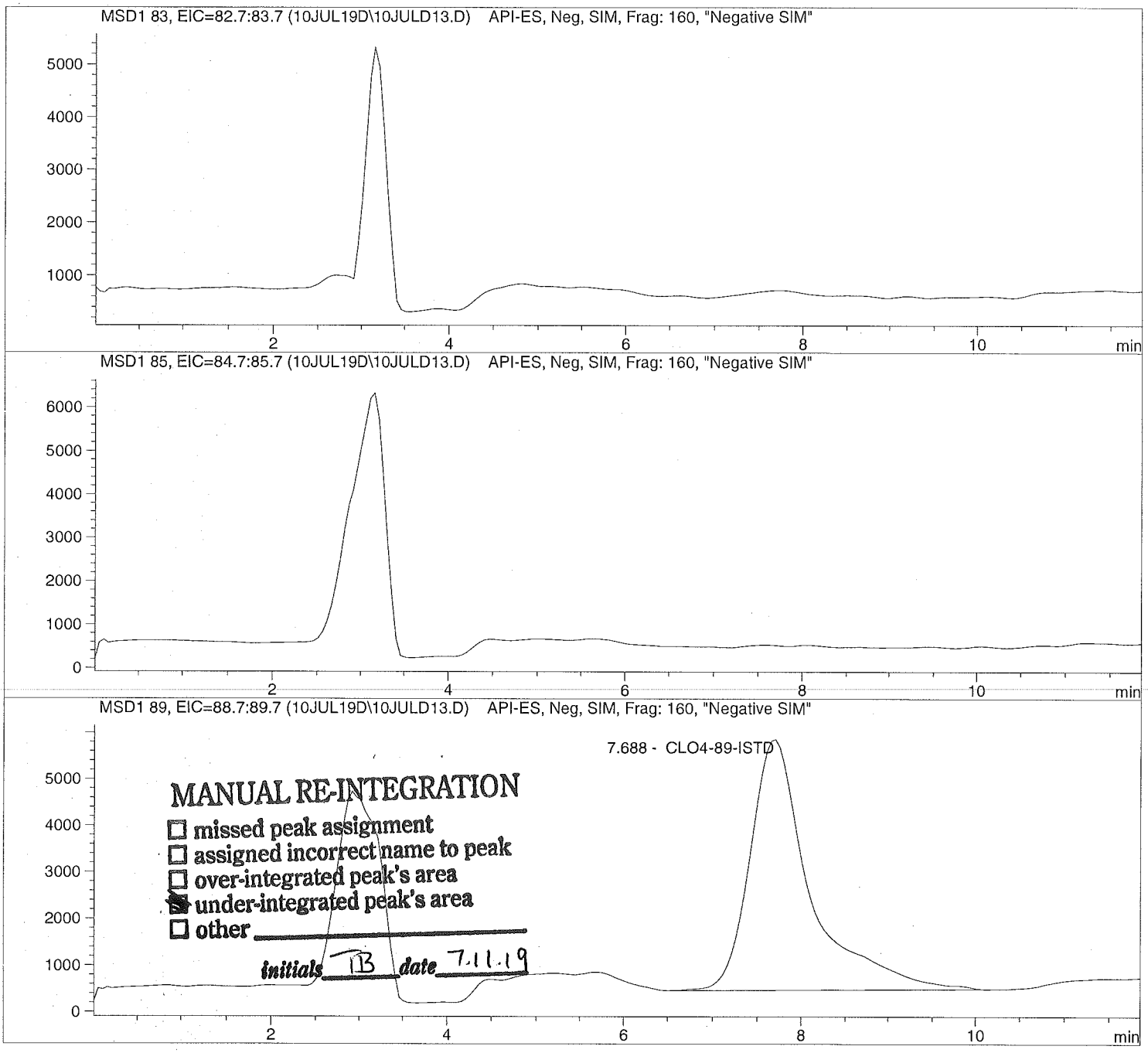
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD13.D Sample Name: 1918373007

Injection Date:	7/10/2019 11:36:55	Seq Line:	13
Sample Name:	1918373007	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD13.D Sample Name: 1918373007

Injection Date:	7/10/2019 11:36:55	Seq Line:	13
Sample Name:	1918373007	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.688	MM	256579.0	5.0000	CLO4-89-ISTD

*** End of Report ***

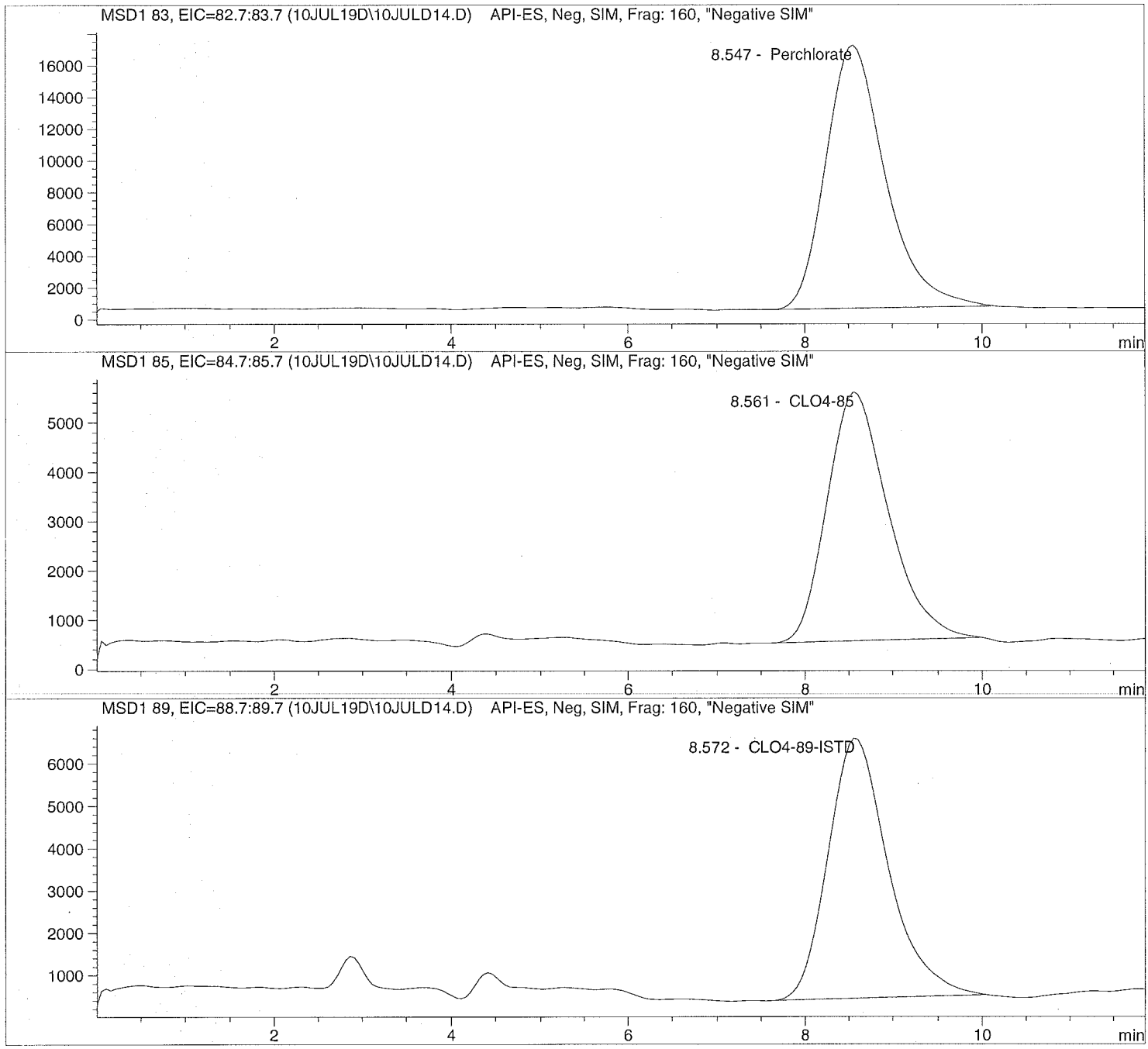
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD14.D Sample Name: 1918373008 10K

Injection Date:	7/10/2019 11:50:45	Seq Line:	14
Sample Name:	1918373008 10K	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD14.D Sample Name: 1918373008 10K

Injection Date:	7/10/2019 11:50:45	Seq Line:	14
Sample Name:	1918373008 10K	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.547	PBA	780844.1	85012.5764	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.561	PBA	243152.5	87944.5239	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.572	PBA	293278.4	50000.0000	CLO4-89-ISTD

*** End of Report ***

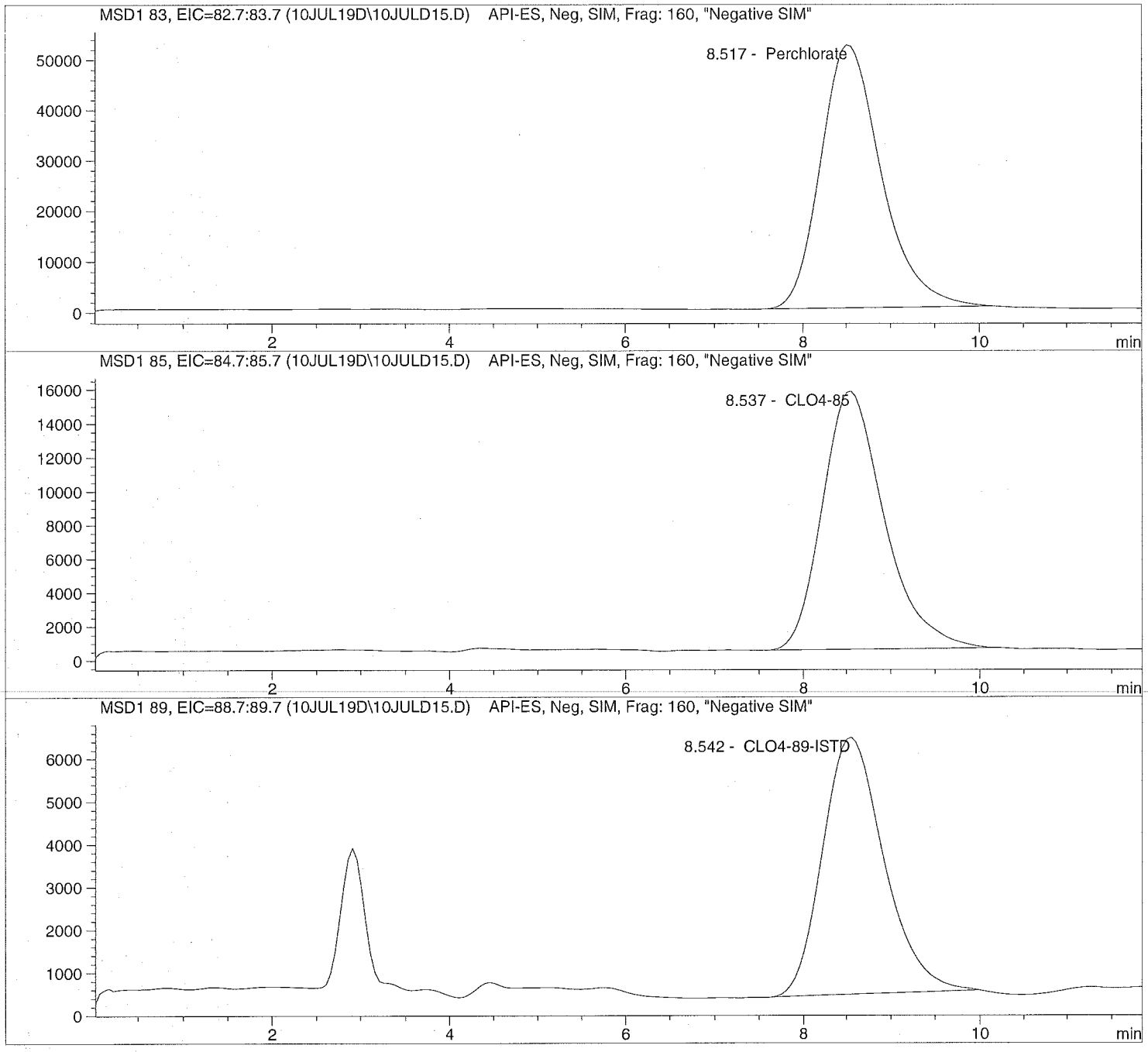
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD15.D Sample Name: 1918373009 10

Injection Date:	7/10/2019 12:04:37	Seq Line:	15
Sample Name:	1918373009 10	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD15.D Sample Name: 1918373009 10

Injection Date:	7/10/2019 12:04:37	Seq Line:	15
Sample Name:	1918373009 10	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.517	PBA	2500331.5	259.3213	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.537	PBA	749555.3	261.8322	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.542	PBA	292692.1	50.0000	CLO4-89-ISTD

*** End of Report ***

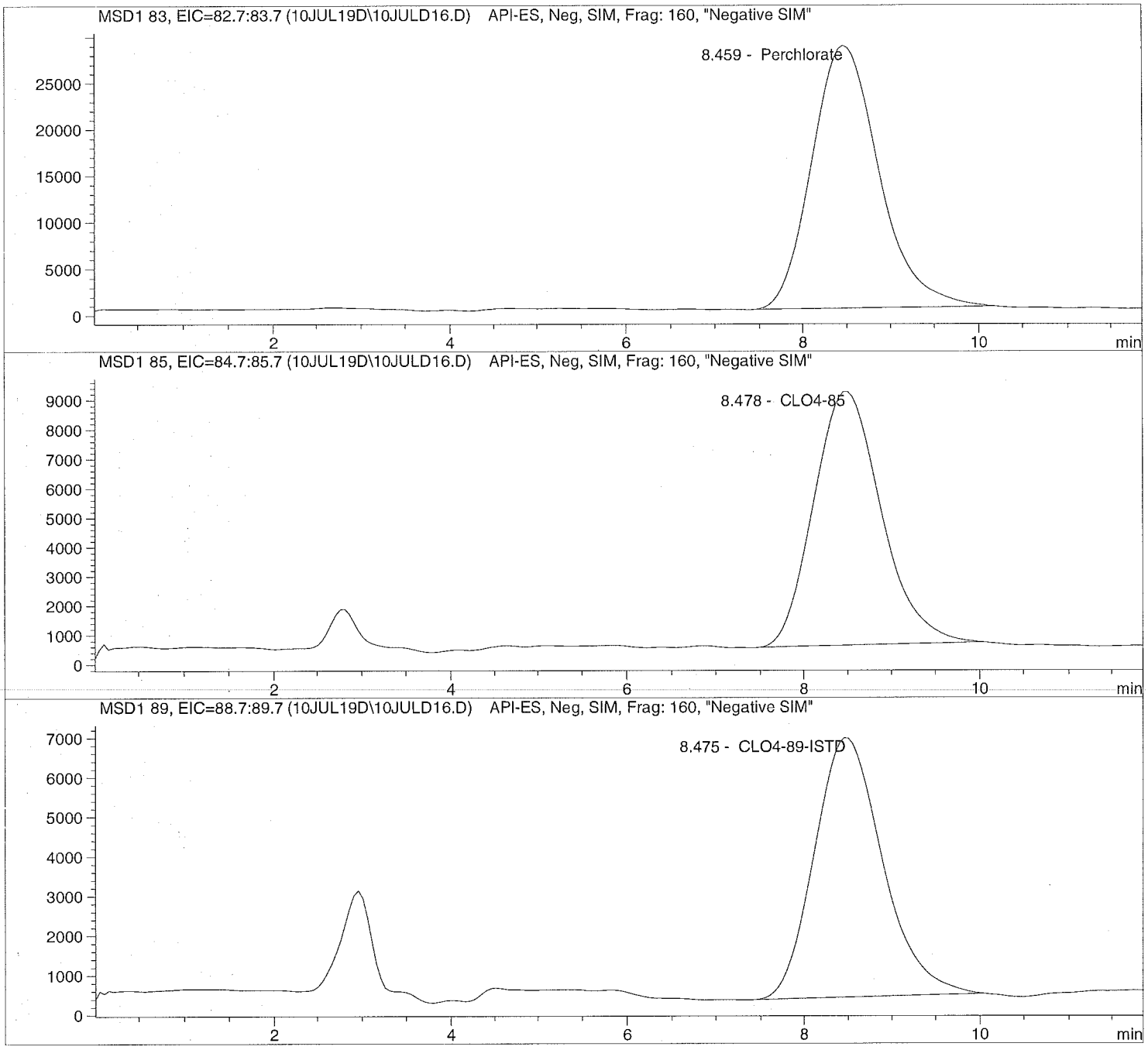
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD16.D Sample Name: 1918525001 100

Injection Date:	7/10/2019 12:18:38	Seq Line:	16
Sample Name:	1918525001 100	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD16.D Sample Name: 1918525001 100

Injection Date:	7/10/2019 12:18:38	Seq Line:	16
Sample Name:	1918525001 100	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.459	PBA	1501595.1	1335.1619	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.478	PBA	461811.6	1373.7604	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.475	PBA	352862.3	500.0000	CLO4-89-ISTD

*** End of Report ***

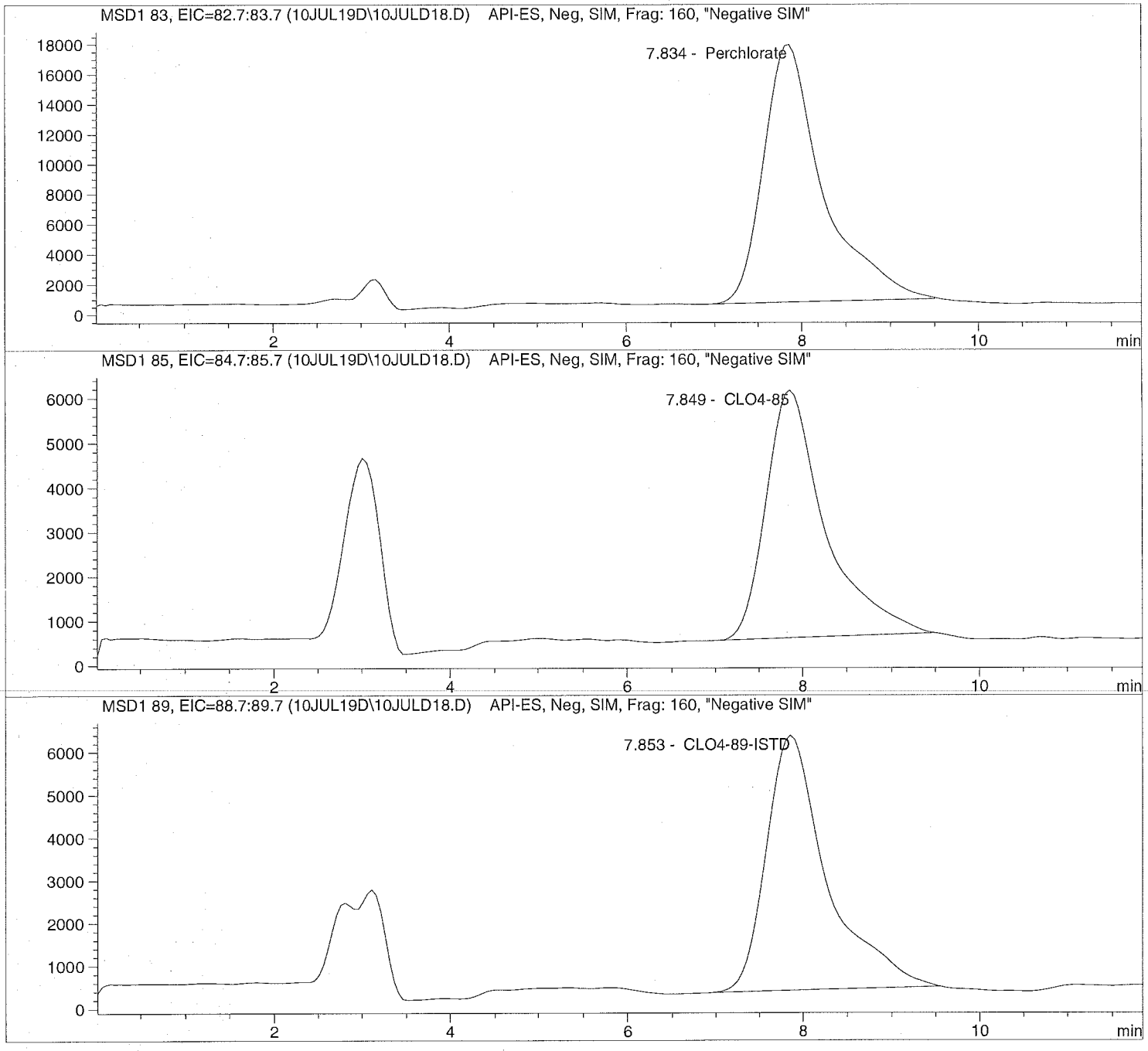
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD18.D Sample Name: 1918525002 10

Injection Date:	7/10/2019 12:46:22	Seq Line:	18
Sample Name:	1918525002 10	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD18.D Sample Name: 1918525002 10

Injection Date:	7/10/2019 12:46:22	Seq Line:	18
Sample Name:	1918525002 10	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.834	PBA	801472.4	89.4028	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.849	PBA	259266.4	96.0941	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.853	PBA	285700.9	50.0000	CLO4-89-ISTD

*** End of Report ***

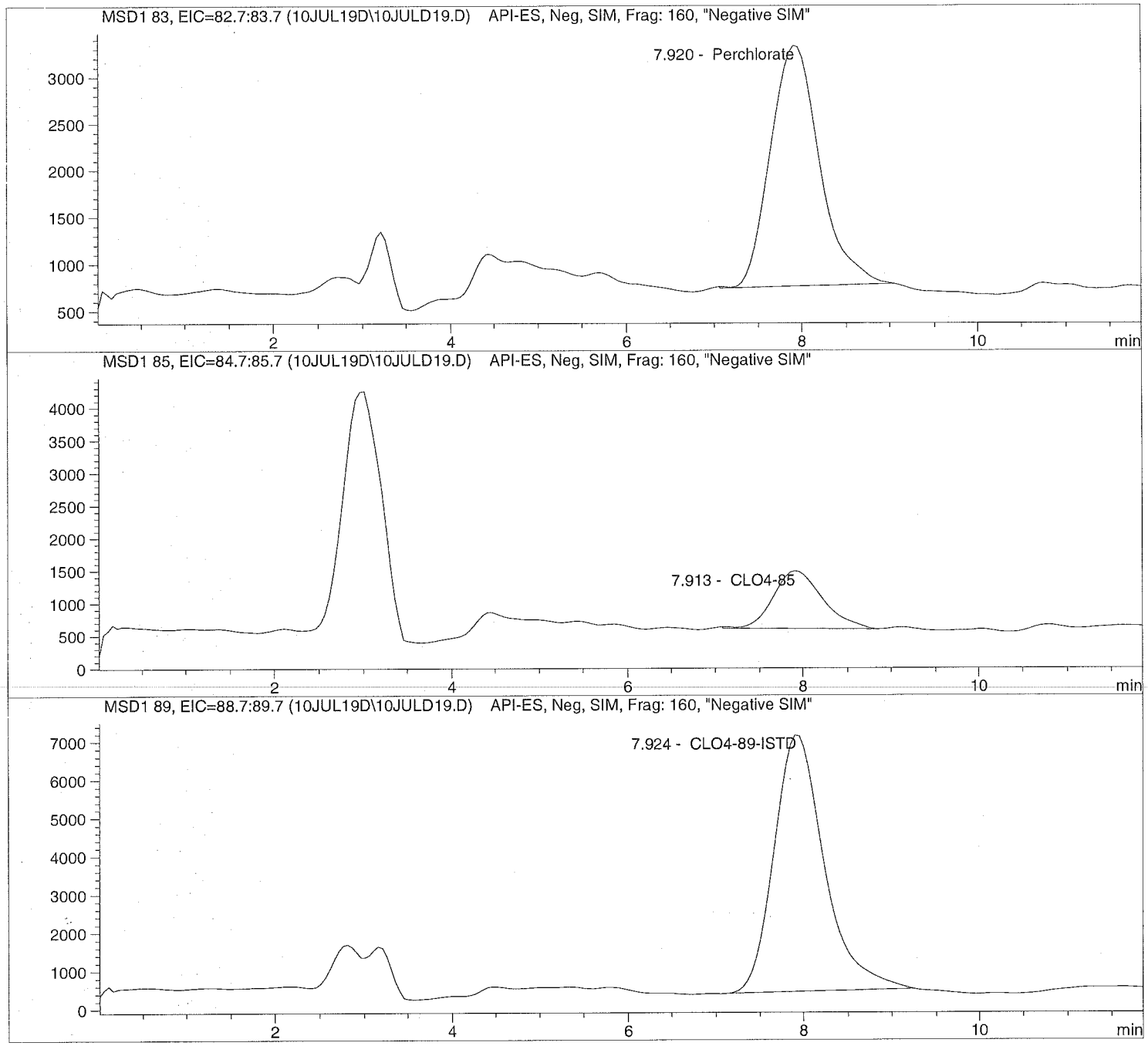
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD19.D Sample Name: 1918525003

Injection Date:	7/10/2019 13:00:15	Seq Line:	19
Sample Name:	1918525003	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD19.D Sample Name: 1918525003

Injection Date:	7/10/2019 13:00:15	Seq Line:	19
Sample Name:	1918525003	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.920	BBA	99719.0	1.3533	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.913	BBA	34459.2	1.3947	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.924	PBA	265508.1	5.0000	CLO4-89-ISTD

*** End of Report ***

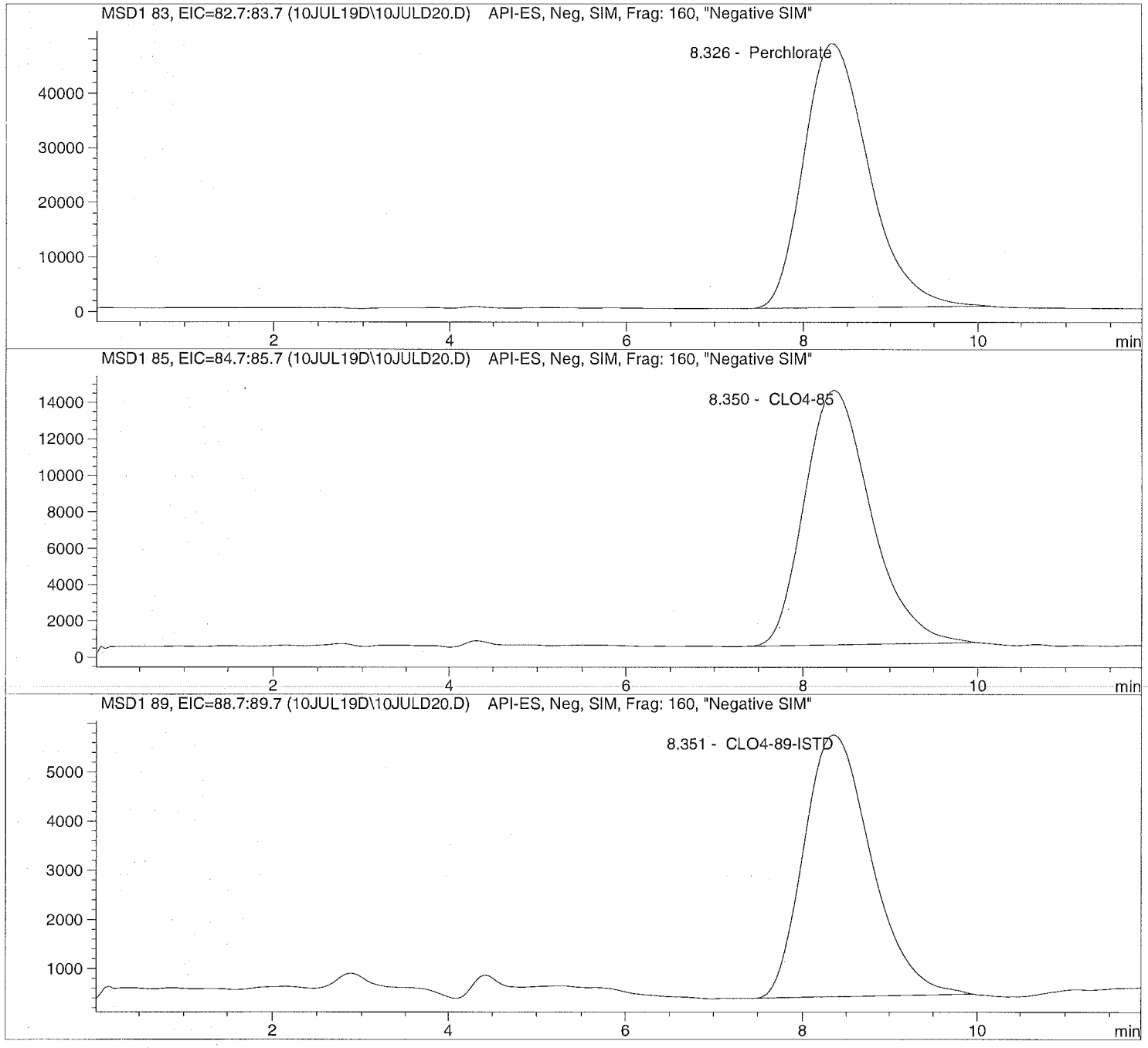
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD20.D Sample Name: 662921 CCV@25

Injection Date:	7/10/2019 13:15:33	Seq Line:	20
Sample Name:	662921 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD20.D Sample Name: 662921 CCV@25

Injection Date:	7/10/2019 13:15:33	Seq Line:	20
Sample Name:	662921 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.326	PBA	2504544.8	26.4781	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.350	PBA	743673.1	26.4969	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.351	PBA	286769.0	5.0000	CLO4-89-ISTD

*** End of Report ***

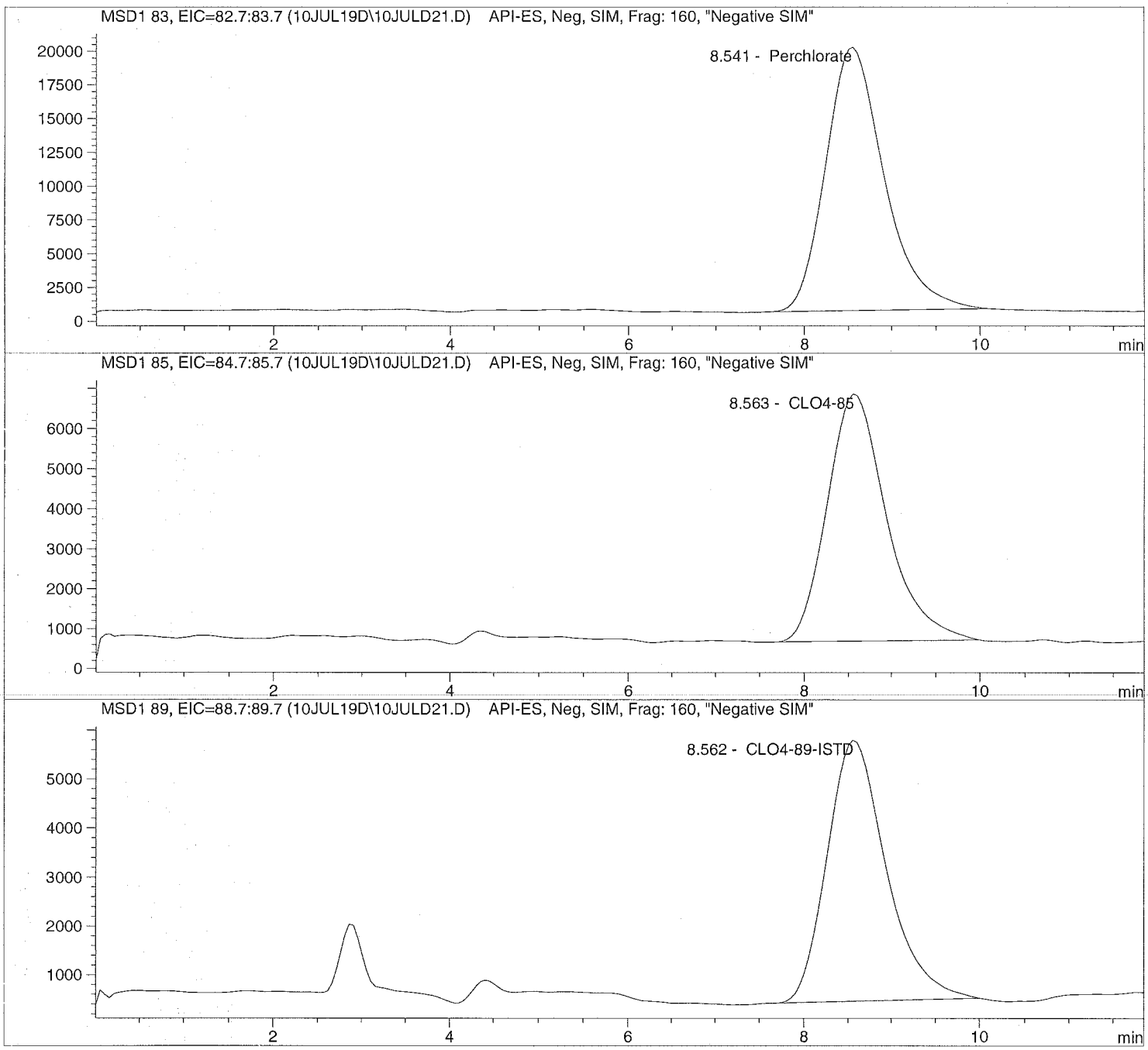
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD21.D Sample Name: 1918525004 1K

Injection Date:	7/10/2019 13:39:18	Seq Line:	21
Sample Name:	1918525004 1K	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD21.D Sample Name: 1918525004 1K

Injection Date:	7/10/2019 13:39:18	Seq Line:	21
Sample Name:	1918525004 1K	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.541	PBA	911870.8	11409.0284	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.563	PBA	292673.1	12213.3165	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.562	PBA	252353.5	5000.0000	CLO4-89-ISTD

*** End of Report ***

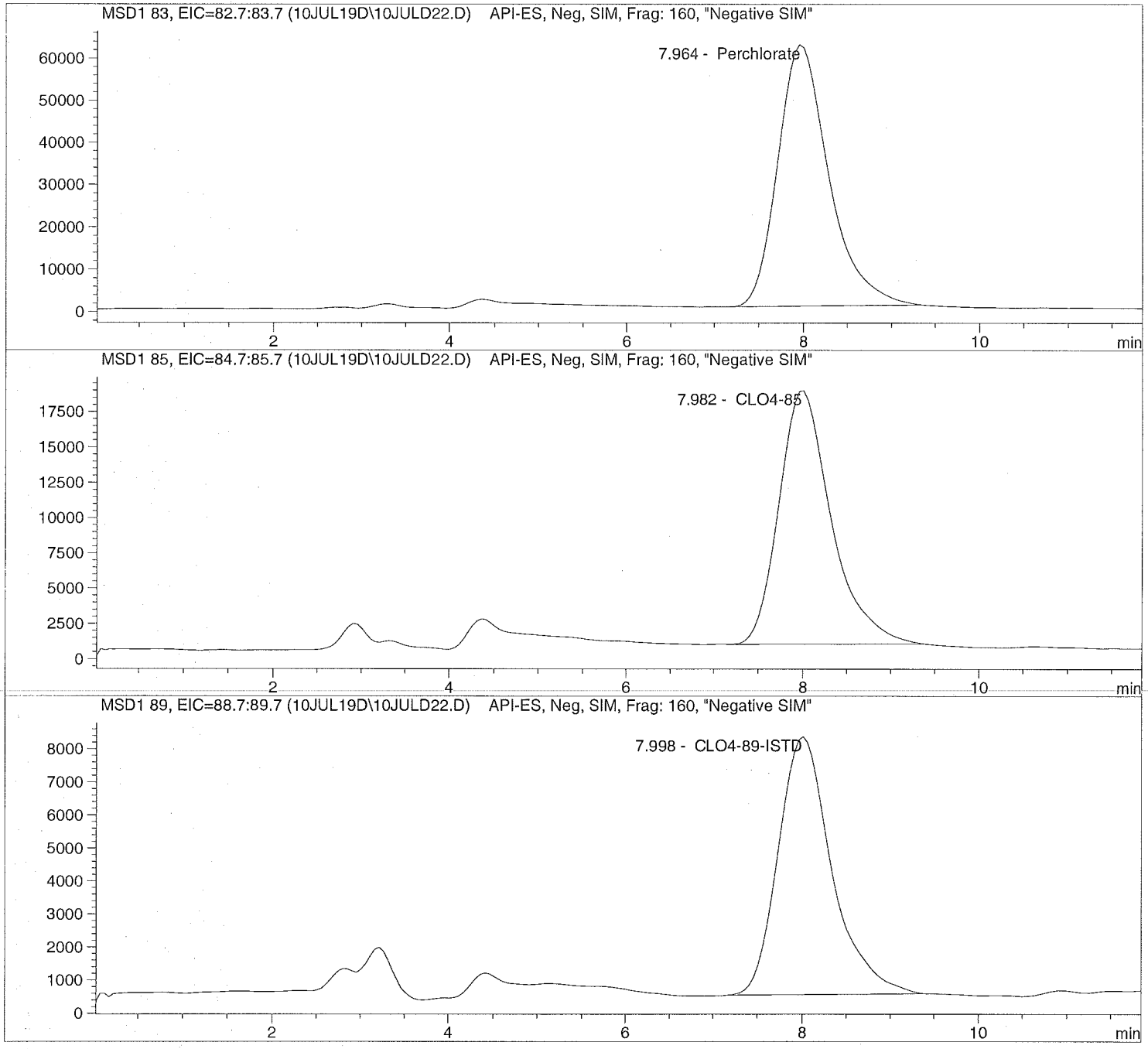
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD22.D Sample Name: 1918682001

Injection Date:	7/10/2019 13:53:14	Seq Line:	22
Sample Name:	1918682001	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD22.D Sample Name: 1918682001

Injection Date:	7/10/2019 13:53:14	Seq Line:	22
Sample Name:	1918682001	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.964	PBA	2472569.8	22.9756	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.982	PBA	738653.3	23.1021	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.998	PBA	329023.1	5.0000	CLO4-89-ISTD

*** End of Report ***

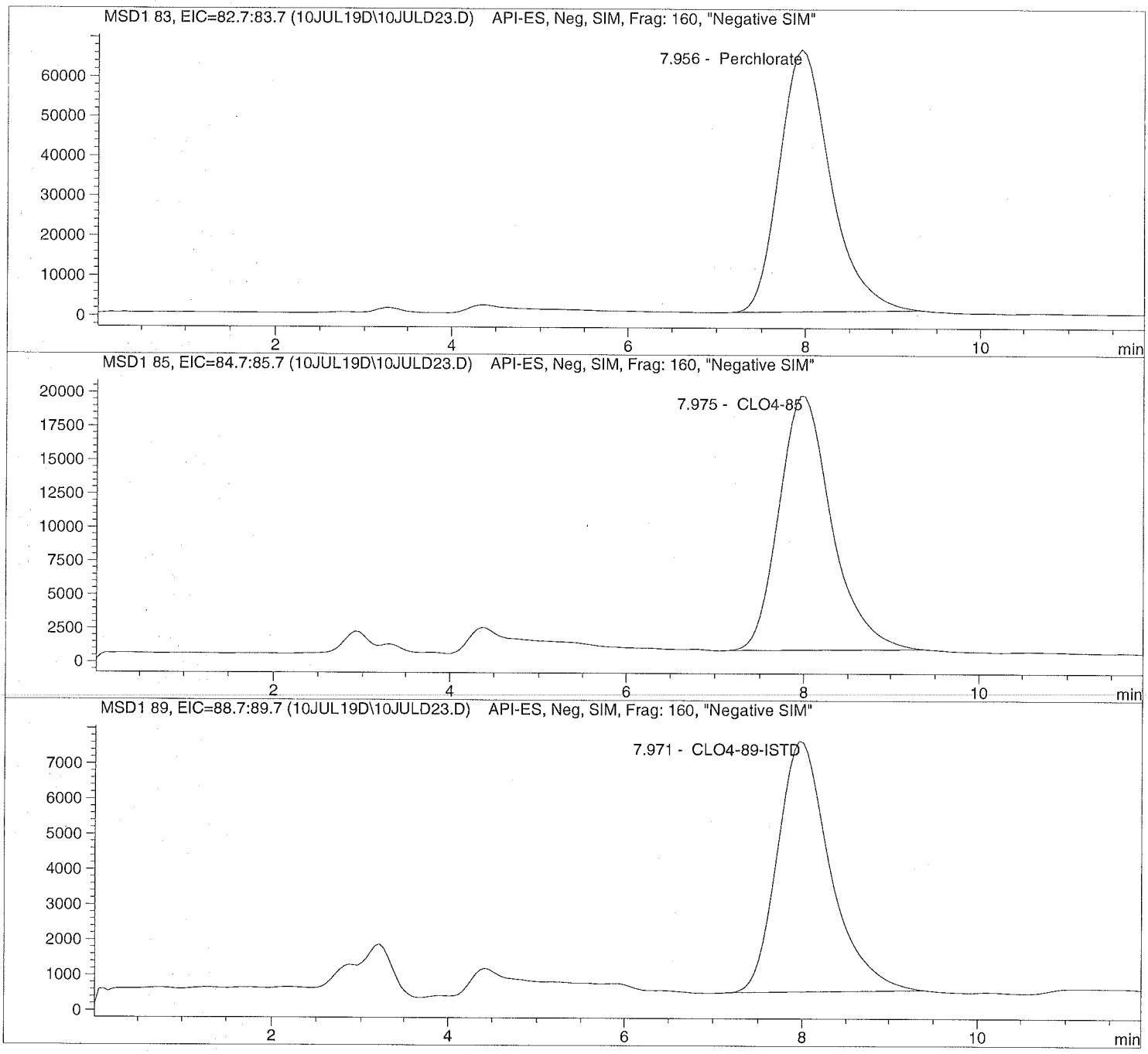
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD23.D Sample Name: 1918682002

Injection Date:	7/10/2019 14:07:09	Seq Line:	23
Sample Name:	1918682002	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD23.D Sample Name: 1918682002

Injection Date:	7/10/2019 14:07:09	Seq Line:	23
Sample Name:	1918682002	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.956	PBA	2649661.3	27.0999	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.975	PBA	784495.3	27.0493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.971	PBA	295991.2	5.0000	CLO4-89-ISTD

*** End of Report ***

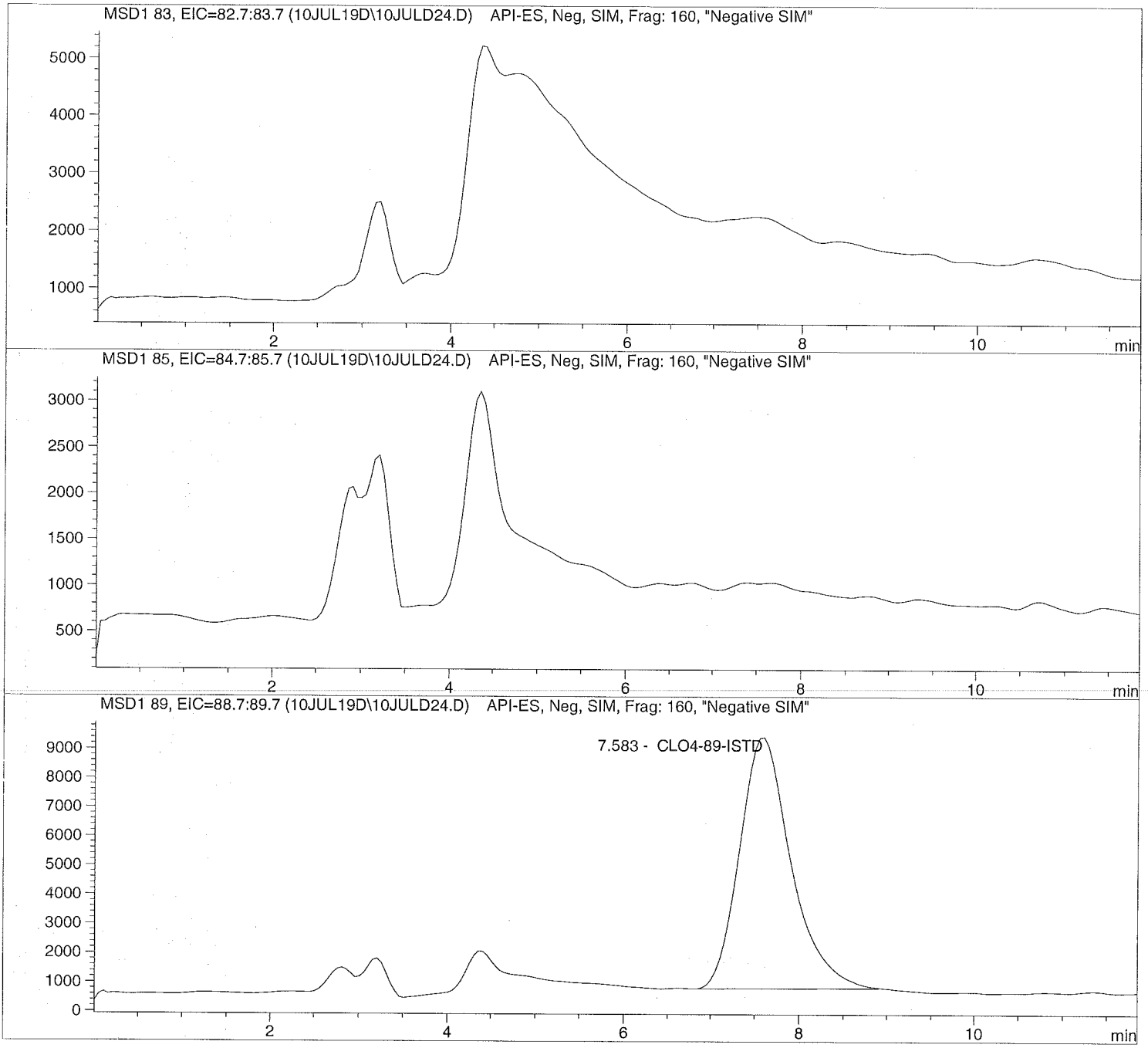
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD24.D Sample Name: 1918682003

Injection Date:	7/10/2019 14:20:59	Seq Line:	24
Sample Name:	1918682003	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD24.D Sample Name: 1918682003

Injection Date:	7/10/2019 14:20:59	Seq Line:	24
Sample Name:	1918682003	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.583	PBA	347868.7	5.0000	CLO4-89-ISTD

*** End of Report ***

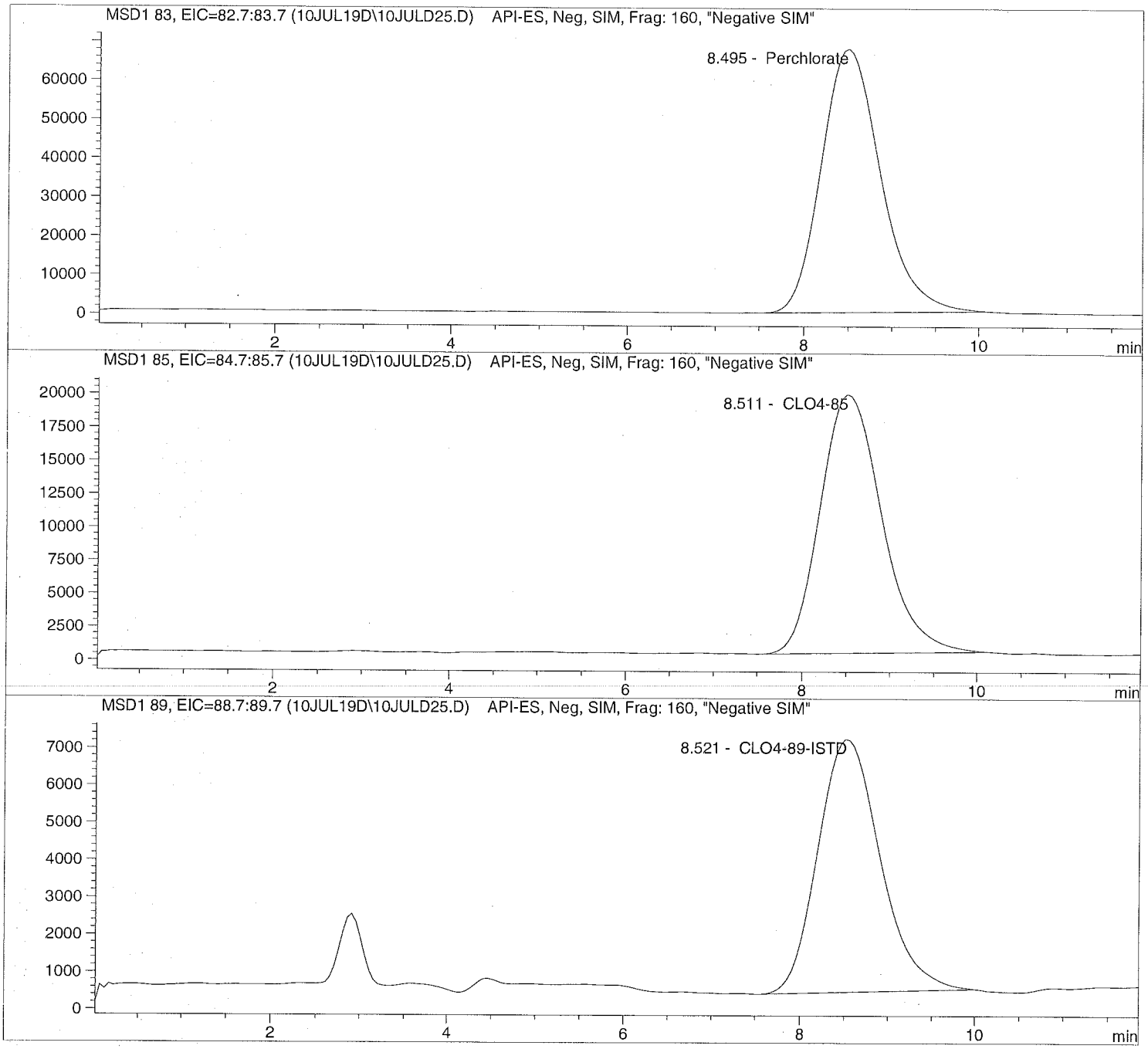
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD25.D Sample Name: 1918682004 100

Injection Date:	7/10/2019 14:34:49	Seq Line:	25
Sample Name:	1918682004 100	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD25.D Sample Name: 1918682004 100

Injection Date:	7/10/2019 14:34:49	Seq Line:	25
Sample Name:	1918682004 100	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.495	PBA	3177637.5	2867.6913	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.511	PBA	949731.6	2888.9947	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.521	PBA	334219.0	500.0000	CLO4-89-ISTD

*** End of Report ***

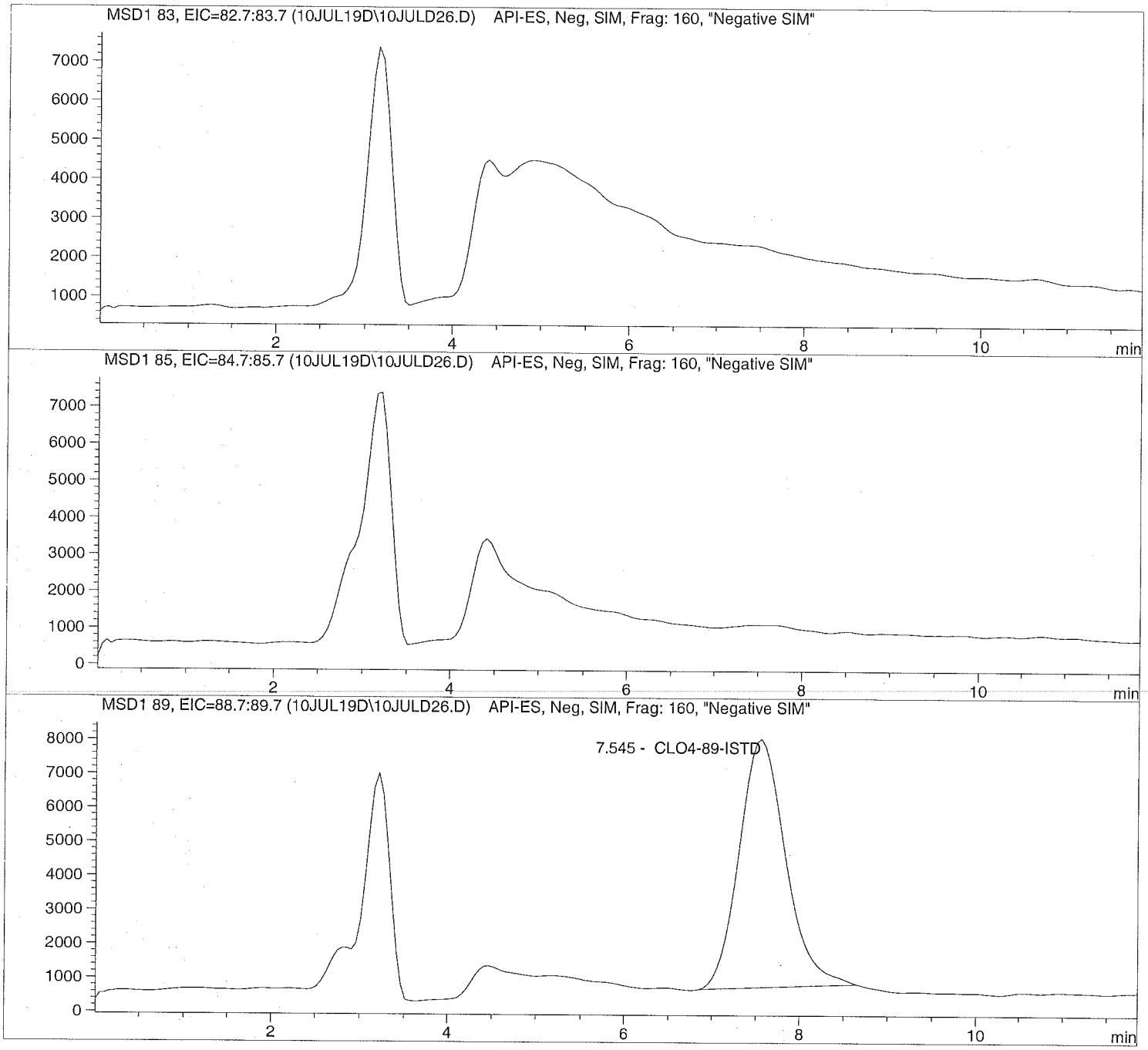
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD26.D Sample Name: 1918682005

Injection Date:	7/10/2019 14:48:53	Seq Line:	26
Sample Name:	1918682005	Location:	Vial 94
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD26.D Sample Name: 1918682005

Injection Date:	7/10/2019 14:48:53	Seq Line:	26
Sample Name:	1918682005	Location:	Vial 94
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.545	PBA	268838.9	5.0000	CLO4-89-ISTD

*** End of Report ***

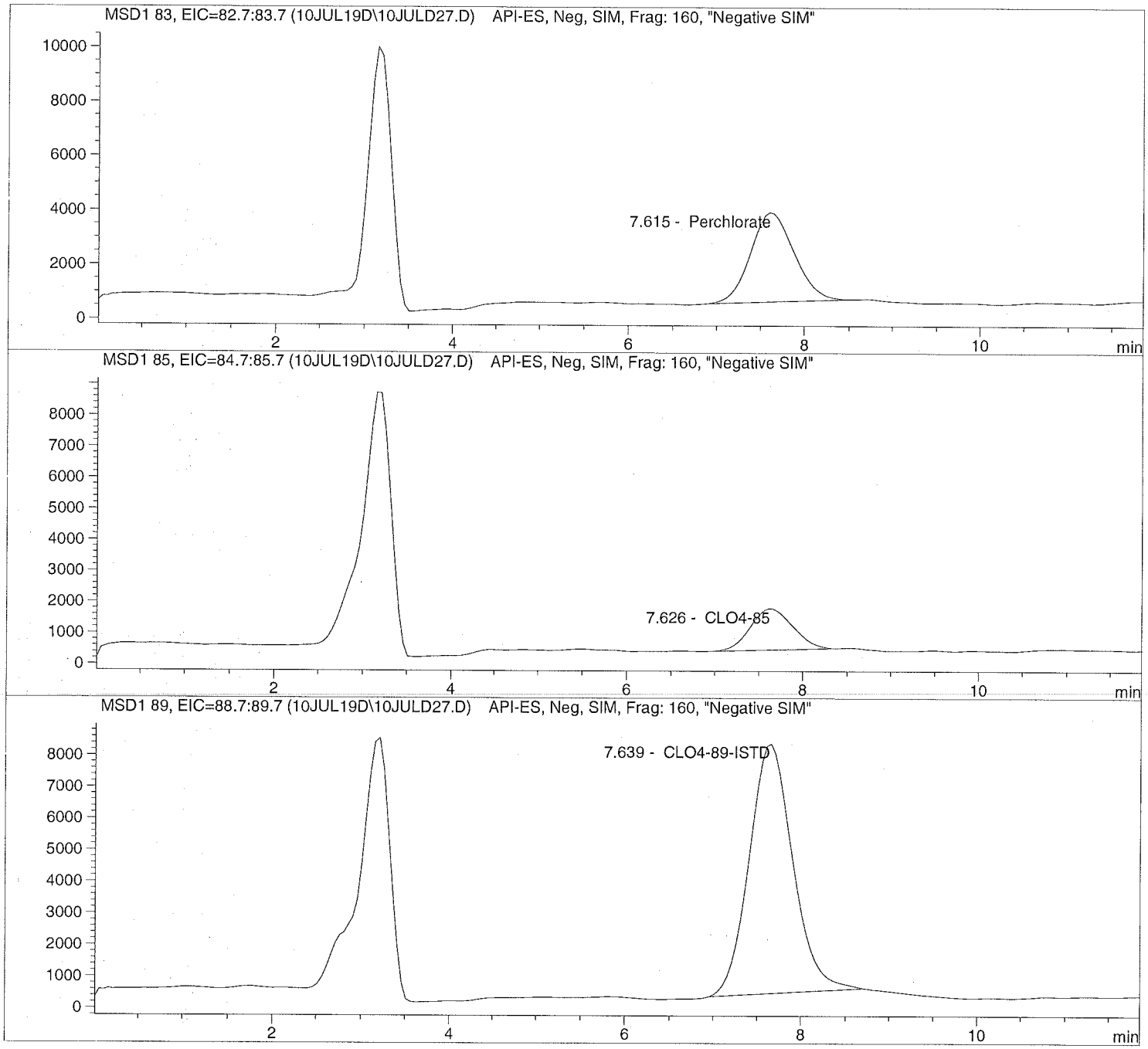
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD27.D Sample Name: 1918373004 4X

Injection Date:	7/10/2019 15:02:46	Seq Line:	27
Sample Name:	1918373004 4X	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD27.D Sample Name: 1918373004 4X

Injection Date:	7/10/2019 15:02:46	Seq Line:	27
Sample Name:	1918373004 4X	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	4.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.615	PBA	113897.9	5.9203	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.626	PBA	45010.5	7.0582	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.639	PBA	274117.7	20.0000	CLO4-89-ISTD

*** End of Report ***

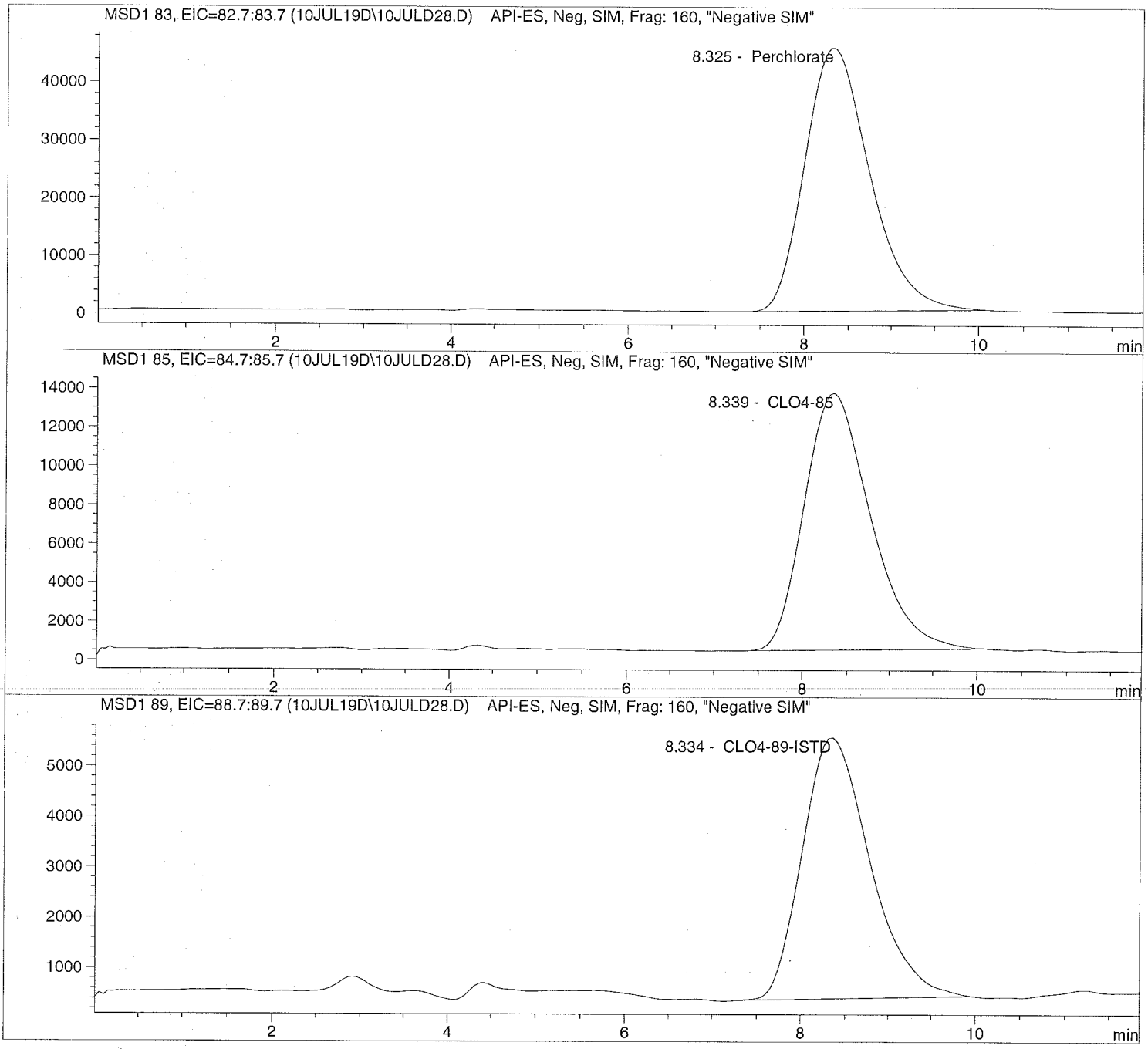
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD28.D Sample Name: 662922 CCV@25

Injection Date:	7/10/2019 15:16:39	Seq Line:	28
Sample Name:	662922 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD28.D Sample Name: 662922 CCV@25

Injection Date:	7/10/2019 15:16:39	Seq Line:	28
Sample Name:	662922 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.325	PBA	2335796.8	25.5805	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.339	PBA	693327.1	25.5842	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.334	PBA	277421.9	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

RIGHT SOLUTIONS | RIGHT PARTNER

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RIGHT SOLUTIONS | RIGHT PARTNER

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

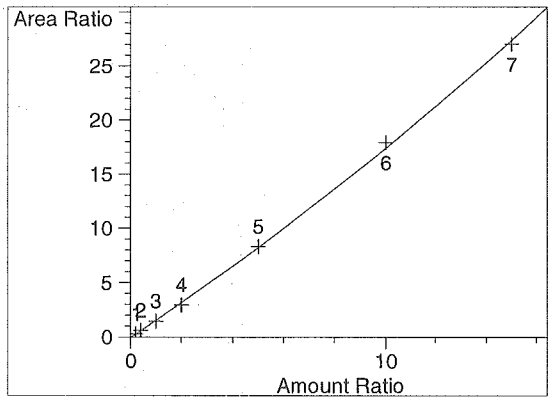
Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

Peak Sum Table

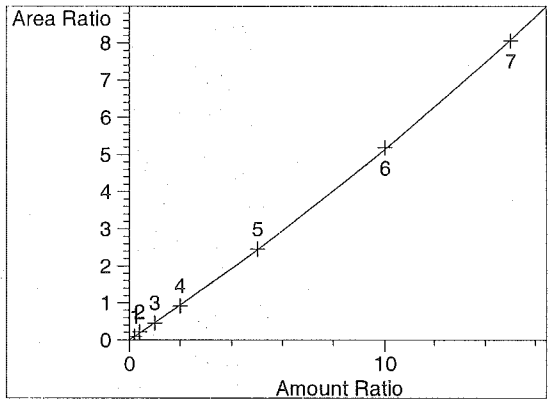
No Entries in table

RIGHT SOLUTIONS | RIGHT PARTNER

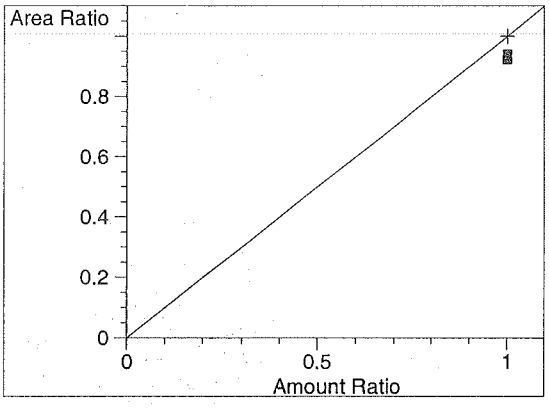
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

RIGHT SOLUTIONS | RIGHT PARTNER

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

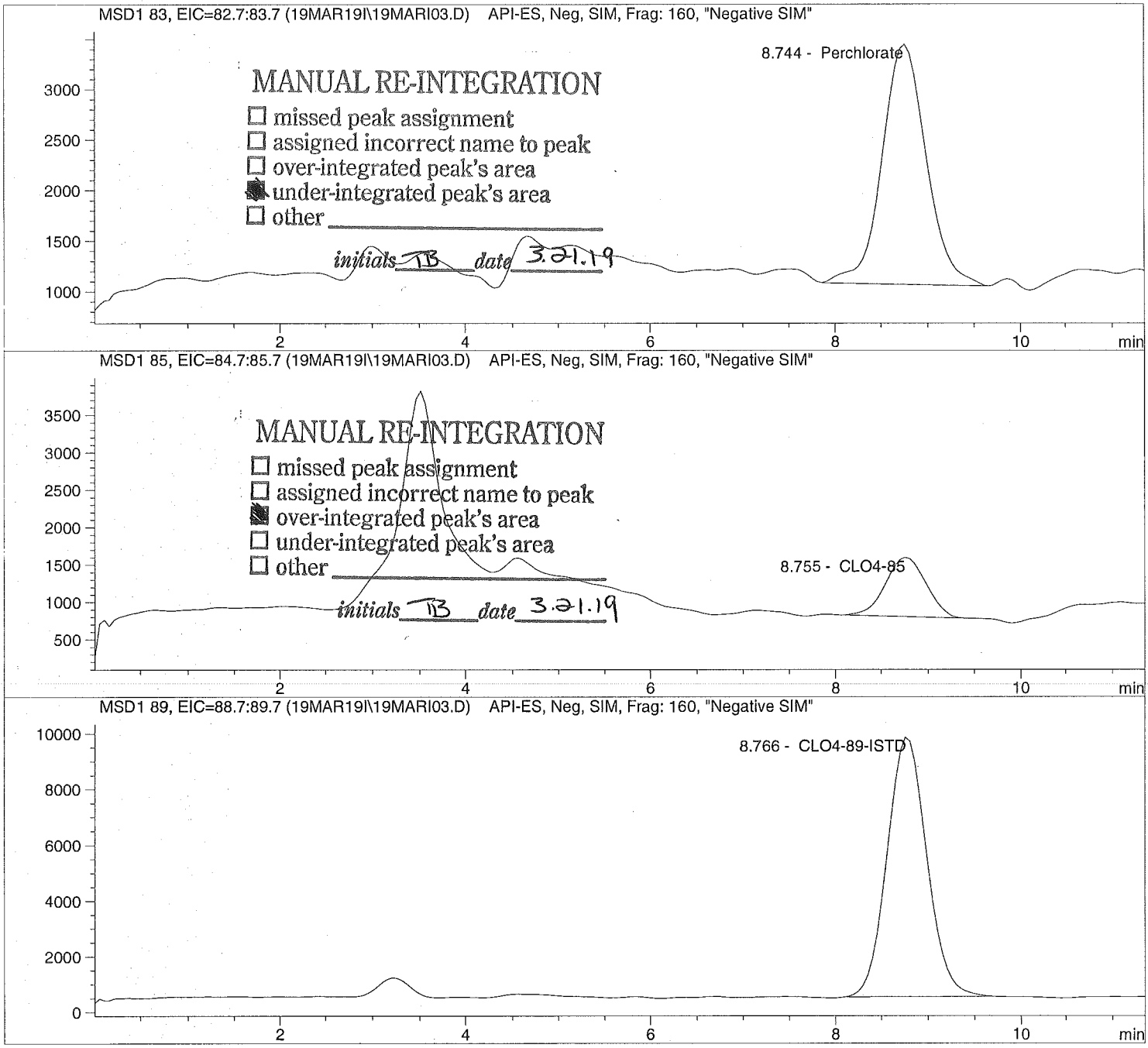
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

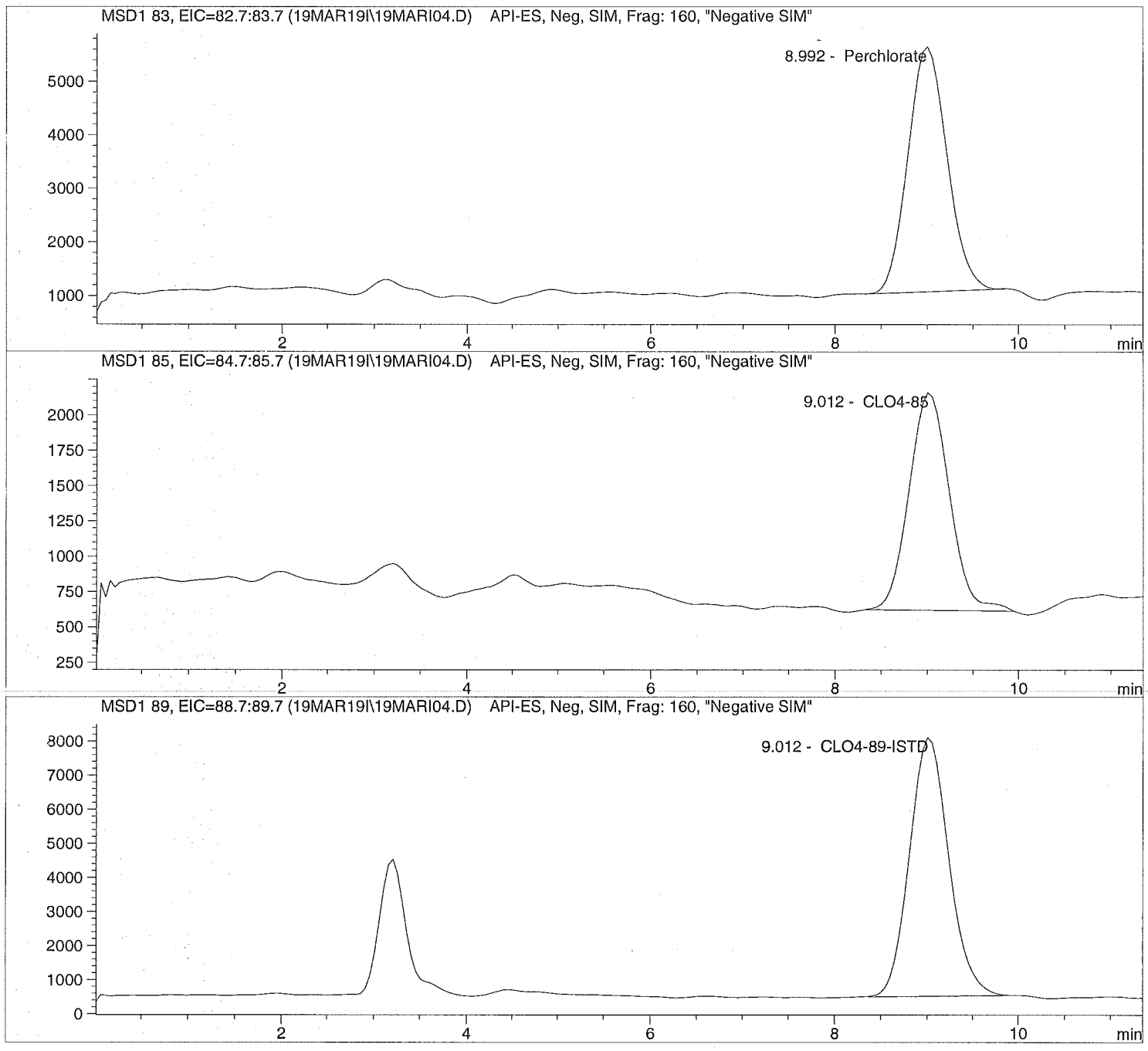
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

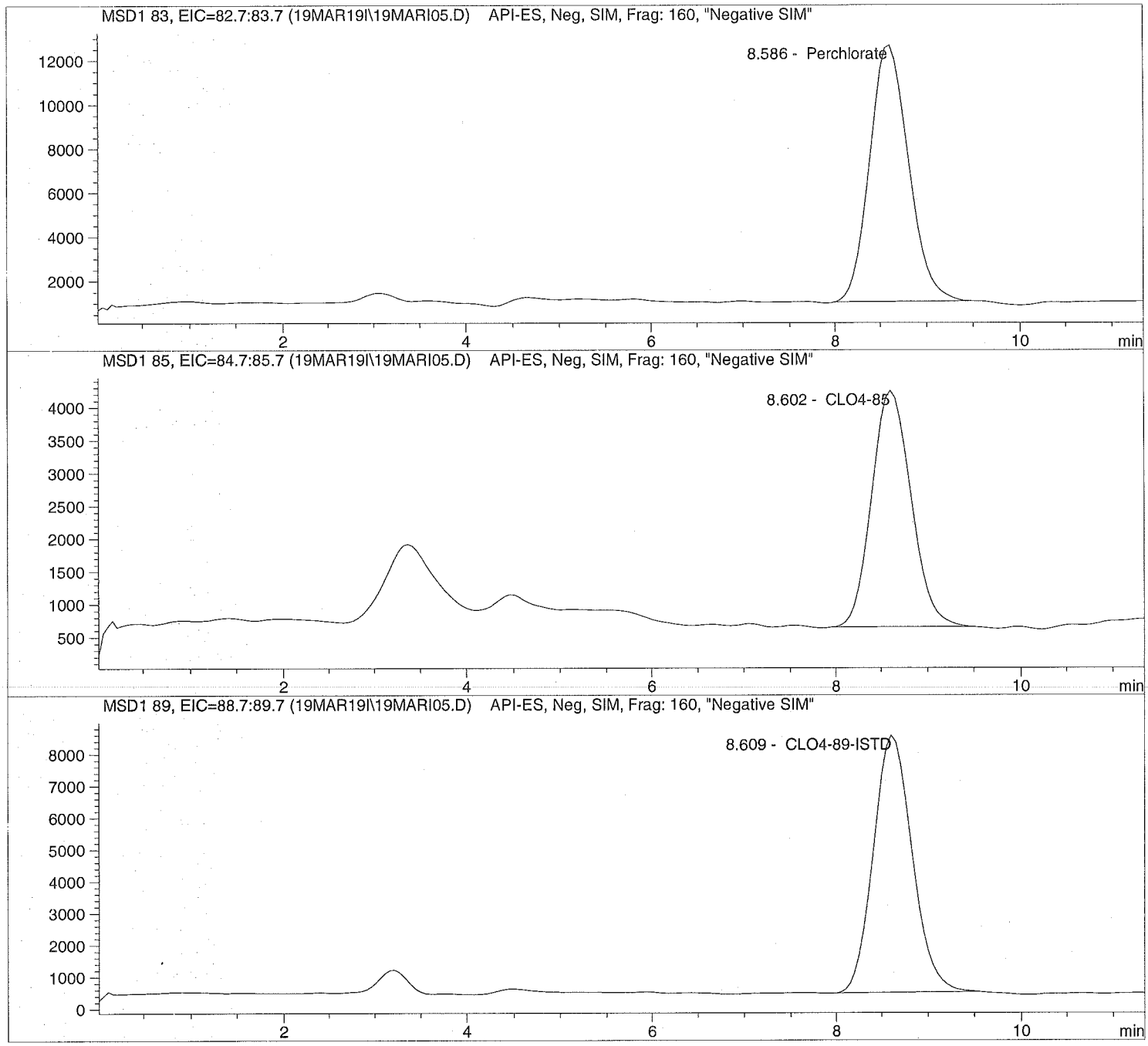
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

*** End of Report ***

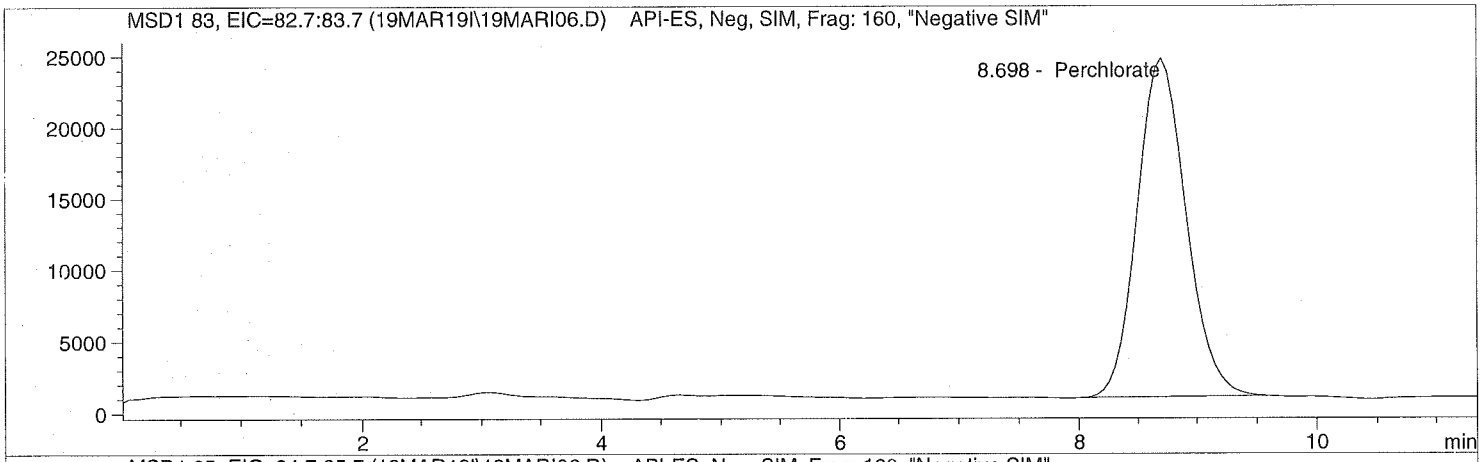
RIGHT SOLUTIONS | RIGHT PARTNER

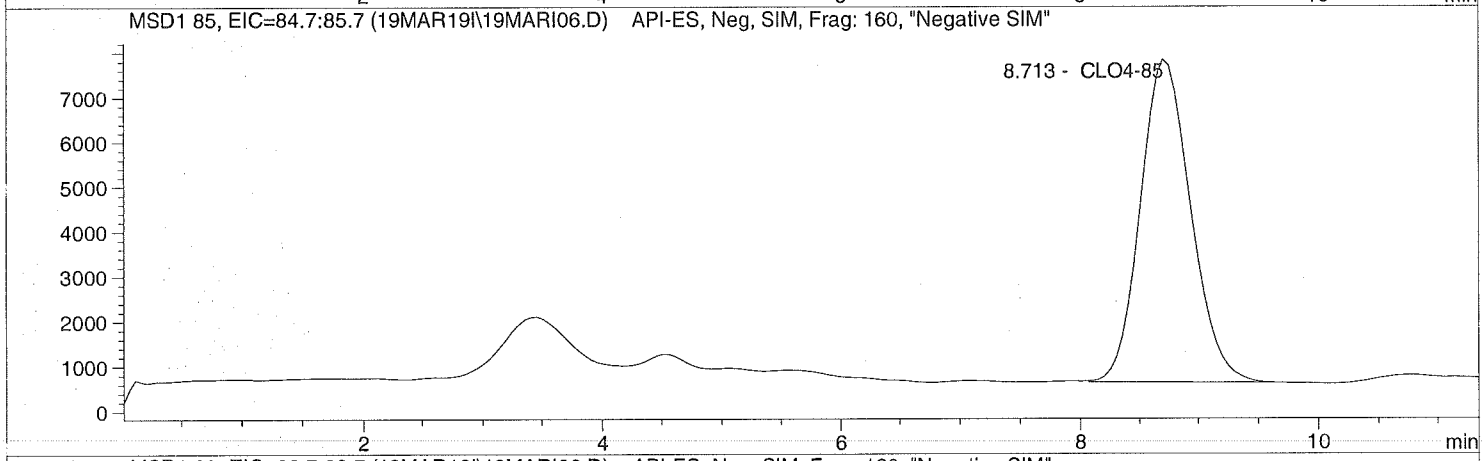
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

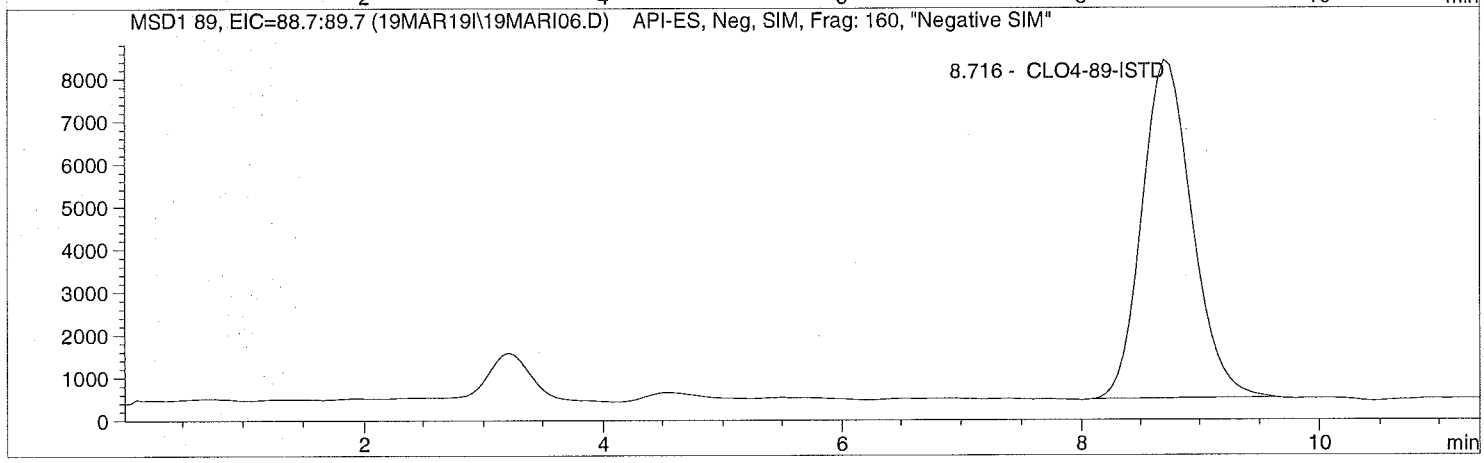
Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

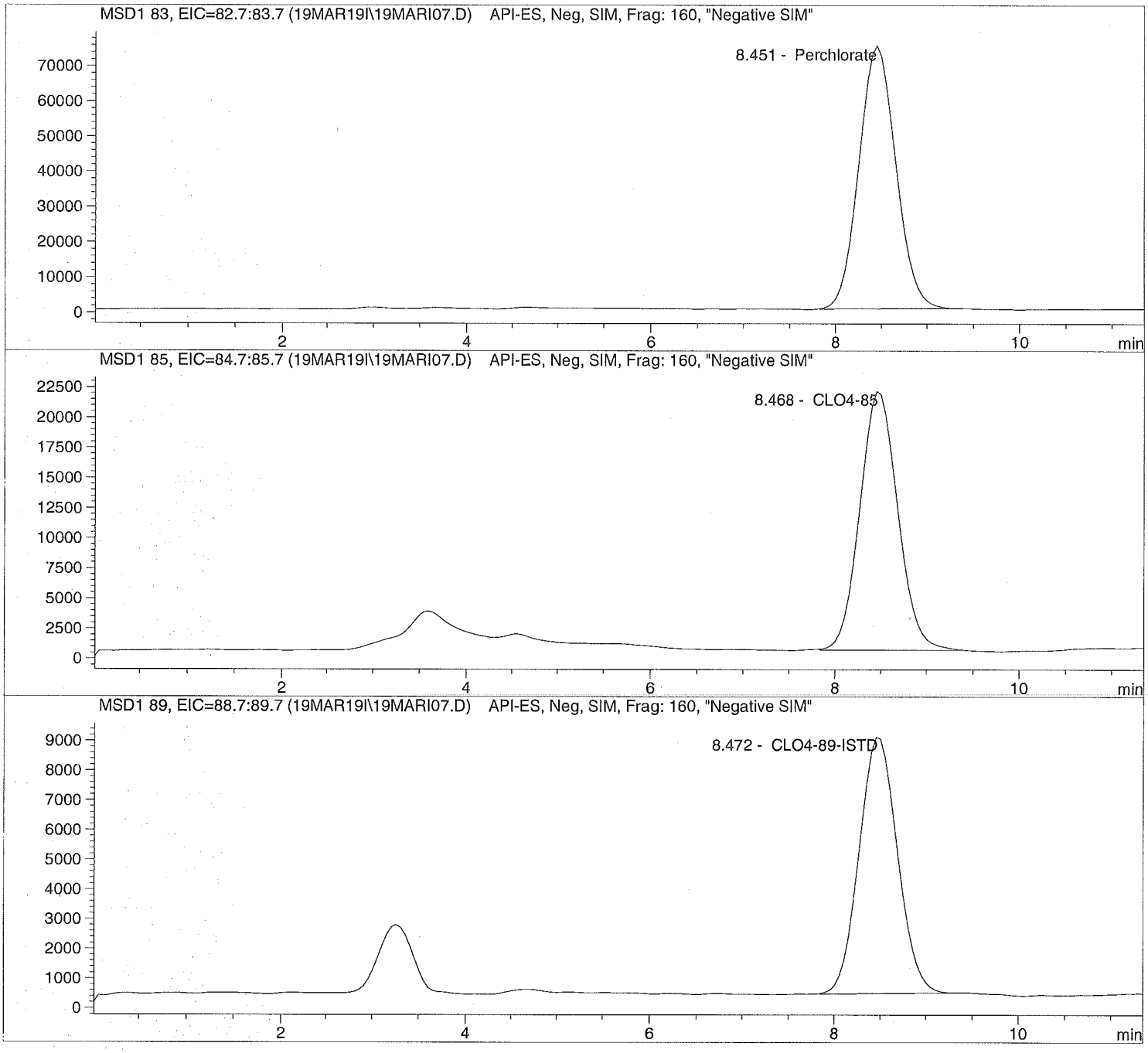
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

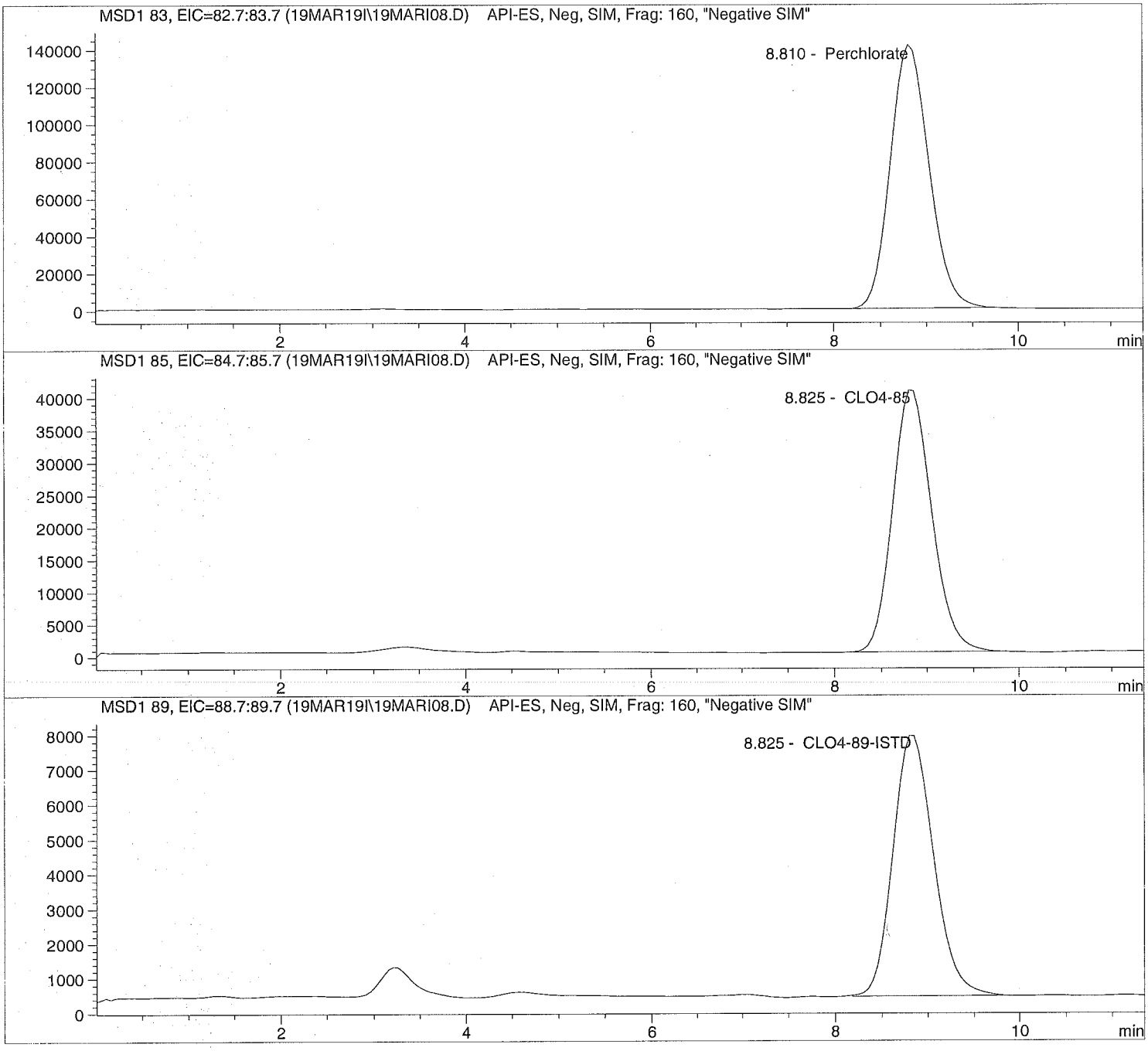
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

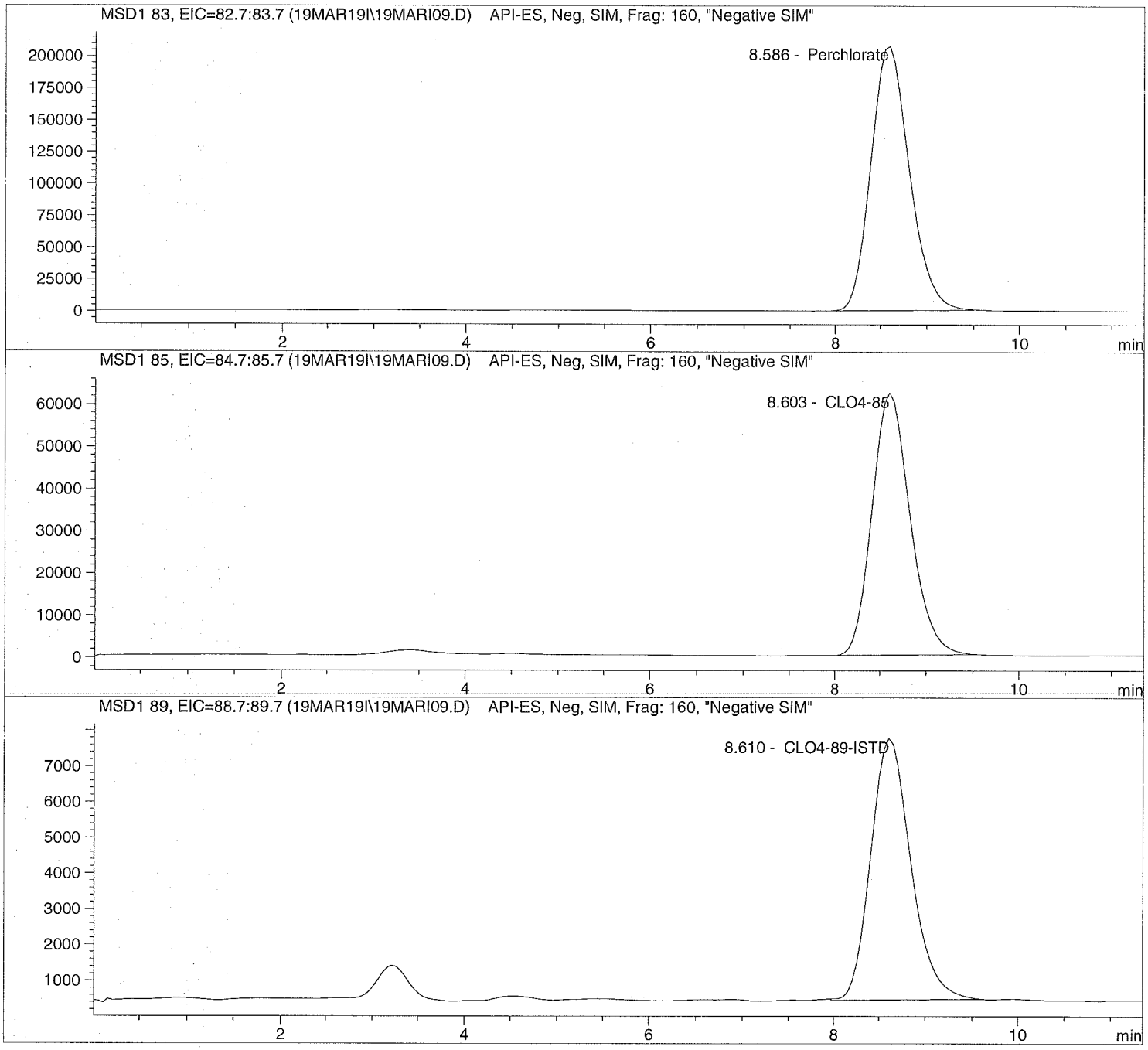
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

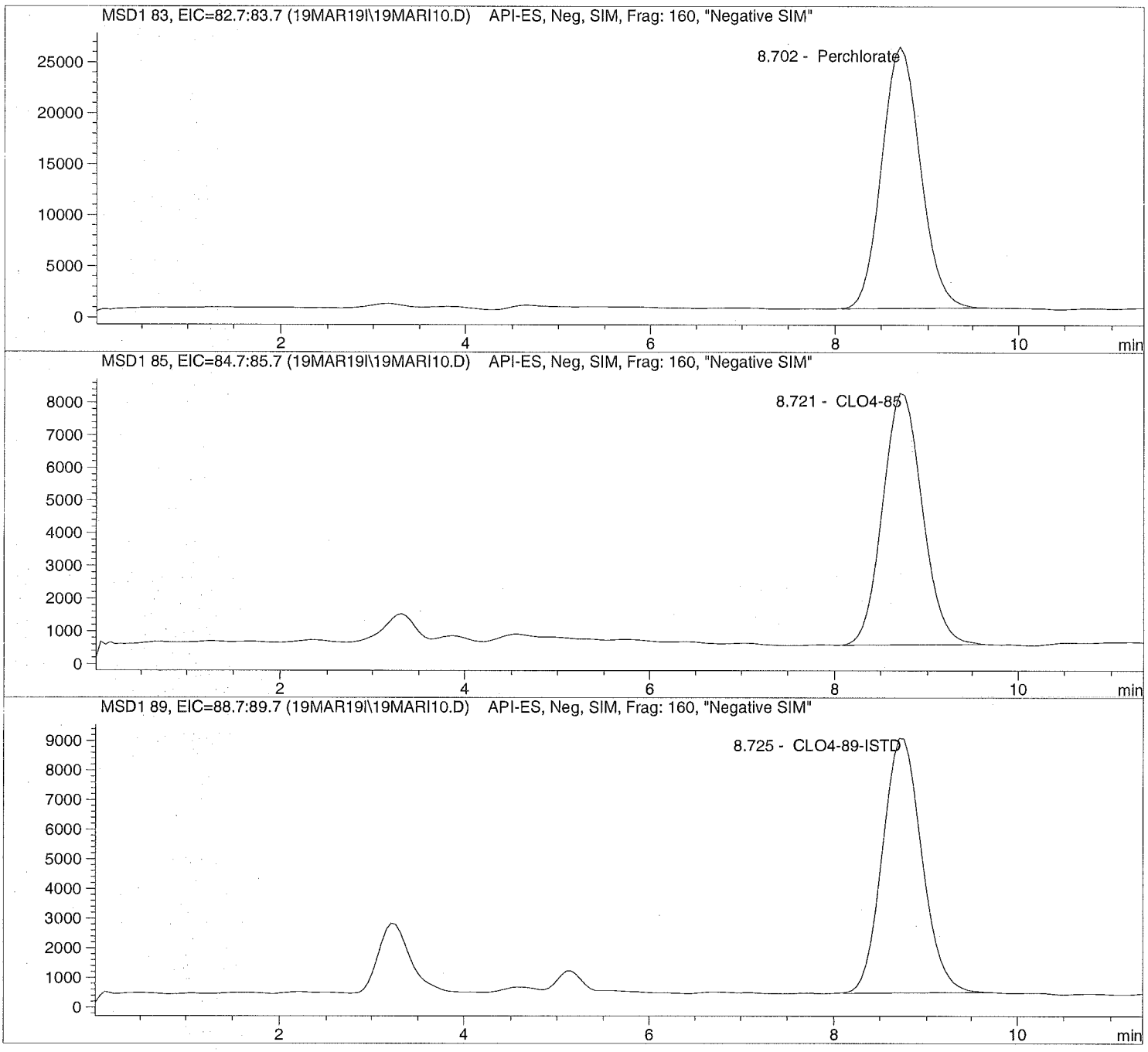
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

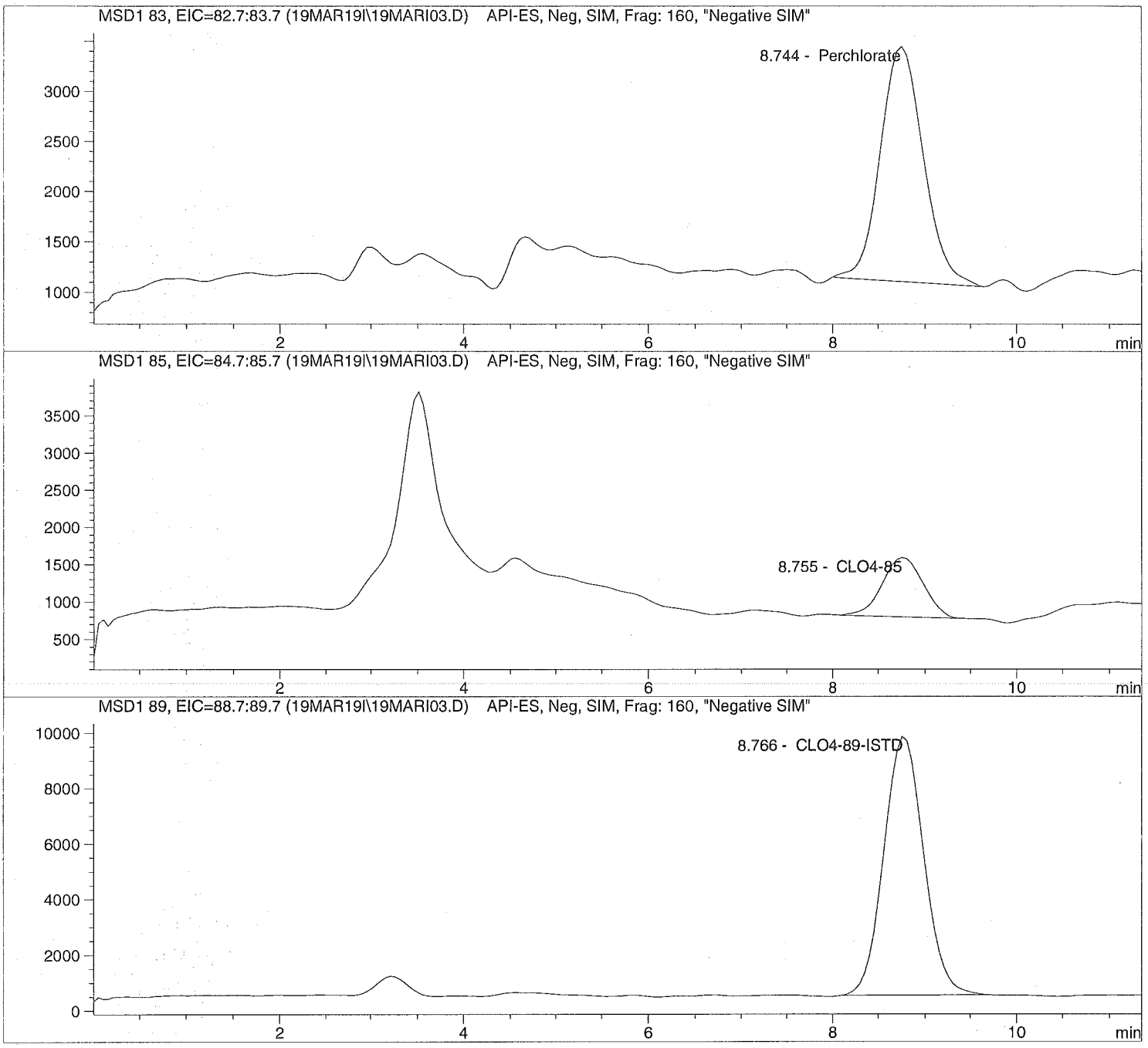
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

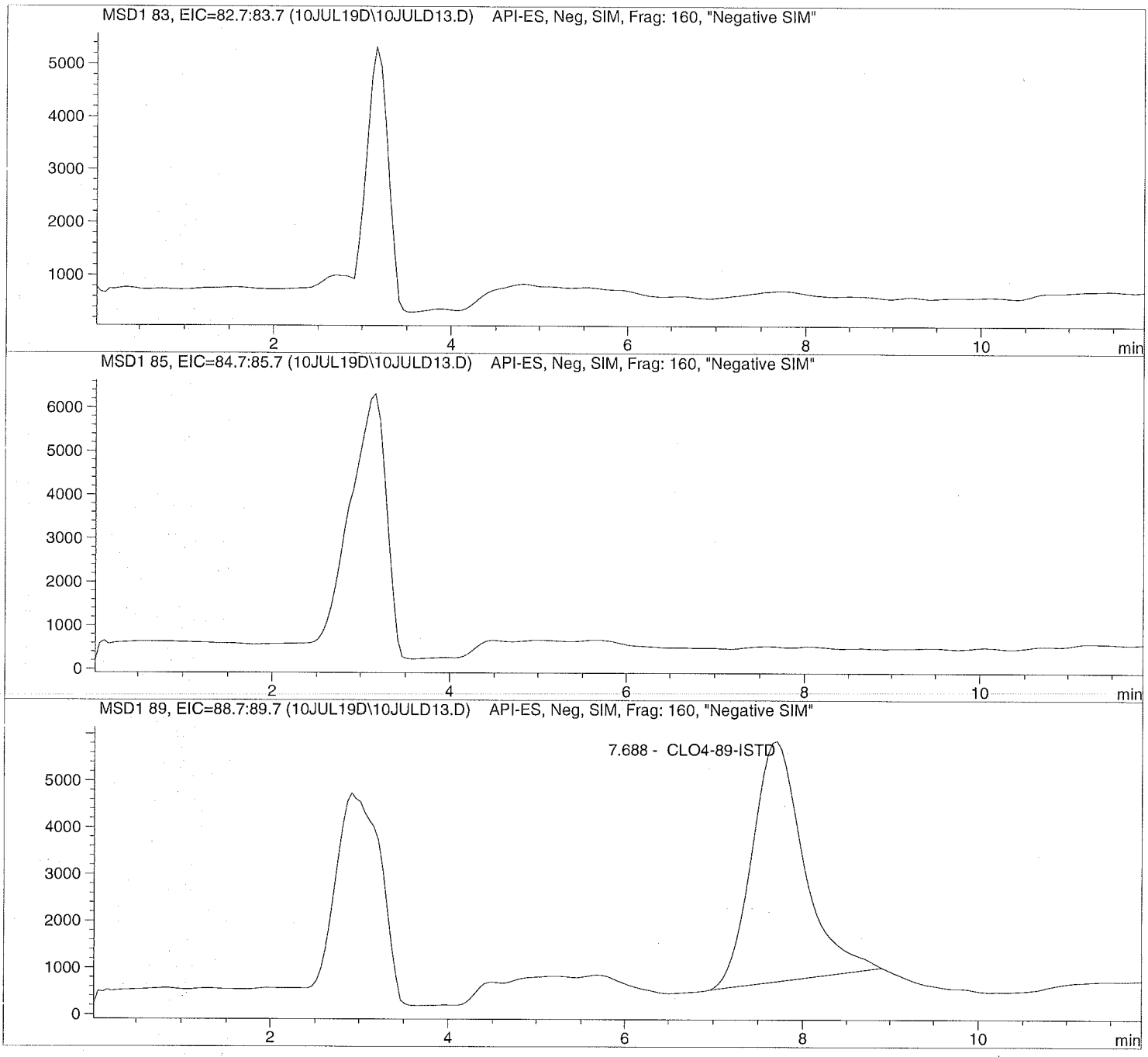
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD13.D Sample Name: 1918373007

Injection Date:	7/10/2019 11:36:55	Seq Line:	13
Sample Name:	1918373007	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD13.D Sample Name: 1918373007

Injection Date:	7/10/2019 11:36:55	Seq Line:	13
Sample Name:	1918373007	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.688	PBA	206768.2	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

July 16, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19061386**

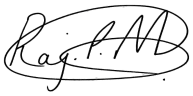
Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 11 sample(s) on Jun 26, 2019 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Houston, US Date: 16-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061386

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19061386-01	17WW08_062519	Water		25-Jun-2019 07:10	26-Jun-2019 08:50	☐
HS19061386-02	130_062519	Water		25-Jun-2019 08:00	26-Jun-2019 08:50	☐
HS19061386-03	130_062519-a	Water		25-Jun-2019 08:00	26-Jun-2019 08:50	☐
HS19061386-04	MW10_062519	Water		25-Jun-2019 08:55	26-Jun-2019 08:50	☐
HS19061386-05	MW13_062519	Water		25-Jun-2019 09:45	26-Jun-2019 08:50	☐
HS19061386-06	CO2_062519	Water		25-Jun-2019 10:30	26-Jun-2019 08:50	☐
HS19061386-07	MW17_062519	Water		25-Jun-2019 11:20	26-Jun-2019 08:50	☐
HS19061386-08	18WW10_062519	Water		25-Jun-2019 12:20	26-Jun-2019 08:50	☐
HS19061386-09	18WW10_062519-a	Water		25-Jun-2019 12:20	26-Jun-2019 08:50	☐
HS19061386-10	MW9_062519	Water		25-Jun-2019 13:10	26-Jun-2019 08:50	☐
HS19061386-11	Trip Blank	Water	C&G-050119-190	25-Jun-2019 00:00	26-Jun-2019 08:50	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19061386

Work Order Comments

• Revised to correct the sample ID for 18WW10_062519-a

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT Final report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142510

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R341869

Sample ID: CCV

• Bromoform, 1,2-Dibromo-3-Chloropropane and 1,2,3-Trichlorobenzene exceeded %D limits for CCV. Samples are ND for these compounds.

Sample ID: HS19061486-01MS

• MS and MSD are for an unrelated sample

Batch ID: R341768

Sample ID: VLCSW-190702

• One sporadic marginal exceedance (Chloroform) for LCS. CCV is OK.

Metals by Method SW7470

Batch ID: 142558

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 142541

Sample ID: HS19061486-01SD

• SD is for an unrelated sample

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 17WW08_062519
Collection Date: 25-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19061386
Lab ID:HS19061386-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:49
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 18:49
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	02-Jul-2019 18:49
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:49
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	02-Jul-2019 18:49
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 18:49
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	02-Jul-2019 18:49
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 17WW08_062519
Collection Date: 25-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19061386
Lab ID:HS19061386-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	02-Jul-2019 18:49
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 18:49
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 18:49
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 18:49
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 18:49
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*1*	*02-Jul-2019 18:49*
Surr: 4-Bromofluorobenzene	*99.7*			**0**	*85-114*	*%REC*	*1*	*02-Jul-2019 18:49*
Surr: Dibromofluoromethane	*98.0*			**0**	*80-119*	*%REC*	*1*	*02-Jul-2019 18:49*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*02-Jul-2019 18:49*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 17WW08_062519
Collection Date: 25-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19061386
Lab ID:HS19061386-01
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**0.0212**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	05-Jul-2019 16:29
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 16:29
Arsenic	**0.00576**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 16:29
Barium	**0.539**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 16:29
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 16:29
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 16:29
Calcium	**129**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	05-Jul-2019 16:29
Chromium	**0.438**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 16:29
Cobalt	**0.0156**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 16:29
Copper	**0.00484**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 16:29
Iron	**29.0**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 16:29
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	05-Jul-2019 16:29
Magnesium	**85.6**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 16:29
Manganese	**1.62**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 16:29
Nickel	**0.370**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 16:29
Potassium	**2.12**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 16:29
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jul-2019 16:29
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jul-2019 16:29
Sodium	**527**		**0.140**	**0.500**	**2.00**	**mg/L**	10	08-Jul-2019 15:03
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 16:29
Vanadium	**0.00169**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 16:29
Zinc	**0.0291**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 16:29
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 14:32
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19061386
Sample ID: 130_062519
Lab ID:HS19061386-02
Collection Date: 25-Jun-2019 08:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:13
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 19:13
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	02-Jul-2019 19:13
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:13
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	02-Jul-2019 19:13
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 19:13
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	02-Jul-2019 19:13
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19061386
Sample ID: 130_062519
Lab ID:HS19061386-02
Collection Date: 25-Jun-2019 08:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	02-Jul-2019 19:13
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	02-Jul-2019 19:13
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	02-Jul-2019 19:13
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	02-Jul-2019 19:13
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	02-Jul-2019 19:13
Surr: 1,2-Dichloroethane-d4	*99.2*			**0**	*81-118*	*%REC*	*1*	*02-Jul-2019 19:13*
Surr: 4-Bromofluorobenzene	*94.5*			**0**	*85-114*	*%REC*	*1*	*02-Jul-2019 19:13*
Surr: Dibromofluoromethane	*95.8*			**0**	*80-119*	*%REC*	*1*	*02-Jul-2019 19:13*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*02-Jul-2019 19:13*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 130_062519
Collection Date: 25-Jun-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19061386
Lab ID:HS19061386-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**5.22**		**0.0180**	**0.0500**	**0.100**	**mg/L**	10	08-Jul-2019 15:06
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 16:31
Arsenic	**0.00360**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 16:31
Barium	**0.0930**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 16:31
Beryllium	**0.000454**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	05-Jul-2019 16:31
Cadmium	**0.000499**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	05-Jul-2019 16:31
Calcium	**8.03**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	05-Jul-2019 16:31
Chromium	**0.00929**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 16:31
Cobalt	**0.00947**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 16:31
Copper	**0.00755**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 16:31
Iron	**7.93**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 16:31
Lead	**0.00546**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 16:31
Magnesium	**5.19**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 16:31
Manganese	**0.285**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 16:31
Nickel	**0.00933**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 16:31
Potassium	**1.88**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 16:31
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jul-2019 16:31
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jul-2019 16:31
Sodium	**123**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 16:31
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 16:31
Vanadium	**0.0165**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 16:31
Zinc	**0.0478**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 16:31
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 14:33
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24 WorkOrder:HS19061386
Sample ID: 130_062519-a Lab ID:HS19061386-03
Collection Date: 25-Jun-2019 08:00 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:32
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 16:32
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jul-2019 16:32
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:32
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jul-2019 16:32
Acetone	**5.8**		**0.40**	**1.0**	**2.0**	**UG/L**	1	03-Jul-2019 16:32
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Carbon disulfide	**1.3**	J	**0.60**	**1.0**	**2.0**	**UG/L**	1	03-Jul-2019 16:32
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19061386
Sample ID: 130_062519-a
Lab ID:HS19061386-03
Collection Date: 25-Jun-2019 08:00
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	03-Jul-2019 16:32
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 16:32
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 16:32
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:32
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:32
Surr: 1,2-Dichloroethane-d4	*92.6*			**0**	*81-118*	*%REC*	*1*	*03-Jul-2019 16:32*
Surr: 4-Bromofluorobenzene	*93.0*			**0**	*85-114*	*%REC*	*1*	*03-Jul-2019 16:32*
Surr: Dibromofluoromethane	*88.5*			**0**	*80-119*	*%REC*	*1*	*03-Jul-2019 16:32*
Surr: Toluene-d8	*96.4*			**0**	*89-112*	*%REC*	*1*	*03-Jul-2019 16:32*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 130_062519-a
Collection Date: 25-Jun-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19061386
Lab ID:HS19061386-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**5.34**		**0.0180**	**0.0500**	**0.100**	**mg/L**	10	08-Jul-2019 14:54
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 16:35
Arsenic	**0.00349**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 16:35
Barium	**0.0899**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 16:35
Beryllium	**0.000469**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	05-Jul-2019 16:35
Cadmium	**0.000533**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	05-Jul-2019 16:35
Calcium	**8.07**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	05-Jul-2019 16:35
Chromium	**0.00918**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 16:35
Cobalt	**0.00954**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 16:35
Copper	**0.00743**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 16:35
Iron	**7.87**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 16:35
Lead	**0.00565**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 16:35
Magnesium	**5.20**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 16:35
Manganese	**0.287**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 16:35
Nickel	**0.00981**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 16:35
Potassium	**1.89**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 16:35
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jul-2019 16:35
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jul-2019 16:35
Sodium	**126**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 16:35
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 16:35
Vanadium	**0.0168**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 16:35
Zinc	**0.0456**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 16:35
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 14:35
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19061386
Sample ID: MW10_062519
Lab ID:HS19061386-04
Collection Date: 25-Jun-2019 08:55
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:08
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 20:08
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jul-2019 20:08
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:08
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jul-2019 20:08
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 20:08
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jul-2019 20:08
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24 WorkOrder:HS19061386
Sample ID: MW10_062519 Lab ID:HS19061386-04
Collection Date: 25-Jun-2019 08:55 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	03-Jul-2019 20:08
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 20:08
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 20:08
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:08
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Trichloroethene	**22**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Jul-2019 20:08
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:08
Surr: 1,2-Dichloroethane-d4	*95.2*			**0**	*81-118*	*%REC*	*1*	*03-Jul-2019 20:08*
Surr: 4-Bromofluorobenzene	*91.9*			**0**	*85-114*	*%REC*	*1*	*03-Jul-2019 20:08*
Surr: Dibromofluoromethane	*91.0*			**0**	*80-119*	*%REC*	*1*	*03-Jul-2019 20:08*
Surr: Toluene-d8	*94.7*			**0**	*89-112*	*%REC*	*1*	*03-Jul-2019 20:08*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	**0.12**		**0.010**	**0.010**	**0.010**	**ug/L**	1	28-Jun-2019 14:36
Surr: 2-Fluorobiphenyl	*85.6*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 14:36*
Surr: 4-Terphenyl-d14	*104*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 14:36*
Surr: Nitrobenzene-d5	*91.7*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 14:36*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19061386
Sample ID: MW13_062519
Lab ID:HS19061386-05
Collection Date: 25-Jun-2019 09:45
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:32
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 20:32
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jul-2019 20:32
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:32
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jul-2019 20:32
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 20:32
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jul-2019 20:32
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19061386
Sample ID: MW13_062519
Lab ID:HS19061386-05
Collection Date: 25-Jun-2019 09:45
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	03-Jul-2019 20:32
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 20:32
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 20:32
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:32
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:32
Surr: 1,2-Dichloroethane-d4	*96.3*			**0**	*81-118*	*%REC*	*1*	*03-Jul-2019 20:32*
Surr: 4-Bromofluorobenzene	*91.9*			**0**	*85-114*	*%REC*	*1*	*03-Jul-2019 20:32*
Surr: Dibromofluoromethane	*92.0*			**0**	*80-119*	*%REC*	*1*	*03-Jul-2019 20:32*
Surr: Toluene-d8	*95.8*			**0**	*89-112*	*%REC*	*1*	*03-Jul-2019 20:32*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW13_062519
Collection Date: 25-Jun-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19061386
Lab ID:HS19061386-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**0.336**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	05-Jul-2019 17:04
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 17:04
Arsenic	**0.000513**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:04
Barium	**0.234**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:04
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:04
Cadmium	**0.000407**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	05-Jul-2019 17:04
Calcium	**14.8**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	05-Jul-2019 17:04
Chromium	**0.738**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:04
Cobalt	**0.00531**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:04
Copper	**0.0274**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:04
Iron	**37.1**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:04
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	05-Jul-2019 17:04
Magnesium	**7.96**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:04
Manganese	**0.844**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:04
Nickel	**0.247**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:04
Potassium	**3.58**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:04
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jul-2019 17:04
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jul-2019 17:04
Sodium	**56.0**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:04
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:04
Vanadium	**0.00339**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:04
Zinc	**0.0257**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:04
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 14:37
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: CO2_062519
Collection Date: 25-Jun-2019 10:30

ANALYTICAL REPORT
WorkOrder:HS19061386
Lab ID:HS19061386-06
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:56
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 20:56
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jul-2019 20:56
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:56
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jul-2019 20:56
Acetone	**5.1**		**0.40**	**1.0**	**2.0**	**UG/L**	1	03-Jul-2019 20:56
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jul-2019 20:56
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19061386
Sample ID: CO2_062519
Lab ID:HS19061386-06
Collection Date: 25-Jun-2019 10:30
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	03-Jul-2019 20:56
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 20:56
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 20:56
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 20:56
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 20:56
Surr: 1,2-Dichloroethane-d4	*97.4*			**0**	*81-118*	*%REC*	*1*	*03-Jul-2019 20:56*
Surr: 4-Bromofluorobenzene	*91.1*			**0**	*85-114*	*%REC*	*1*	*03-Jul-2019 20:56*
Surr: Dibromofluoromethane	*91.9*			**0**	*80-119*	*%REC*	*1*	*03-Jul-2019 20:56*
Surr: Toluene-d8	*94.8*			**0**	*89-112*	*%REC*	*1*	*03-Jul-2019 20:56*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW17_062519
Collection Date: 25-Jun-2019 11:20

ANALYTICAL REPORT
WorkOrder:HS19061386
Lab ID:HS19061386-07
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILES SIM	**Method:SW8270SIM**					Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	**0.31**		**0.010**	**0.010**	**0.010**	**ug/L**	1	28-Jun-2019 14:57
Surr: 2-Fluorobiphenyl	*85.0*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 14:57*
Surr: 4-Terphenyl-d14	*105*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 14:57*
Surr: Nitrobenzene-d5	*108*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 14:57*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)	**Method:NA**							Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW10_062519
Collection Date: 25-Jun-2019 12:20

ANALYTICAL REPORT
WorkOrder:HS19061386
Lab ID:HS19061386-08
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:20
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 21:20
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jul-2019 21:20
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:20
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jul-2019 21:20
Acetone	**3.9**		**0.40**	**1.0**	**2.0**	**UG/L**	1	03-Jul-2019 21:20
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jul-2019 21:20
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
ANALYTICAL REPORT
Project: LHAAP 18 24
WorkOrder:HS19061386
Sample ID: 18WW10_062519
Lab ID:HS19061386-08
Collection Date: 25-Jun-2019 12:20
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	03-Jul-2019 21:20
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 21:20
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 21:20
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:20
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:20
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*03-Jul-2019 21:20*
Surr: 4-Bromofluorobenzene	*87.2*			**0**	*85-114*	*%REC*	*1*	*03-Jul-2019 21:20*
Surr: Dibromofluoromethane	*94.0*			**0**	*80-119*	*%REC*	*1*	*03-Jul-2019 21:20*
Surr: Toluene-d8	*93.1*			**0**	*89-112*	*%REC*	*1*	*03-Jul-2019 21:20*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 15:18
Surr: 2-Fluorobiphenyl	*96.3*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 15:18*
Surr: 4-Terphenyl-d14	*122*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 15:18*
Surr: Nitrobenzene-d5	*123*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 15:18*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19061386
Sample ID: 18WW10_062519-a Lab ID:HS19061386-09
Collection Date: 25-Jun-2019 12:20 Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:43
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 21:43
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jul-2019 21:43
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:43
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jul-2019 21:43
Acetone	**2.0**		**0.40**	**1.0**	**2.0**	**UG/L**	1	03-Jul-2019 21:43
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jul-2019 21:43
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW10_062519-a
Collection Date: 25-Jun-2019 12:20

ANALYTICAL REPORT
WorkOrder:HS19061386
Lab ID:HS19061386-09
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	03-Jul-2019 21:43
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 21:43
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 21:43
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 21:43
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 21:43
Surr: 1,2-Dichloroethane-d4	*95.2*			**0**	*81-118*	*%REC*	*1*	*03-Jul-2019 21:43*
Surr: 4-Bromofluorobenzene	*88.9*			**0**	*85-114*	*%REC*	*1*	*03-Jul-2019 21:43*
Surr: Dibromofluoromethane	*92.9*			**0**	*80-119*	*%REC*	*1*	*03-Jul-2019 21:43*
Surr: Toluene-d8	*93.1*			**0**	*89-112*	*%REC*	*1*	*03-Jul-2019 21:43*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	28-Jun-2019 15:38
Surr: 2-Fluorobiphenyl	*86.1*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 15:38*
Surr: 4-Terphenyl-d14	*124*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 15:38*
Surr: Nitrobenzene-d5	*109*			**0**	*40-140*	*%REC*	*1*	*28-Jun-2019 15:38*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW9_062519
Collection Date: 25-Jun-2019 13:10

ANALYTICAL REPORT
WorkOrder:HS19061386
Lab ID:HS19061386-10
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:20
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 17:20
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jul-2019 17:20
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:20
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jul-2019 17:20
Acetone	**2.1**		**0.40**	**1.0**	**2.0**	**UG/L**	1	03-Jul-2019 17:20
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jul-2019 17:20
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW9_062519
Collection Date: 25-Jun-2019 13:10

ANALYTICAL REPORT
WorkOrder:HS19061386
Lab ID:HS19061386-10
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
cis-1,2-Dichloroethene	**25**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Jul-2019 17:20
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	03-Jul-2019 17:20
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 17:20
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 17:20
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:20
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Trichloroethene	**1,100**		**5.0**	**12**	**25**	**UG/L**	25	03-Jul-2019 19:20
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:20
Surr: 1,2-Dichloroethane-d4	*99.4*			**0**	*81-118*	*%REC*	*1*	*03-Jul-2019 17:20*
Surr: 1,2-Dichloroethane-d4	*95.6*			**0**	*81-118*	*%REC*	*25*	*03-Jul-2019 19:20*
Surr: 4-Bromofluorobenzene	*92.1*			**0**	*85-114*	*%REC*	*1*	*03-Jul-2019 17:20*
Surr: 4-Bromofluorobenzene	*92.8*			**0**	*85-114*	*%REC*	*25*	*03-Jul-2019 19:20*
Surr: Dibromofluoromethane	*94.8*			**0**	*80-119*	*%REC*	*1*	*03-Jul-2019 17:20*
Surr: Dibromofluoromethane	*92.0*			**0**	*80-119*	*%REC*	*25*	*03-Jul-2019 19:20*
Surr: Toluene-d8	*95.8*			**0**	*89-112*	*%REC*	*1*	*03-Jul-2019 17:20*
Surr: Toluene-d8	*95.7*			**0**	*89-112*	*%REC*	*25*	*03-Jul-2019 19:20*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 27-Jun-2019		Analyst: LG
1,4-Dioxane	**2.0**		**0.050**	**0.050**	**0.050**	**ug/L**	5	28-Jun-2019 19:47
Surr: 2-Fluorobiphenyl	*91.6*			**0**	*40-140*	*%REC*	*5*	*28-Jun-2019 19:47*
Surr: 4-Terphenyl-d14	*111*			**0**	*40-140*	*%REC*	*5*	*28-Jun-2019 19:47*
Surr: Nitrobenzene-d5	*107*			**0**	*40-140*	*%REC*	*5*	*28-Jun-2019 19:47*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW9_062519
Collection Date: 25-Jun-2019 13:10

ANALYTICAL REPORT
WorkOrder:HS19061386
Lab ID:HS19061386-10
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**0.0255**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	05-Jul-2019 17:06
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 17:06
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 17:06
Barium	**0.119**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:06
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:06
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:06
Calcium	**15.0**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	05-Jul-2019 17:06
Chromium	**0.156**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:06
Cobalt	**0.00255**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:06
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	05-Jul-2019 17:06
Iron	**0.830**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:06
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	05-Jul-2019 17:06
Magnesium	**3.78**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:06
Manganese	**0.0495**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:06
Nickel	**0.127**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:06
Potassium	**0.438**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:06
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jul-2019 17:06
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jul-2019 17:06
Sodium	**17.2**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:06
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:06
Vanadium	**0.000919**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:06
Zinc	**0.0279**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:06
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 14:39
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 25-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061386
Lab ID:HS19061386-11
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:09
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 16:09
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jul-2019 16:09
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:09
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jul-2019 16:09
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 16:09
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jul-2019 16:09
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 25-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061386
Lab ID:HS19061386-11
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	03-Jul-2019 16:09
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 16:09
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 16:09
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:09
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:09
Surr: 1,2-Dichloroethane-d4	*92.1*			**0**	*81-118*	*%REC*	*1*	*03-Jul-2019 16:09*
Surr: 4-Bromofluorobenzene	*92.3*			**0**	*85-114*	*%REC*	*1*	*03-Jul-2019 16:09*
Surr: Dibromofluoromethane	*89.6*			**0**	*80-119*	*%REC*	*1*	*03-Jul-2019 16:09*
Surr: Toluene-d8	*94.4*			**0**	*89-112*	*%REC*	*1*	*03-Jul-2019 16:09*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

Batch ID: 142510 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061386-04	1	1000	1 (mL)	0.001
HS19061386-07	1	1000	1 (mL)	0.001
HS19061386-08	1	1000	1 (mL)	0.001
HS19061386-09	1	1000	1 (mL)	0.001
HS19061386-10	1	1000	1 (mL)	0.001

Batch ID: 142541 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061386-01	1	10	10 (mL)	1
HS19061386-02	1	10	10 (mL)	1
HS19061386-03	1	10	10 (mL)	1
HS19061386-05	1	10	10 (mL)	1
HS19061386-10	1	10	10 (mL)	1

Batch ID: 142558 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061386-01	1	10 (mL)	10 (mL)	1
HS19061386-02	1	10 (mL)	10 (mL)	1
HS19061386-03	1	10 (mL)	10 (mL)	1
HS19061386-05	1	10 (mL)	10 (mL)	1
HS19061386-10	1	10 (mL)	10 (mL)	1

ALS Houston, US Date: 16-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142510 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Water	
HS19061386-04	MW10_062519	25 Jun 2019 08:55		27 Jun 2019 14:45	28 Jun 2019 14:36	1
HS19061386-07	MW17_062519	25 Jun 2019 11:20		27 Jun 2019 14:45	28 Jun 2019 14:57	1
HS19061386-08	18WW10_062519	25 Jun 2019 12:20		27 Jun 2019 14:45	28 Jun 2019 15:18	1
HS19061386-09	18WW10_062519-a	25 Jun 2019 12:20		27 Jun 2019 14:45	28 Jun 2019 15:38	1
HS19061386-10	MW9_062519	25 Jun 2019 13:10		27 Jun 2019 14:45	28 Jun 2019 19:47	5
Batch ID: 142541 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Water	
HS19061386-01	17WW08_062519	25 Jun 2019 07:10		28 Jun 2019 11:59	08 Jul 2019 15:03	10
HS19061386-01	17WW08_062519	25 Jun 2019 07:10		28 Jun 2019 11:59	05 Jul 2019 16:29	1
HS19061386-02	130_062519	25 Jun 2019 08:00		28 Jun 2019 11:59	08 Jul 2019 15:06	10
HS19061386-02	130_062519	25 Jun 2019 08:00		28 Jun 2019 11:59	05 Jul 2019 16:31	1
HS19061386-03	130_062519-a	25 Jun 2019 08:00		28 Jun 2019 11:59	08 Jul 2019 14:54	10
HS19061386-03	130_062519-a	25 Jun 2019 08:00		28 Jun 2019 11:59	05 Jul 2019 16:35	1
HS19061386-05	MW13_062519	25 Jun 2019 09:45		28 Jun 2019 11:59	05 Jul 2019 17:04	1
HS19061386-10	MW9_062519	25 Jun 2019 13:10		28 Jun 2019 11:59	05 Jul 2019 17:06	1
Batch ID: 142558 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Water	
HS19061386-01	17WW08_062519	25 Jun 2019 07:10		28 Jun 2019 09:30	28 Jun 2019 14:32	1
HS19061386-02	130_062519	25 Jun 2019 08:00		28 Jun 2019 09:30	28 Jun 2019 14:33	1
HS19061386-03	130_062519-a	25 Jun 2019 08:00		28 Jun 2019 09:30	28 Jun 2019 14:35	1
HS19061386-05	MW13_062519	25 Jun 2019 09:45		28 Jun 2019 09:30	28 Jun 2019 14:37	1
HS19061386-10	MW9_062519	25 Jun 2019 13:10		28 Jun 2019 09:30	28 Jun 2019 14:39	1
Batch ID: R341768 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19061386-01	17WW08_062519	25 Jun 2019 07:10			02 Jul 2019 18:49	1
HS19061386-02	130_062519	25 Jun 2019 08:00			02 Jul 2019 19:13	1
Batch ID: R341869 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19061386-03	130_062519-a	25 Jun 2019 08:00			03 Jul 2019 16:32	1
HS19061386-04	MW10_062519	25 Jun 2019 08:55			03 Jul 2019 20:08	1
HS19061386-05	MW13_062519	25 Jun 2019 09:45			03 Jul 2019 20:32	1
HS19061386-06	CO2_062519	25 Jun 2019 10:30			03 Jul 2019 20:56	1
HS19061386-08	18WW10_062519	25 Jun 2019 12:20			03 Jul 2019 21:20	1
HS19061386-09	18WW10_062519-a	25 Jun 2019 12:20			03 Jul 2019 21:43	1
HS19061386-10	MW9_062519	25 Jun 2019 13:10			03 Jul 2019 19:20	25
HS19061386-10	MW9_062519	25 Jun 2019 13:10			03 Jul 2019 17:20	1
HS19061386-11	Trip Blank	25 Jun 2019 00:00			03 Jul 2019 16:09	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R342378 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Water	
HS19061386-01	17WW08_062519	25 Jun 2019 07:10			12 Jul 2019 18:48	1
HS19061386-02	130_062519	25 Jun 2019 08:00			12 Jul 2019 18:48	1
HS19061386-03	130_062519-a	25 Jun 2019 08:00			12 Jul 2019 18:48	1
HS19061386-04	MW10_062519	25 Jun 2019 08:55			12 Jul 2019 18:48	1
HS19061386-05	MW13_062519	25 Jun 2019 09:45			12 Jul 2019 18:48	1
HS19061386-06	CO2_062519	25 Jun 2019 10:30			12 Jul 2019 18:48	1
HS19061386-07	MW17_062519	25 Jun 2019 11:20			12 Jul 2019 18:48	1
HS19061386-08	18WW10_062519	25 Jun 2019 12:20			12 Jul 2019 18:48	1
HS19061386-09	18WW10_062519-a	25 Jun 2019 12:20			12 Jul 2019 18:48	1
HS19061386-10	MW9_062519	25 Jun 2019 13:10			12 Jul 2019 18:48	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142541** Units: **mg/L** Analysis Date: **05-Jul-2019 15:49**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5155804** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.004417	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00100	0.00500								U
Iron	0.0500	0.200								U
Magnesium	0.01315	0.200								J
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00250	0.00500								U

MBLK Sample ID: **MBLK-142541** Units: **mg/L** Analysis Date: **08-Jul-2019 13:53**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157125** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.00100	0.00500								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142541** Units: **mg/L** Analysis Date: **05-Jul-2019 15:51**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5155805** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09504	0.0100	0.1	0	95.0	84 - 117				
Antimony	0.05029	0.00500	0.05	0	101	85 - 117				
Arsenic	0.05092	0.00500	0.05	0	102	84 - 116				
Barium	0.04966	0.00500	0.05	0	99.3	86 - 114				
Beryllium	0.05036	0.00200	0.05	0	101	83 - 121				
Cadmium	0.0504	0.00200	0.05	0	101	87 - 115				
Calcium	5.026	0.500	5	0	101	87 - 118				
Chromium	0.0522	0.00500	0.05	0	104	85 - 116				
Cobalt	0.05274	0.00500	0.05	0	105	86 - 115				
Copper	0.0545	0.00500	0.05	0	109	85 - 118				
Iron	5.193	0.200	5	0	104	87 - 118				
Lead	0.05298	0.00500	0.05	0	106	88 - 115				
Magnesium	5.5	0.200	5	0	110	83 - 118				
Manganese	0.05088	0.00500	0.05	0	102	87 - 115				
Nickel	0.05412	0.00500	0.05	0	108	85 - 117				
Potassium	5.248	0.200	5	0	105	87 - 115				
Selenium	0.05096	0.00500	0.05	0	102	80 - 120				
Silver	0.05061	0.00500	0.05	0	101	85 - 116				
Sodium	5.358	0.200	5	0	107	85 - 117				
Thallium	0.0498	0.00200	0.05	0	99.6	82 - 116				
Vanadium	0.05244	0.00500	0.05	0	105	86 - 115				
Zinc	0.05376	0.00500	0.05	0	108	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19061486-01MS** Units: **mg/L** Analysis Date: **05-Jul-2019 15:59**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5155808** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.739	0.0100	0.4	0.3697	92.3	84 - 117				
Antimony	0.04732	0.00500	0.05	0.0008	93.0	85 - 117				
Arsenic	0.04842	0.00500	0.05	0	96.8	84 - 116				
Barium	0.2815	0.00500	0.05	0.238	87.0	86 - 114				O
Beryllium	0.04857	0.00200	0.05	0	97.1	83 - 121				
Cadmium	0.04813	0.00200	0.05	0	96.3	87 - 115				
Calcium	81.2	0.500	5	76.32	97.6	87 - 118				O
Chromium	0.05476	0.00500	0.05	0.006591	96.3	85 - 116				
Cobalt	0.04919	0.00500	0.05	0.000529	97.3	86 - 115				
Copper	0.05037	0.00500	0.05	0.001192	98.4	85 - 118				
Iron	5.246	0.200	5	0.3538	97.8	87 - 118				
Magnesium	8.622	0.200	5	3.785	96.7	83 - 118				
Manganese	0.1269	0.00500	0.05	0.07982	94.2	87 - 115				
Nickel	0.05352	0.00500	0.05	0.00408	98.9	85 - 117				
Potassium	5.438	0.200	5	0.5115	98.5	87 - 115				
Selenium	0.04621	0.00500	0.05	0	92.4	80 - 120				
Silver	0.04831	0.00500	0.05	0	96.6	85 - 116				
Sodium	19.1	0.200	5	14.32	95.6	85 - 117				
Thallium	0.04492	0.00200	0.05	0.000881	88.1	82 - 116				
Vanadium	0.05006	0.00500	0.05	0.001987	96.1	86 - 115				
Zinc	0.0719	0.00500	0.05	0.02524	93.3	83 - 119				

MS Sample ID: **HS19061486-01MS** Units: **mg/L** Analysis Date: **08-Jul-2019 13:58**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157127** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.04682	0.00500	0.05	0	93.6	88 - 115				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19061486-01MSD** Units: **mg/L** Analysis Date: **05-Jul-2019 16:01**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5155809** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.7553	0.0100	0.4	0.3697	96.4	84 - 117	0.739	2.18	20	
Antimony	0.04868	0.00500	0.05	0.0008	95.8	85 - 117	0.04732	2.84	20	
Arsenic	0.04954	0.00500	0.05	0	99.1	84 - 116	0.04842	2.27	20	
Barium	0.287	0.00500	0.05	0.238	98.0	86 - 114	0.2815	1.95	20	O
Beryllium	0.0485	0.00200	0.05	0	97.0	83 - 121	0.04857	0.142	20	
Cadmium	0.0486	0.00200	0.05	0	97.2	87 - 115	0.04813	0.966	20	
Calcium	81.29	0.500	5	76.32	99.3	87 - 118	81.2	0.104	20	O
Chromium	0.05662	0.00500	0.05	0.006591	100	85 - 116	0.05476	3.34	20	
Cobalt	0.05007	0.00500	0.05	0.000529	99.1	86 - 115	0.04919	1.76	20	
Copper	0.05145	0.00500	0.05	0.001192	101	85 - 118	0.05037	2.12	20	
Iron	5.285	0.200	5	0.3538	98.6	87 - 118	5.246	0.742	20	
Lead	0.04787	0.00500	0.05	0	95.7	88 - 115	0.04832	0.925	20	
Magnesium	8.77	0.200	5	3.785	99.7	83 - 118	8.622	1.7	20	
Manganese	0.1284	0.00500	0.05	0.07982	97.2	87 - 115	0.1269	1.2	20	
Nickel	0.05428	0.00500	0.05	0.00408	100	85 - 117	0.05352	1.41	20	
Potassium	5.433	0.200	5	0.5115	98.4	87 - 115	5.438	0.0912	20	
Selenium	0.0486	0.00500	0.05	0	97.2	80 - 120	0.04621	5.05	20	
Silver	0.04796	0.00500	0.05	0	95.9	85 - 116	0.04831	0.717	20	
Sodium	19.67	0.200	5	14.32	107	85 - 117	19.1	2.92	20	
Thallium	0.04425	0.00200	0.05	0.000881	86.7	82 - 116	0.04492	1.5	20	
Vanadium	0.05188	0.00500	0.05	0.001987	99.8	86 - 115	0.05006	3.57	20	
Zinc	0.07298	0.00500	0.05	0.02524	95.5	83 - 119	0.0719	1.49	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19061486-01PDS** Units: **mg/L** Analysis Date: **05-Jul-2019 16:03**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5155810** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.487	0.0100	0.1	0.3697	117	80 - 120				
Arsenic	0.09568	0.00500	0.1	0.000356	95.3	80 - 120				
Barium	0.3243	0.00500	0.1	0.238	86.3	80 - 120				
Beryllium	0.08784	0.00200	0.1	0.000034	87.8	80 - 120				
Cadmium	0.09239	0.00200	0.1	0.000163	92.2	80 - 120				
Calcium	84.54	0.500	10	76.32	82.1	80 - 120				O
Chromium	0.1036	0.00500	0.1	0.006591	97.0	80 - 120				
Cobalt	0.0997	0.00500	0.1	0.000529	99.2	80 - 120				
Copper	0.09939	0.00500	0.1	0.001192	98.2	80 - 120				
Iron	10.01	0.200	10	0.3538	96.6	80 - 120				
Lead	0.09928	0.00500	0.1	0.000498	98.8	80 - 120				
Magnesium	13.55	0.200	10	3.785	97.6	80 - 120				
Manganese	0.1738	0.00500	0.1	0.07982	94.0	80 - 120				
Nickel	0.1011	0.00500	0.1	0.00408	97.0	80 - 120				
Potassium	10.21	0.200	10	0.5115	97.0	80 - 120				
Selenium	0.09467	0.00500	0.1	0.000462	94.2	80 - 120				
Silver	0.09272	0.00500	0.1	0.000026	92.7	80 - 120				
Sodium	24.03	0.200	10	14.32	97.1	80 - 120				
Thallium	0.1018	0.00200	0.1	0.000881	101	80 - 120				
Vanadium	0.09888	0.00500	0.1	0.001987	96.9	80 - 120				
Zinc	0.1221	0.00500	0.1	0.02524	96.9	80 - 120				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19061486-01SD** Units: **mg/L** Analysis Date: **05-Jul-2019 15:56**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5155807** PrepDate: **28-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.3834	0.0500					0.3697	3.7	10	
Antimony	0.00250	0.0250					0.0008	0	10	U
Arsenic	0.00250	0.0250					0.000356	0	10	U
Barium	0.2349	0.0250					0.238	1.31	10	
Beryllium	0.00250	0.0100					0.000034	0	10	U
Cadmium	0.00250	0.0100					0.000163	0	10	U
Calcium	73.47	2.50					76.32	3.74	10	
Chromium	0.006325	0.0250					0.006591	0	10	J
Cobalt	0.00250	0.0250					0.000529	0	10	U
Copper	0.00500	0.0250					0.001192	0	10	U
Iron	0.3675	1.00					0.3538	0	10	J
Lead	0.00500	0.0250					0.000498	0	10	U
Magnesium	3.655	1.00					3.785	3.44	10	
Manganese	0.08094	0.0250					0.07982	1.4	10	
Nickel	0.00368	0.0250					0.00408	0	10	J
Potassium	0.6068	1.00					0.5115	0	10	J
Selenium	0.0125	0.0250					0.000462	0	10	U
Silver	0.00250	0.0250					0.000026	0	10	U
Sodium	15.04	1.00					14.32	5.03	10	
Thallium	0.00250	0.0100					0.000881	0	10	U
Vanadium	0.003882	0.0250					0.001987	0	10	J
Zinc	0.02966	0.0250					0.02524	17.5	10	R

The following samples were analyzed in this batch: HS19061386-01 HS19061386-02 HS19061386-03 HS19061386-05 HS19061386-10

Revision: 1

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ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: 142558 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142558** Units: **mg/L** Analysis Date: **28-Jun-2019 13:58**
Client ID: Run ID: **HG03_341562** SeqNo: **5146995** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142558** Units: **mg/L** Analysis Date: **28-Jun-2019 13:59**
Client ID: Run ID: **HG03_341562** SeqNo: **5146996** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00514	0.000200	0.005	0	103	80 - 120				

MS Sample ID: **HS19061383-01MS** Units: **mg/L** Analysis Date: **28-Jun-2019 14:03**
Client ID: Run ID: **HG03_341562** SeqNo: **5146998** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000517	0.000000200	5e-006	-0.0000000010	103	75 - 125				

MSD Sample ID: **HS19061383-01MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 14:05**
Client ID: Run ID: **HG03_341562** SeqNo: **5146999** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000514	0.000000200	5e-006	-0.0000000010	103	75 - 125	0.000005170	0.582	20	

The following samples were analyzed in this batch: HS19061386-01 HS19061386-02 HS19061386-03 HS19061386-05 HS19061386-10

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: 142510 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142510** Units: **ug/L** Analysis Date: **27-Jun-2019 22:37**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146408** PrepDate: **27-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.0594*	*0*	*0.08*	*0*	*74.3*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.08022*	*0*	*0.08*	*0*	*100*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07461*	*0*	*0.08*	*0*	*93.3*	*40 - 140*				

LCS Sample ID: **LCS-142510** Units: **ug/L** Analysis Date: **27-Jun-2019 22:58**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146409** PrepDate: **27-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08012	0.010	0.08	0	100	40 - 140				
Surr: 2-Fluorobiphenyl	*0.07847*	*0*	*0.08*	*0*	*98.1*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.08943*	*0*	*0.08*	*0*	*112*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08221*	*0*	*0.08*	*0*	*103*	*40 - 140*				

LCSD Sample ID: **LCSD-142510** Units: **ug/L** Analysis Date: **27-Jun-2019 23:19**
Client ID: Run ID: **SV-5_341545** SeqNo: **5146410** PrepDate: **27-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07797	0.010	0.08	0	97.5	40 - 140	0.08012	2.72	20	
Surr: 2-Fluorobiphenyl	*0.07625*	*0*	*0.08*	*0*	*95.3*	*40 - 140*	*0.07847*	*2.86*	*20*	
Surr: 4-Terphenyl-d14	*0.09409*	*0*	*0.08*	*0*	*118*	*40 - 140*	*0.08943*	*5.08*	*20*	
Surr: Nitrobenzene-d5	*0.08067*	*0*	*0.08*	*0*	*101*	*40 - 140*	*0.08221*	*1.89*	*20*	

The following samples were analyzed in this batch: HS19061386-04 HS19061386-07 HS19061386-08 HS19061386-09 HS19061386-10

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190702** Units: **UG/L** Analysis Date: **02-Jul-2019 11:38**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151546** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190702** Units: **UG/L** Analysis Date: **02-Jul-2019 11:38**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151546** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*48.37*	*1.0*	*50*	*0*	*96.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.48*	*1.0*	*50*	*0*	*95.0*	*85 - 114*				
Surr: Dibromofluoromethane	*46.31*	*1.0*	*50*	*0*	*92.6*	*80 - 119*				
Surr: Toluene-d8	*50.22*	*1.0*	*50*	*0*	*100*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190702** Units: **UG/L** Analysis Date: **02-Jul-2019 10:26**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151545** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.88	1.0	20	0	99.4	78 - 124				
1,1,1-Trichloroethane	18.61	1.0	20	0	93.1	74 - 131				
1,1,2,2-Tetrachloroethane	21.7	1.0	20	0	108	71 - 121				
1,1,2-Trichloroethane	21.03	1.0	20	0	105	80 - 119				
1,1-Dichloroethane	19.31	1.0	20	0	96.5	77 - 125				
1,1-Dichloroethene	18.25	1.0	20	0	91.2	71 - 131				
1,1-Dichloropropene	18.58	1.0	20	0	92.9	78 - 125				
1,2,3-Trichlorobenzene	23.14	1.0	20	0	116	69 - 129				
1,2,3-Trichloropropane	18.92	1.0	20	0	94.6	73 - 122				
1,2,4-Trichlorobenzene	20.64	1.0	20	0	103	69 - 130				
1,2,4-Trimethylbenzene	17.82	1.0	20	0	89.1	76 - 124				
1,2-Dibromo-3-chloropropane	22.28	1.0	20	0	111	62 - 128				
1,2-Dibromoethane	20.44	1.0	20	0	102	77 - 121				
1,2-Dichlorobenzene	19.09	1.0	20	0	95.5	80 - 119				
1,2-Dichloroethane	18.92	1.0	20	0	94.6	73 - 128				
1,2-Dichloropropane	19.38	1.0	20	0	96.9	78 - 122				
1,3,5-Trimethylbenzene	17.15	1.0	20	0	85.8	75 - 124				
1,3-Dichlorobenzene	18.25	1.0	20	0	91.3	80 - 119				
1,3-Dichloropropane	20.81	1.0	20	0	104	80 - 119				
1,4-Dichlorobenzene	19.84	1.0	20	0	99.2	79 - 118				
2,2-Dichloropropane	19.77	1.0	20	0	98.8	60 - 139				
2-Butanone	44.92	2.0	40	0	112	56 - 143				
2-Chlorotoluene	19.2	1.0	20	0	96.0	79 - 122				
2-Hexanone	40.3	2.0	40	0	101	57 - 139				
4-Chlorotoluene	19.14	1.0	20	0	95.7	78 - 122				
4-Isopropyltoluene	16.8	1.0	20	0	84.0	77 - 127				
4-Methyl-2-pentanone	39.68	2.0	40	0	99.2	67 - 130				
Acetone	47.19	2.0	40	0	118	39 - 160				
Benzene	19.98	1.0	20	0	99.9	79 - 120				
Bromobenzene	18.71	1.0	20	0	93.6	80 - 120				
Bromochloromethane	19.36	1.0	20	0	96.8	78 - 123				
Bromodichloromethane	20.21	1.0	20	0	101	79 - 125				
Bromoform	21.67	1.0	20	0	108	66 - 130				
Bromomethane	20.75	1.0	20	0	104	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190702** Units: **UG/L** Analysis Date: **02-Jul-2019 10:26**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151545** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.79	2.0	40	0	89.5	64 - 133				
Carbon tetrachloride	18.07	1.0	20	0	90.3	72 - 136				
Chlorobenzene	19.29	1.0	20	0	96.5	82 - 118				
Chloroethane	18.27	1.0	20	0	91.4	60 - 138				
Chloroform	27.06	1.0	20	0	135	79 - 124				S
Chloromethane	17.7	1.0	20	0	88.5	50 - 139				
cis-1,2-Dichloroethene	20.04	1.0	20	0	100	78 - 123				
cis-1,3-Dichloropropene	19.46	1.0	20	0	97.3	75 - 124				
Dibromochloromethane	19.85	1.0	20	0	99.2	74 - 126				
Dibromomethane	20.01	1.0	20	0	100	79 - 123				
Dichlorodifluoromethane	18.31	1.0	20	0	91.5	32 - 152				
Ethylbenzene	18.31	1.0	20	0	91.5	79 - 121				
Hexachlorobutadiene	22.83	1.0	20	0	114	66 - 134				
Isopropylbenzene	17.5	1.0	20	0	87.5	72 - 131				
m,p-Xylene	37.16	2.0	40	0	92.9	80 - 121				
Methylene chloride	19.46	2.0	20	0	97.3	74 - 124				
Naphthalene	22.02	1.0	20	0	110	61 - 128				
n-Butylbenzene	17.1	1.0	20	0	85.5	75 - 128				
n-Propylbenzene	18.1	1.0	20	0	90.5	76 - 126				
o-Xylene	18.52	1.0	20	0	92.6	78 - 122				
sec-Butylbenzene	17.6	1.0	20	0	88.0	77 - 126				
Styrene	19.81	1.0	20	0	99.1	78 - 123				
tert-Butylbenzene	17.93	1.0	20	0	89.7	78 - 124				
Tetrachloroethene	17.9	1.0	20	0	89.5	74 - 129				
Toluene	19.07	1.0	20	0	95.4	80 - 121				
trans-1,2-Dichloroethene	19.56	1.0	20	0	97.8	75 - 124				
trans-1,3-Dichloropropene	20.02	1.0	20	0	100	73 - 127				
Trichloroethene	18.94	1.0	20	0	94.7	79 - 123				
Trichlorofluoromethane	17.56	1.0	20	0	87.8	65 - 141				
Vinyl chloride	17.16	1.0	20	0	85.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.7*	*1.0*	*50*	*0*	*103*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.55*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*50.71*	*1.0*	*50*	*0*	*101*	*80 - 119*				
Surr: Toluene-d8	*49.5*	*1.0*	*50*	*0*	*99.0*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061279-02MS** Units: **UG/L** Analysis Date: **02-Jul-2019 14:26**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151553** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.03	1.0	20	0	90.2	78 - 124				
1,1,1-Trichloroethane	18.04	1.0	20	0	90.2	74 - 131				
1,1,2,2-Tetrachloroethane	17.83	1.0	20	0	89.1	71 - 121				
1,1,2-Trichloroethane	18.28	1.0	20	0	91.4	80 - 119				
1,1-Dichloroethane	16.8	1.0	20	0	84.0	77 - 125				
1,1-Dichloroethene	17.59	1.0	20	0	88.0	71 - 131				
1,1-Dichloropropene	19.29	1.0	20	0	96.5	78 - 125				
1,2,3-Trichlorobenzene	18.52	1.0	20	0	92.6	69 - 129				
1,2,3-Trichloropropane	18.32	1.0	20	0	91.6	73 - 122				
1,2,4-Trichlorobenzene	18.51	1.0	20	0	92.6	69 - 130				
1,2,4-Trimethylbenzene	18.55	1.0	20	0	92.7	76 - 124				
1,2-Dibromo-3-chloropropane	18.32	1.0	20	0	91.6	62 - 128				
1,2-Dibromoethane	17.49	1.0	20	0	87.4	77 - 121				
1,2-Dichlorobenzene	17.91	1.0	20	0	89.5	80 - 119				
1,2-Dichloroethane	16.42	1.0	20	0	82.1	73 - 128				
1,2-Dichloropropane	17.32	1.0	20	0	86.6	78 - 122				
1,3,5-Trimethylbenzene	18.27	1.0	20	0	91.4	75 - 124				
1,3-Dichlorobenzene	17.89	1.0	20	0	89.5	80 - 119				
1,3-Dichloropropane	17.94	1.0	20	0	89.7	80 - 119				
1,4-Dichlorobenzene	19.13	1.0	20	0	95.7	79 - 118				
2,2-Dichloropropane	18.56	1.0	20	0	92.8	60 - 139				
2-Butanone	34.72	2.0	40	0	86.8	56 - 143				
2-Chlorotoluene	19.37	1.0	20	0	96.9	79 - 122				
2-Hexanone	31.75	2.0	40	0	79.4	57 - 139				
4-Chlorotoluene	19.3	1.0	20	0	96.5	78 - 122				
4-Isopropyltoluene	19.37	1.0	20	0	96.8	77 - 127				
4-Methyl-2-pentanone	32.44	2.0	40	0	81.1	67 - 130				
Acetone	37.3	2.0	40	0	93.2	39 - 160				
Benzene	18.39	1.0	20	0	92.0	79 - 120				
Bromobenzene	17.14	1.0	20	0	85.7	80 - 120				
Bromochloromethane	16.05	1.0	20	0	80.2	78 - 123				
Bromodichloromethane	17.72	1.0	20	0	88.6	79 - 125				
Bromoform	17.73	1.0	20	0	88.6	66 - 130				
Bromomethane	17.74	1.0	20	0	88.7	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061279-02MS** Units: **UG/L** Analysis Date: **02-Jul-2019 14:26**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151553** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	33.1	2.0	40	0	82.8	64 - 133				
Carbon tetrachloride	19.3	1.0	20	0	96.5	72 - 136				
Chlorobenzene	17.94	1.0	20	0	89.7	82 - 118				
Chloroethane	16.25	1.0	20	0	81.3	60 - 138				
Chloroform	17.26	1.0	20	0	86.3	79 - 124				
Chloromethane	17.74	1.0	20	0	88.7	50 - 139				
cis-1,2-Dichloroethene	17.2	1.0	20	0	86.0	78 - 123				
cis-1,3-Dichloropropene	16.63	1.0	20	0	83.2	75 - 124				
Dibromochloromethane	17.38	1.0	20	0	86.9	74 - 126				
Dibromomethane	17.13	1.0	20	0	85.6	79 - 123				
Dichlorodifluoromethane	17.34	1.0	20	0	86.7	32 - 152				
Ethylbenzene	18.59	1.0	20	0	93.0	79 - 121				
Hexachlorobutadiene	21.22	1.0	20	0	106	66 - 134				
Isopropylbenzene	19.1	1.0	20	0	95.5	72 - 131				
m,p-Xylene	37.18	2.0	40	0	92.9	80 - 121				
Methylene chloride	15.9	2.0	20	0	79.5	74 - 124				
Naphthalene	17.16	1.0	20	0	85.8	61 - 128				
n-Butylbenzene	19.55	1.0	20	0	97.7	75 - 128				
n-Propylbenzene	20	1.0	20	0	100	76 - 126				
o-Xylene	17.95	1.0	20	0	89.8	78 - 122				
sec-Butylbenzene	20.61	1.0	20	0	103	77 - 126				
Styrene	18.46	1.0	20	0	92.3	78 - 123				
tert-Butylbenzene	20.24	1.0	20	0	101	78 - 124				
Tetrachloroethene	19.16	1.0	20	0	95.8	74 - 129				
Toluene	18.03	1.0	20	0	90.1	80 - 121				
trans-1,2-Dichloroethene	17.55	1.0	20	0	87.8	75 - 124				
trans-1,3-Dichloropropene	16.75	1.0	20	0	83.7	73 - 127				
Trichloroethene	18.63	1.0	20	0	93.1	79 - 123				
Trichlorofluoromethane	17.98	1.0	20	0	89.9	65 - 141				
Vinyl chloride	16.37	1.0	20	0	81.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.67*	*1.0*	*50*	*0*	*95.3*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.65*	*1.0*	*50*	*0*	*99.3*	*85 - 114*				
Surr: Dibromofluoromethane	*47.23*	*1.0*	*50*	*0*	*94.5*	*80 - 119*				
Surr: Toluene-d8	*48.99*	*1.0*	*50*	*0*	*98.0*	*89 - 112*				

Revision: 1

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ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19061279-02MSD** Units: **UG/L** Analysis Date: **02-Jul-2019 14:50**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151554** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.01	1.0	20	0	90.1	78 - 124	18.03	0.0865	20	
1,1,1-Trichloroethane	18.39	1.0	20	0	92.0	74 - 131	18.04	1.93	20	
1,1,2,2-Tetrachloroethane	18.7	1.0	20	0	93.5	71 - 121	17.83	4.76	20	
1,1,2-Trichloroethane	18.66	1.0	20	0	93.3	80 - 119	18.28	2.05	20	
1,1-Dichloroethane	17.35	1.0	20	0	86.8	77 - 125	16.8	3.26	20	
1,1-Dichloroethene	17.79	1.0	20	0	89.0	71 - 131	17.59	1.14	20	
1,1-Dichloropropene	19.11	1.0	20	0	95.6	78 - 125	19.29	0.936	20	
1,2,3-Trichlorobenzene	20.01	1.0	20	0	100	69 - 129	18.52	7.74	20	
1,2,3-Trichloropropane	18.82	1.0	20	0	94.1	73 - 122	18.32	2.72	20	
1,2,4-Trichlorobenzene	19.44	1.0	20	0	97.2	69 - 130	18.51	4.86	20	
1,2,4-Trimethylbenzene	18.6	1.0	20	0	93.0	76 - 124	18.55	0.272	20	
1,2-Dibromo-3-chloropropane	19.01	1.0	20	0	95.1	62 - 128	18.32	3.69	20	
1,2-Dibromoethane	18.08	1.0	20	0	90.4	77 - 121	17.49	3.33	20	
1,2-Dichlorobenzene	18.35	1.0	20	0	91.8	80 - 119	17.91	2.45	20	
1,2-Dichloroethane	17.01	1.0	20	0	85.0	73 - 128	16.42	3.48	20	
1,2-Dichloropropane	17.17	1.0	20	0	85.9	78 - 122	17.32	0.85	20	
1,3,5-Trimethylbenzene	18.34	1.0	20	0	91.7	75 - 124	18.27	0.352	20	
1,3-Dichlorobenzene	18.32	1.0	20	0	91.6	80 - 119	17.89	2.37	20	
1,3-Dichloropropane	18.22	1.0	20	0	91.1	80 - 119	17.94	1.56	20	
1,4-Dichlorobenzene	19.85	1.0	20	0	99.3	79 - 118	19.13	3.69	20	
2,2-Dichloropropane	18.5	1.0	20	0	92.5	60 - 139	18.56	0.293	20	
2-Butanone	36.4	2.0	40	0	91.0	56 - 143	34.72	4.73	20	
2-Chlorotoluene	19.38	1.0	20	0	96.9	79 - 122	19.37	0.0148	20	
2-Hexanone	33.92	2.0	40	0	84.8	57 - 139	31.75	6.59	20	
4-Chlorotoluene	19.53	1.0	20	0	97.6	78 - 122	19.3	1.14	20	
4-Isopropyltoluene	19.16	1.0	20	0	95.8	77 - 127	19.37	1.05	20	
4-Methyl-2-pentanone	34.11	2.0	40	0	85.3	67 - 130	32.44	5.02	20	
Acetone	38.91	2.0	40	0	97.3	39 - 160	37.3	4.23	20	
Benzene	18.33	1.0	20	0	91.7	79 - 120	18.39	0.339	20	
Bromobenzene	17.11	1.0	20	0	85.5	80 - 120	17.14	0.209	20	
Bromochloromethane	16.97	1.0	20	0	84.9	78 - 123	16.05	5.62	20	
Bromodichloromethane	18.02	1.0	20	0	90.1	79 - 125	17.72	1.67	20	
Bromoform	18.17	1.0	20	0	90.9	66 - 130	17.73	2.47	20	
Bromomethane	17.59	1.0	20	0	88.0	53 - 141	17.74	0.834	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341768 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19061279-02MSD** Units: **UG/L** Analysis Date: **02-Jul-2019 14:50**
Client ID: Run ID: **VOA6_341768** SeqNo: **5151554** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	33.18	2.0	40	0	83.0	64 - 133	33.1	0.239	20	
Carbon tetrachloride	19.29	1.0	20	0	96.5	72 - 136	19.3	0.0519	20	
Chlorobenzene	18.04	1.0	20	0	90.2	82 - 118	17.94	0.592	20	
Chloroethane	17.66	1.0	20	0	88.3	60 - 138	16.25	8.29	20	
Chloroform	17.58	1.0	20	0	87.9	79 - 124	17.26	1.83	20	
Chloromethane	16.74	1.0	20	0	83.7	50 - 139	17.74	5.81	20	
cis-1,2-Dichloroethene	17.71	1.0	20	0	88.5	78 - 123	17.2	2.9	20	
cis-1,3-Dichloropropene	17.24	1.0	20	0	86.2	75 - 124	16.63	3.63	20	
Dibromochloromethane	17.51	1.0	20	0	87.6	74 - 126	17.38	0.749	20	
Dibromomethane	17.5	1.0	20	0	87.5	79 - 123	17.13	2.13	20	
Dichlorodifluoromethane	16.92	1.0	20	0	84.6	32 - 152	17.34	2.41	20	
Ethylbenzene	18.48	1.0	20	0	92.4	79 - 121	18.59	0.622	20	
Hexachlorobutadiene	21.2	1.0	20	0	106	66 - 134	21.22	0.0826	20	
Isopropylbenzene	19.21	1.0	20	0	96.1	72 - 131	19.1	0.57	20	
m,p-Xylene	36.92	2.0	40	0	92.3	80 - 121	37.18	0.695	20	
Methylene chloride	16.19	2.0	20	0	81.0	74 - 124	15.9	1.84	20	
Naphthalene	18.92	1.0	20	0	94.6	61 - 128	17.16	9.76	20	
n-Butylbenzene	19.36	1.0	20	0	96.8	75 - 128	19.55	0.956	20	
n-Propylbenzene	20.01	1.0	20	0	100	76 - 126	20	0.0421	20	
o-Xylene	18.32	1.0	20	0	91.6	78 - 122	17.95	2.02	20	
sec-Butylbenzene	20.38	1.0	20	0	102	77 - 126	20.61	1.12	20	
Styrene	18.72	1.0	20	0	93.6	78 - 123	18.46	1.41	20	
tert-Butylbenzene	20.29	1.0	20	0	101	78 - 124	20.24	0.291	20	
Tetrachloroethene	18.91	1.0	20	0	94.5	74 - 129	19.16	1.35	20	
Toluene	18	1.0	20	0	90.0	80 - 121	18.03	0.169	20	
trans-1,2-Dichloroethene	17.99	1.0	20	0	90.0	75 - 124	17.55	2.49	20	
trans-1,3-Dichloropropene	17.13	1.0	20	0	85.7	73 - 127	16.75	2.28	20	
Trichloroethene	18.32	1.0	20	0	91.6	79 - 123	18.63	1.68	20	
Trichlorofluoromethane	18	1.0	20	0	90.0	65 - 141	17.98	0.106	20	
Vinyl chloride	16.22	1.0	20	0	81.1	58 - 137	16.37	0.923	20	
Surr: 1,2-Dichloroethane-d4	*48.93*	*1.0*	*50*	*0*	*97.9*	*81 - 118*	*47.67*	*2.6*	*20*	
Surr: 4-Bromofluorobenzene	*49.69*	*1.0*	*50*	*0*	*99.4*	*85 - 114*	*49.65*	*0.063*	*20*	
Surr: Dibromofluoromethane	*48.03*	*1.0*	*50*	*0*	*96.1*	*80 - 119*	*47.23*	*1.66*	*20*	
Surr: Toluene-d8	*49.1*	*1.0*	*50*	*0*	*98.2*	*89 - 112*	*48.99*	*0.233*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP 18 24
WorkOrder:	HS19061386

QC BATCH REPORT

Batch ID:	**R341768 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch: HS19061386-01 HS19061386-02

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190703** Units: **UG/L** Analysis Date: **03-Jul-2019 15:45**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153631** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MBLK Sample ID: **VBLKW-190703** Units: **UG/L** Analysis Date: **03-Jul-2019 15:45**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153631** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.09*	*1.0*	*50*	*0*	*92.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.05*	*1.0*	*50*	*0*	*96.1*	*85 - 114*				
Surr: Dibromofluoromethane	*44.95*	*1.0*	*50*	*0*	*89.9*	*80 - 119*				
Surr: Toluene-d8	*48.5*	*1.0*	*50*	*0*	*97.0*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-190703** Units: **UG/L** Analysis Date: **03-Jul-2019 14:57**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153630** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.99	1.0	20	0	89.9	78 - 124				
1,1,1-Trichloroethane	18.38	1.0	20	0	91.9	74 - 131				
1,1,2,2-Tetrachloroethane	19.33	1.0	20	0	96.6	71 - 121				
1,1,2-Trichloroethane	19	1.0	20	0	95.0	80 - 119				
1,1-Dichloroethane	17.63	1.0	20	0	88.1	77 - 125				
1,1-Dichloroethene	17.56	1.0	20	0	87.8	71 - 131				
1,1-Dichloropropene	18.07	1.0	20	0	90.4	78 - 125				
1,2,3-Trichlorobenzene	23.54	1.0	20	0	118	69 - 129				
1,2,3-Trichloropropane	19.44	1.0	20	0	97.2	73 - 122				
1,2,4-Trichlorobenzene	21.42	1.0	20	0	107	69 - 130				
1,2,4-Trimethylbenzene	17.67	1.0	20	0	88.3	76 - 124				
1,2-Dibromo-3-chloropropane	21.87	1.0	20	0	109	62 - 128				
1,2-Dibromoethane	18.58	1.0	20	0	92.9	77 - 121				
1,2-Dichlorobenzene	18.25	1.0	20	0	91.3	80 - 119				
1,2-Dichloroethane	17.32	1.0	20	0	86.6	73 - 128				
1,2-Dichloropropane	17.52	1.0	20	0	87.6	78 - 122				
1,3,5-Trimethylbenzene	17.42	1.0	20	0	87.1	75 - 124				
1,3-Dichlorobenzene	17.82	1.0	20	0	89.1	80 - 119				
1,3-Dichloropropane	18.44	1.0	20	0	92.2	80 - 119				
1,4-Dichlorobenzene	18.95	1.0	20	0	94.8	79 - 118				
2,2-Dichloropropane	16.75	1.0	20	0	83.7	60 - 139				
2-Butanone	43.93	2.0	40	0	110	56 - 143				
2-Chlorotoluene	18.48	1.0	20	0	92.4	79 - 122				
2-Hexanone	38.01	2.0	40	0	95.0	57 - 139				
4-Chlorotoluene	18.53	1.0	20	0	92.6	78 - 122				
4-Isopropyltoluene	17.94	1.0	20	0	89.7	77 - 127				
4-Methyl-2-pentanone	36.09	2.0	40	0	90.2	67 - 130				
Acetone	46.53	2.0	40	0	116	39 - 160				
Benzene	18.29	1.0	20	0	91.4	79 - 120				
Bromobenzene	17.41	1.0	20	0	87.1	80 - 120				
Bromochloromethane	17.81	1.0	20	0	89.0	78 - 123				
Bromodichloromethane	18.24	1.0	20	0	91.2	79 - 125				
Bromoform	19.34	1.0	20	0	96.7	66 - 130				
Bromomethane	20.11	1.0	20	0	101	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-190703** Units: **UG/L** Analysis Date: **03-Jul-2019 14:57**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153630** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	33.73	2.0	40	0	84.3	64 - 133				
Carbon tetrachloride	18.32	1.0	20	0	91.6	72 - 136				
Chlorobenzene	17.54	1.0	20	0	87.7	82 - 118				
Chloroethane	16.99	1.0	20	0	84.9	60 - 138				
Chloroform	19.05	1.0	20	0	95.2	79 - 124				
Chloromethane	16.14	1.0	20	0	80.7	50 - 139				
cis-1,2-Dichloroethene	18.45	1.0	20	0	92.3	78 - 123				
cis-1,3-Dichloropropene	17.19	1.0	20	0	85.9	75 - 124				
Dibromochloromethane	18.13	1.0	20	0	90.6	74 - 126				
Dibromomethane	18.03	1.0	20	0	90.1	79 - 123				
Dichlorodifluoromethane	17.79	1.0	20	0	88.9	32 - 152				
Ethylbenzene	17.65	1.0	20	0	88.3	79 - 121				
Hexachlorobutadiene	23.03	1.0	20	0	115	66 - 134				
Isopropylbenzene	18.08	1.0	20	0	90.4	72 - 131				
m,p-Xylene	35.62	2.0	40	0	89.0	80 - 121				
Methylene chloride	17.81	2.0	20	0	89.1	74 - 124				
Naphthalene	21.95	1.0	20	0	110	61 - 128				
n-Butylbenzene	17.82	1.0	20	0	89.1	75 - 128				
n-Propylbenzene	18.62	1.0	20	0	93.1	76 - 126				
o-Xylene	17.72	1.0	20	0	88.6	78 - 122				
sec-Butylbenzene	19.01	1.0	20	0	95.1	77 - 126				
Styrene	18.33	1.0	20	0	91.7	78 - 123				
tert-Butylbenzene	18.81	1.0	20	0	94.1	78 - 124				
Tetrachloroethene	17.9	1.0	20	0	89.5	74 - 129				
Toluene	17.39	1.0	20	0	86.9	80 - 121				
trans-1,2-Dichloroethene	18.49	1.0	20	0	92.4	75 - 124				
trans-1,3-Dichloropropene	17.69	1.0	20	0	88.4	73 - 127				
Trichloroethene	17.79	1.0	20	0	89.0	79 - 123				
Trichlorofluoromethane	18.03	1.0	20	0	90.1	65 - 141				
Vinyl chloride	16.88	1.0	20	0	84.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.62*	*1.0*	*50*	*0*	*99.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.98*	*1.0*	*50*	*0*	*96.0*	*85 - 114*				
Surr: Dibromofluoromethane	*49.25*	*1.0*	*50*	*0*	*98.5*	*80 - 119*				
Surr: Toluene-d8	*45.94*	*1.0*	*50*	*0*	*91.9*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19061486-01MS** Units: **UG/L** Analysis Date: **03-Jul-2019 18:08**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153637** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	16.51	1.0	20	0	82.5	78 - 124				
1,1,1-Trichloroethane	16.62	1.0	20	0	83.1	74 - 131				
1,1,2,2-Tetrachloroethane	17.57	1.0	20	0	87.9	71 - 121				
1,1,2-Trichloroethane	17.26	1.0	20	0	86.3	80 - 119				
1,1-Dichloroethane	15.31	1.0	20	0	76.5	77 - 125				S
1,1-Dichloroethene	16.44	1.0	20	0	82.2	71 - 131				
1,1-Dichloropropene	17.45	1.0	20	0	87.3	78 - 125				
1,2,3-Trichlorobenzene	20.81	1.0	20	0	104	69 - 129				
1,2,3-Trichloropropane	17.72	1.0	20	0	88.6	73 - 122				
1,2,4-Trichlorobenzene	19.95	1.0	20	0	99.7	69 - 130				
1,2,4-Trimethylbenzene	16.6	1.0	20	0	83.0	76 - 124				
1,2-Dibromo-3-chloropropane	19.76	1.0	20	0	98.8	62 - 128				
1,2-Dibromoethane	16.72	1.0	20	0	83.6	77 - 121				
1,2-Dichlorobenzene	16.97	1.0	20	0	84.9	80 - 119				
1,2-Dichloroethane	15.42	1.0	20	0	77.1	73 - 128				
1,2-Dichloropropane	15.7	1.0	20	0	78.5	78 - 122				
1,3,5-Trimethylbenzene	16.77	1.0	20	0	83.9	75 - 124				
1,3-Dichlorobenzene	16.72	1.0	20	0	83.6	80 - 119				
1,3-Dichloropropane	16.64	1.0	20	0	83.2	80 - 119				
1,4-Dichlorobenzene	17.61	1.0	20	0	88.1	79 - 118				
2,2-Dichloropropane	16.67	1.0	20	0	83.4	60 - 139				
2-Butanone	35.5	2.0	40	0	88.8	56 - 143				
2-Chlorotoluene	17.41	1.0	20	0	87.0	79 - 122				
2-Hexanone	32.54	2.0	40	0	81.4	57 - 139				
4-Chlorotoluene	17.42	1.0	20	0	87.1	78 - 122				
4-Isopropyltoluene	17.75	1.0	20	0	88.7	77 - 127				
4-Methyl-2-pentanone	33.2	2.0	40	0	83.0	67 - 130				
Acetone	37.89	2.0	40	4.161	84.3	39 - 160				
Benzene	16.63	1.0	20	0	83.2	79 - 120				
Bromobenzene	15.78	1.0	20	0	78.9	80 - 120				S
Bromochloromethane	15.16	1.0	20	0	75.8	78 - 123				S
Bromodichloromethane	16.26	1.0	20	0	81.3	79 - 125				
Bromoform	17.61	1.0	20	0	88.1	66 - 130				
Bromomethane	16.43	1.0	20	0	82.1	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061486-01MS** Units: **UG/L** Analysis Date: **03-Jul-2019 18:08**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153637** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	30.33	2.0	40	0	75.8	64 - 133				
Carbon tetrachloride	17.83	1.0	20	0	89.2	72 - 136				
Chlorobenzene	16.32	1.0	20	0	81.6	82 - 118				S
Chloroethane	15.5	1.0	20	0	77.5	60 - 138				
Chloroform	15.88	1.0	20	0	79.4	79 - 124				
Chloromethane	14.92	1.0	20	0	74.6	50 - 139				
cis-1,2-Dichloroethene	15.81	1.0	20	0	79.1	78 - 123				
cis-1,3-Dichloropropene	15.72	1.0	20	0	78.6	75 - 124				
Dibromochloromethane	16.19	1.0	20	0	81.0	74 - 126				
Dibromomethane	16.1	1.0	20	0	80.5	79 - 123				
Dichlorodifluoromethane	15.64	1.0	20	0	78.2	32 - 152				
Ethylbenzene	17	1.0	20	0	85.0	79 - 121				
Hexachlorobutadiene	21.68	1.0	20	0	108	66 - 134				
Isopropylbenzene	17.62	1.0	20	0	88.1	72 - 131				
m,p-Xylene	34.49	2.0	40	0	86.2	80 - 121				
Methylene chloride	15.03	2.0	20	0	75.1	74 - 124				
Naphthalene	19.79	1.0	20	0	98.9	61 - 128				
n-Butylbenzene	17.77	1.0	20	0	88.8	75 - 128				
n-Propylbenzene	18.11	1.0	20	0	90.6	76 - 126				
o-Xylene	16.52	1.0	20	0	82.6	78 - 122				
sec-Butylbenzene	19.08	1.0	20	0	95.4	77 - 126				
Styrene	16.93	1.0	20	0	84.7	78 - 123				
tert-Butylbenzene	18.55	1.0	20	0	92.8	78 - 124				
Tetrachloroethene	17.69	1.0	20	0	88.5	74 - 129				
Toluene	16.65	1.0	20	0	83.3	80 - 121				
trans-1,2-Dichloroethene	16.67	1.0	20	0	83.4	75 - 124				
trans-1,3-Dichloropropene	15.41	1.0	20	0	77.1	73 - 127				
Trichloroethene	19.25	1.0	20	0	96.3	79 - 123				
Trichlorofluoromethane	16.99	1.0	20	0	85.0	65 - 141				
Vinyl chloride	14.99	1.0	20	0	75.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.86*	*1.0*	*50*	*0*	*91.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.41*	*1.0*	*50*	*0*	*96.8*	*85 - 114*				
Surr: Dibromofluoromethane	*45.73*	*1.0*	*50*	*0*	*91.5*	*80 - 119*				
Surr: Toluene-d8	*47.34*	*1.0*	*50*	*0*	*94.7*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061486-01MSD** Units: **UG/L** Analysis Date: **03-Jul-2019 18:32**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153638** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	16.57	1.0	20	0	82.9	78 - 124	16.51	0.402	20	
1,1,1-Trichloroethane	16.72	1.0	20	0	83.6	74 - 131	16.62	0.596	20	
1,1,2,2-Tetrachloroethane	17.64	1.0	20	0	88.2	71 - 121	17.57	0.396	20	
1,1,2-Trichloroethane	17.31	1.0	20	0	86.5	80 - 119	17.26	0.254	20	
1,1-Dichloroethane	15.14	1.0	20	0	75.7	77 - 125	15.31	1.12	20	S
1,1-Dichloroethene	15.9	1.0	20	0	79.5	71 - 131	16.44	3.34	20	
1,1-Dichloropropene	17.2	1.0	20	0	86.0	78 - 125	17.45	1.47	20	
1,2,3-Trichlorobenzene	21.62	1.0	20	0	108	69 - 129	20.81	3.79	20	
1,2,3-Trichloropropane	18.13	1.0	20	0	90.7	73 - 122	17.72	2.32	20	
1,2,4-Trichlorobenzene	20.17	1.0	20	0	101	69 - 130	19.95	1.11	20	
1,2,4-Trimethylbenzene	16.82	1.0	20	0	84.1	76 - 124	16.6	1.35	20	
1,2-Dibromo-3-chloropropane	19.64	1.0	20	0	98.2	62 - 128	19.76	0.602	20	
1,2-Dibromoethane	16.91	1.0	20	0	84.6	77 - 121	16.72	1.13	20	
1,2-Dichlorobenzene	17.08	1.0	20	0	85.4	80 - 119	16.97	0.64	20	
1,2-Dichloroethane	15.51	1.0	20	0	77.5	73 - 128	15.42	0.587	20	
1,2-Dichloropropane	15.75	1.0	20	0	78.8	78 - 122	15.7	0.313	20	
1,3,5-Trimethylbenzene	16.61	1.0	20	0	83.1	75 - 124	16.77	0.95	20	
1,3-Dichlorobenzene	16.63	1.0	20	0	83.2	80 - 119	16.72	0.552	20	
1,3-Dichloropropane	16.84	1.0	20	0	84.2	80 - 119	16.64	1.21	20	
1,4-Dichlorobenzene	18.12	1.0	20	0	90.6	79 - 118	17.61	2.81	20	
2,2-Dichloropropane	16.43	1.0	20	0	82.2	60 - 139	16.67	1.45	20	
2-Butanone	36.09	2.0	40	0	90.2	56 - 143	35.5	1.64	20	
2-Chlorotoluene	17.25	1.0	20	0	86.3	79 - 122	17.41	0.897	20	
2-Hexanone	33.5	2.0	40	0	83.8	57 - 139	32.54	2.91	20	
4-Chlorotoluene	17.25	1.0	20	0	86.2	78 - 122	17.42	1.02	20	
4-Isopropyltoluene	17.61	1.0	20	0	88.1	77 - 127	17.75	0.749	20	
4-Methyl-2-pentanone	33.33	2.0	40	0	83.3	67 - 130	33.2	0.392	20	
Acetone	37.8	2.0	40	4.161	84.1	39 - 160	37.89	0.25	20	
Benzene	16.71	1.0	20	0	83.6	79 - 120	16.63	0.479	20	
Bromobenzene	15.97	1.0	20	0	79.8	80 - 120	15.78	1.2	20	S
Bromochloromethane	14.89	1.0	20	0	74.4	78 - 123	15.16	1.82	20	S
Bromodichloromethane	16.58	1.0	20	0	82.9	79 - 125	16.26	1.99	20	
Bromoform	18.12	1.0	20	0	90.6	66 - 130	17.61	2.84	20	
Bromomethane	15.98	1.0	20	0	79.9	53 - 141	16.43	2.73	20	

Revision: 1

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ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061486-01MSD** Units: **UG/L** Analysis Date: **03-Jul-2019 18:32**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153638** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	30.26	2.0	40	0	75.7	64 - 133	30.33	0.215	20	
Carbon tetrachloride	17.75	1.0	20	0	88.7	72 - 136	17.83	0.463	20	
Chlorobenzene	16.44	1.0	20	0	82.2	82 - 118	16.32	0.761	20	
Chloroethane	15.28	1.0	20	0	76.4	60 - 138	15.5	1.42	20	
Chloroform	15.71	1.0	20	0	78.6	79 - 124	15.88	1.07	20	S
Chloromethane	14.69	1.0	20	0	73.4	50 - 139	14.92	1.58	20	
cis-1,2-Dichloroethene	15.7	1.0	20	0	78.5	78 - 123	15.81	0.692	20	
cis-1,3-Dichloropropene	15.68	1.0	20	0	78.4	75 - 124	15.72	0.238	20	
Dibromochloromethane	16.67	1.0	20	0	83.4	74 - 126	16.19	2.91	20	
Dibromomethane	16.2	1.0	20	0	81.0	79 - 123	16.1	0.6	20	
Dichlorodifluoromethane	15.34	1.0	20	0	76.7	32 - 152	15.64	1.95	20	
Ethylbenzene	16.85	1.0	20	0	84.2	79 - 121	17	0.905	20	
Hexachlorobutadiene	22.45	1.0	20	0	112	66 - 134	21.68	3.48	20	
Isopropylbenzene	17.51	1.0	20	0	87.5	72 - 131	17.62	0.618	20	
m,p-Xylene	33.91	2.0	40	0	84.8	80 - 121	34.49	1.71	20	
Methylene chloride	14.82	2.0	20	0	74.1	74 - 124	15.03	1.35	20	
Naphthalene	20.33	1.0	20	0	102	61 - 128	19.79	2.71	20	
n-Butylbenzene	17.71	1.0	20	0	88.6	75 - 128	17.77	0.323	20	
n-Propylbenzene	18.14	1.0	20	0	90.7	76 - 126	18.11	0.153	20	
o-Xylene	16.36	1.0	20	0	81.8	78 - 122	16.52	0.968	20	
sec-Butylbenzene	18.96	1.0	20	0	94.8	77 - 126	19.08	0.607	20	
Styrene	16.9	1.0	20	0	84.5	78 - 123	16.93	0.183	20	
tert-Butylbenzene	18.61	1.0	20	0	93.1	78 - 124	18.55	0.304	20	
Tetrachloroethene	17.87	1.0	20	0	89.3	74 - 129	17.69	0.987	20	
Toluene	16.4	1.0	20	0	82.0	80 - 121	16.65	1.53	20	
trans-1,2-Dichloroethene	16.25	1.0	20	0	81.3	75 - 124	16.67	2.54	20	
trans-1,3-Dichloropropene	15.73	1.0	20	0	78.7	73 - 127	15.41	2.08	20	
Trichloroethene	17.49	1.0	20	0	87.5	79 - 123	19.25	9.57	20	
Trichlorofluoromethane	16.54	1.0	20	0	82.7	65 - 141	16.99	2.69	20	
Vinyl chloride	14.75	1.0	20	0	73.8	58 - 137	14.99	1.6	20	
Surr: 1,2-Dichloroethane-d4	*47.12*	*1.0*	*50*	*0*	*94.2*	*81 - 118*	*45.86*	*2.7*	*20*	
Surr: 4-Bromofluorobenzene	*48.48*	*1.0*	*50*	*0*	*97.0*	*85 - 114*	*48.41*	*0.13*	*20*	
Surr: Dibromofluoromethane	*46.14*	*1.0*	*50*	*0*	*92.3*	*80 - 119*	*45.73*	*0.893*	*20*	
Surr: Toluene-d8	*46.66*	*1.0*	*50*	*0*	*93.3*	*89 - 112*	*47.34*	*1.44*	*20*	

Revision: 1

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ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061386

QC BATCH REPORT

Batch ID: R341869 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS19061386-03	HS19061386-04	HS19061386-05	HS19061386-06
HS19061386-08	HS19061386-09	HS19061386-10	HS19061386-11

Revision: 1

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ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19061386**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

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ALS Houston, US Date: 16-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061386

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19061386-01	17WW08_062519	Login	26/06/2019 16:06:30	PMG	MET065
HS19061386-01	17WW08_062519	Login	26/06/2019 16:06:30	PMG	Sub
HS19061386-01	17WW08_062519	Login	26/06/2019 16:06:30	PMG	EXT022
HS19061386-01	17WW08_062519	Login	26/06/2019 16:06:30	PMG	VOA034

Revision:1

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ALS Houston, US Date: 16-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19061386
Date/Time Received: **26-Jun-2019 08:50**
Received by: **PMG**

Checklist completed by: *Paresh M. Giga* eSignature 26-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature 26-Jun-2019 Date

Matrices: **Water**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	2.1c U/c	IR11	
Cooler(s)/Kit(s):	45012		
Date/Time sample(s) sent to storage:	6/26/19 16:45		
Water - VOA vials have zero headspace?	Yes ☐	No ☐	No VOA vials submitted ☑
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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bhate

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE							Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
17WW08_062519		25Jun2019	0710	-	N		WG	5	X	X	X											
132_062519		25Jun2019	0800	-	N		WG	5	X	X	X											
130_062519_a		25Jun2019	0800	-	FD		WG	5	X	X	X											
MW10_062519		25Jun2019	0855		N		WG	5	X	X		X										
MW13_062519		25Jun2019	0945		N		WG	5	X	X	X											
C02_062519		25Jun2019	1030	-	N		WG	4	X	X												
MW17_062519		25Jun2019	1120	-	N		WG	2		X		X										
18WW10_062519		25Jun2019	1220	-	N		WG	5	X	X		X										
18WW10_062519_a		25Jun2019	1220	-	FD		WG	5	X	X		X										
MW9_062519		25Jun2019	1310	-	N		WG	6	X	X	X	X										
Trip Blank		25Jun2019		-	TB		W	2	X													

Sample Analysis Requested (5) | Quality Assurance Samples (6)

HS19061386
Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS:

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	6/25/19	1430	1. [illegible]	[illegible]	[illegible]
2.			2. [illegible]	[illegible]	[illegible]
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill Number:

Analytical Lab: ALS 10450 Stanciff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

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00941683

ALS Environmental	CUSTODY SEAL	Seal Broken By:
10450 Stancliff Rd., Suite 210 Houston, Texas 77099 Tel. +1 281 530 5656 Fax. +1 281 530 5887	Date: 6/25/19 Time: 1430 Name: Scott Beesinger Company: Bhate	Date: 6/26/19

45012

45012

Must Deliver Next Business Day
Time and Tempature Sensitive!

45012

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202

MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 24MAY19
ACTWGT: 1.00 LB MAN
CAD: 3001300/CAFE3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF RD.
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP/18/24 & SURFACE WATER - RJ

RMA:

FedEx Express

RETURN MAT

WED - 26 JUN 10:30A
PRIORITY OVERNIGHT

FedEx
TRK# 4809 7834 3160
0221

77099
TX
IAH

AB SGRA

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1918528, 1918705, 1918871

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2270 (243267)

General Set Information: There were twenty-four field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1918705007 was analyzed and reported from a 1:10 dilution. Field sample 1918528010 was analyzed and reported from a 1:100 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 663033) was less than 1/2 the CRDL. The recovery for the LCS (663034) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on samples 1918705002/03 and 1918705009/10 (Client ID's: CO9_062619 and MW18_062619). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The MS/MSD percent recoveries and relative percent difference were within the performance limits. The MS (1918705002MS) failed QC acceptance criteria for percent recovery. MS/MSD 1918705002/03 also failed the relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 663031) is reported from the analysis of the Laboratory Control Sample (LCS – 663034) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafile 11JULD20.

Thomas Bosch July 12, 2019
Analyst Date

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ANALYTICAL REPORT

Report Date: July 12, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1918528**
Project ID: HS19061386
Purchase Order: HS19061386
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
17WW08_062519	1918528001	06/25/19	06/27/19	
130_062519	1918528002	06/25/19	06/27/19	
130_062519_a	1918528003	06/25/19	06/27/19	
MW10_062519	1918528004	06/25/19	06/27/19	
MW13_062519	1918528005	06/25/19	06/27/19	
CO2_062519	1918528006	06/25/19	06/27/19	
MW17_062519	1918528007	06/25/19	06/27/19	
18WW10_062519	1918528008	06/25/19	06/27/19	
18WW10_062519_a	1918528009	06/25/19	06/27/19	
MW9_062519	1918528010	06/25/19	06/27/19	

ANALYTICAL REPORT

Workorder: 34-1918528
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **17WW08_062519** | Sampling Site: NA | Collected: 06/25/2019
Lab ID: 1918528001 | Media: 125 mL Nalgene | Received: 06/27/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 12:07 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **130_062519** | Sampling Site: NA | Collected: 06/25/2019
Lab ID: 1918528002 | Media: 125 mL Nalgene | Received: 06/27/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 12:21 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **130_062519_a** | Sampling Site: NA | Collected: 06/25/2019
Lab ID: 1918528003 | Media: 125 mL Nalgene | Received: 06/27/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 12:34 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **MW10_062519** | Sampling Site: NA | Collected: 06/25/2019
Lab ID: 1918528004 | Media: 125 mL Nalgene | Received: 06/27/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 12:48 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

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ANALYTICAL REPORT

Workorder: 34-1918528
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **MW13_062519** | Sampling Site: NA | Collected: 06/25/2019
Lab ID: 1918528005 | Media: 125 mL Nalgene | Received: 06/27/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 13:02 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **CO2_062519** | Sampling Site: NA | Collected: 06/25/2019
Lab ID: 1918528006 | Media: 125 mL Nalgene | Received: 06/27/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 13:16 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **MW17_062519** | Sampling Site: NA | Collected: 06/25/2019
Lab ID: 1918528007 | Media: 125 mL Nalgene | Received: 06/27/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 13:30 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18WW10_062519** | Sampling Site: NA | Collected: 06/25/2019
Lab ID: 1918528008 | Media: 125 mL Nalgene | Received: 06/27/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 13:43 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

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ANALYTICAL REPORT

Workorder: 34-1918528
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18WW10_062519_a** | Sampling Site: NA | Collected: 06/25/2019
Lab ID: 1918528009 | Media: 125 mL Nalgene | Received: 06/27/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 13:57 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **MW9_062519** | Sampling Site: NA | Collected: 06/25/2019
Lab ID: 1918528010 | Media: 125 mL Nalgene | Received: 06/27/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 14:11 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**520**	100	200	400	100	

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/12/2019 10:14	/S/ Stephen Brose 07/12/2019 11:30

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1918528
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1918528

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2270 (HBN: 243267)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 663033
Analyzed: 07/11/2019 11:53
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 663034
Analyzed: 07/11/2019 11:26
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.41	4.00	110	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

	Sample: 1918705001	MS: 1918705002	MSD: 1918705003
	Analyzed: 07/11/2019 14:39	Analyzed: 07/11/2019 14:52	Analyzed: 07/11/2019 15:06
	Dilution: 1	Dilution: 1	Dilution: 1
	Units: ug/L	Units: ug/L	Units: ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	5.21	4	# 130	78.8	123.8	4.09	102	# 24	0.0	20.0

	Sample: 1918705008	MS: 1918705009	MSD: 1918705010
	Analyzed: 07/11/2019 16:17	Analyzed: 07/11/2019 16:31	Analyzed: 07/11/2019 16:45
	Dilution: 1	Dilution: 1	Dilution: 1
	Units: ug/L	Units: ug/L	Units: ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.4	4	110	78.8	123.8	3.92	98.0	11.5	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/12/2019 10:17	07/12/2019 11:30

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19061386 | ***Split:*** | **Workorder ID:** 1918528 | **Level:** ENV_LVL4

Client: ALS Environmental (Houston) | **Account:** 8101 | **Type:** 125Poly

Comments:

Preservatives: COOL

Requested Analysis: EPA 6850, DoD QSM

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis
1	06/25/2019 07:10	17WW08_062519	1918528001		Water	A	1	A
2	06/25/2019 08:00	130_062519	1918528002		Water	A	1	A
3	06/25/2019 08:00	130_062519_a	1918528003		Water	A	1	A
4	06/25/2019 08:55	MW10_062519	1918528004		Water	A	1	A
5	06/25/2019 09:45	MW13_062519	1918528005		Water	A	1	A
6	06/25/2019 10:30	CO2_062519	1918528006		Water	A	1	A
7	06/25/2019 11:20	MW17_062519	1918528007		Water	A	1	A
8	06/25/2019 12:20	18WW10_062519	1918528008		Water	A	1	A
9	06/25/2019 12:20	18WW10_062519_a	1918528009		Water	A	1	A
10	06/25/2019 13:10	MW9_062519	1918528010		Water	A	1	A

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Vprath, Julie	06/27/2019 09:07	ALS Sample Receiving	Sample Login
[signature]	6/27/19 1400	6B	Storage
R.33.1	7.10.19/08:25	T. Bush	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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00941693

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11681**

SUBCONTRACT TO:

1918528

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123 **Phone:** +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19061386
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19061386-01**	**17WW08_062519**	**Water**	**25 Jun 2019 07:10**
	SUB_Perch-6850			05 Jul 2019
2.	**HS19061386-02**	**130_062519**	**Water**	**25 Jun 2019 08:00**
	SUB_Perch-6850			05 Jul 2019
3.	**HS19061386-03**	**130_062519-a**	**Water**	**25 Jun 2019 08:00**
	SUB_Perch-6850			05 Jul 2019
4.	**HS19061386-04**	**MW10_062519**	**Water**	**25 Jun 2019 08:55**
	SUB_Perch-6850			05 Jul 2019
5.	**HS19061386-05**	**MW13_062519**	**Water**	**25 Jun 2019 09:45**
	SUB_Perch-6850			05 Jul 2019
6.	**HS19061386-06**	**CO2_062519**	**Water**	**25 Jun 2019 10:30**
	SUB_Perch-6850			05 Jul 2019
7.	**HS19061386-07**	**MW17_062519**	**Water**	**25 Jun 2019 11:20**
	SUB_Perch-6850			05 Jul 2019
8.	**HS19061386-08**	**18WW10_062519**	**Water**	**25 Jun 2019 12:20**
	SUB_Perch-6850			05 Jul 2019
9.	**HS19061386-09**	**18WW10_062519-a**	**Water**	**25 Jun 2019 12:20**

Custody Seal intact RW

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Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11681**

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
		SUB_Perch-6850		05 Jul 2019
10.	**HS19061386-10**	**MW9_062519**	**Water**	**25 Jun 2019 13:10**
		SUB_Perch-6850		05 Jul 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 6/26/19 1800.

Received By: _____ Date/Time: 06/27/19 0907

Cooler ID(s): _____ Temperature(s): _____

Custody Seal Intact Rw

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ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ASL Houston

Project/Task/Site: 91852E

Date/Time of Receipt: 062719 0907

Number of Coolers Received: 1

Condition of Coolers:	(Acceptable)/Unacceptable	Temperature Control:	(Present)/Not Included
Cooler Custody Seals:	Present/Absent/NA		
	(Intact)/Broken/NA	Location Temp Taken:	(Cooler)/Between Samples
Container Custody Seals:	Present/(Absent)/NA		
	Intact/Broken/(NA)	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	(Yes)/No/NA		
	Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9732	3 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [signature] (Signature) Rebecca Wise (Printed Name) 062719 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? YES ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc Revised 01/01/2018

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Must Deliver Next Business Day
Time and Tempature Sensitive!

ALS

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 26JUN19
ACTWGT: 18.70 LB
CAD: 3001307/CAFE3211
DIMS: 14x11x10 IN
BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19061383 - RJ

FedEx Express

TRK# 0201 4809 7835 3973

THU - 27 JUN 3:00P
STANDARD OVERNIGHT

AX BTFA

84123
UT-US SLC

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Batch Worklist

Batch: ELMS/ 2270 Created: 7/10/2019 13:34 Instrument: HBN: 243267

Rule: EPA 6850, DoD QSM Water Analyst: T. Bosch Status: WP

Workorder: 1918528 [ENV_LVL4]
Workorder: 1918705 [ENV_LVL4]
Workorder: 1918871 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	663030	CCV for HBN 243267 [ELMS/2270]				CCV	3		E685041C3Q	5311		7/11/2019	
2	663031	RLVS for HBN 243267 [ELMS/2270				RLVS	3		E685041C3Q	5311		7/11/2019	
3	663032	ICS for HBN 243267 [ELMS/2270]				ICS	3		E6850..D3Q	5311		7/11/2019	
4	663033	LMB for HBN 243267 [ELMS/2270]				LMB	3		E6850Q413Q	5311		7/11/2019	
5	663034	LCS for HBN 243267 [ELMS/2270]				LCS	3		E6850Q413Q	5311		7/11/2019	
6	1918528001	17WW08_062519				SAMPLE	3	1918528001-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
7	1918528002	130_062519				SAMPLE	3	1918528002-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
8	1918528003	130_062519_a				SAMPLE	3	1918528003-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
9	1918528004	MW10_062519				SAMPLE	3	1918528004-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
10	1918528005	MW13_062519				SAMPLE	3	1918528005-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
11	1918528006	CO2_062519				SAMPLE	3	1918528006-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
12	1918528007	MW17_062519				SAMPLE	3	1918528007-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
13	1918528008	18WW10_062519				SAMPLE	3	1918528008-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
14	1918528009	18WW10_062519_a				SAMPLE	3	1918528009-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
15	1918528010	MW9_062519				SAMPLE	3	1918528010-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
16	663035	CCV for HBN 243267 [ELMS/2270]				CCV	3		E685041C3Q	5311		7/11/2019	
17	1918705001	CO9_062619				SAMPLE	3	1918705001-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
18	1918705002	CO9_062619 MS				MS	3	1918705002-A	E6850Q413Q	5480		7/11/2019	
19	1918705003	CO9_062619 MSD				MSD	3	1918705003-A	E6850Q413Q	5480		7/11/2019	
20	1918705004	C06_062619				SAMPLE	3	1918705004-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
21	1918705005	18WW16_062619				SAMPLE	3	1918705005-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
22	1918705006	18CPTMW18_062619				SAMPLE	3	1918705006-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
23	1918705007	CO3_062619				SAMPLE	3	1918705007-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
24	1918705008	MW18_062619				SAMPLE	3	1918705008-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
25	1918705009	MW18_062619 MS				MS	3	1918705009-A	E6850Q413Q	5480		7/11/2019	
26	1918705010	MW18_062619 MSD				MSD	3	1918705010-A	E6850Q413Q	5480		7/11/2019	
27	663036	CCV for HBN 243267 [ELMS/2270]				CCV	3		E685041C3Q	5311		7/11/2019	

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Batch Worklist

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
28	1918871001	18WW08_062719				SAMPLE	3	1918871001-A	E6850Q41.3	5480	7/25/2019	7/12/2019	
29	1918871002	18WW09_062719				SAMPLE	3	1918871002-A	E6850Q41.3	5480	7/25/2019	7/12/2019	
30	1918871003	18CPTMW16_062719				SAMPLE	3	1918871003-A	E6850Q41.3	5480	7/25/2019	7/12/2019	
31	1918871004	18WW2516_062719				SAMPLE	3	1918871004-A	E6850Q41.3	5480	7/25/2019	7/12/2019	
32	663037	CCV for HBN 243267 [ELMS/2270]				CCV	3		E685041C3Q	5311		7/11/2019	

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1918528 (001-10), 1918705 (001-10); 1918871 (001-04)
ELMS Batch/HBN ID: 2270 (243267)
Prep Date: 07/10/2019 Analysis Date: 07/11/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\11JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 30µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 663034; Target = 4.0µg/L. ASTM type II water was used for LMB 663033.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on samples 1918705002/03 and 1918705009/10 (Client ID's: CO9_062619 and MW18_062619). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field sample 1918705007 was analyzed and reported from a 1:10 dilution. Field sample 1918528010 was analyzed and reported from a 1:100 dilution. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS (1918705002MS) failed QC acceptance criteria for percent recovery. MS/MSD 1918705002/03 also failed the relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\243267-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 663031) is reported from the analysis of the Laboratory Control Sample (LCS – 663034) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 11JULD20.

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2270 HBN: 243267 Sample Set IDs if Applicable: 1918528/1918705/1918871	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SD
Standards traceability checked and meets criteria	TB	SD
Standard curve coefficients evaluated and meet criteria	TB	SD
ICVs analyzed and meet acceptance criteria	TB	SD
CCVs analyzed and meet acceptance criteria	TB	SD
Method Blanks analyzed and meet acceptance criteria	TB	SD
Retention Time Windows checked	TB	SD
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SD
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SD
RLVS analyzed	TB	SD
Preparation and analysis hold times met	TB	SD
Preparation deviations and re-preparations noted when performed	TB	SD
Analysis deviations and re-analyses noted when performed	TB	SD
Sample dilution factors noted on reports	TB	SD
Electronic records in HBN transcription accuracy and completeness checked	TB	SD
Preparation and analysis calculations checked	TB	SD
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SD
Manual integrations checked	TB	SD

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

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STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description - 6850 QC WKG STD 100ug/L

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ANAB ACCREDITED

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

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125 Market Street
New Haven, CT 06513
USA

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

AccuStandard®

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

QR-ORG/INO-001
Rev. 5/18

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Report: C:\HPCHEM\1\DATA\11JUL19D\11JUL19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	663030 CCV@25	Vial 71	1	Control	1	2.11871e6	8.255	26.67636
*	663034 QC@4.0	Vial 41	1	Control	2	3.99419e5	7.994	4.40774
*	663032 ICS@4.0	Vial 42	1	Control	3	3.13185e5	7.844	3.89337
*	663033 LMB	Vial 43	1	Control	4	0.00000	0.000	0.00000
*	1918528001	Vial 44	1	Sample	5	0.00000	0.000	0.00000
*	1918528002	Vial 45	1	Sample	6	0.00000	0.000	0.00000
*	1918528003	Vial 46	1	Sample	7	0.00000	0.000	0.00000
*	1918528004	Vial 47	1	Sample	8	0.00000	0.000	0.00000
*	1918528005	Vial 48	1	Sample	9	0.00000	0.000	0.00000
*	1918528006	Vial 49	1	Sample	10	0.00000	0.000	0.00000
*	1918528007	Vial 50	1	Sample	11	0.00000	0.000	0.00000
*	1918528008	Vial 51	1	Sample	12	0.00000	0.000	0.00000
*	1918528009	Vial 52	1	Sample	13	0.00000	0.000	0.00000
*	1918528010 100	Vial 53	1	Sample	14	4.15809e5	8.321	518.23230
*	663035 CCV@25	Vial 71	1	Control	15	2.05306e6	8.245	25.67471
*	1918705001	Vial 54	1	Sample	16	0.00000	0.000	0.00000
*	1918705002 MS	Vial 55	1	Sample	17	3.65014e5	7.751	5.20905
*	1918705003 MSD	Vial 56	1	Sample	18	3.50062e5	7.740	4.09212
*	1918705004	Vial 57	1	Sample	19	0.00000	0.000	0.00000
*	1918705005	Vial 58	1	Sample	20	2.64722e5	7.233	4.40918
*	1918705006	Vial 59	1	Sample	21	0.00000	0.000	0.00000
*	1918705007 10X	Vial 60	1	Sample	22	4.80293e5	8.237	53.73554
*	1918705008	Vial 61	1	Sample	23	0.00000	0.000	0.00000
*	1918705009 MS	Vial 62	1	Sample	24	2.88361e5	7.509	4.39917
*	1918705010 MSD	Vial 63	1	Sample	25	2.77079e5	7.505	3.92076
*	663036 CCV@25	Vial 71	1	Control	26	1.87786e6	8.284	25.56775
*	1918871001	Vial 64	1	Sample	27	0.00000	0.000	0.00000
*	1918871002	Vial 65	1	Sample	28	0.00000	0.000	0.00000
*	1918871003	Vial 66	1	Sample	29	0.00000	0.000	0.00000
*	1918871004	Vial 67	1	Sample	30	0.00000	0.000	0.00000
*	663037 CCV@25	Vial 71	1	Control	31	1.97048e6	8.269	25.87251

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	663030 CCV@25	Vial 71	1	Control	1	6.24075e5	8.272	26.49423
*	663034 QC@4.0	Vial 41	1	Control	2	1.31480e5	7.999	4.73215
*	663032 ICS@4.0	Vial 42	1	Control	3	1.02079e5	7.839	4.11867
*	663033 LMB	Vial 43	1	Control	4	0.00000	0.000	0.00000
*	1918528001	Vial 44	1	Sample	5	0.00000	0.000	0.00000
*	1918528002	Vial 45	1	Sample	6	0.00000	0.000	0.00000
*	1918528003	Vial 46	1	Sample	7	0.00000	0.000	0.00000
*	1918528004	Vial 47	1	Sample	8	0.00000	0.000	0.00000
*	1918528005	Vial 48	1	Sample	9	0.00000	0.000	0.00000
*	1918528006	Vial 49	1	Sample	10	0.00000	0.000	0.00000
*	1918528007	Vial 50	1	Sample	11	0.00000	0.000	0.00000
*	1918528008	Vial 51	1	Sample	12	0.00000	0.000	0.00000
*	1918528009	Vial 52	1	Sample	13	0.00000	0.000	0.00000
*	1918528010 100	Vial 53	1	Sample	14	1.37449e5	8.342	561.78024
*	663035 CCV@25	Vial 71	1	Control	15	6.14214e5	8.269	25.87142
*	1918705001	Vial 54	1	Sample	16	0.00000	0.000	0.00000
*	1918705002 MS	Vial 55	1	Sample	17	1.12801e5	7.762	5.28376
*	1918705003 MSD	Vial 56	1	Sample	18	1.10963e5	7.755	4.21966
*	1918705004	Vial 57	1	Sample	19	0.00000	0.000	0.00000
*	1918705005	Vial 58	1	Sample	20	9.11835e4	7.238	4.95128
*	1918705006	Vial 59	1	Sample	21	0.00000	0.000	0.00000
*	1918705007 10X	Vial 60	1	Sample	22	1.65863e5	8.254	60.89054
*	1918705008	Vial 61	1	Sample	23	0.00000	0.000	0.00000
*	1918705009 MS	Vial 62	1	Sample	24	9.39754e4	7.516	4.67594
*	1918705010 MSD	Vial 63	1	Sample	25	9.16631e4	7.522	4.21052
*	663036 CCV@25	Vial 71	1	Control	26	5.59339e5	8.296	25.65584

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#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	1918871001	Vial 64	1	Sample	27	0.00000	0.000	0.00000
*	1918871002	Vial 65	1	Sample	28	0.00000	0.000	0.00000
*	1918871003	Vial 66	1	Sample	29	0.00000	0.000	0.00000
*	1918871004	Vial 67	1	Sample	30	0.00000	0.000	0.00000
*	663037 CCV@25	Vial 71	1	Control	31	5.83651e5	8.278	25.82631

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	663030 CCV@25	Vial 71	1	Control	1	2.40676e5	8.290	5.00000
*	663034 QC@4.0	Vial 41	1	Control	2	2.97198e5	8.012	5.00000
*	663032 ICS@4.0	Vial 42	1	Control	3	2.65421e5	7.859	5.00000
*	663033 LMB	Vial 43	1	Control	4	3.18343e5	8.270	5.00000
*	1918528001	Vial 44	1	Sample	5	2.09428e5	7.499	5.00000
*	1918528002	Vial 45	1	Sample	6	2.27592e5	7.803	5.00000
*	1918528003	Vial 46	1	Sample	7	2.83805e5	7.792	5.00000
*	1918528004	Vial 47	1	Sample	8	2.31744e5	7.766	5.00000
*	1918528005	Vial 48	1	Sample	9	2.65465e5	7.949	5.00000
*	1918528006	Vial 49	1	Sample	10	3.02483e5	7.805	5.00000
*	1918528007	Vial 50	1	Sample	11	2.39370e5	7.809	5.00000
*	1918528008	Vial 51	1	Sample	12	2.57536e5	7.582	5.00000
*	1918528009	Vial 52	1	Sample	13	3.47245e5	7.601	5.00000
*	1918528010 100	Vial 53	1	Sample	14	2.61248e5	8.355	500.00000
*	663035 CCV@25	Vial 71	1	Control	15	2.42892e5	8.260	5.00000
*	1918705001	Vial 54	1	Sample	16	3.40152e5	7.747	5.00000
*	1918705002 MS	Vial 55	1	Sample	17	2.28107e5	7.767	5.00000
*	1918705003 MSD	Vial 56	1	Sample	18	2.81563e5	7.755	5.00000
*	1918705004	Vial 57	1	Sample	19	2.40535e5	7.689	5.00000
*	1918705005	Vial 58	1	Sample	20	1.96905e5	7.258	5.00000
*	1918705006	Vial 59	1	Sample	21	1.63865e5	7.481	5.00000
*	1918705007 10X	Vial 60	1	Sample	22	2.90576e5	8.248	50.00000
*	1918705008	Vial 61	1	Sample	23	2.37165e5	7.528	5.00000
*	1918705009 MS	Vial 62	1	Sample	24	2.14999e5	7.533	5.00000
*	1918705010 MSD	Vial 63	1	Sample	25	2.33099e5	7.524	5.00000
*	663036 CCV@25	Vial 71	1	Control	26	2.23151e5	8.308	5.00000
*	1918871001	Vial 64	1	Sample	27	2.17462e5	7.475	5.00000
*	1918871002	Vial 65	1	Sample	28	2.52228e5	7.881	5.00000
*	1918871003	Vial 66	1	Sample	29	2.97108e5	7.854	5.00000
*	1918871004	Vial 67	1	Sample	30	2.73039e5	7.829	5.00000
*	663037 CCV@25	Vial 71	1	Control	31	2.31231e5	8.296	5.00000

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\11JUL19D.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	663030	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 41	663034	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 42	663032	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 43	663033	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 44	1918528001		CLO4-AQN	1	Sample		
6	Vial 45	1918528002		CLO4-AQN	1	Sample		
7	Vial 46	1918528003		CLO4-AQN	1	Sample		
8	Vial 47	1918528004		CLO4-AQN	1	Sample		
9	Vial 48	1918528005		CLO4-AQN	1	Sample		
10	Vial 49	1918528006		CLO4-AQN	1	Sample		
11	Vial 50	1918528007		CLO4-AQN	1	Sample		
12	Vial 51	1918528008		CLO4-AQN	1	Sample		
13	Vial 52	1918528009		CLO4-AQN	1	Sample		
14	Vial 53	1918528010	100	CLO4-AQN	1	Sample		
15	Vial 71	663035	CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 54	1918705001		CLO4-AQN	1	Sample		
17	Vial 55	1918705002	MS	CLO4-AQN	1	Sample		
18	Vial 56	1918705003	MSD	CLO4-AQN	1	Sample		
19	Vial 57	1918705004		CLO4-AQN	1	Sample		
20	Vial 58	1918705005		CLO4-AQN	1	Sample		
21	Vial 59	1918705006		CLO4-AQN	1	Sample		
22	Vial 60	1918705007	10X	CLO4-AQN	1	Sample		
23	Vial 61	1918705008		CLO4-AQN	1	Sample		
24	Vial 62	1918705009	MS	CLO4-AQN	1	Sample		
25	Vial 63	1918705010	MSD	CLO4-AQN	1	Sample		
26	Vial 71	663036	CCV@25	CLO4-AQN	1	Ctrl Samp		
27	Vial 64	1918871001		CLO4-AQN	1	Sample		
28	Vial 65	1918871002		CLO4-AQN	1	Sample		
29	Vial 66	1918871003		CLO4-AQN	1	Sample		
30	Vial 67	1918871004		CLO4-AQN	1	Sample		
31	Vial 71	663037	CCV@25	CLO4-AQN	1	Ctrl Samp		

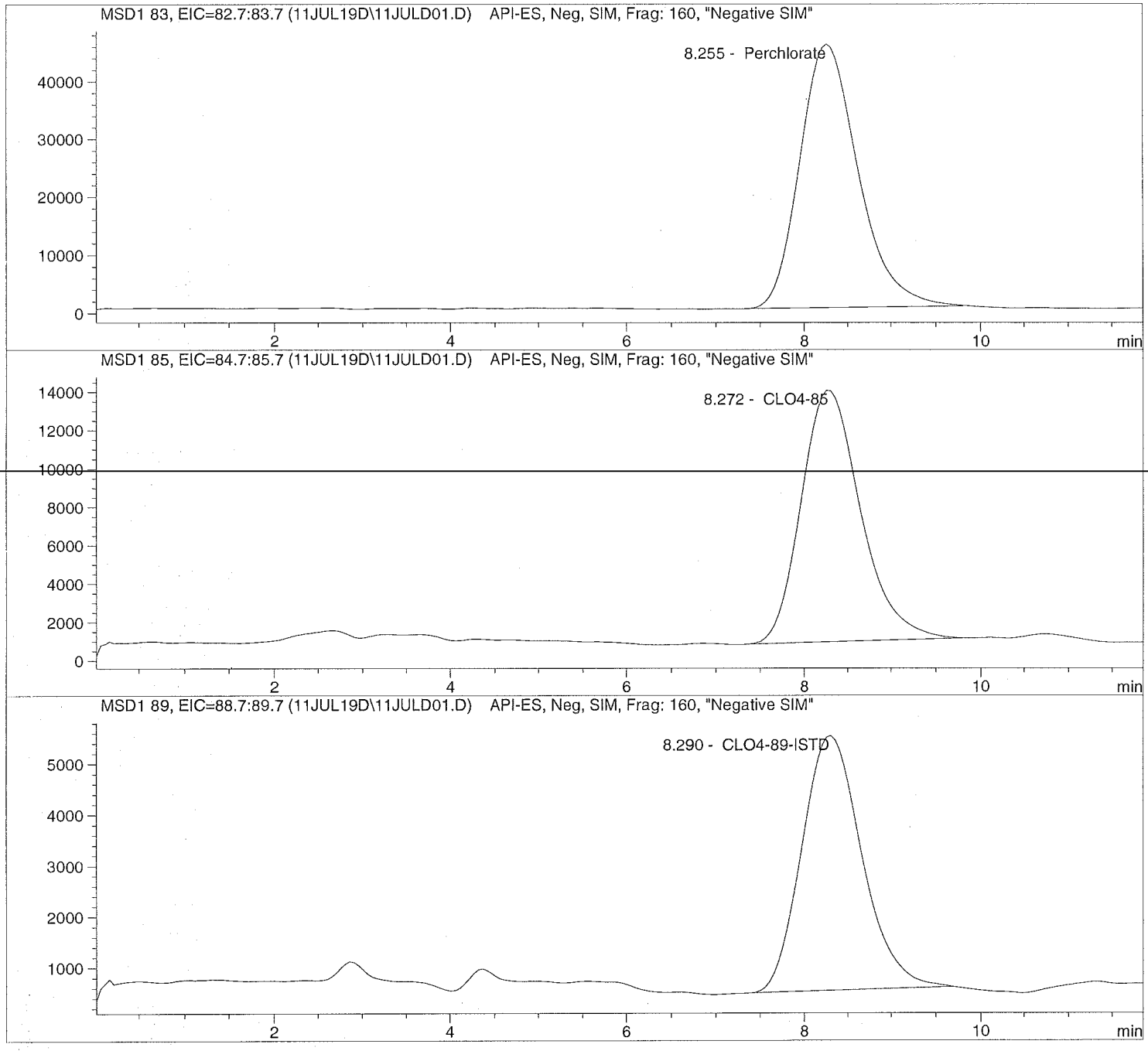
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD01.D Sample Name: 663030 CCV@25

Injection Date:	7/11/2019 11:12:20	Seq Line:	1
Sample Name:	663030 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD01.D Sample Name: 663030 CCV@25

Injection Date:	7/11/2019 11:12:20	Seq Line:	1
Sample Name:	663030 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.255	PBA	2118713.0	26.6764	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.272	PBA	624075.3	26.4942	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.290	PBA	240676.4	5.0000	CLO4-89-ISTD

*** End of Report ***

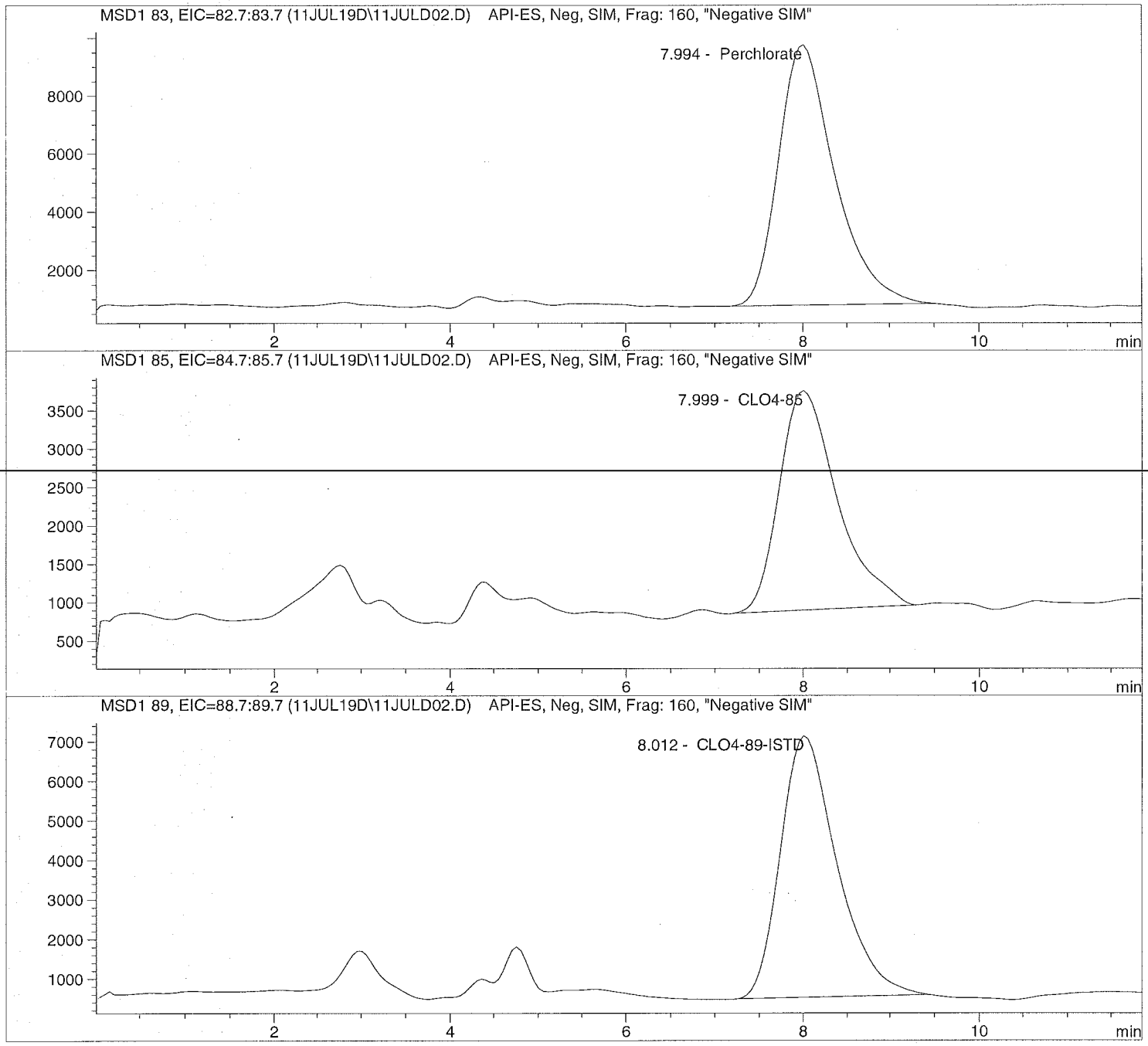
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD02.D Sample Name: 663034 QC@4.0

Injection Date:	7/11/2019 11:26:05	Seq Line:	2
Sample Name:	663034 QC@4.0	Location:	Vial 41
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD02.D Sample Name: 663034 QC@4.0

Injection Date:	7/11/2019 11:26:05	Seq Line:	2
Sample Name:	663034 QC@4.0	Location:	Vial 41
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.994	PBA	399419.3	4.4077	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.999	PBA	131479.8	4.7322	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.012	PBA	297197.6	5.0000	CLO4-89-ISTD

*** End of Report ***

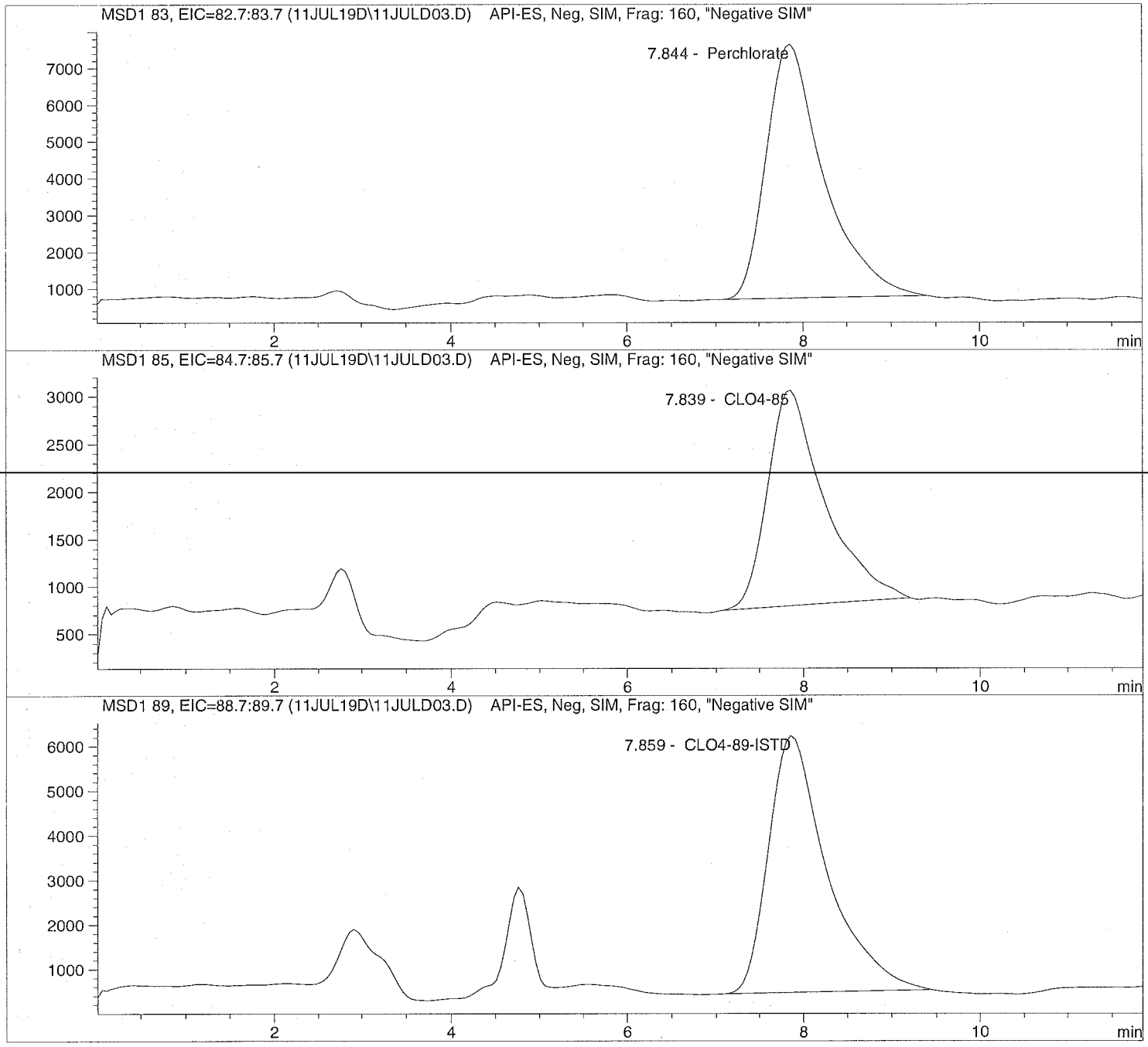
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD03.D Sample Name: 663032 ICS@4.0

Injection Date:	7/11/2019 11:39:52	Seq Line:	3
Sample Name:	663032 ICS@4.0	Location:	Vial 42
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD03.D Sample Name: 663032 ICS@4.0

Injection Date:	7/11/2019 11:39:52	Seq Line:	3
Sample Name:	663032 ICS@4.0	Location:	Vial 42
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.844	PBA	313184.6	3.8934	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.839	PBA	102078.9	4.1187	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.859	PBA	265421.4	5.0000	CLO4-89-ISTD

*** End of Report ***

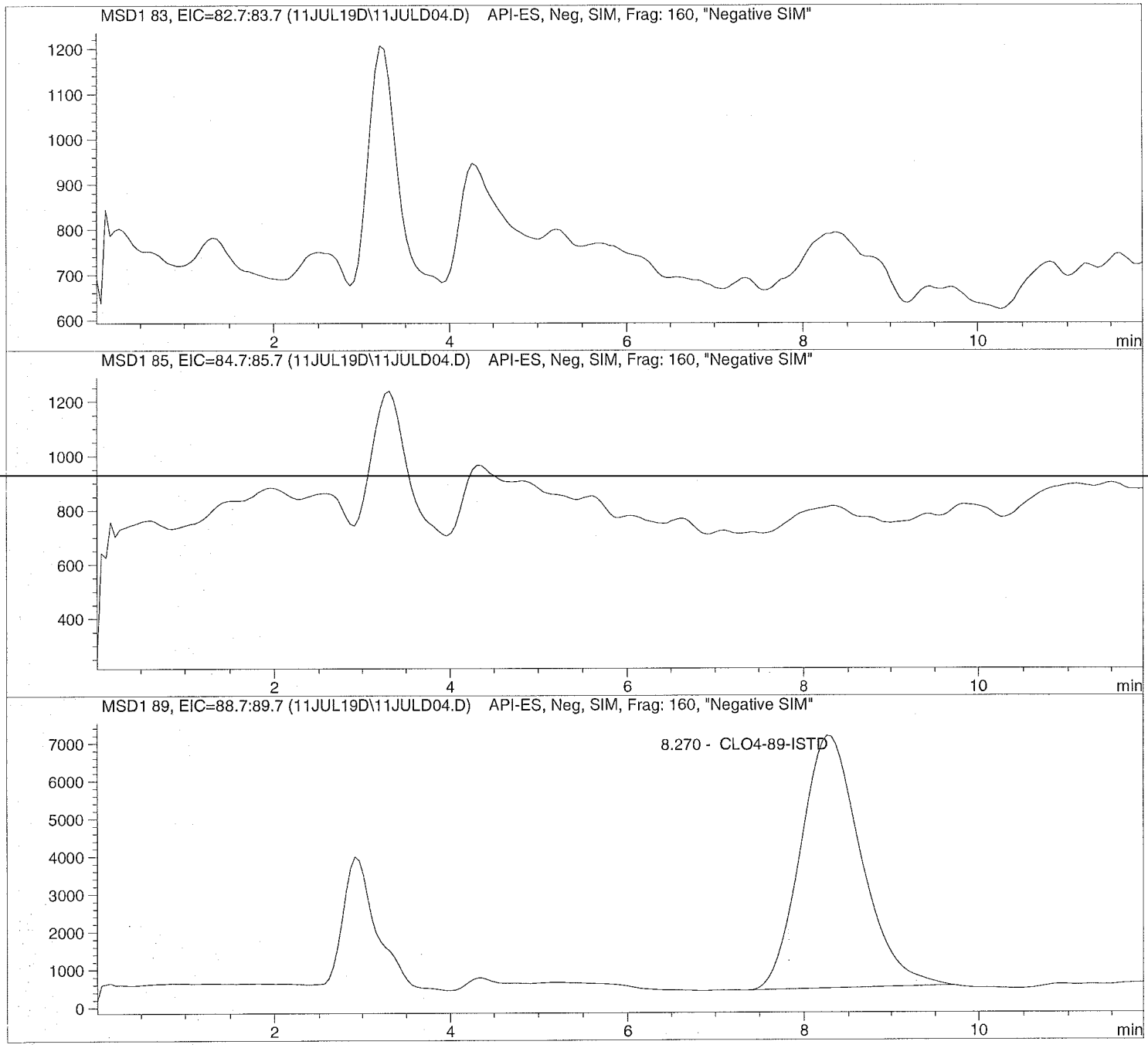
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD04.D Sample Name: 663033 LMB

Injection Date:	7/11/2019 11:53:41	Seq Line:	4
Sample Name:	663033 LMB	Location:	Vial 43
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD04.D Sample Name: 663033 LMB

Injection Date:	7/11/2019 11:53:41	Seq Line:	4
Sample Name:	663033 LMB	Location:	Vial 43
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.270	PBA	318342.8	5.0000	CLO4-89-ISTD

*** End of Report ***

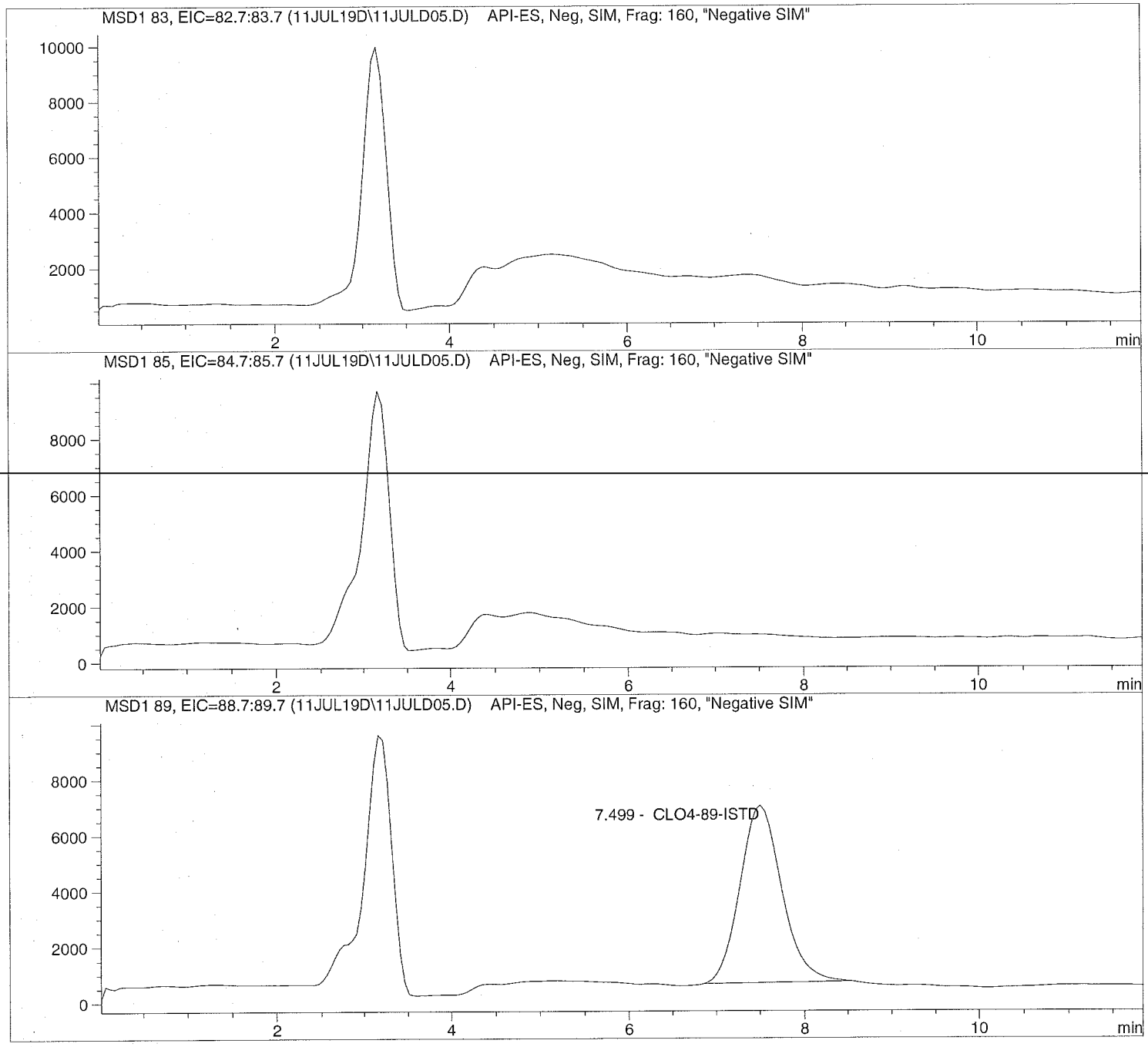
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD05.D Sample Name: 1918528001

Injection Date:	7/11/2019 12:07:26	Seq Line:	5
Sample Name:	1918528001	Location:	Vial 44
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD05.D Sample Name: 1918528001

Injection Date:	7/11/2019 12:07:26	Seq Line:	5
Sample Name:	1918528001	Location:	Vial 44
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.499	PBA	209428.4	5.0000	CLO4-89-ISTD

*** End of Report ***

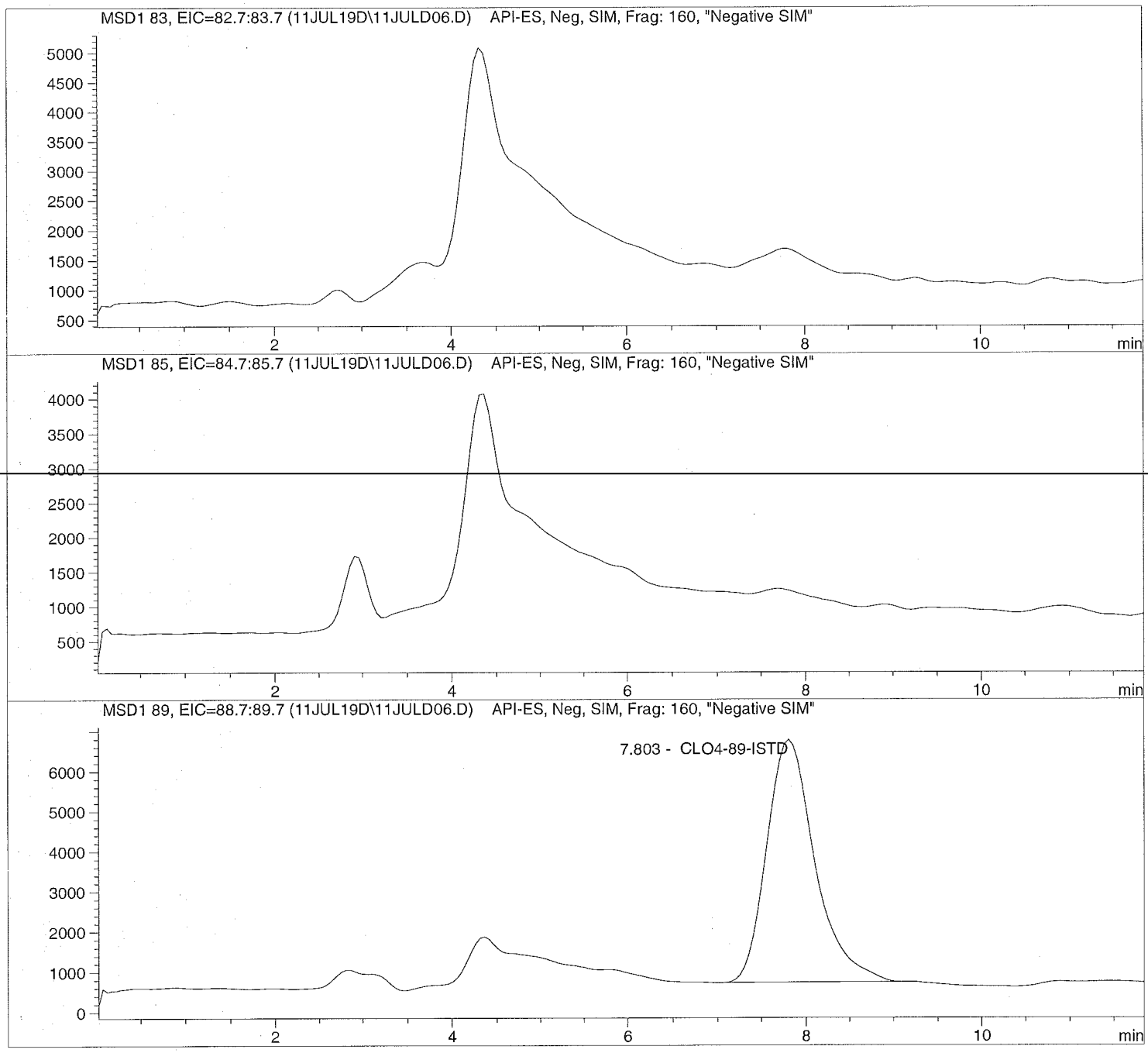
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD06.D Sample Name: 1918528002

Injection Date:	7/11/2019 12:21:11	Seq Line:	6
Sample Name:	1918528002	Location:	Vial 45
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD06.D Sample Name: 1918528002

Injection Date:	7/11/2019 12:21:11	Seq Line:	6
Sample Name:	1918528002	Location:	Vial 45
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.803	PBA	227591.6	5.0000	CLO4-89-ISTD

*** End of Report ***

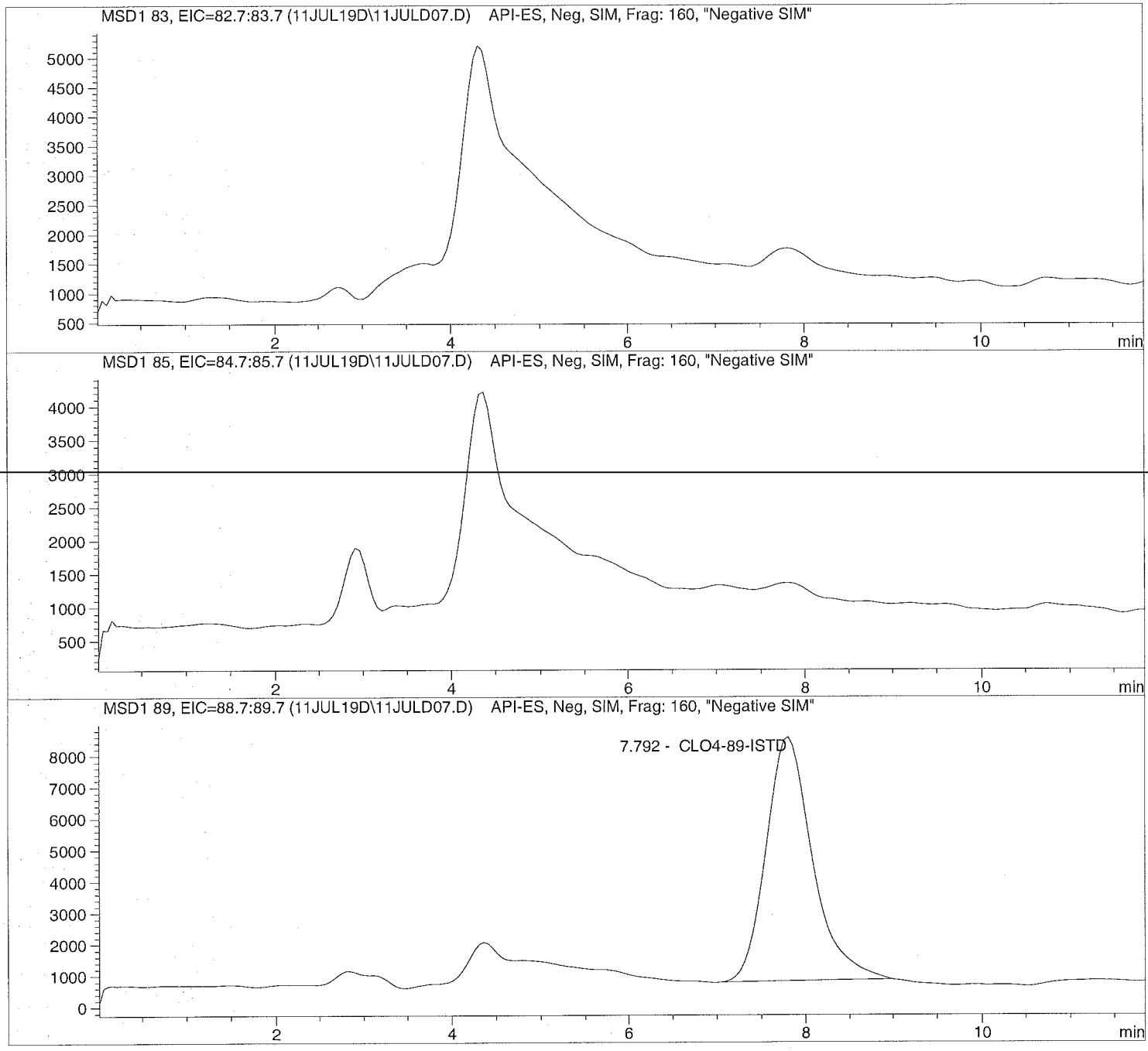
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD07.D Sample Name: 1918528003

Injection Date:	7/11/2019 12:34:58	Seq Line:	7
Sample Name:	1918528003	Location:	Vial 46
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD07.D Sample Name: 1918528003

Injection Date:	7/11/2019 12:34:58	Seq Line:	7
Sample Name:	1918528003	Location:	Vial 46
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.792	PBA	283804.7	5.0000	CLO4-89-ISTD

*** End of Report ***

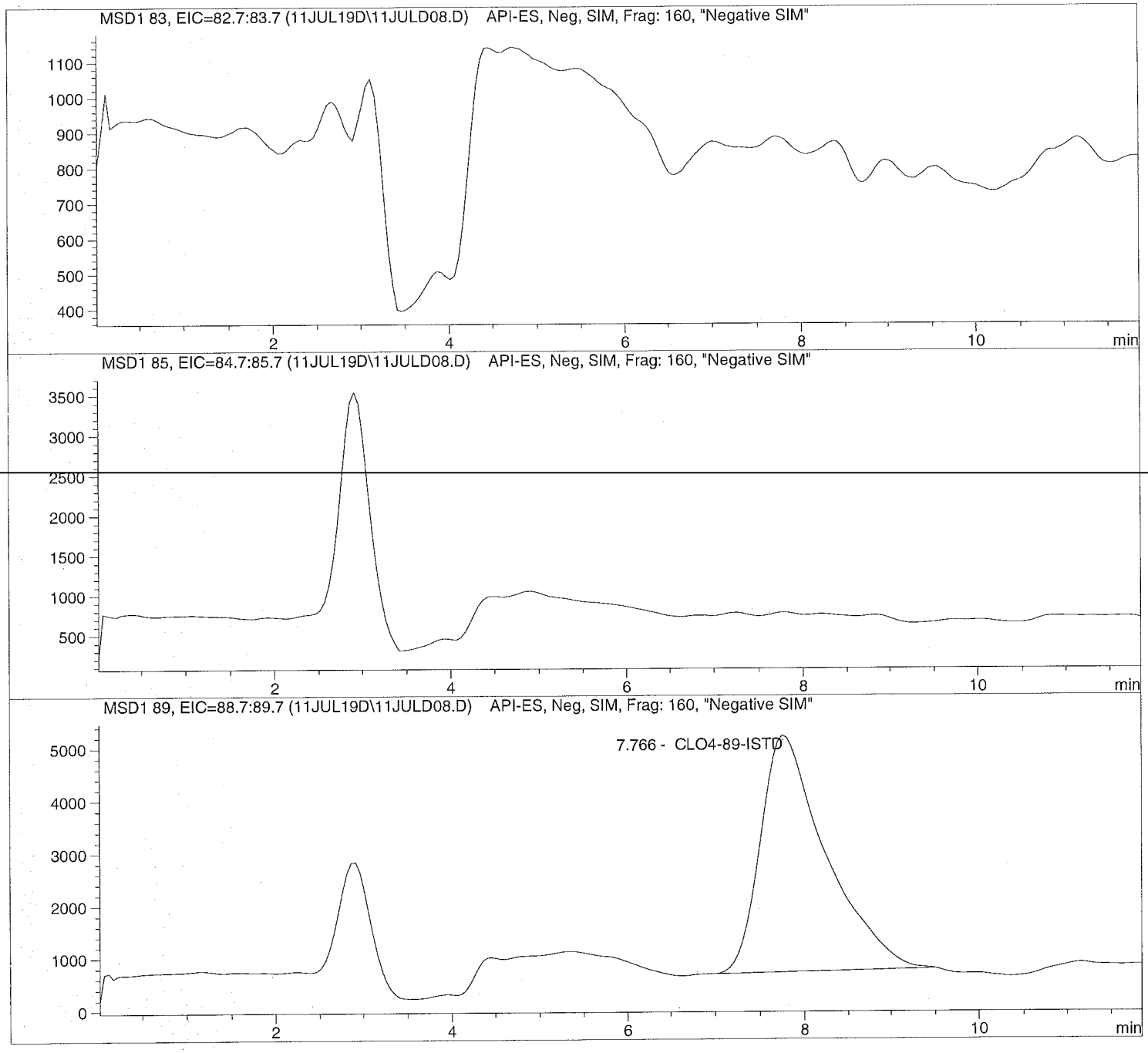
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD08.D Sample Name: 1918528004

Injection Date:	7/11/2019 12:48:44	Seq Line:	8
Sample Name:	1918528004	Location:	Vial 47
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD08.D Sample Name: 1918528004

Injection Date:	7/11/2019 12:48:44	Seq Line:	8
Sample Name:	1918528004	Location:	Vial 47
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.766	PBA	231743.6	5.0000	CLO4-89-ISTD

*** End of Report ***

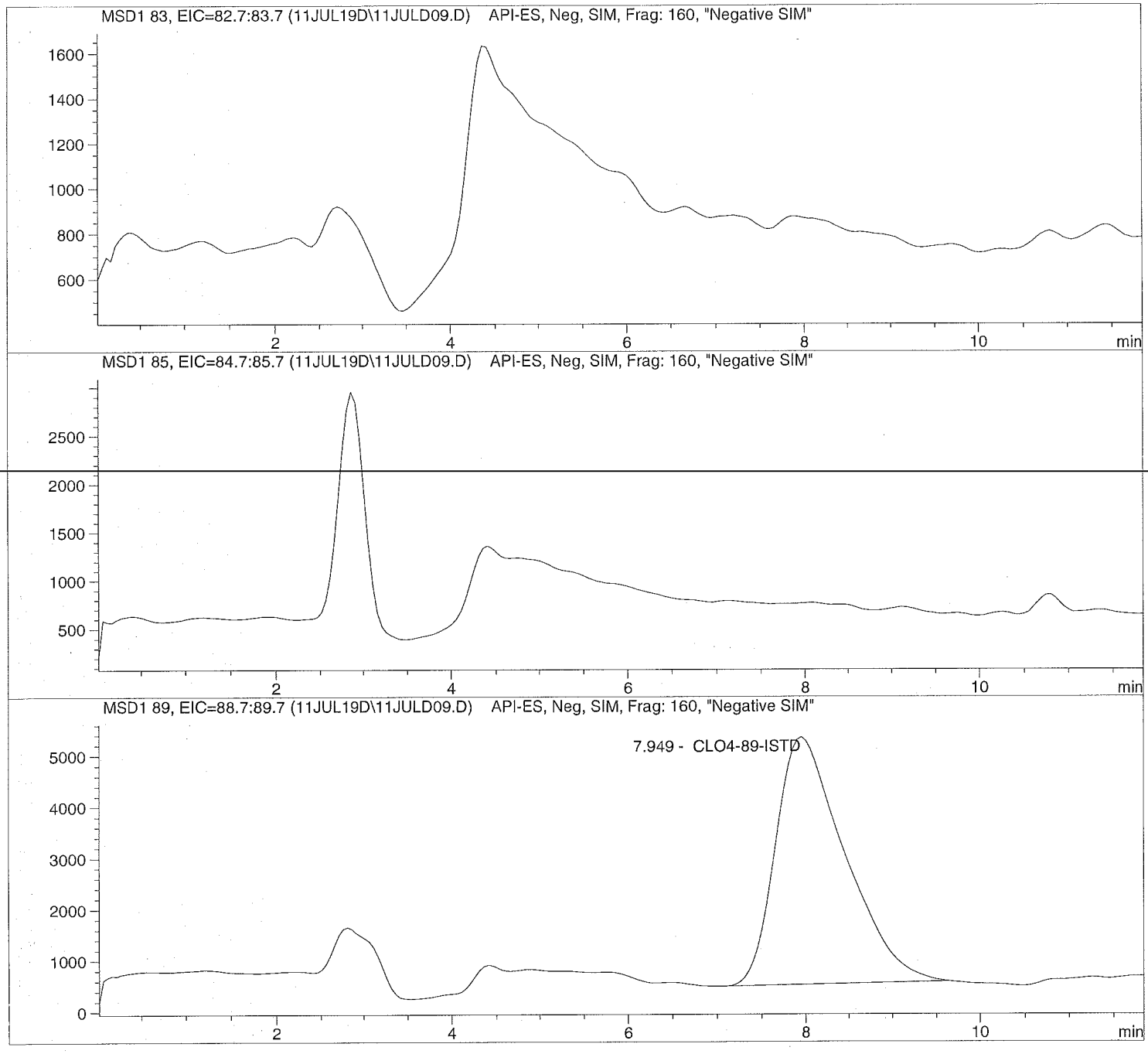
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD09.D Sample Name: 1918528005

Injection Date:	7/11/2019 13:02:32	Seq Line:	9
Sample Name:	1918528005	Location:	Vial 48
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD09.D Sample Name: 1918528005

Injection Date:	7/11/2019 13:02:32	Seq Line:	9
Sample Name:	1918528005	Location:	Vial 48
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.949	PBA	265464.7	5.0000	CLO4-89-ISTD

*** End of Report ***

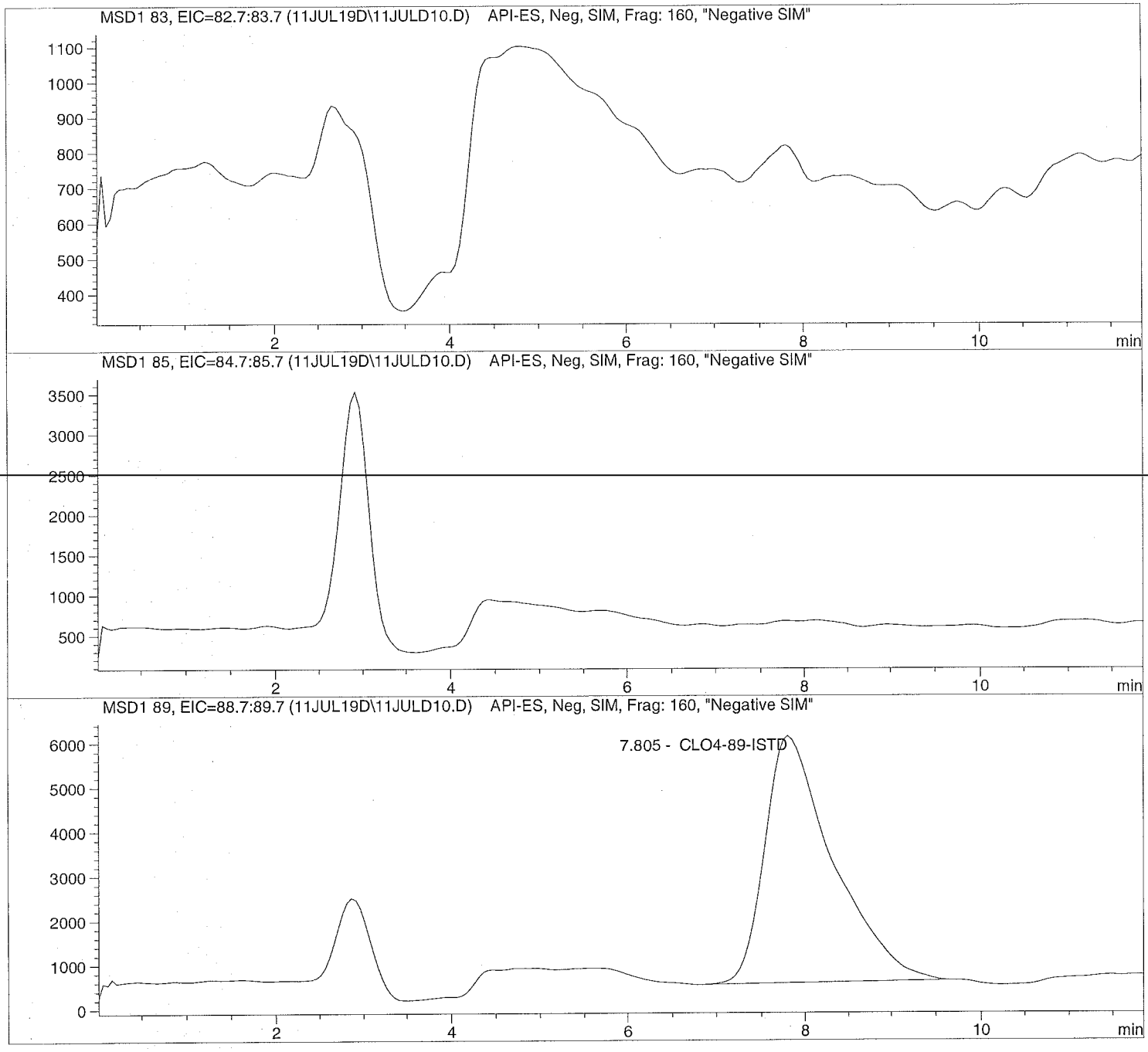
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD10.D Sample Name: 1918528006

Injection Date:	7/11/2019 13:16:18	Seq Line:	10
Sample Name:	1918528006	Location:	Vial 49
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD10.D Sample Name: 1918528006

Injection Date:	7/11/2019 13:16:18	Seq Line:	10
Sample Name:	1918528006	Location:	Vial 49
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	302483.2	5.0000	CLO4-89-ISTD

*** End of Report ***

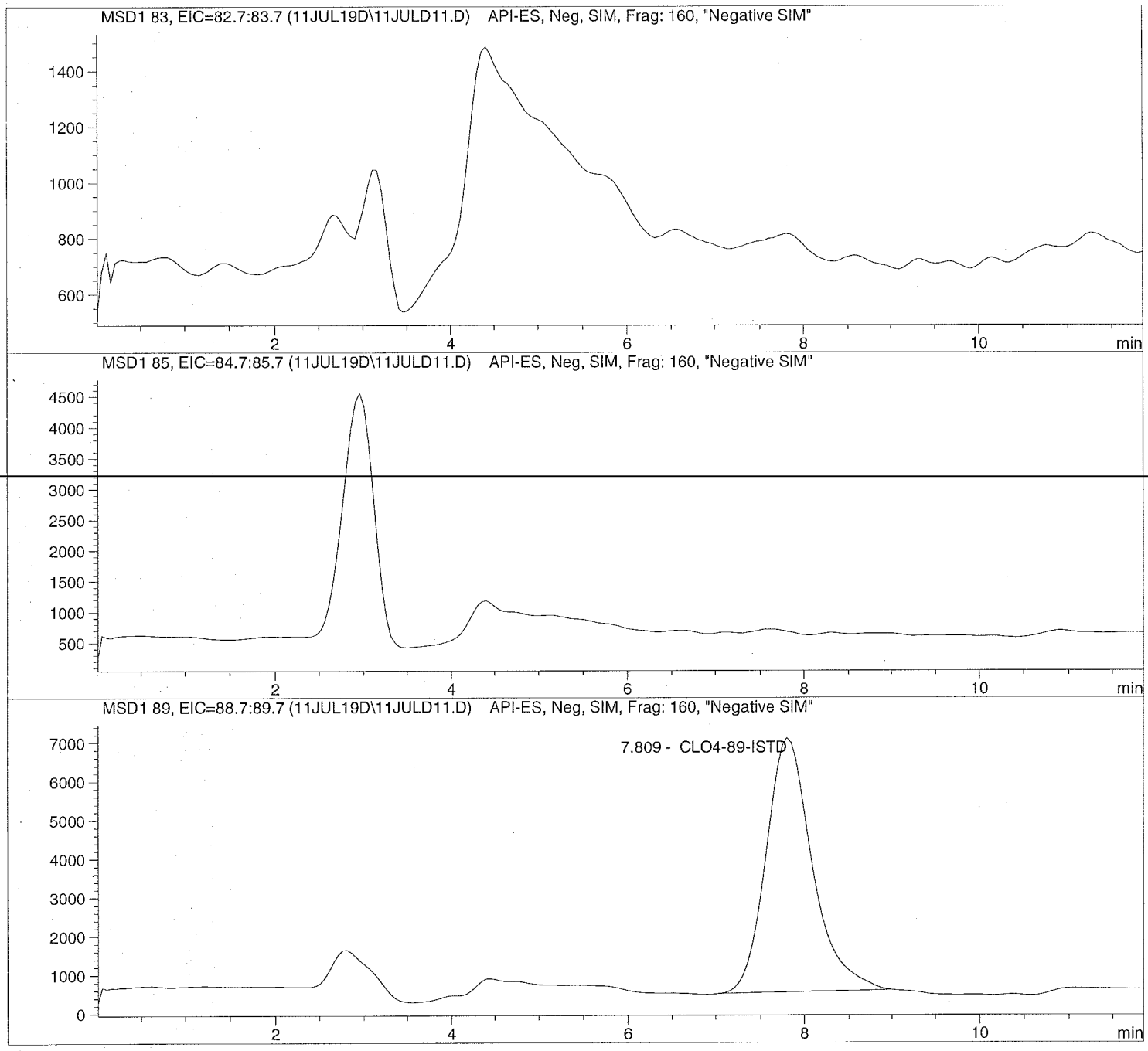
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD11.D Sample Name: 1918528007

Injection Date:	7/11/2019 13:30:12	Seq Line:	11
Sample Name:	1918528007	Location:	Vial 50
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD11.D Sample Name: 1918528007

Injection Date:	7/11/2019 13:30:12	Seq Line:	11
Sample Name:	1918528007	Location:	Vial 50
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.809	PBA	239369.6	5.0000	CLO4-89-ISTD

*** End of Report ***

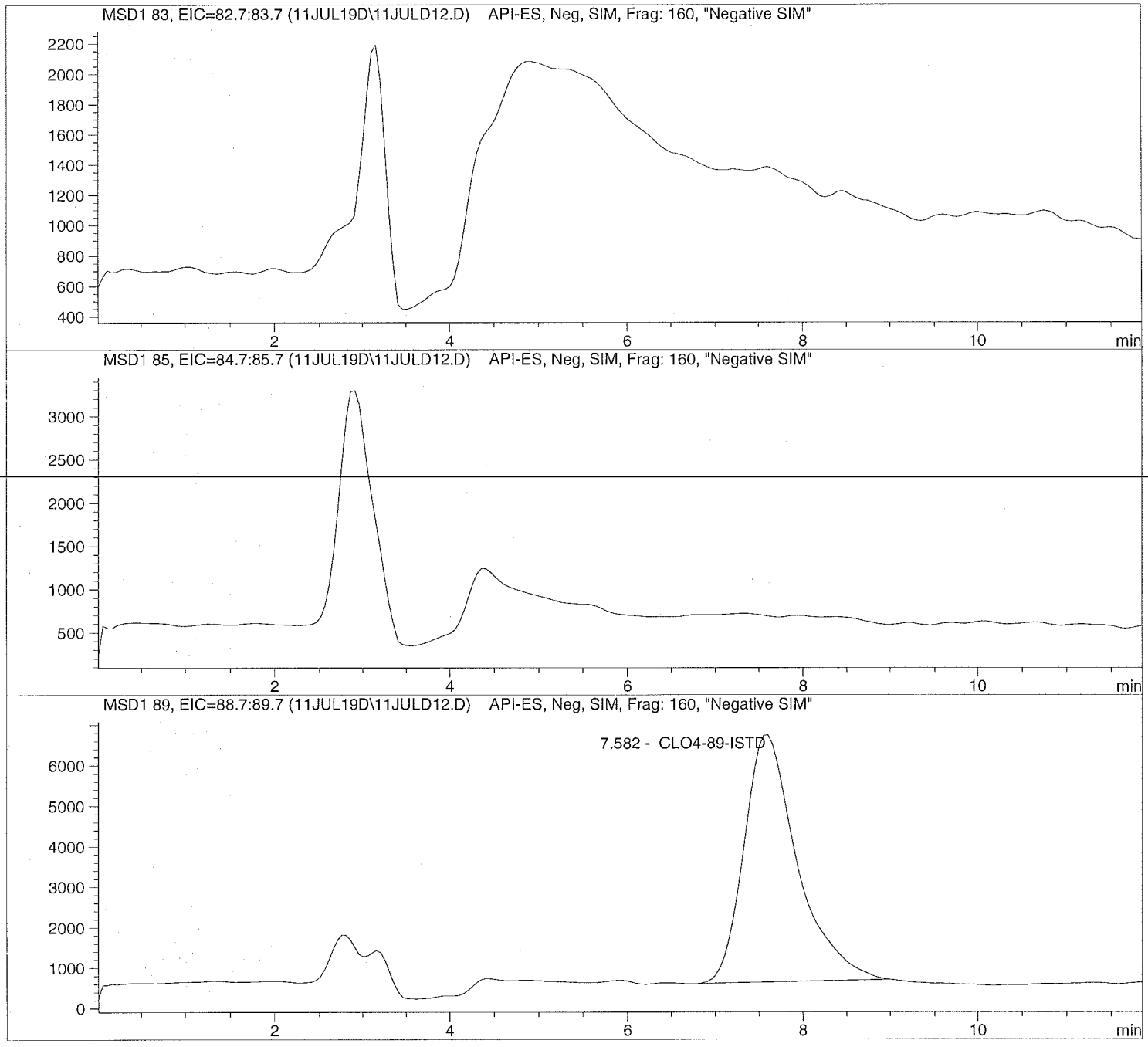
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD12.D Sample Name: 1918528008

Injection Date:	7/11/2019 13:43:59	Seq Line:	12
Sample Name:	1918528008	Location:	Vial 51
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD12.D Sample Name: 1918528008

Injection Date:	7/11/2019 13:43:59	Seq Line:	12
Sample Name:	1918528008	Location:	Vial 51
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.582	PBA	257536.2	5.0000	CLO4-89-ISTD

*** End of Report ***

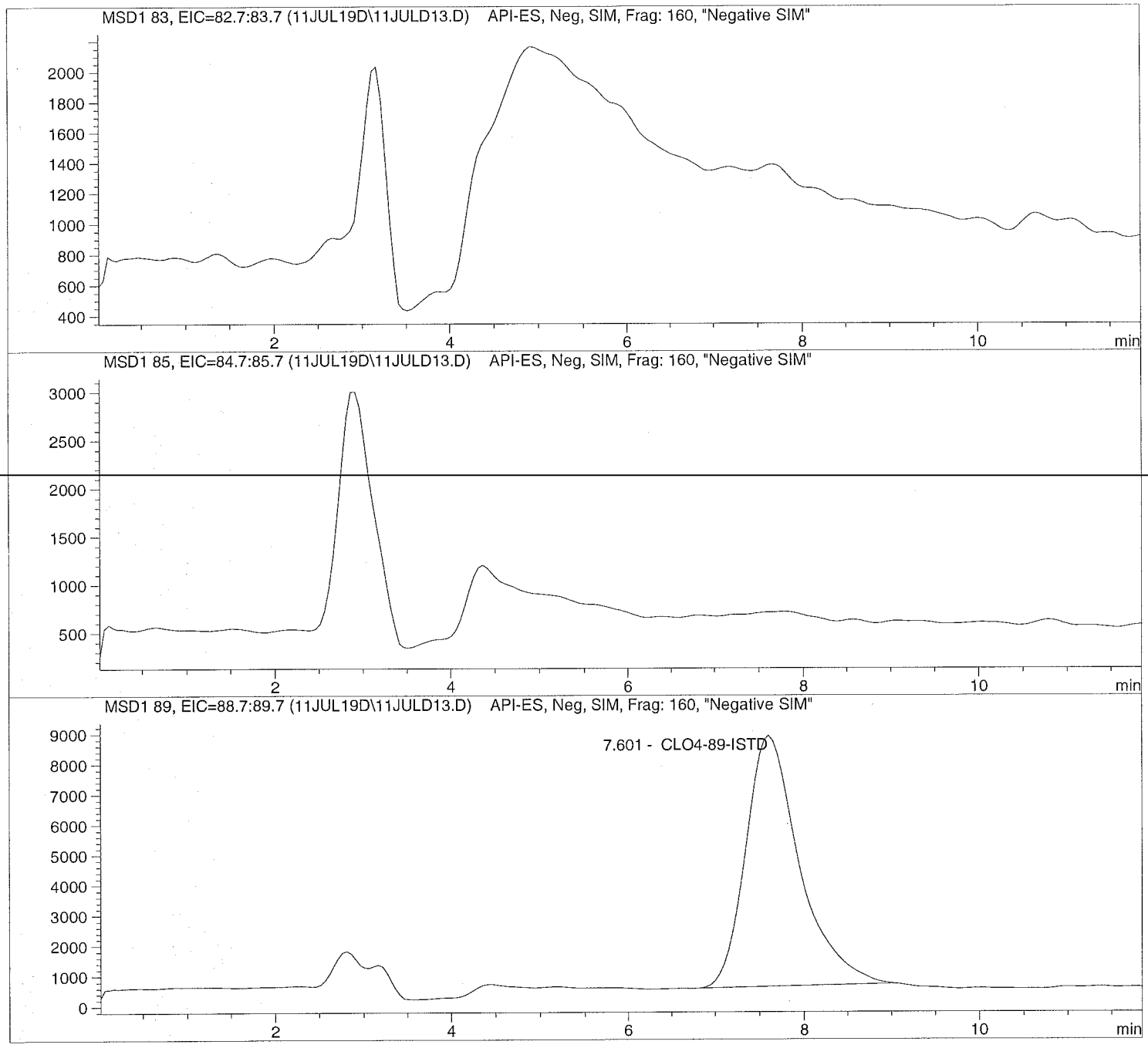
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD13.D Sample Name: 1918528009

Injection Date:	7/11/2019 13:57:45	Seq Line:	13
Sample Name:	1918528009	Location:	Vial 52
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD13.D Sample Name: 1918528009

Injection Date:	7/11/2019 13:57:45	Seq Line:	13
Sample Name:	1918528009	Location:	Vial 52
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.601	PBA	347244.5	5.0000	CLO4-89-ISTD

*** End of Report ***

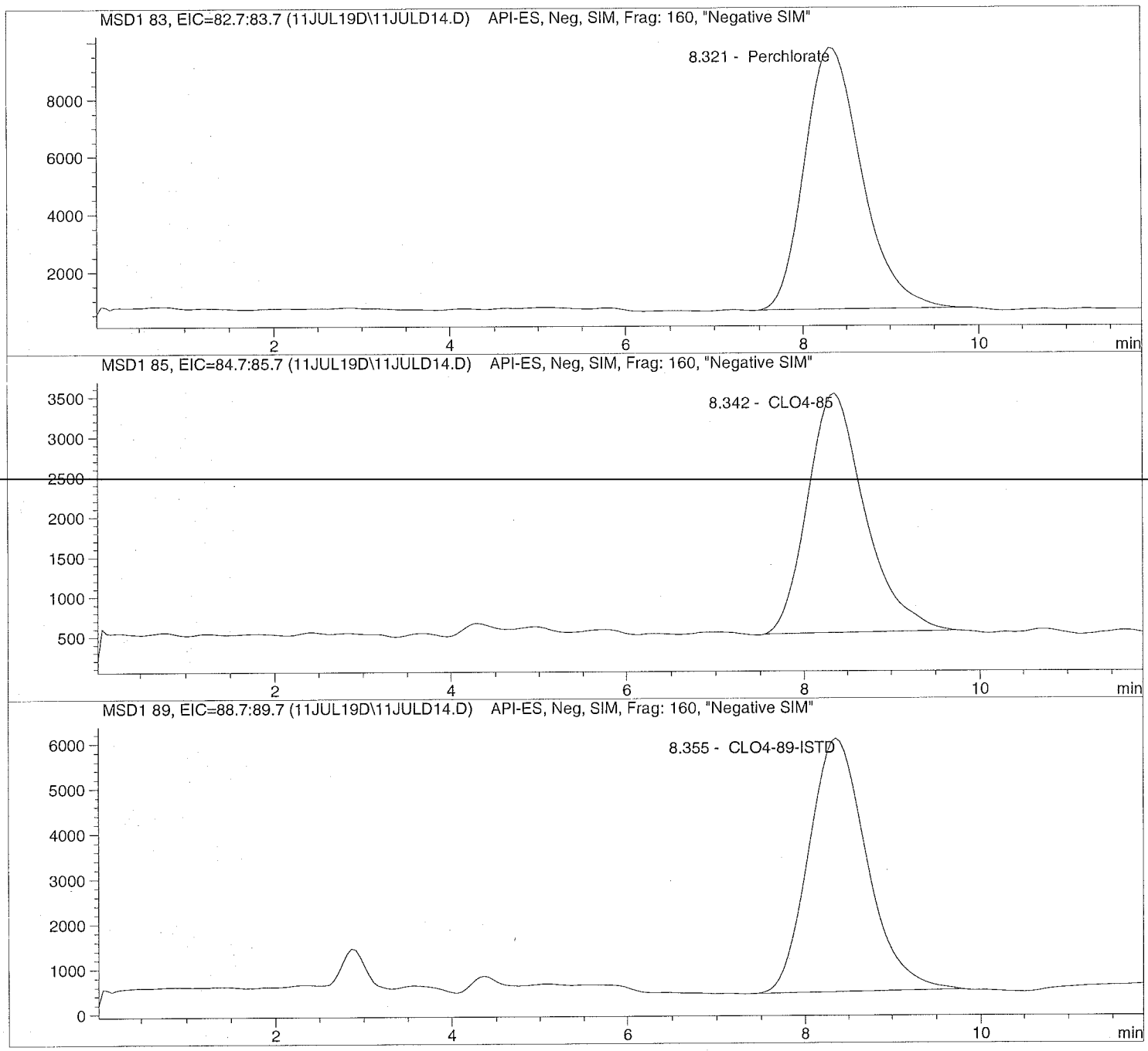
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD14.D Sample Name: 1918528010 100

Injection Date:	7/11/2019 14:11:32	Seq Line:	14
Sample Name:	1918528010 100	Location:	Vial 53
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD14.D Sample Name: 1918528010 100

Injection Date:	7/11/2019 14:11:32	Seq Line:	14
Sample Name:	1918528010 100	Location:	Vial 53
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 100.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.321	BBA	415809.4	518.2323	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.342	PBA	137449.3	561.7802	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.355	PBA	261248.4	500.0000	CLO4-89-ISTD

*** End of Report ***

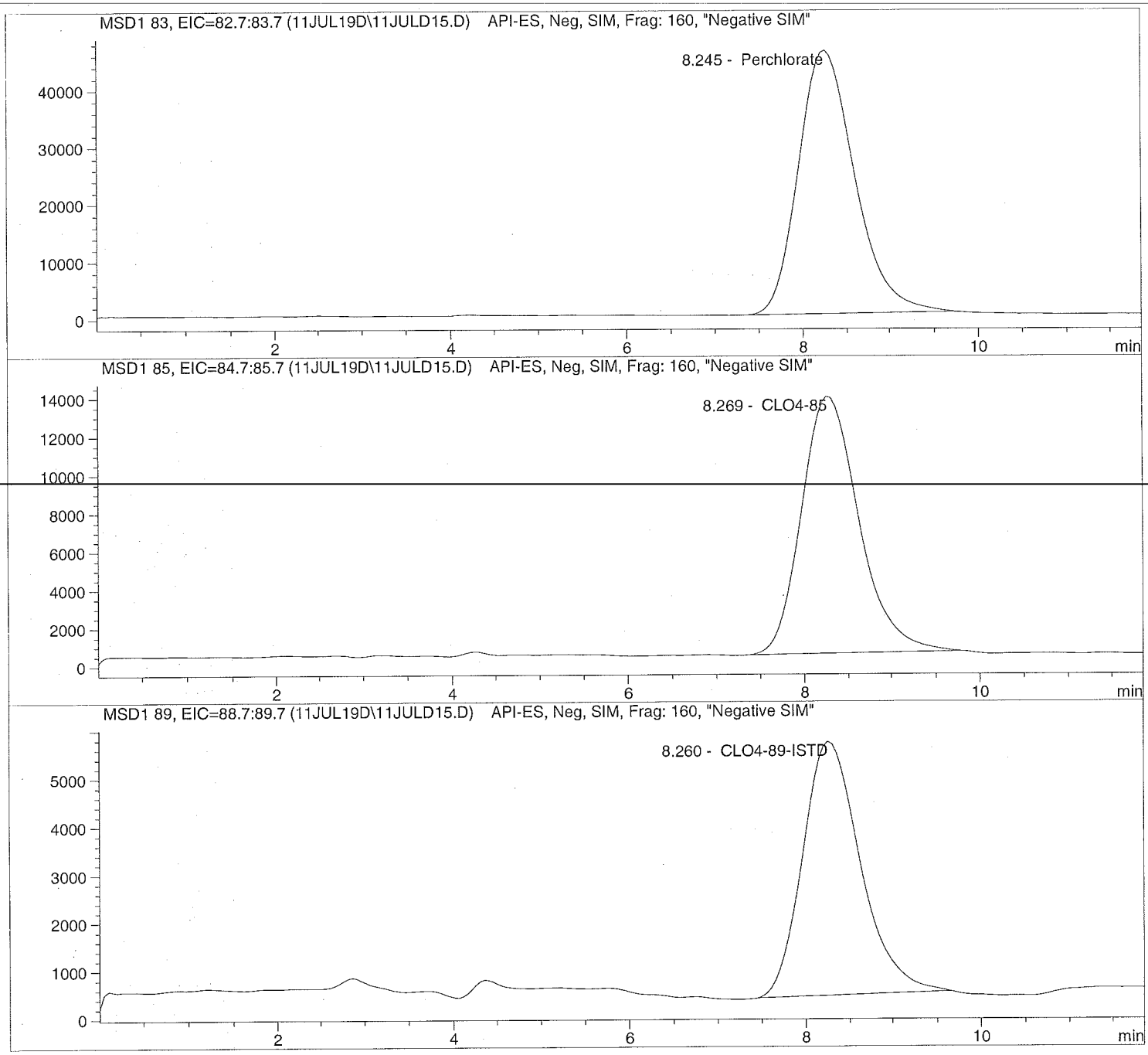
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD15.D Sample Name: 663035 CCV@25

Injection Date:	7/11/2019 14:25:24	Seq Line:	15
Sample Name:	663035 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD15.D Sample Name: 663035 CCV@25

Injection Date:	7/11/2019 14:25:24	Seq Line:	15
Sample Name:	663035 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.245	PBA	2053058.0	25.6747	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.269	PBA	614213.5	25.8714	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.260	PBA	242891.8	5.0000	CLO4-89-ISTD

*** End of Report ***

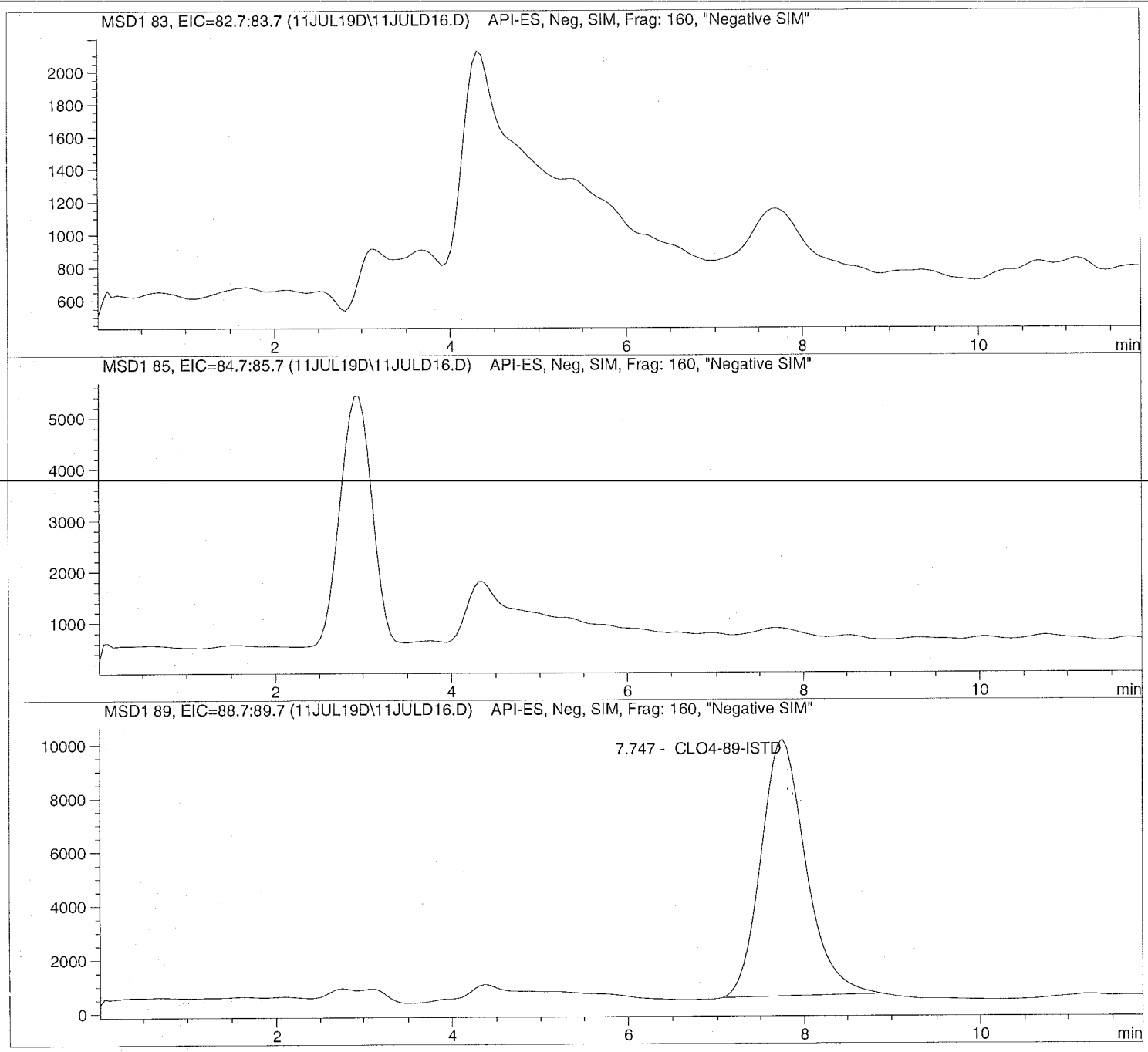
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD16.D Sample Name: 1918705001

Injection Date:	7/11/2019 14:39:13	Seq Line:	16
Sample Name:	1918705001	Location:	Vial 54
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD16.D Sample Name: 1918705001

Injection Date:	7/11/2019 14:39:13	Seq Line:	16
Sample Name:	1918705001	Location:	Vial 54
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.747	PBA	340152.4	5.0000	CLO4-89-ISTD

*** End of Report ***

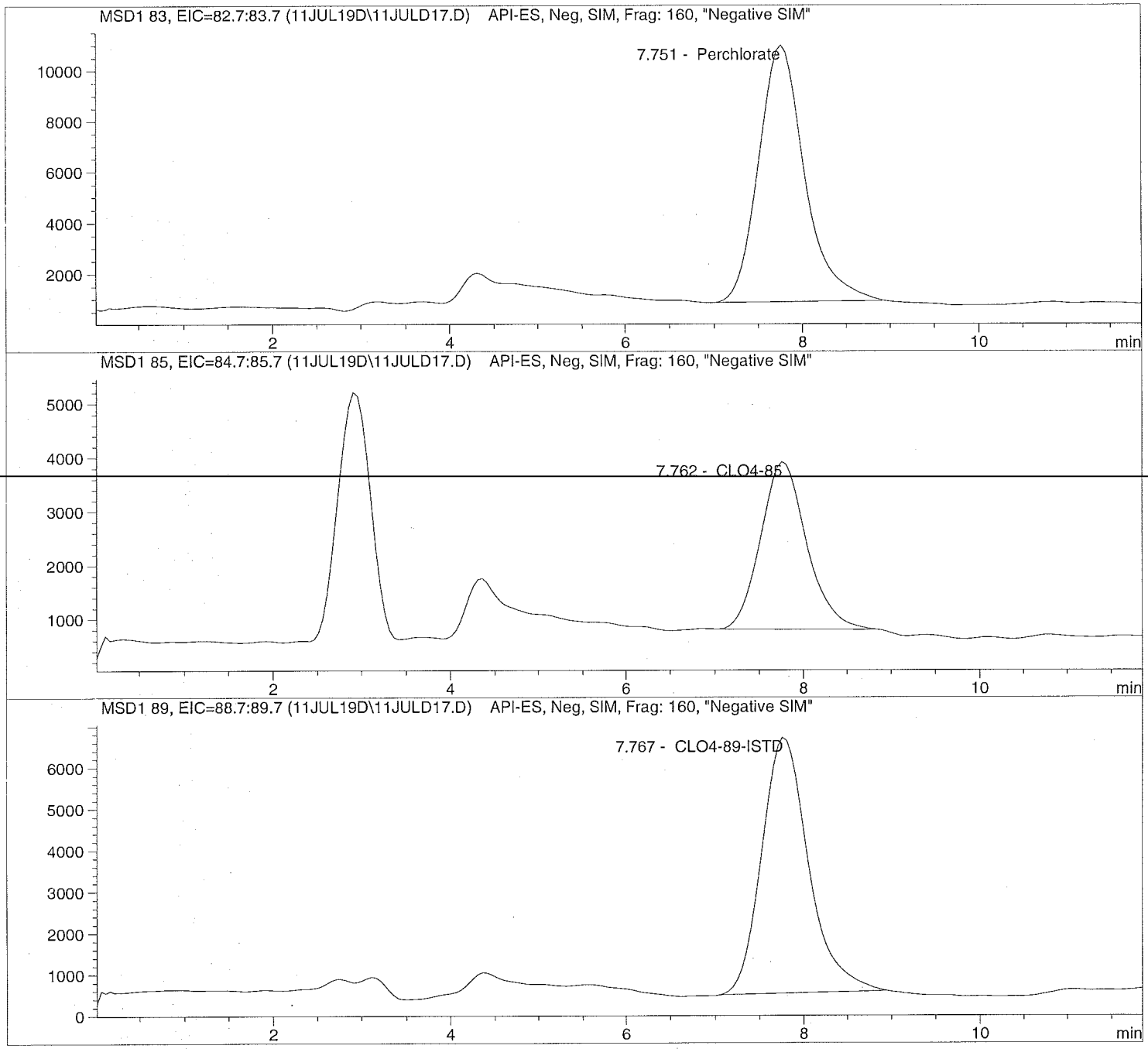
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD17.D Sample Name: 1918705002 MS

Injection Date:	7/11/2019 14:52:59	Seq Line:	17
Sample Name:	1918705002 MS	Location:	Vial 55
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD17.D Sample Name: 1918705002 MS

Injection Date:	7/11/2019 14:52:59	Seq Line:	17
Sample Name:	1918705002 MS	Location:	Vial 55
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.751	PBA	365013.6	5.2090	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.762	BBA	112800.8	5.2838	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	228107.2	5.0000	CLO4-89-ISTD

*** End of Report ***

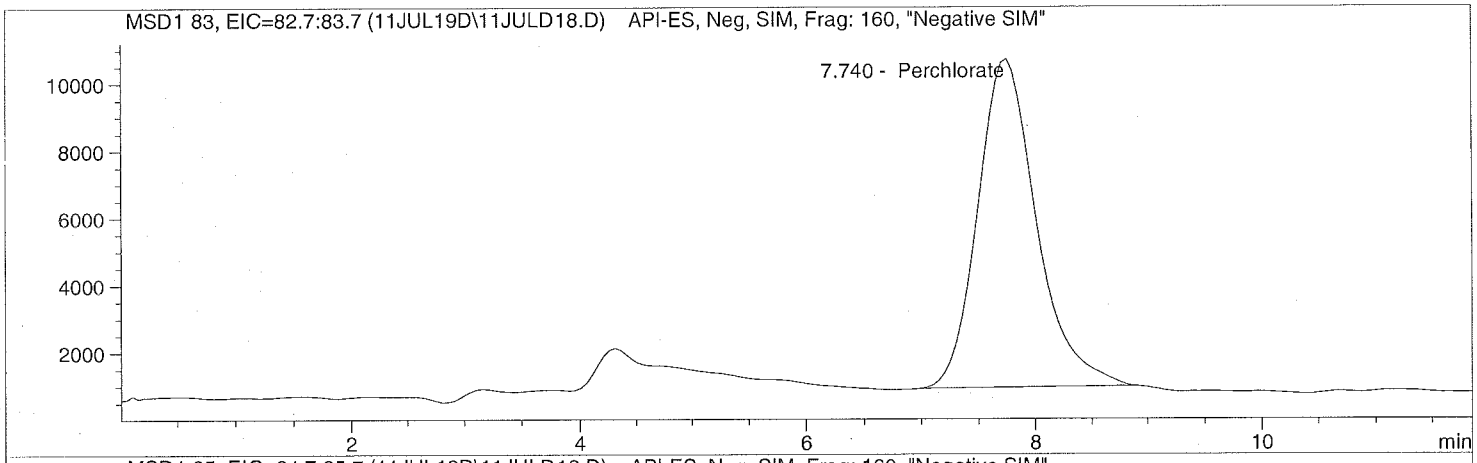
RIGHT SOLUTIONS | RIGHT PARTNER

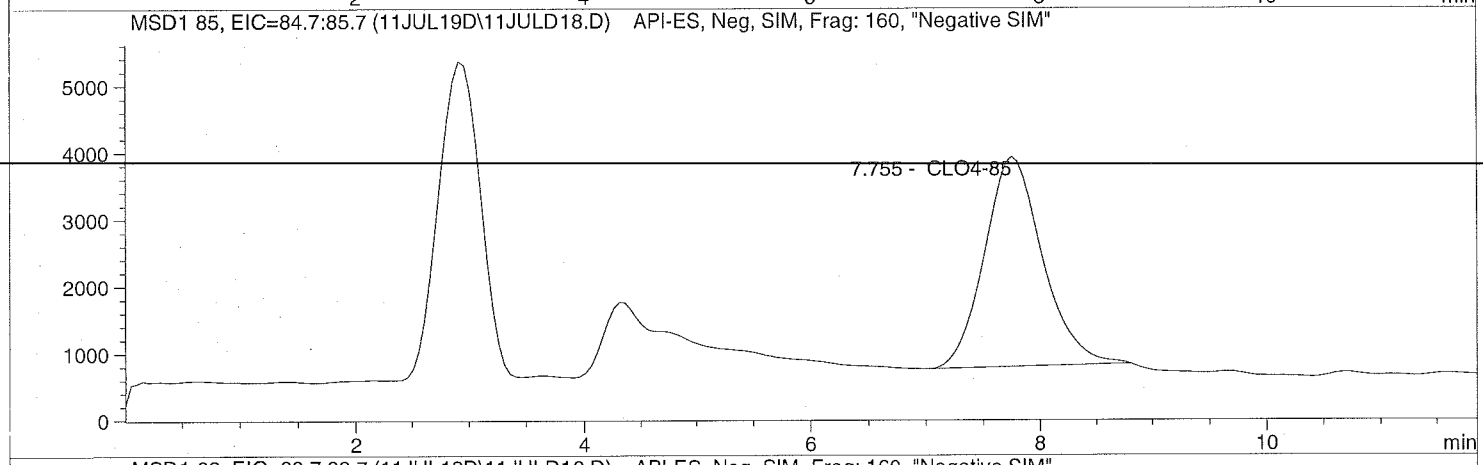
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD18.D Sample Name: 1918705003 MSD

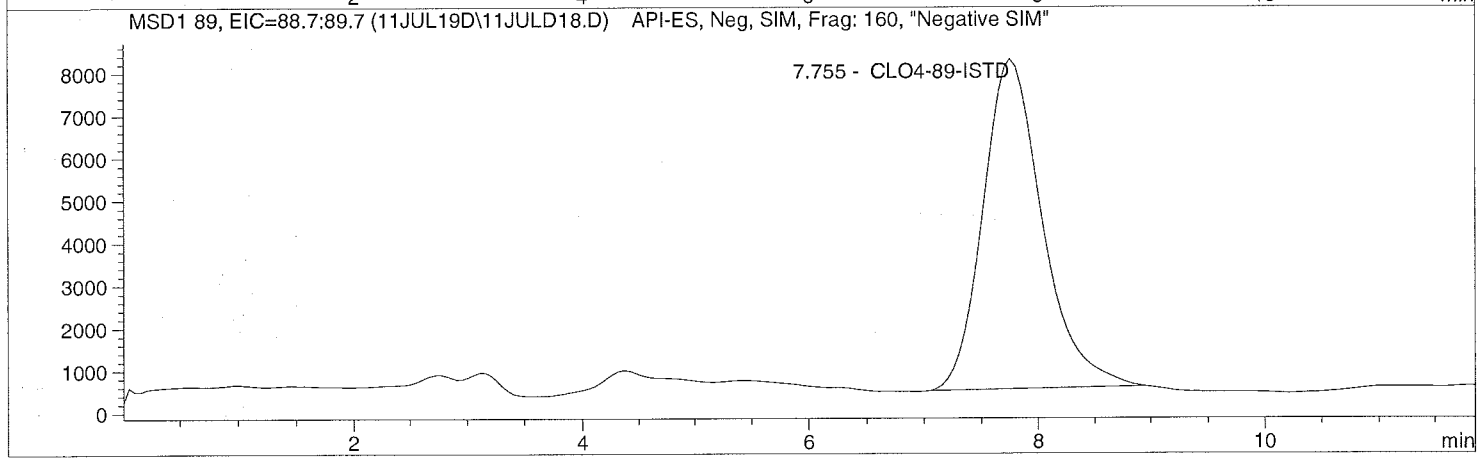
Injection Date:	7/11/2019 15:06:56	Seq Line:	18
Sample Name:	1918705003 MSD	Location:	Vial 56
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD18.D Sample Name: 1918705003 MSD

Injection Date:	7/11/2019 15:06:56	Seq Line:	18
Sample Name:	1918705003 MSD	Location:	Vial 56
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.740	PBA	350061.6	4.0921	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.755	PBA	110963.2	4.2197	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.755	PBA	281563.4	5.0000	CLO4-89-ISTD

*** End of Report ***

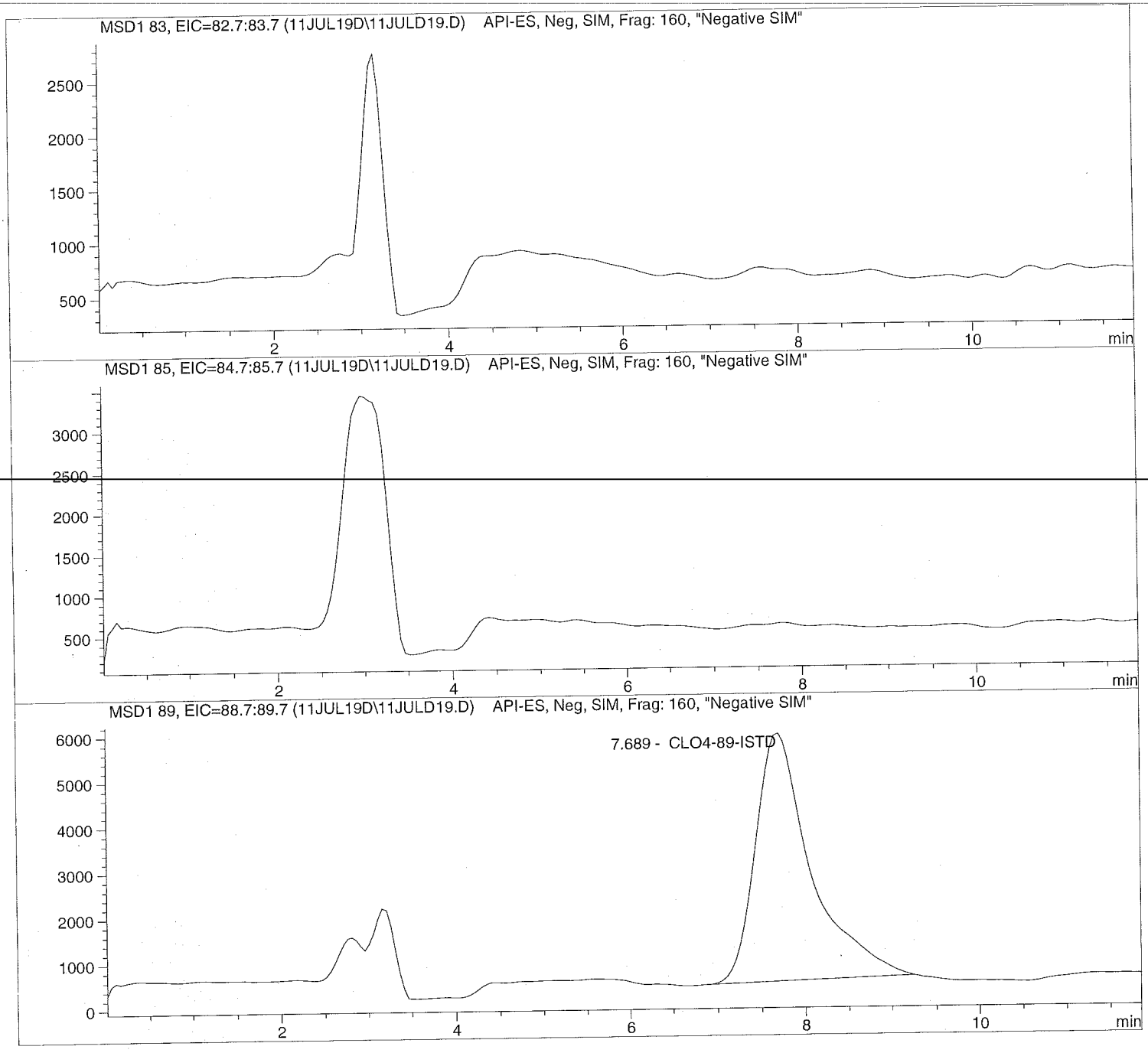
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD19.D Sample Name: 1918705004

Injection Date:	7/11/2019 15:21:50	Seq Line:	19
Sample Name:	1918705004	Location:	Vial 57
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD19.D Sample Name: 1918705004

Injection Date:	7/11/2019 15:21:50	Seq Line:	19
Sample Name:	1918705004	Location:	Vial 57
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.689	PBA	240534.6	5.0000	CLO4-89-ISTD

*** End of Report ***

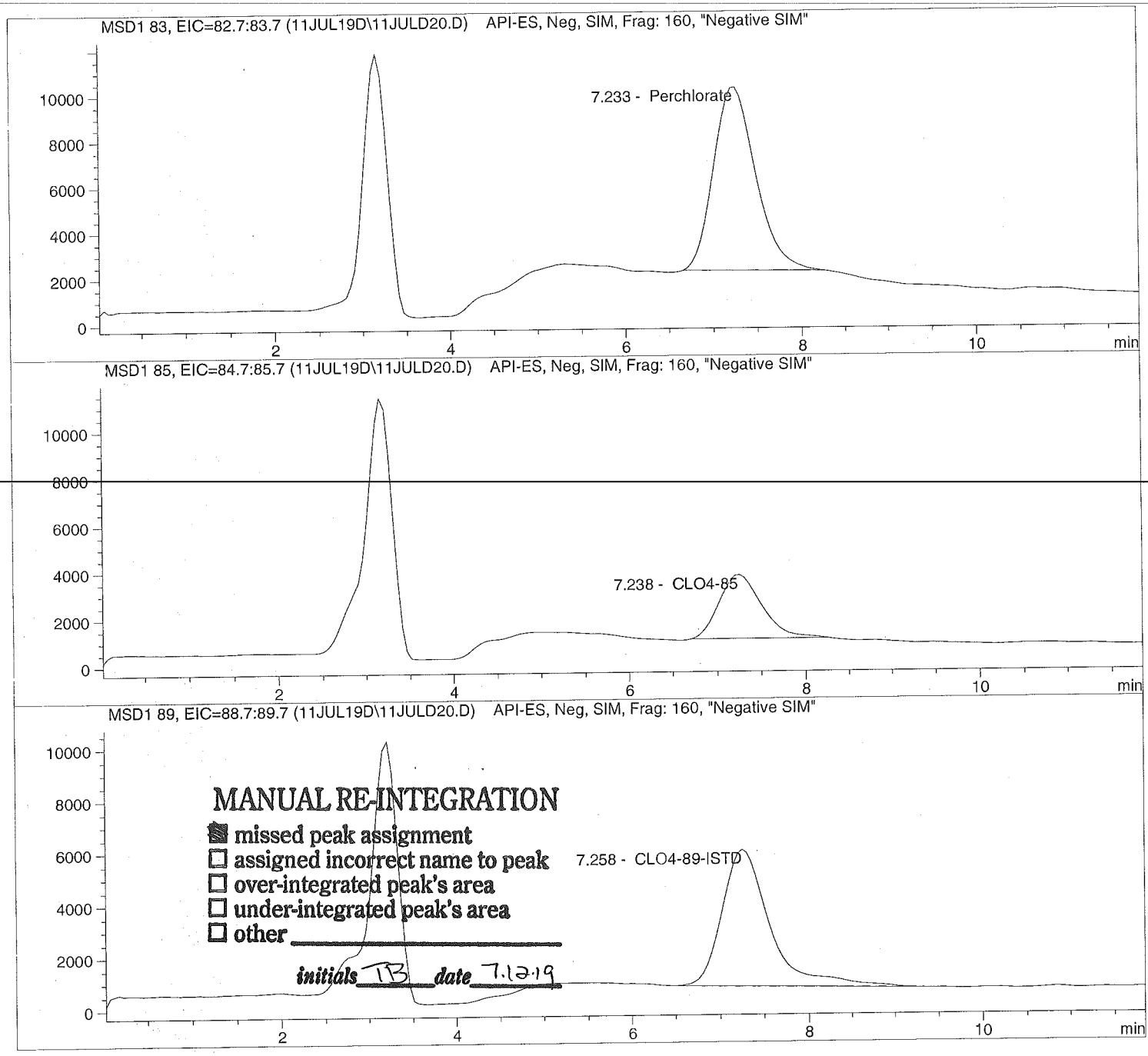
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD20.D Sample Name: 1918705005

Injection Date:	7/11/2019 15:35:52	Seq Line:	20
Sample Name:	1918705005	Location:	Vial 58
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD20.D Sample Name: 1918705005

Injection Date:	7/11/2019 15:35:52	Seq Line:	20
Sample Name:	1918705005	Location:	Vial 58
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.233	PBA	264721.6	4.4092	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.238	BBA	91183.5	4.9513	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.258	MM	196904.8	5.0000	CLO4-89-ISTD

*** End of Report ***

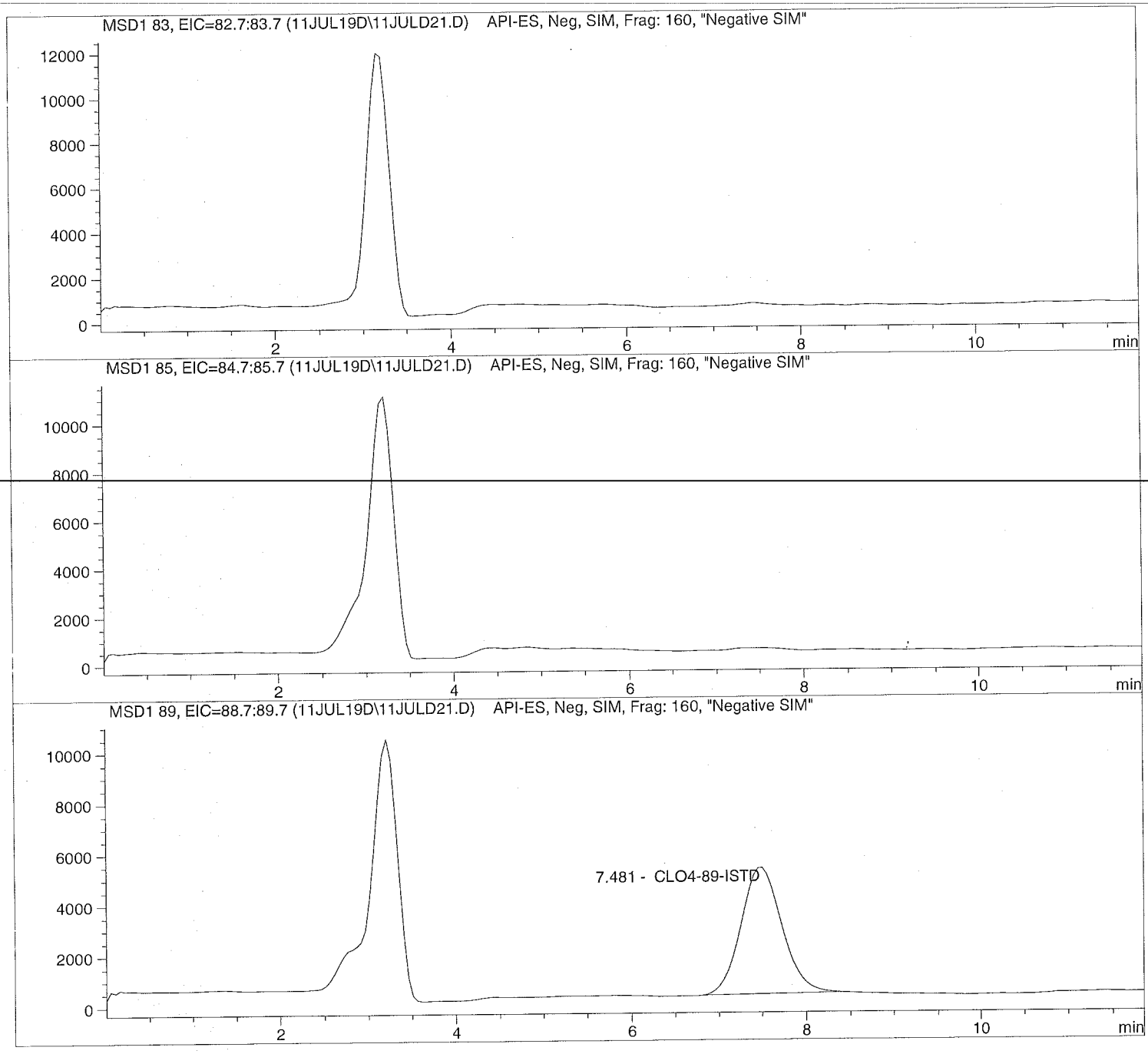
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD21.D Sample Name: 1918705006

Injection Date:	7/11/2019 15:49:37	Seq Line:	21
Sample Name:	1918705006	Location:	Vial 59
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD21.D Sample Name: 1918705006

Injection Date:	7/11/2019 15:49:37	Seq Line:	21
Sample Name:	1918705006	Location:	Vial 59
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.481	PBA	163865.3	5.0000	CLO4-89-ISTD

*** End of Report ***

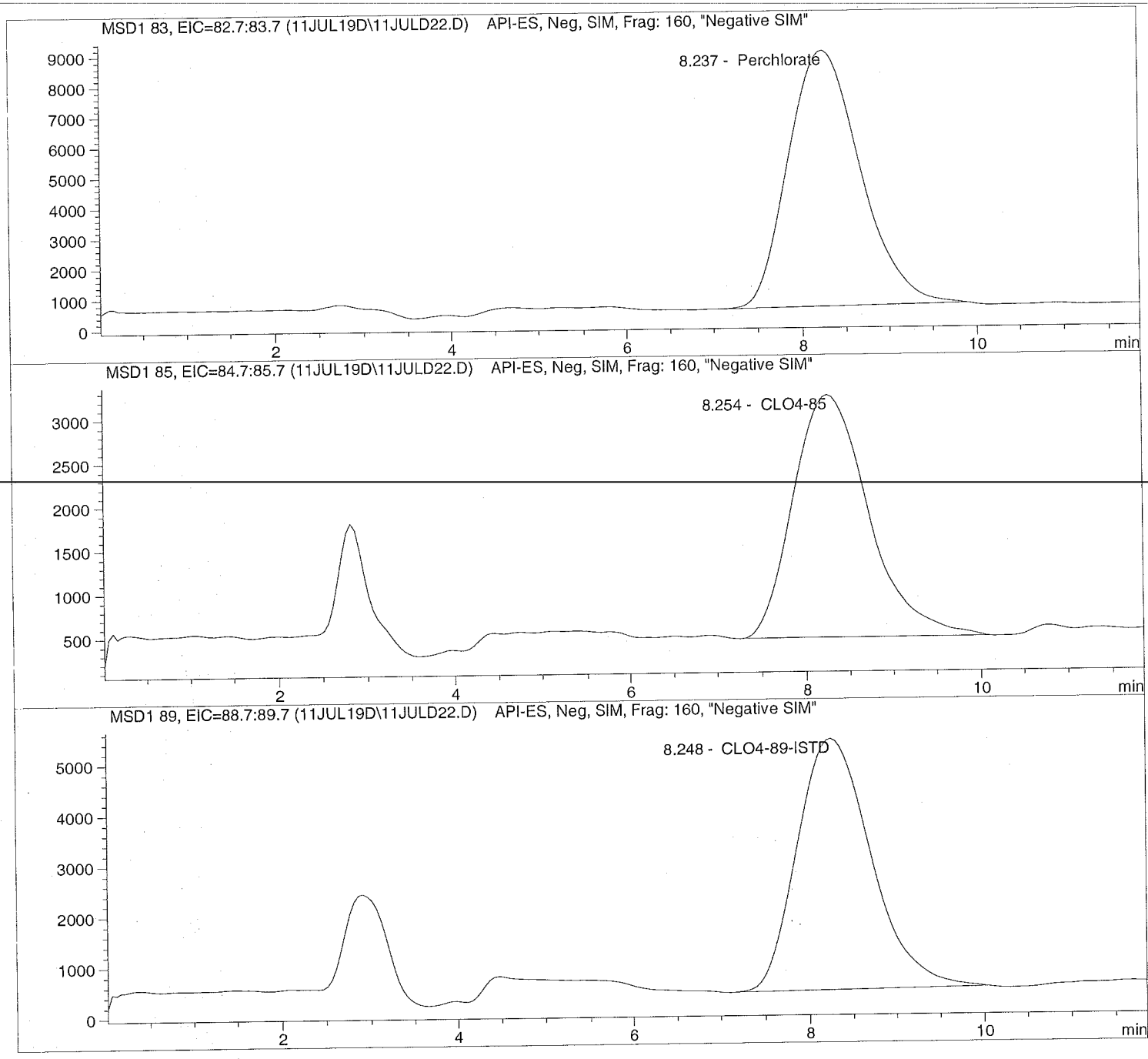
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD22.D Sample Name: 1918705007 10X

Injection Date:	7/11/2019 16:03:27	Seq Line:	22
Sample Name:	1918705007 10X	Location:	Vial 60
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD22.D Sample Name: 1918705007 10X

Injection Date:	7/11/2019 16:03:27	Seq Line:	22
Sample Name:	1918705007 10X	Location:	Vial 60
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.237	PBA	480293.1	53.7355	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.254	PBA	165862.6	60.8905	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.248	PBA	290575.8	50.0000	CLO4-89-ISTD

*** End of Report ***

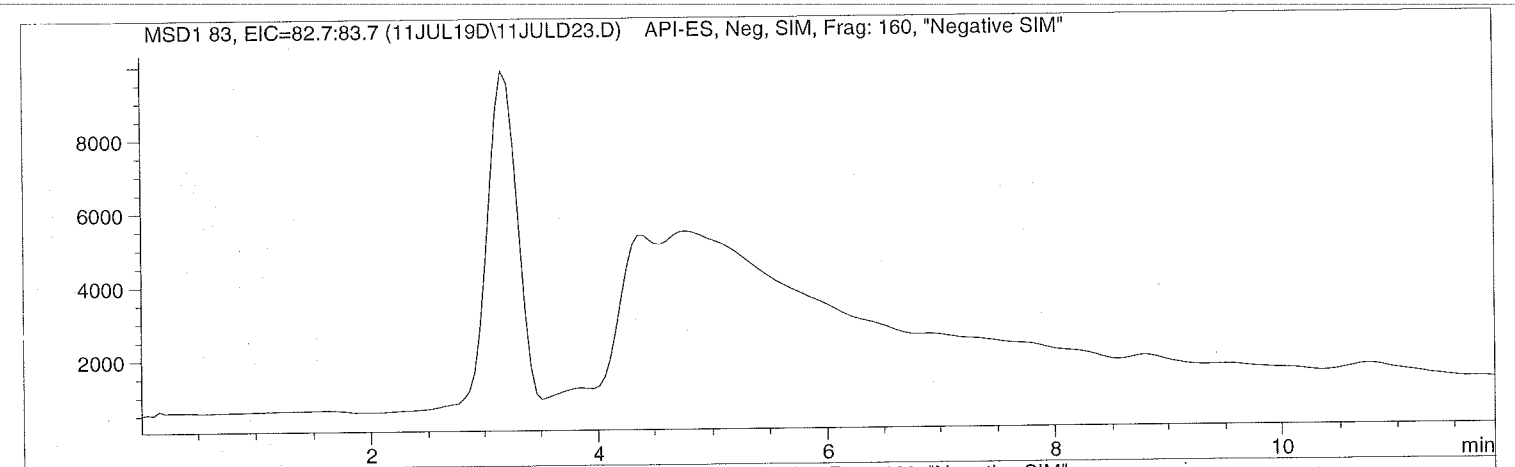
RIGHT SOLUTIONS | RIGHT PARTNER

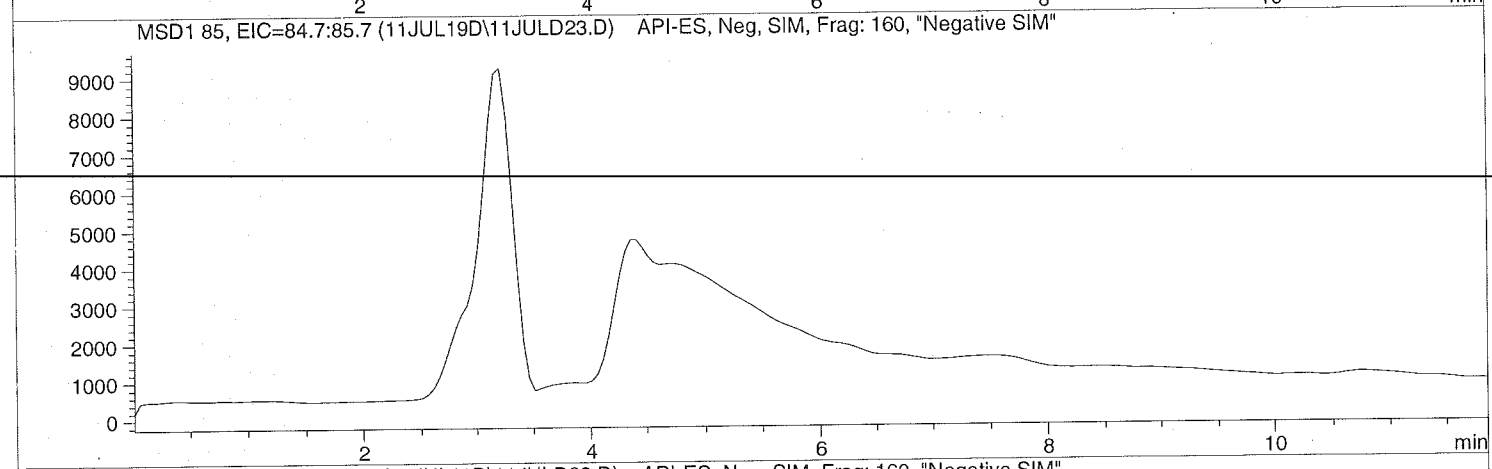
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD23.D Sample Name: 1918705008

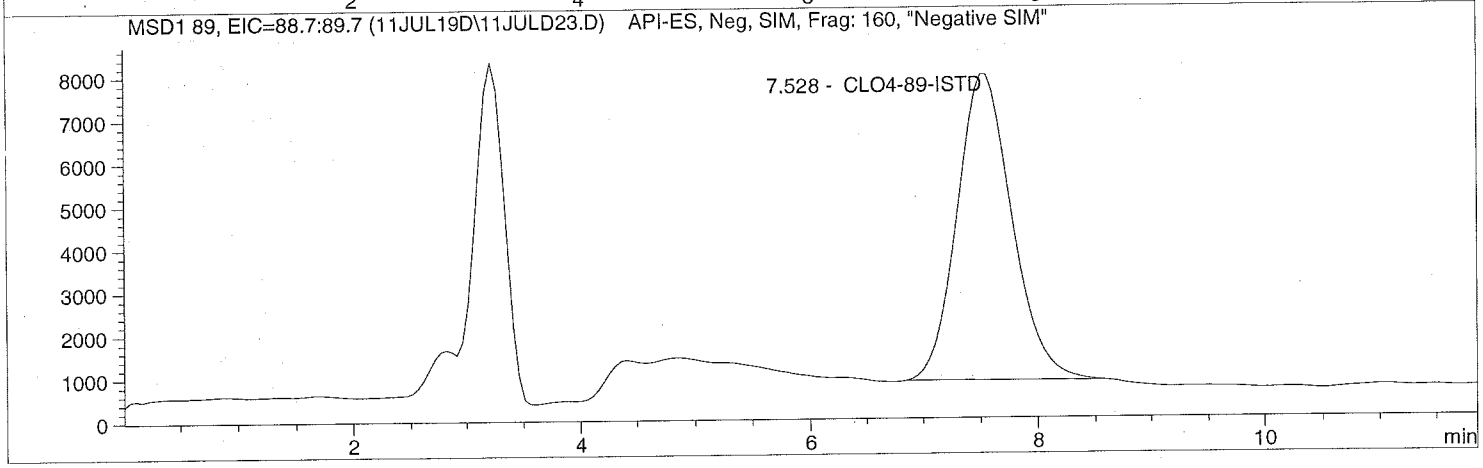
Injection Date:	7/11/2019 16:17:15	Seq Line:	23
Sample Name:	1918705008	Location:	Vial 61
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD23.D Sample Name: 1918705008

Injection Date:	7/11/2019 16:17:15	Seq Line:	23
Sample Name:	1918705008	Location:	Vial 61
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.528	PBA	237165.4	5.0000	CLO4-89-ISTD

*** End of Report ***

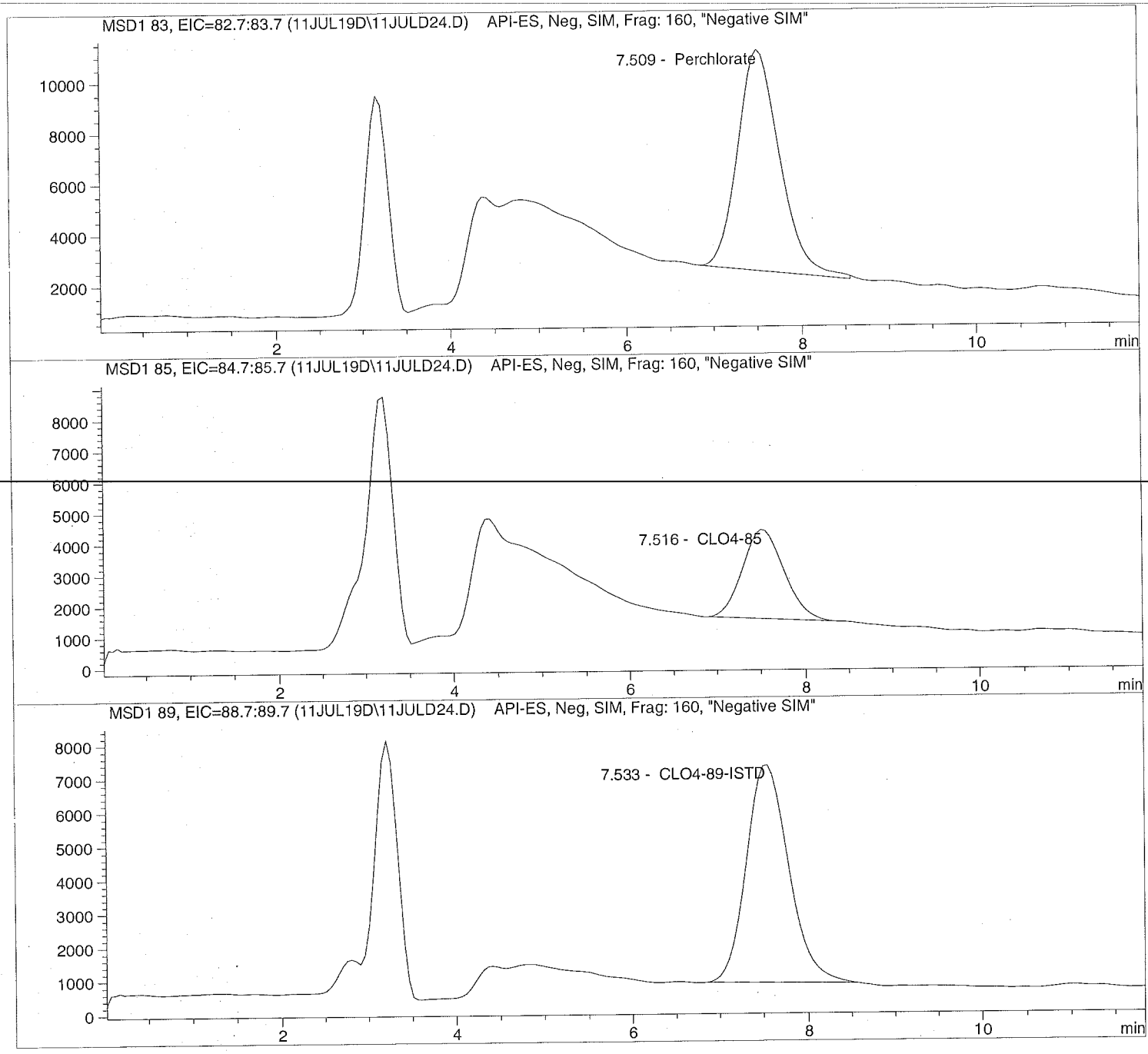
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD24.D Sample Name: 1918705009 MS

Injection Date:	7/11/2019 16:31:15	Seq Line:	24
Sample Name:	1918705009 MS	Location:	Vial 62
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD24.D Sample Name: 1918705009 MS

Injection Date:	7/11/2019 16:31:15	Seq Line:	24
Sample Name:	1918705009 MS	Location:	Vial 62
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.509	PBA	288361.0	4.3992	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.516	PBA	93975.4	4.6759	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.533	PBA	214999.5	5.0000	CLO4-89-ISTD

*** End of Report ***

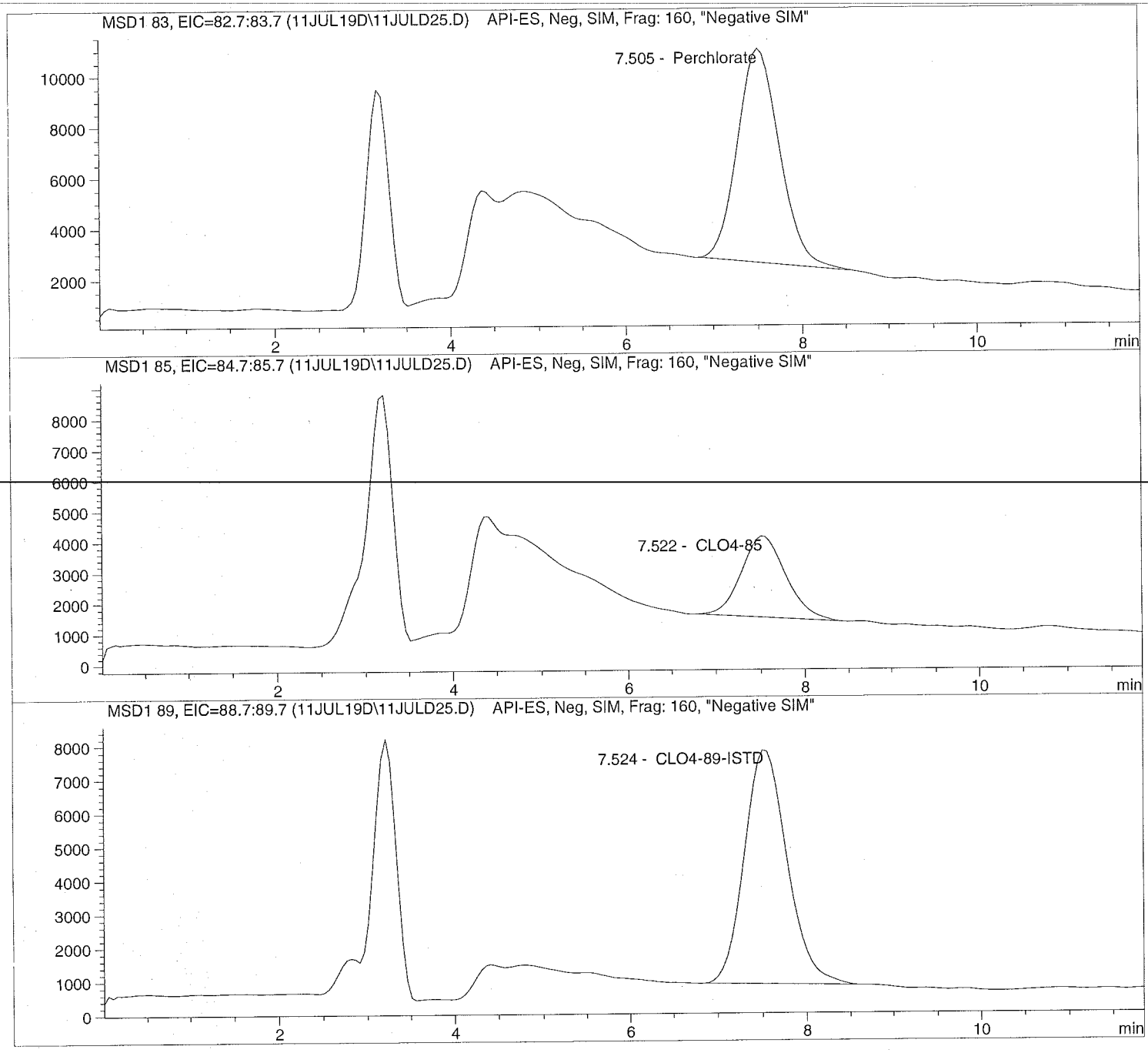
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD25.D Sample Name: 1918705010 MSD

Injection Date:	7/11/2019 16:45:02	Seq Line:	25
Sample Name:	1918705010 MSD	Location:	Vial 63
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD25.D Sample Name: 1918705010 MSD

Injection Date:	7/11/2019 16:45:02	Seq Line:	25
Sample Name:	1918705010 MSD	Location:	Vial 63
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.505	PBA	277079.4	3.9208	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.522	PBA	91663.1	4.2105	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.524	PBA	233099.0	5.0000	CLO4-89-ISTD

*** End of Report ***

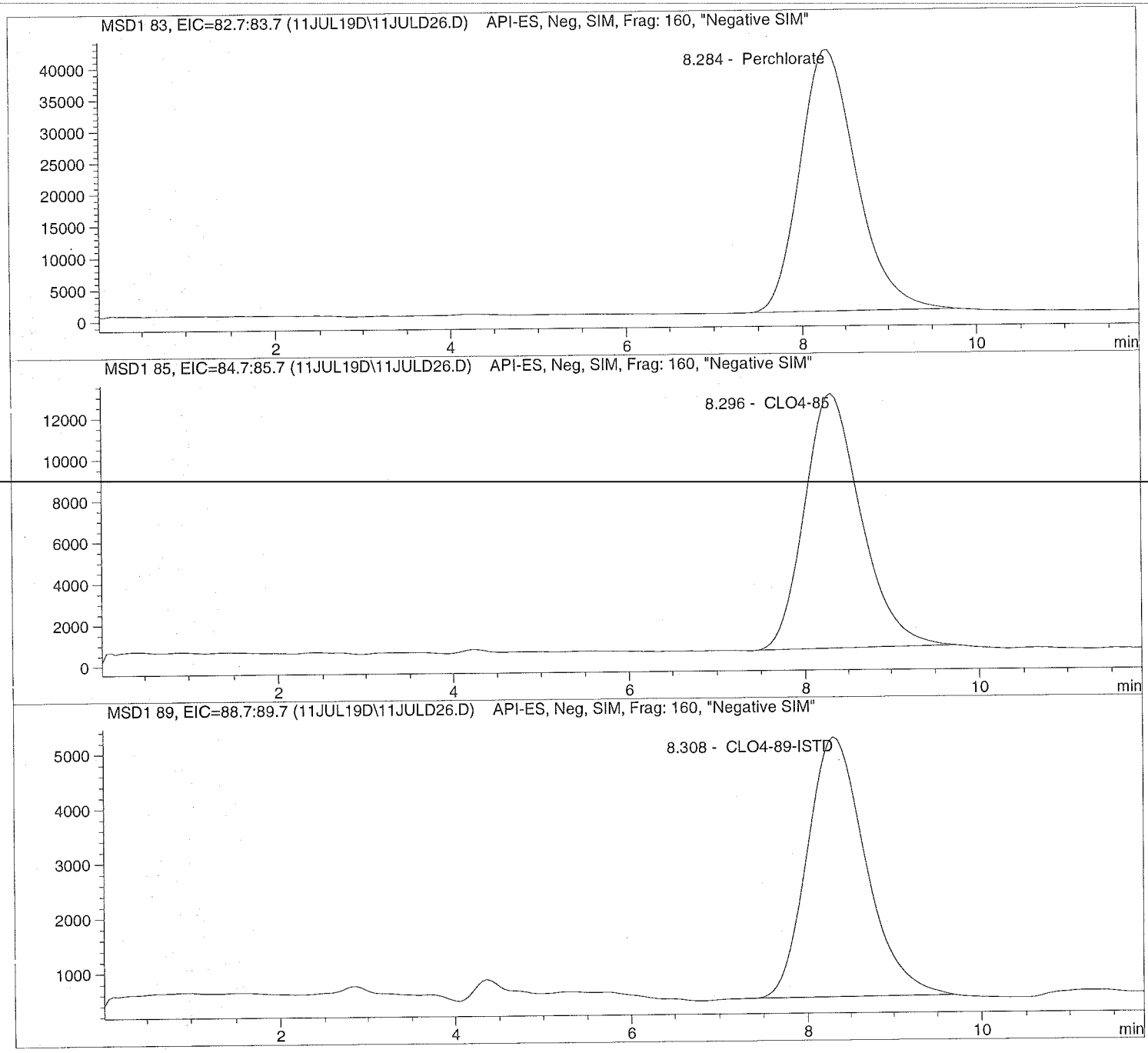
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD26.D Sample Name: 663036 CCV@25

Injection Date:	7/11/2019 16:58:48	Seq Line:	26
Sample Name:	663036 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD26.D Sample Name: 663036 CCV@25

Injection Date:	7/11/2019 16:58:48	Seq Line:	26
Sample Name:	663036 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.284	PBA	1877862.1	25.5677	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.296	PBA	559339.1	25.6558	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.308	BBA	223151.0	5.0000	CLO4-89-ISTD

*** End of Report ***

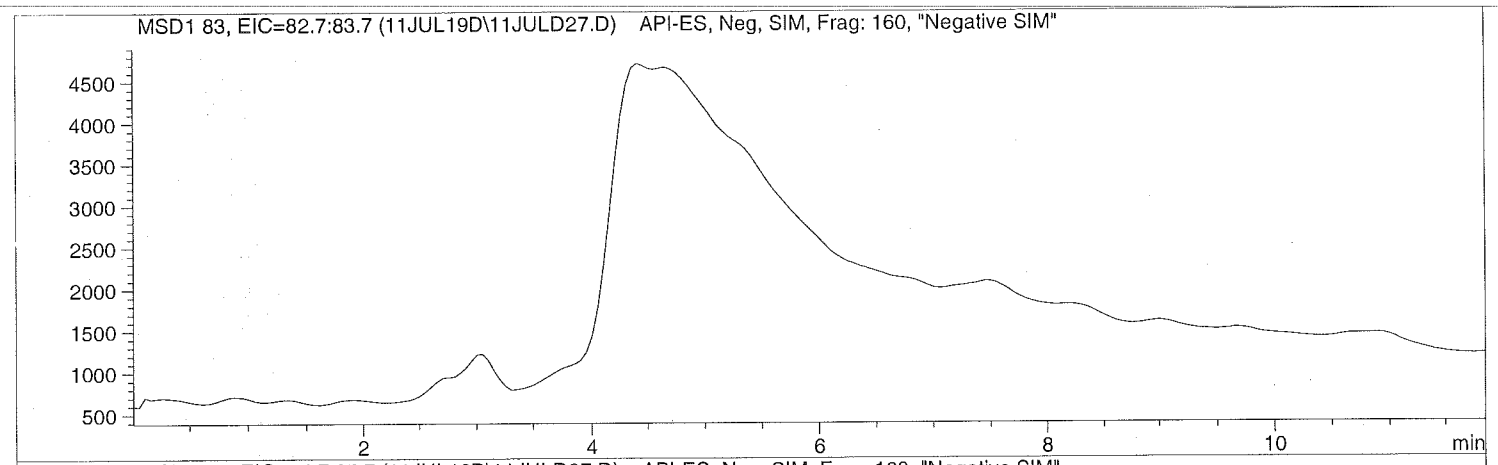
RIGHT SOLUTIONS | RIGHT PARTNER

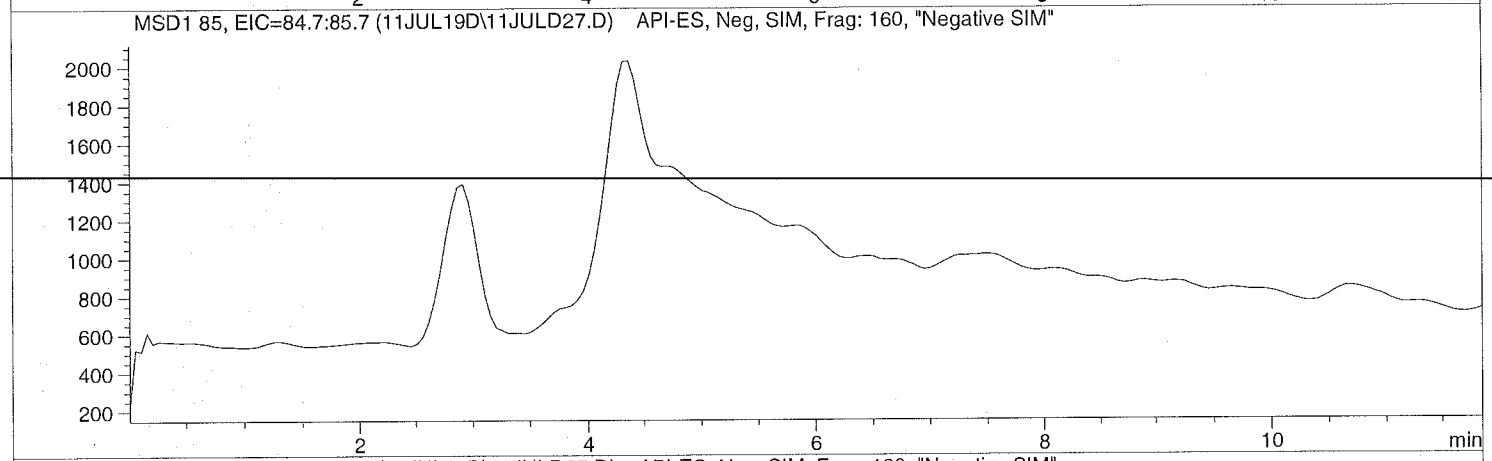
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD27.D Sample Name: 1918871001

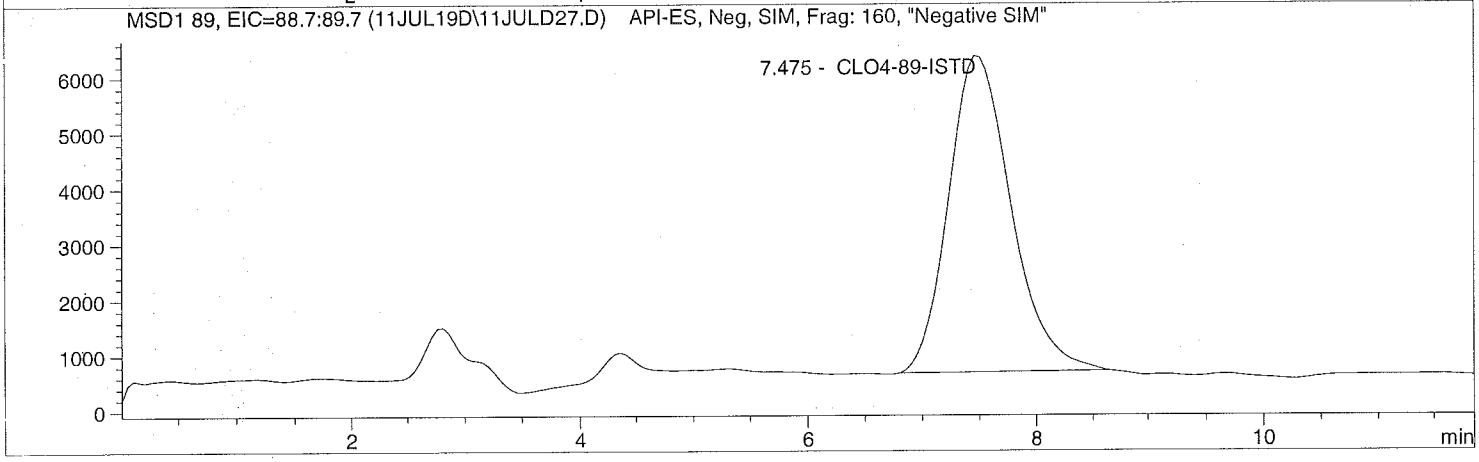
Injection Date:	7/11/2019 17:12:38	Seq Line:	27
Sample Name:	1918871001	Location:	Vial 64
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD27.D Sample Name: 1918871001

Injection Date:	7/11/2019 17:12:38	Seq Line:	27
Sample Name:	1918871001	Location:	Vial 64
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.475	PBA	217461.8	5.0000	CLO4-89-ISTD

*** End of Report ***

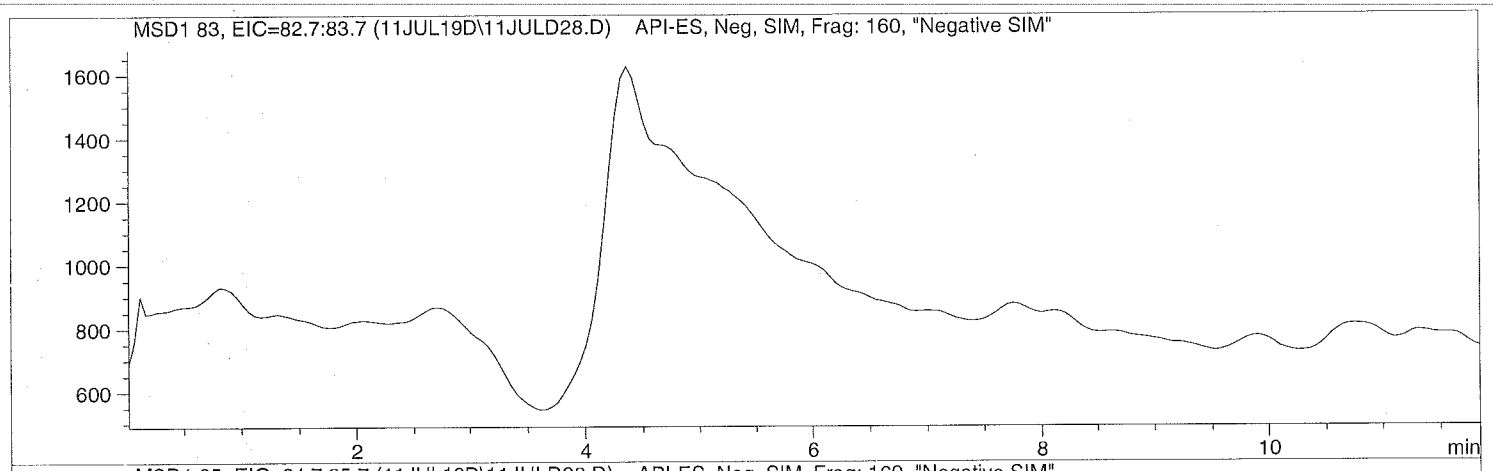
RIGHT SOLUTIONS | RIGHT PARTNER

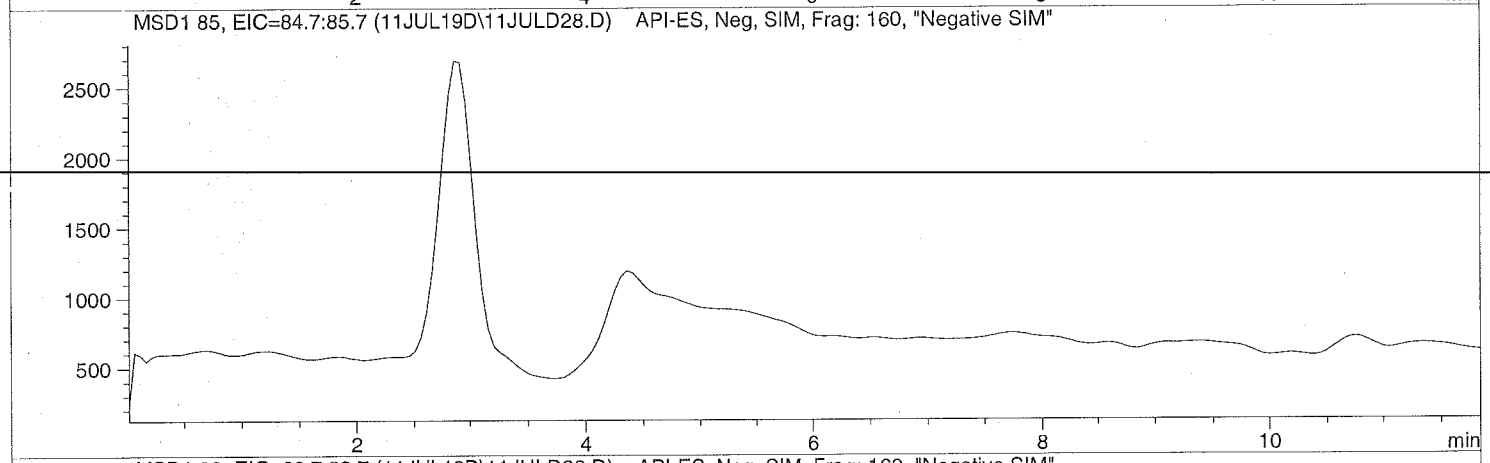
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD28.D Sample Name: 1918871002

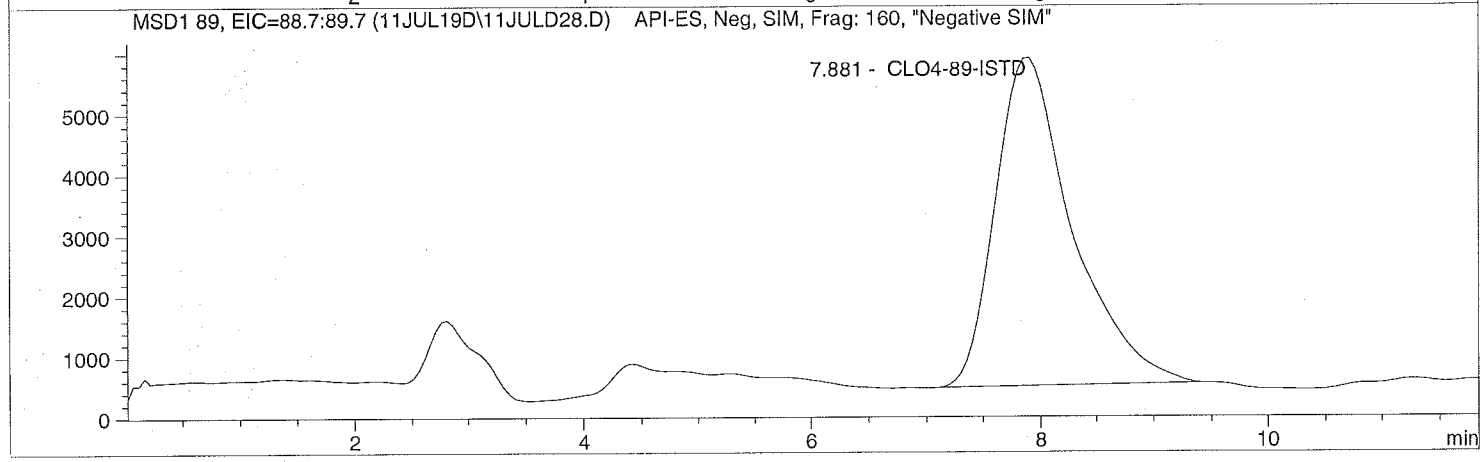
Injection Date:	7/11/2019 17:26:27	Seq Line:	28
Sample Name:	1918871002	Location:	Vial 65
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD28.D Sample Name: 1918871002

Injection Date:	7/11/2019 17:26:27	Seq Line:	28
Sample Name:	1918871002	Location:	Vial 65
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.881	PBA	252228.0	5.0000	CLO4-89-ISTD

*** End of Report ***

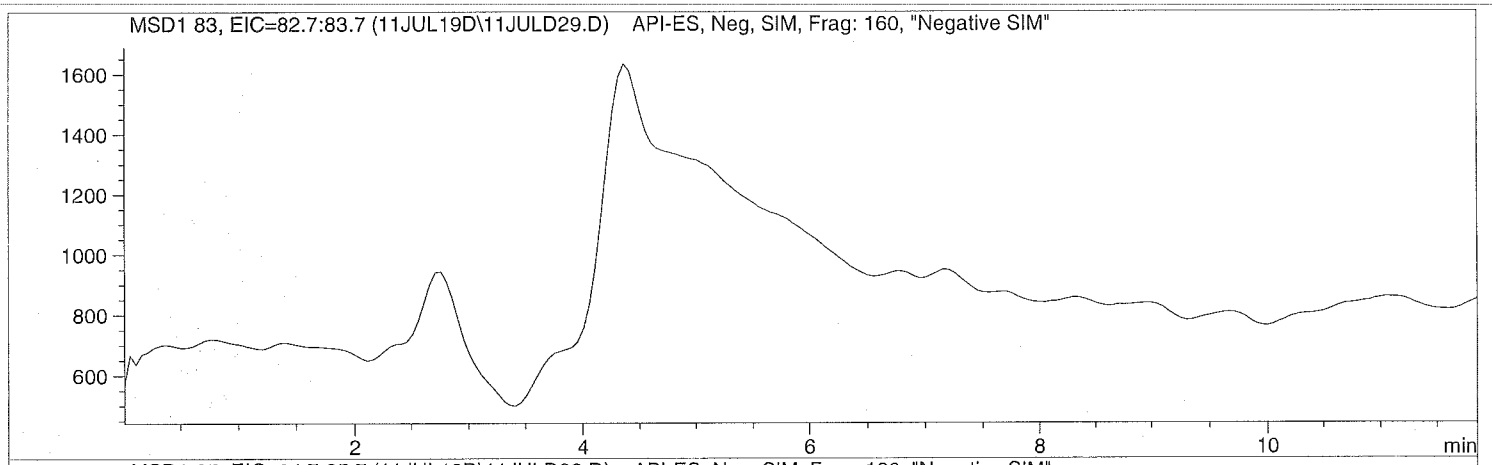
RIGHT SOLUTIONS | RIGHT PARTNER

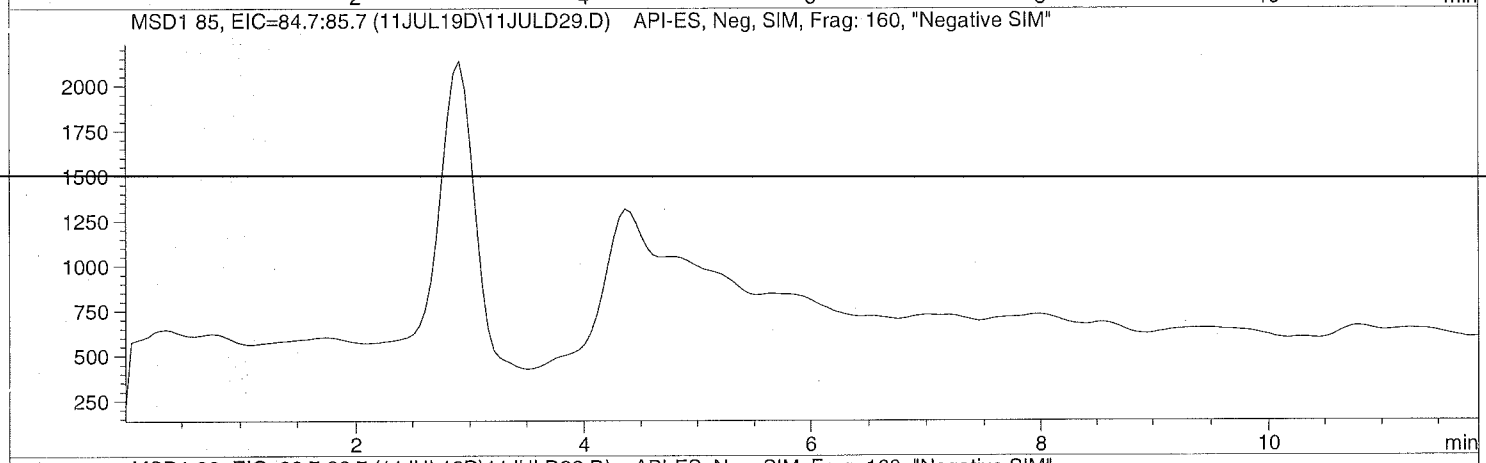
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD29.D Sample Name: 1918871003

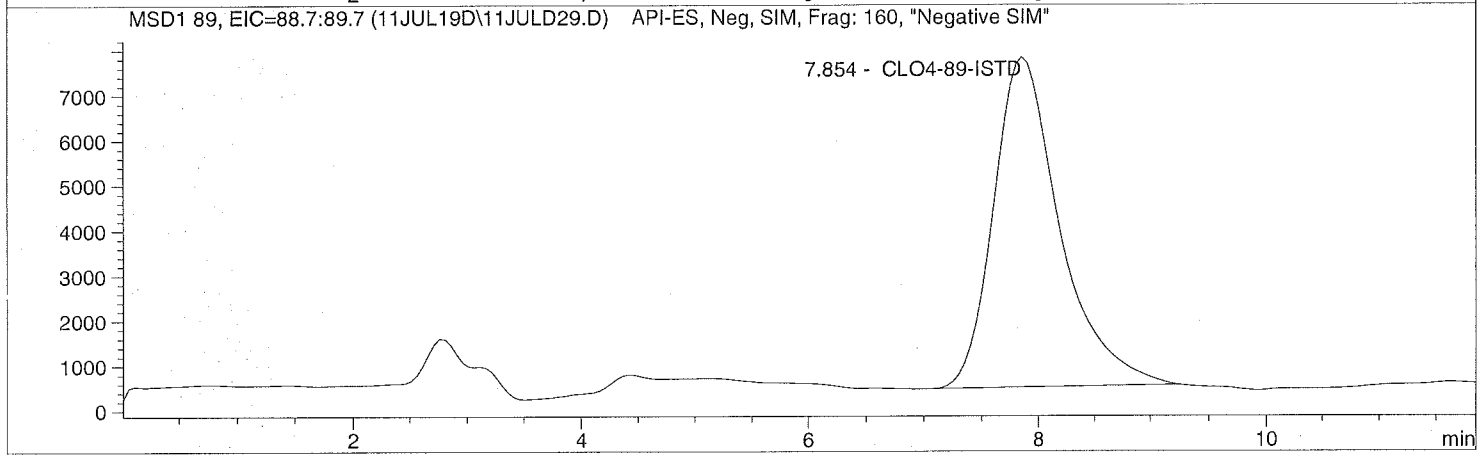
Injection Date:	7/11/2019 17:40:12	Seq Line:	29
Sample Name:	1918871003	Location:	Vial 66
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD29.D Sample Name: 1918871003

Injection Date:	7/11/2019 17:40:12	Seq Line:	29
Sample Name:	1918871003	Location:	Vial 66
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.854	PBA	297108.1	5.0000	CLO4-89-ISTD

*** End of Report ***

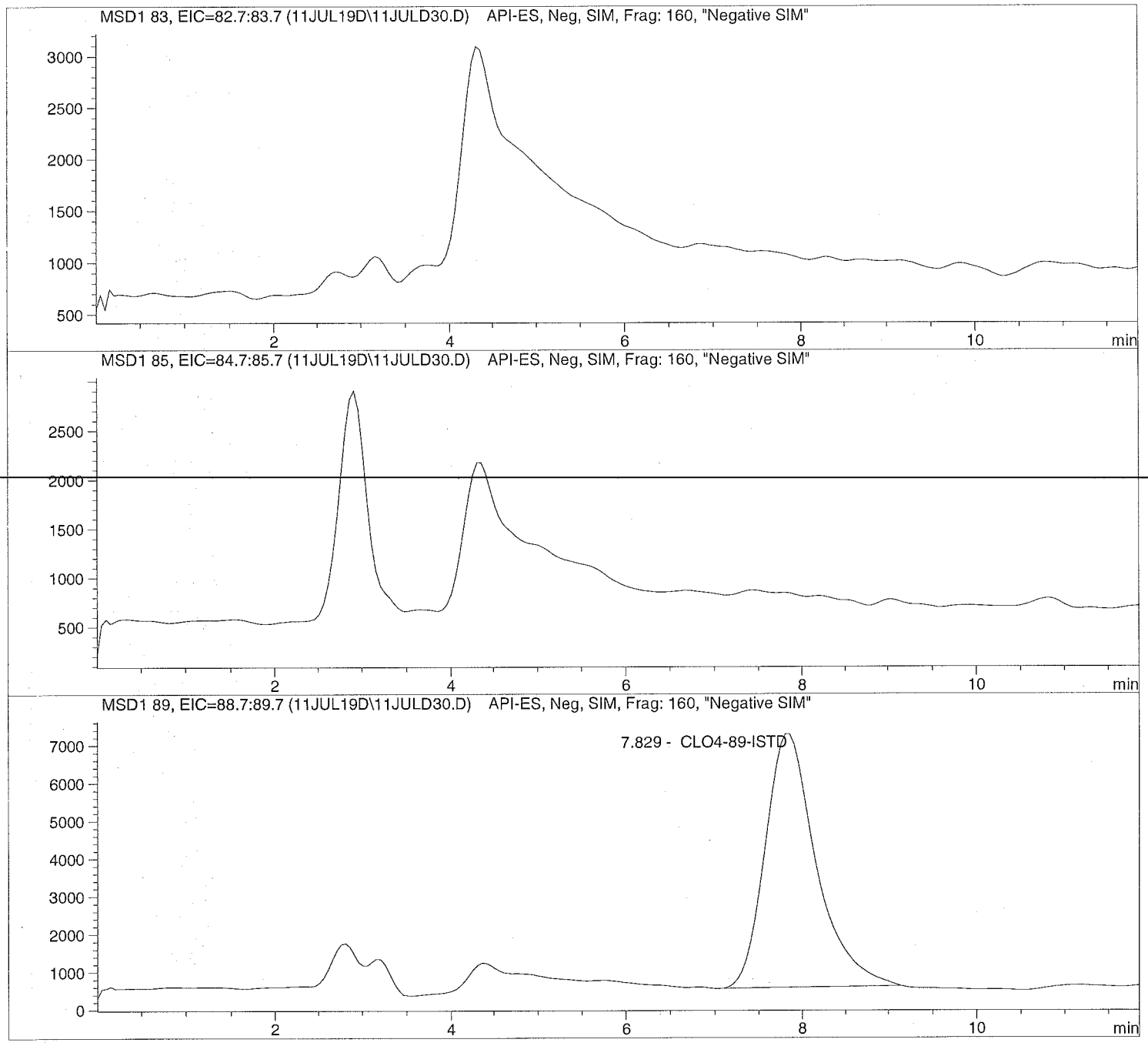
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD30.D Sample Name: 1918871004

Injection Date:	7/11/2019 17:54:08	Seq Line:	30
Sample Name:	1918871004	Location:	Vial 67
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD30.D Sample Name: 1918871004

Injection Date:	7/11/2019 17:54:08	Seq Line:	30
Sample Name:	1918871004	Location:	Vial 67
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.829	PBA	273038.9	5.0000	CLO4-89-ISTD

*** End of Report ***

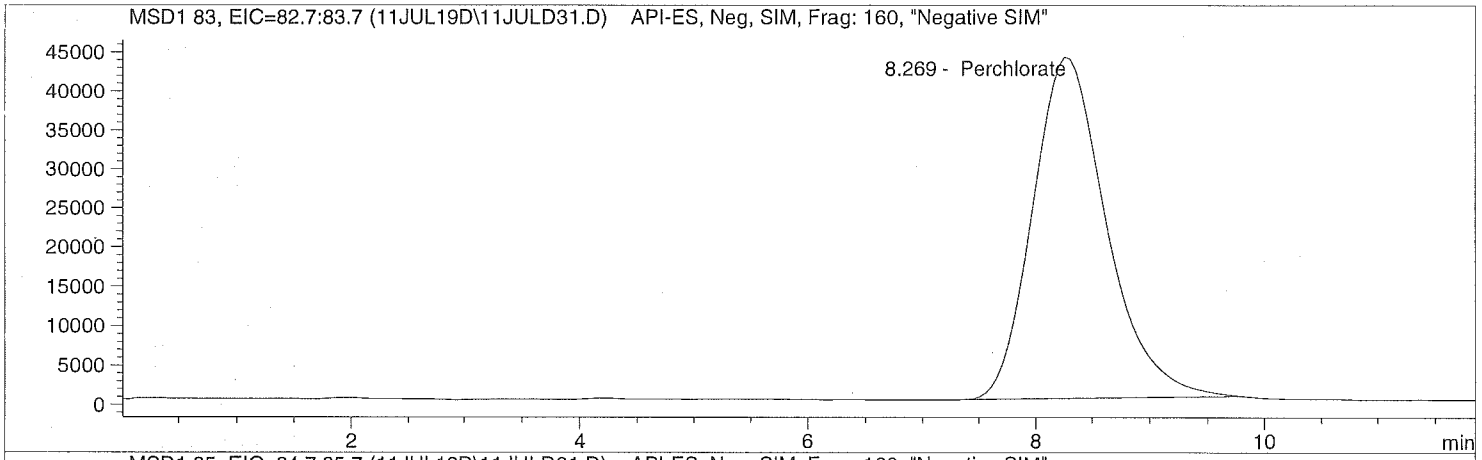
RIGHT SOLUTIONS | RIGHT PARTNER

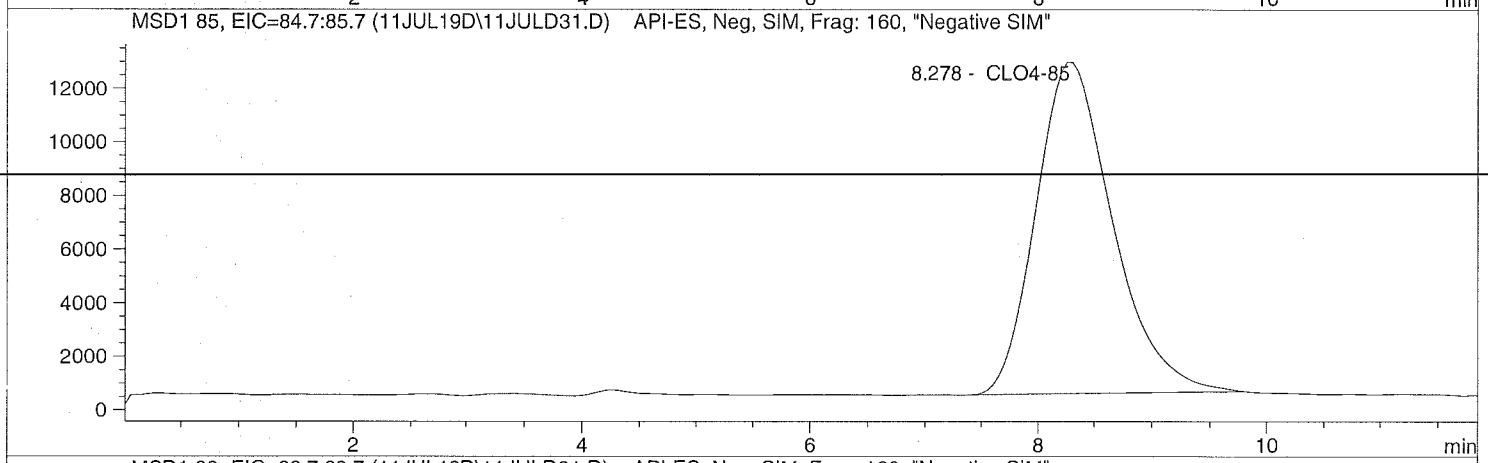
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD31.D Sample Name: 663037 CCV@25

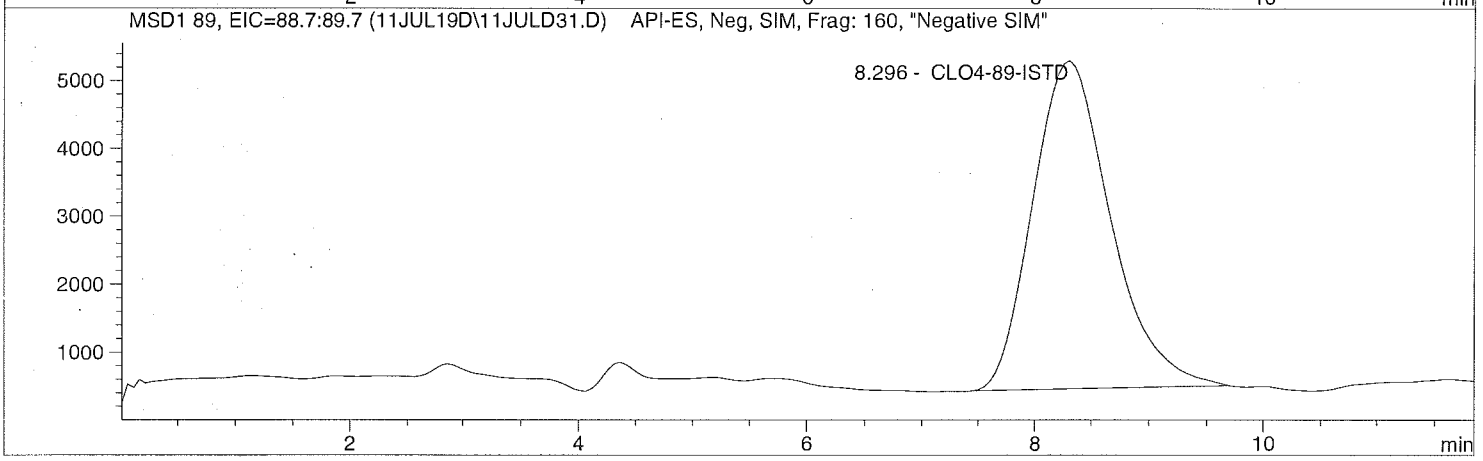
Injection Date:	7/11/2019 18:07:55	Seq Line:	31
Sample Name:	663037 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Injection Date:	7/11/2019 18:07:55	Seq Line:	31
Sample Name:	663037 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.269	PBA	1970476.5	25.8725	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.278	PBA	583651.3	25.8263	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.296	PBA	231230.8	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

RIGHT SOLUTIONS | RIGHT PARTNER

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RIGHT SOLUTIONS | RIGHT PARTNER

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

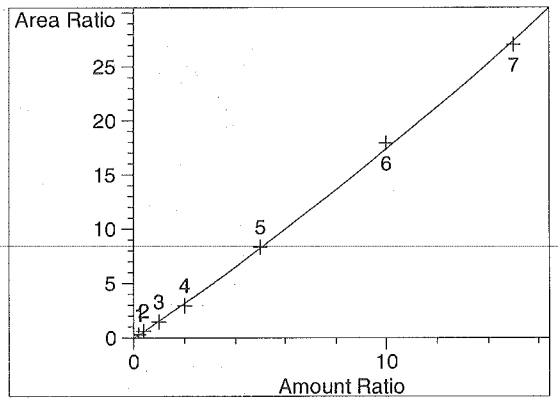
Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

Peak Sum Table

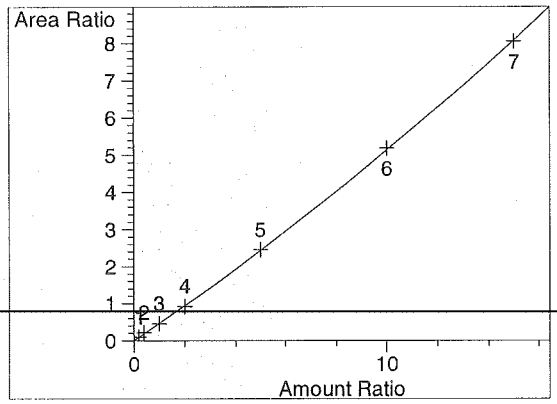
No Entries in table

RIGHT SOLUTIONS | RIGHT PARTNER

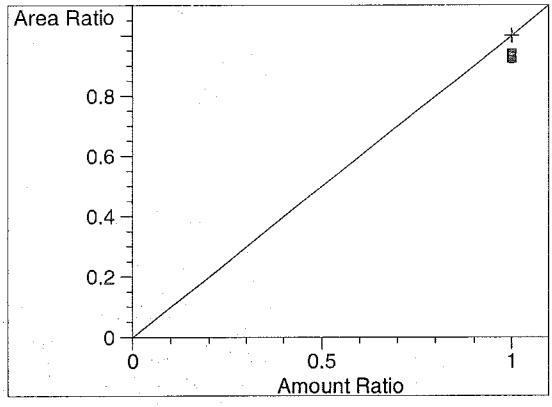
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

RIGHT SOLUTIONS | RIGHT PARTNER

Batch Report: C:\HPCHEM\1\DATA\19MAR19I\19MAR19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

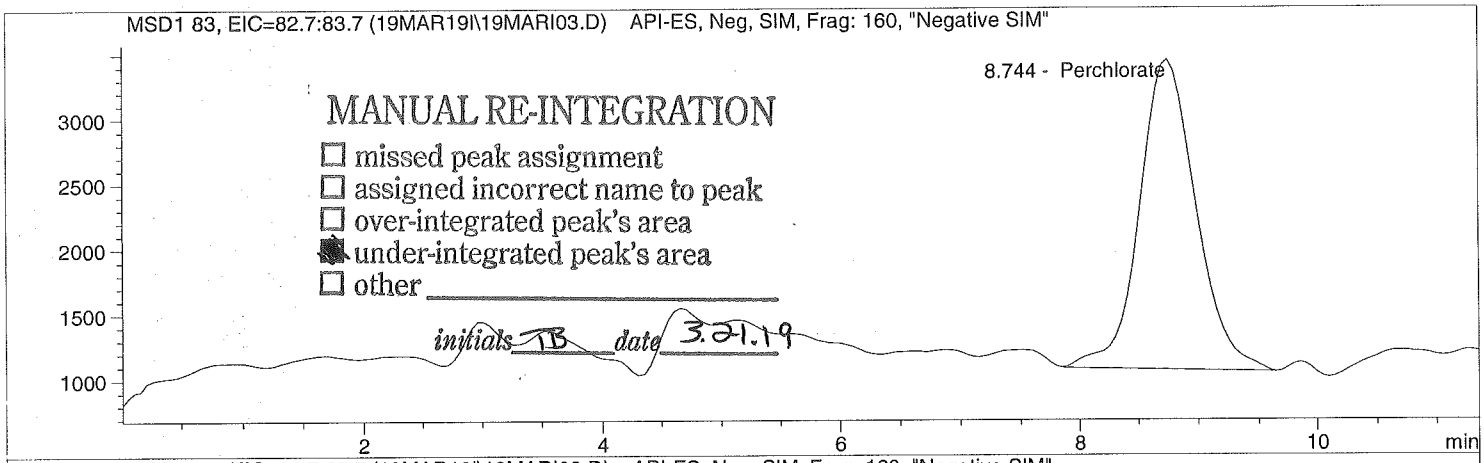
RIGHT SOLUTIONS | RIGHT PARTNER

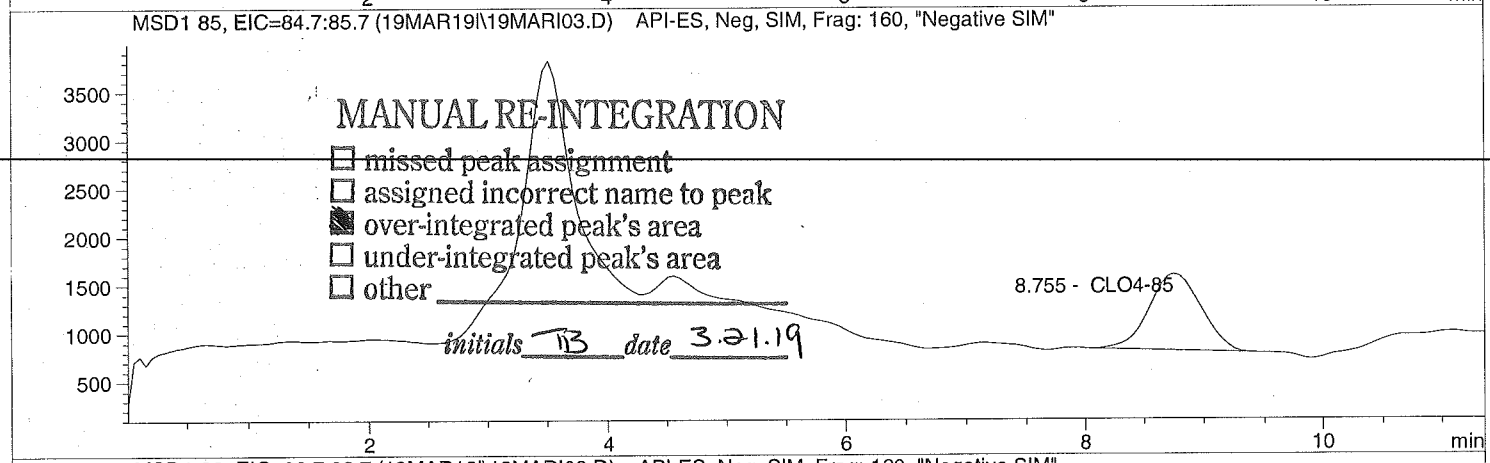
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

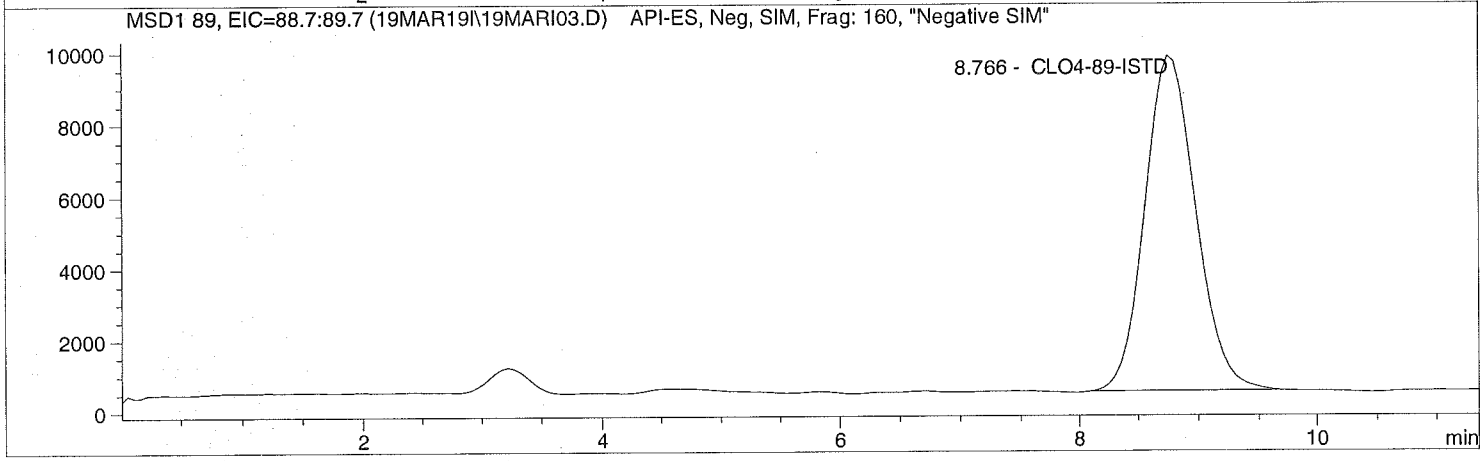
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

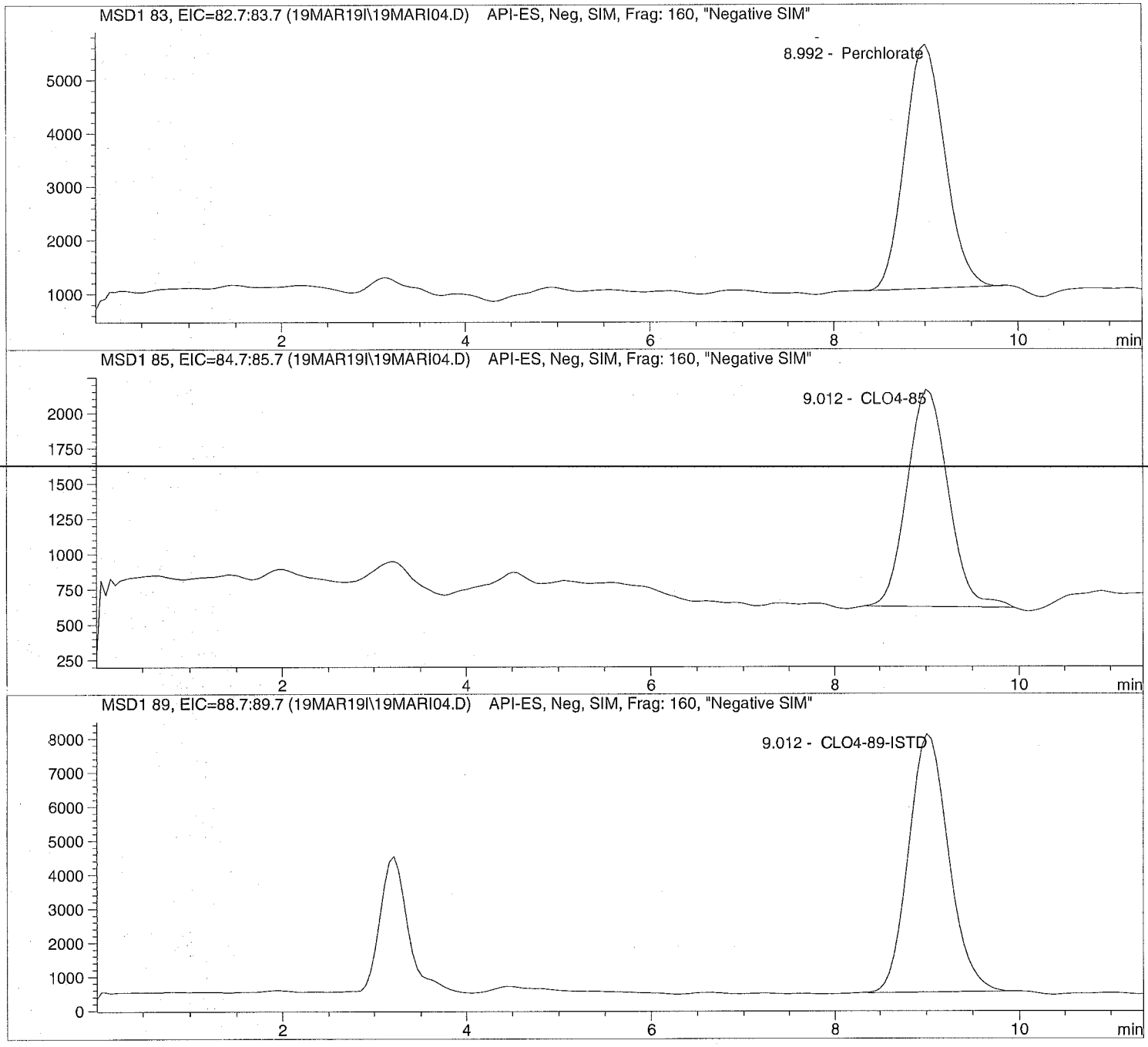
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

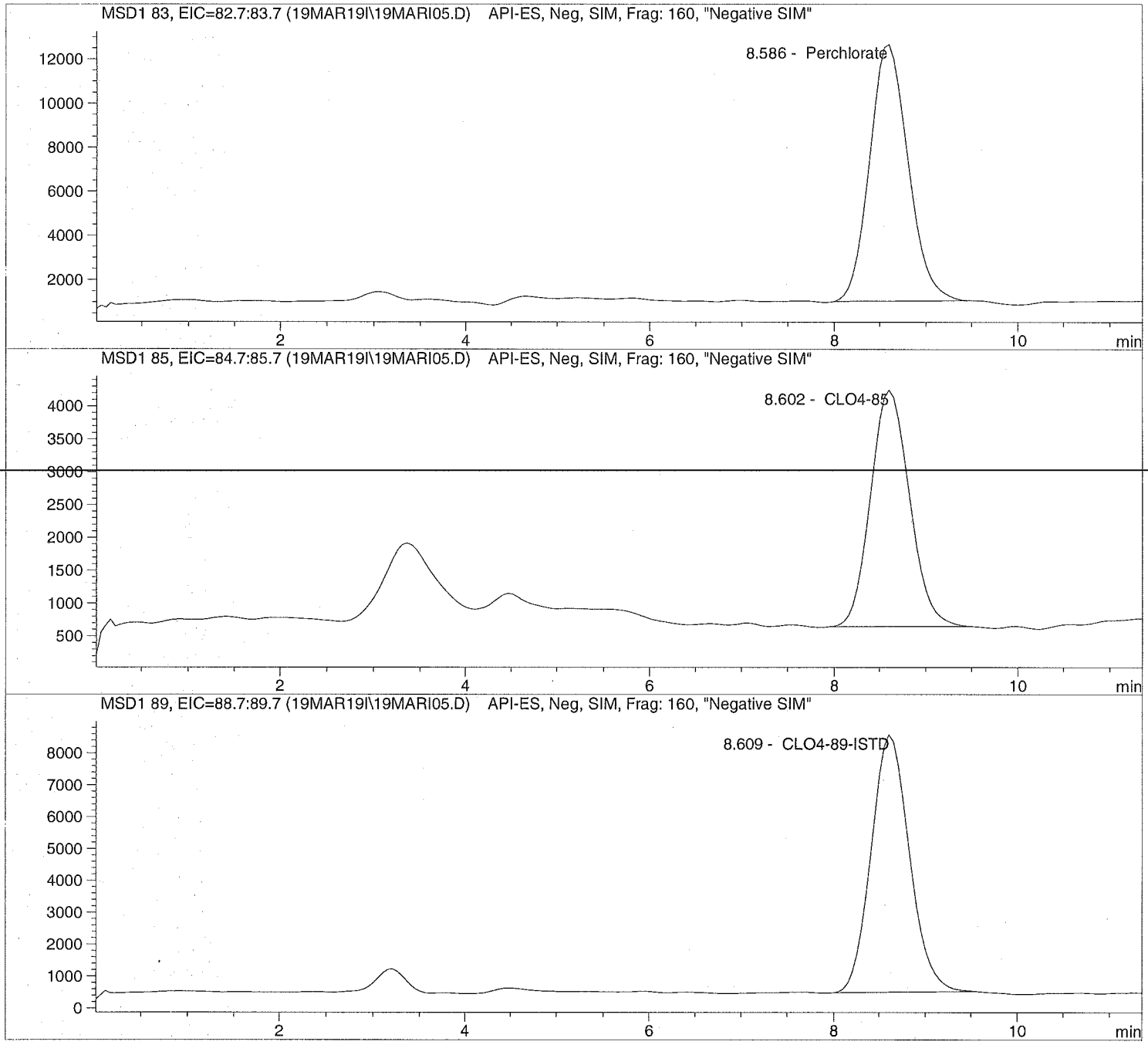
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

*** End of Report ***

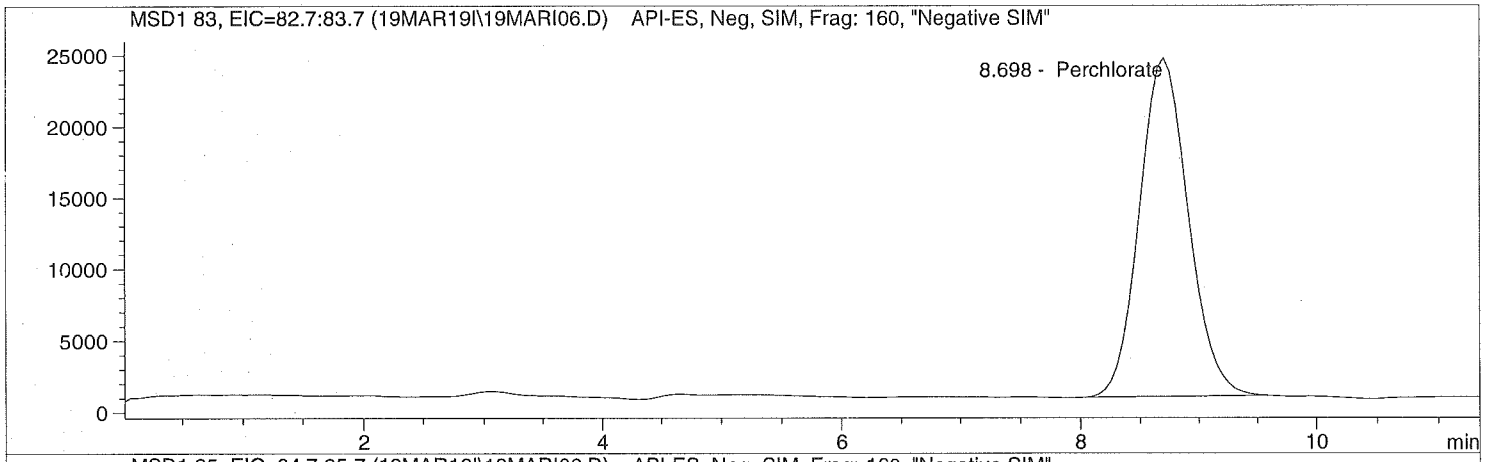
RIGHT SOLUTIONS | RIGHT PARTNER

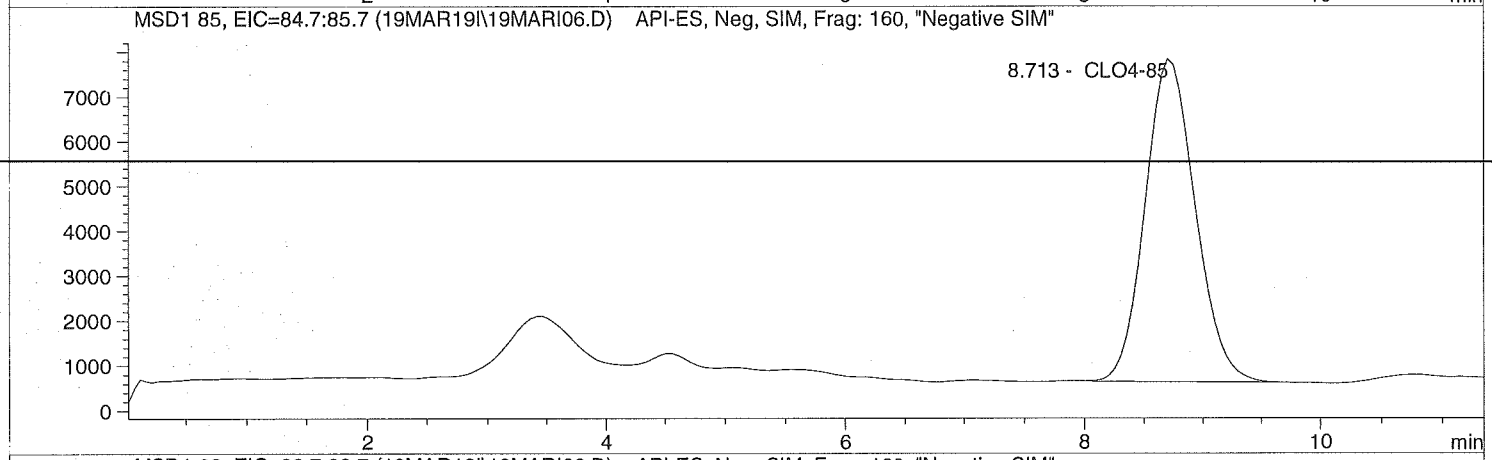
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

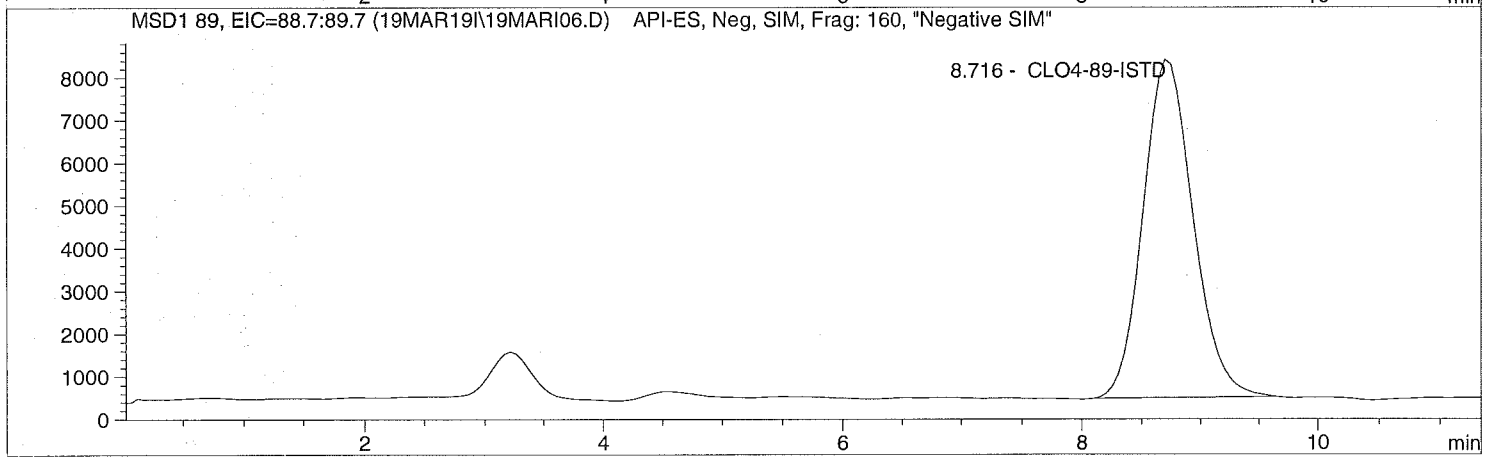
Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

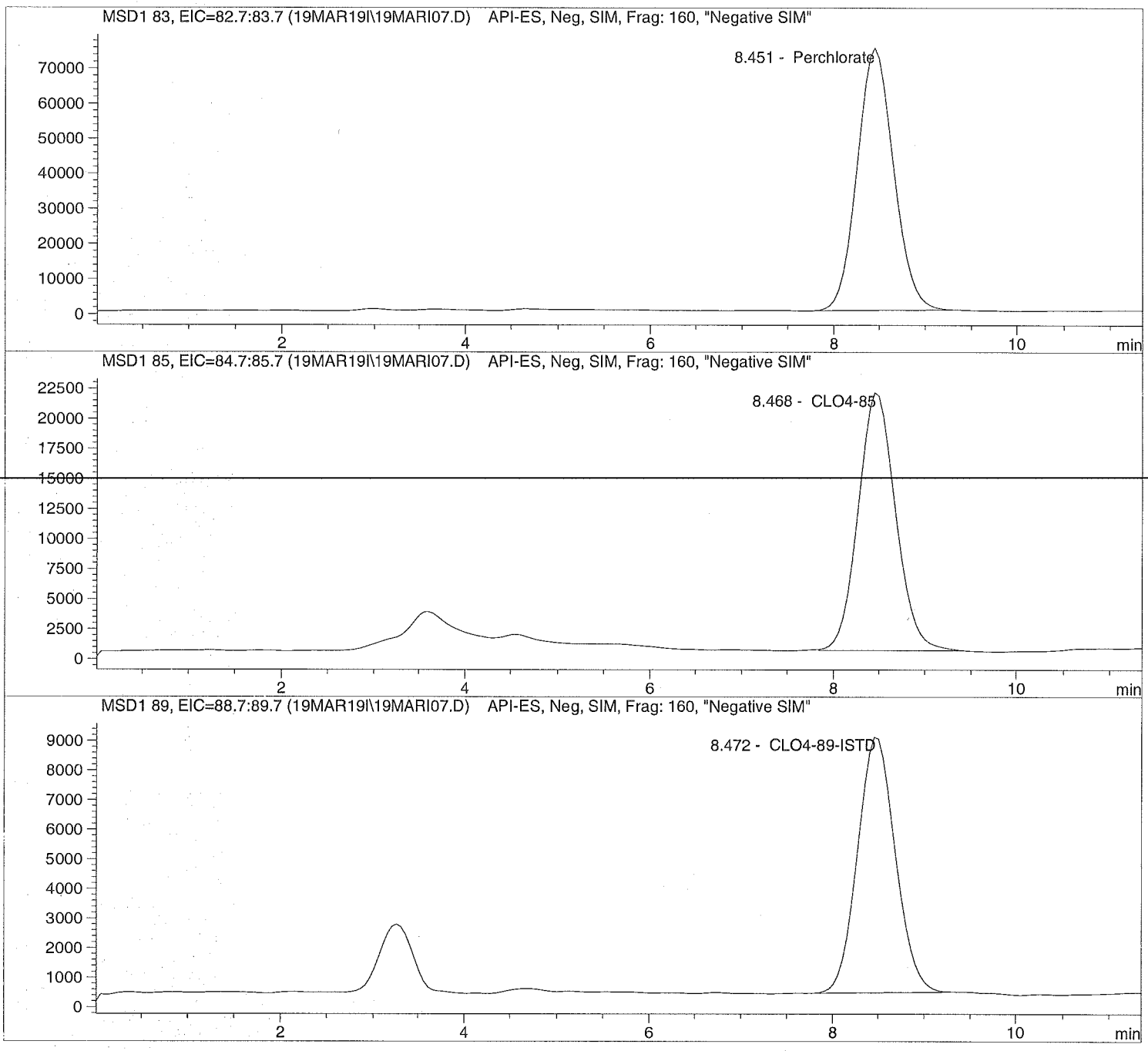
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

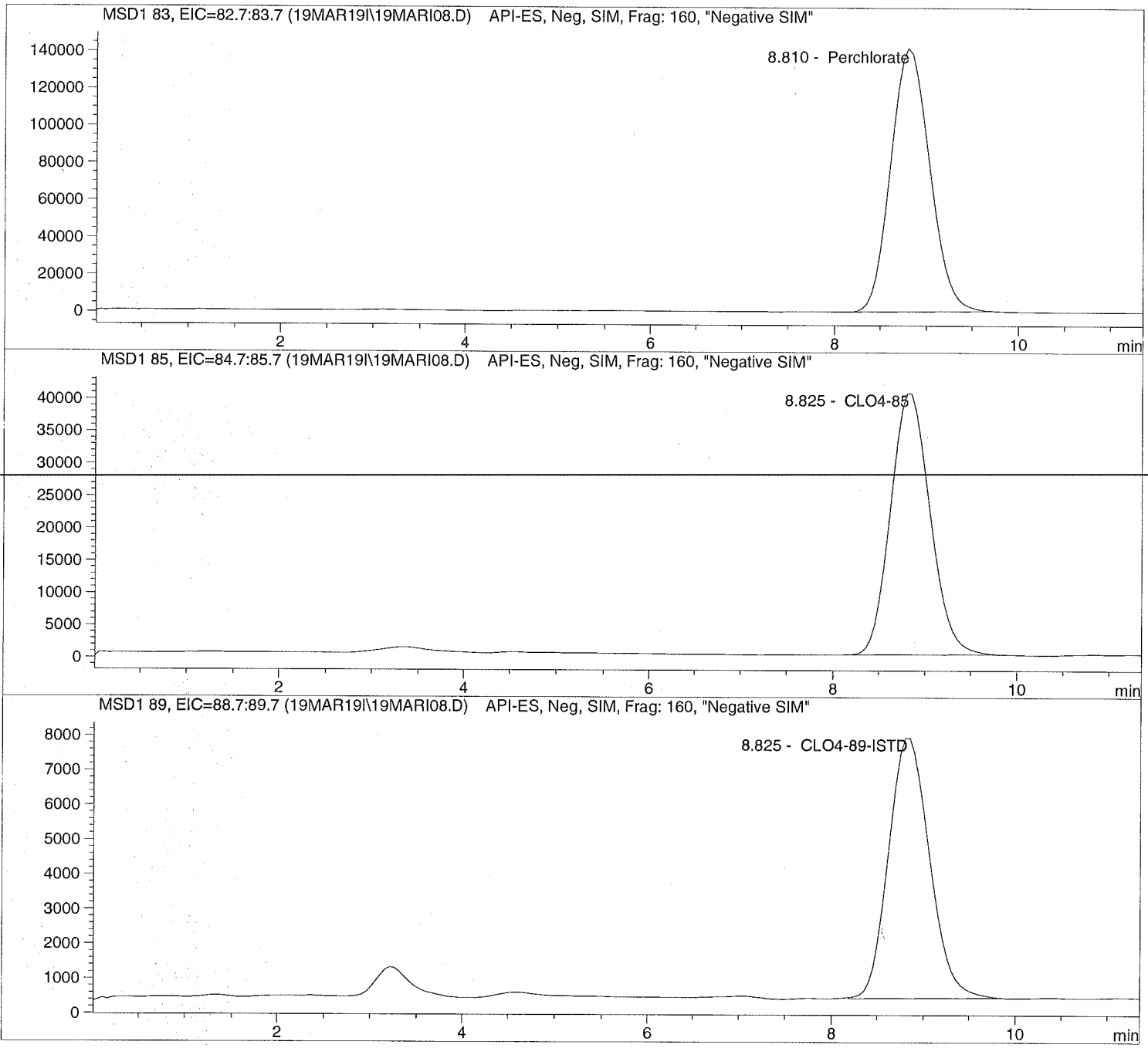
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

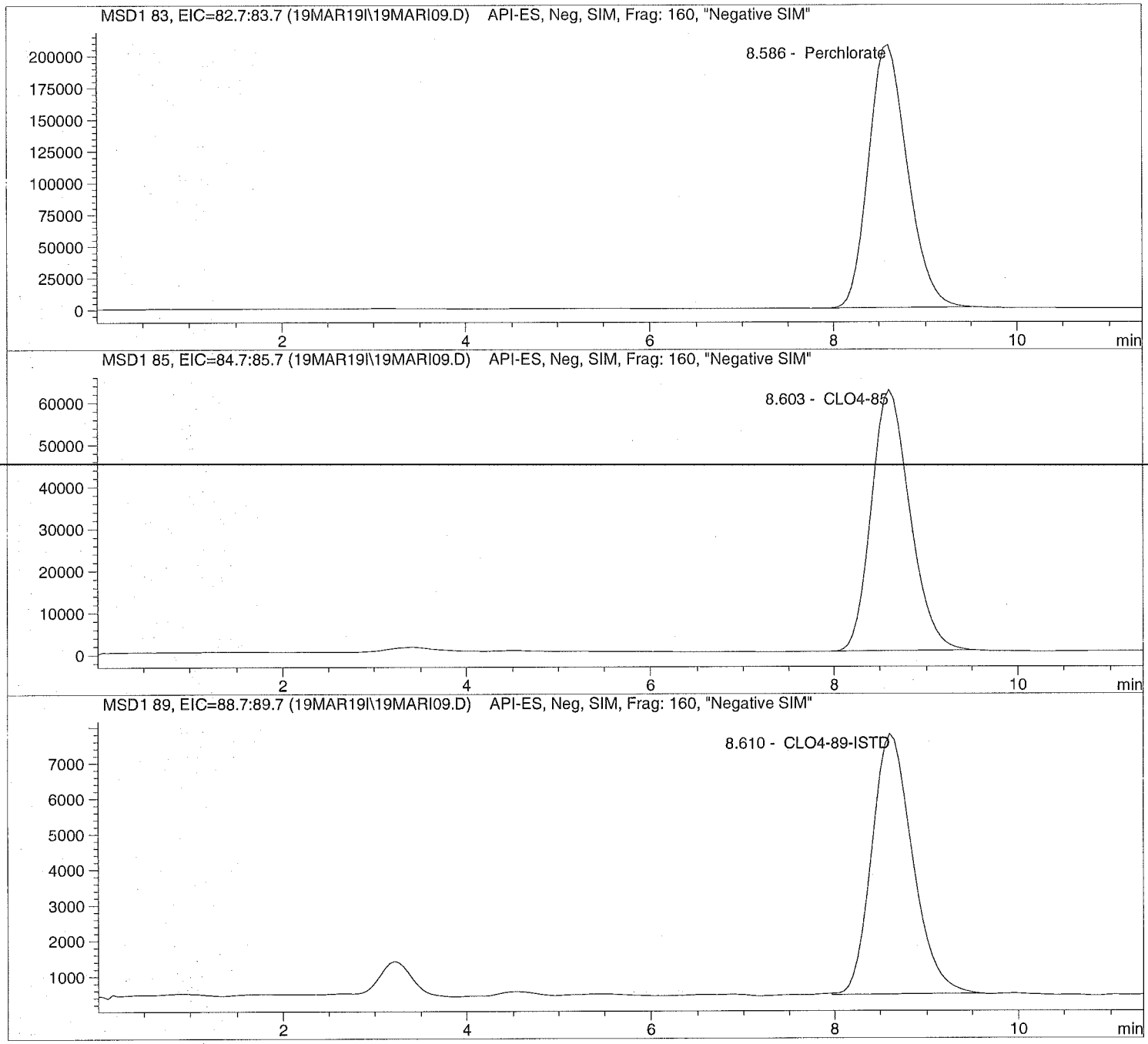
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

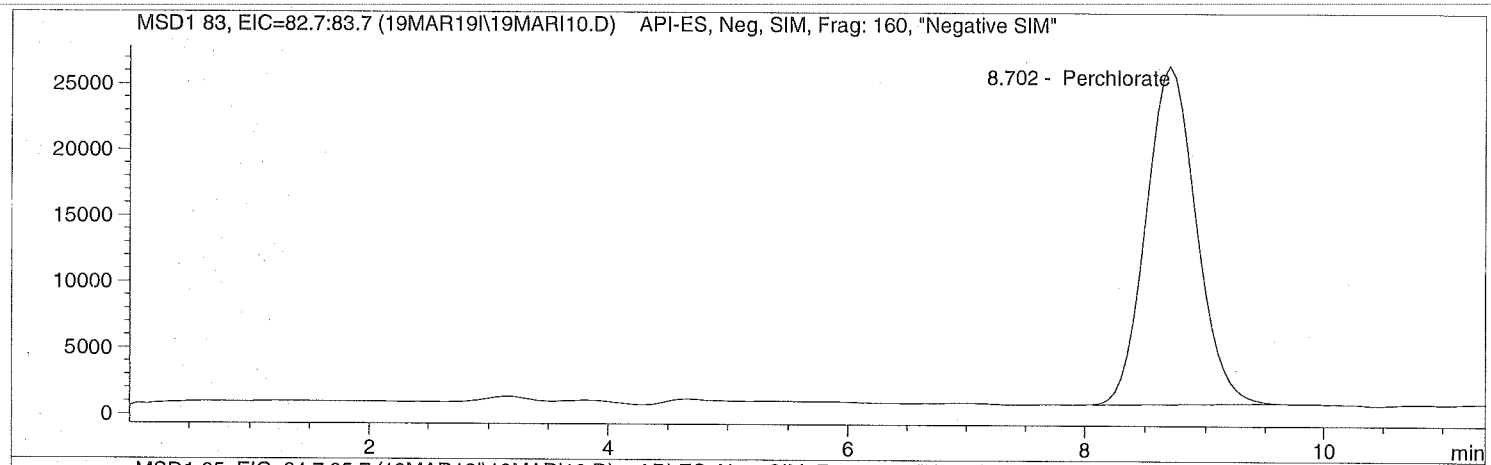
RIGHT SOLUTIONS | RIGHT PARTNER

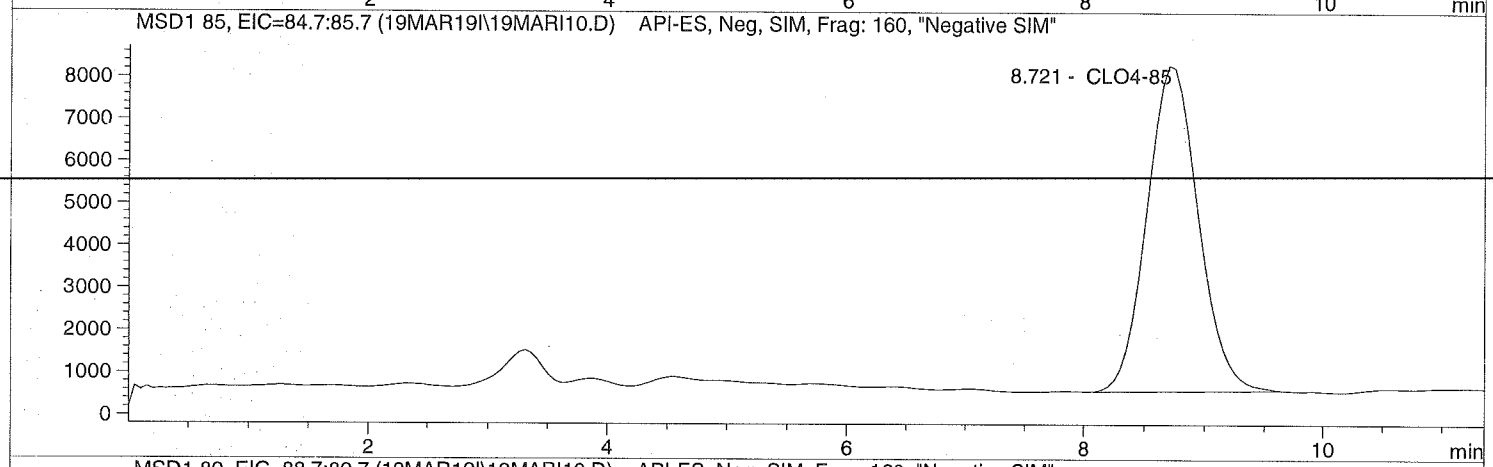
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

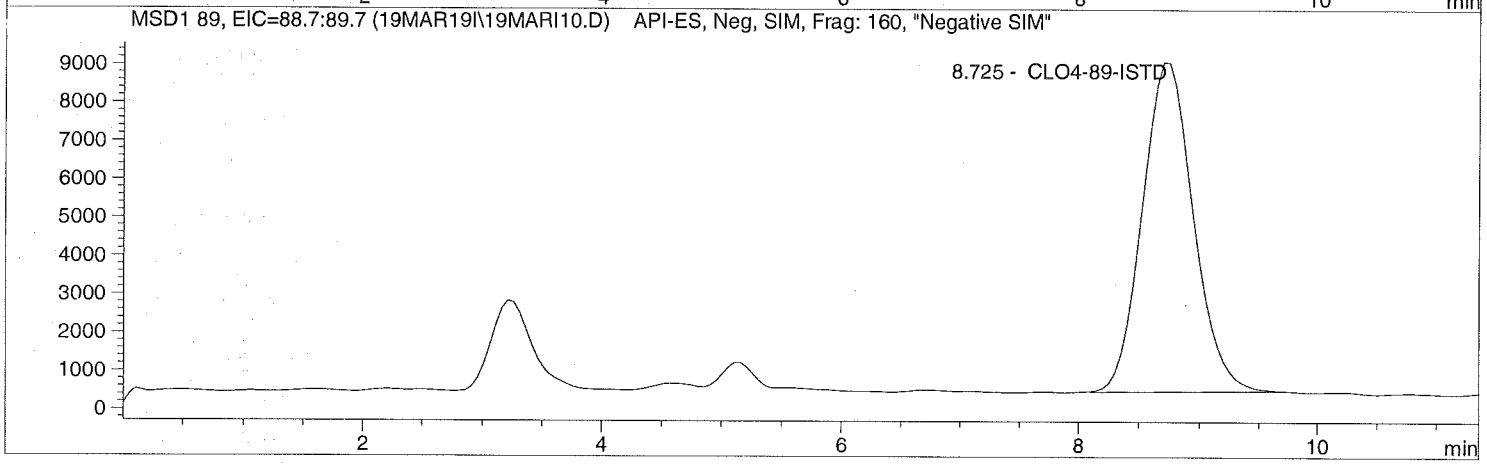
Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

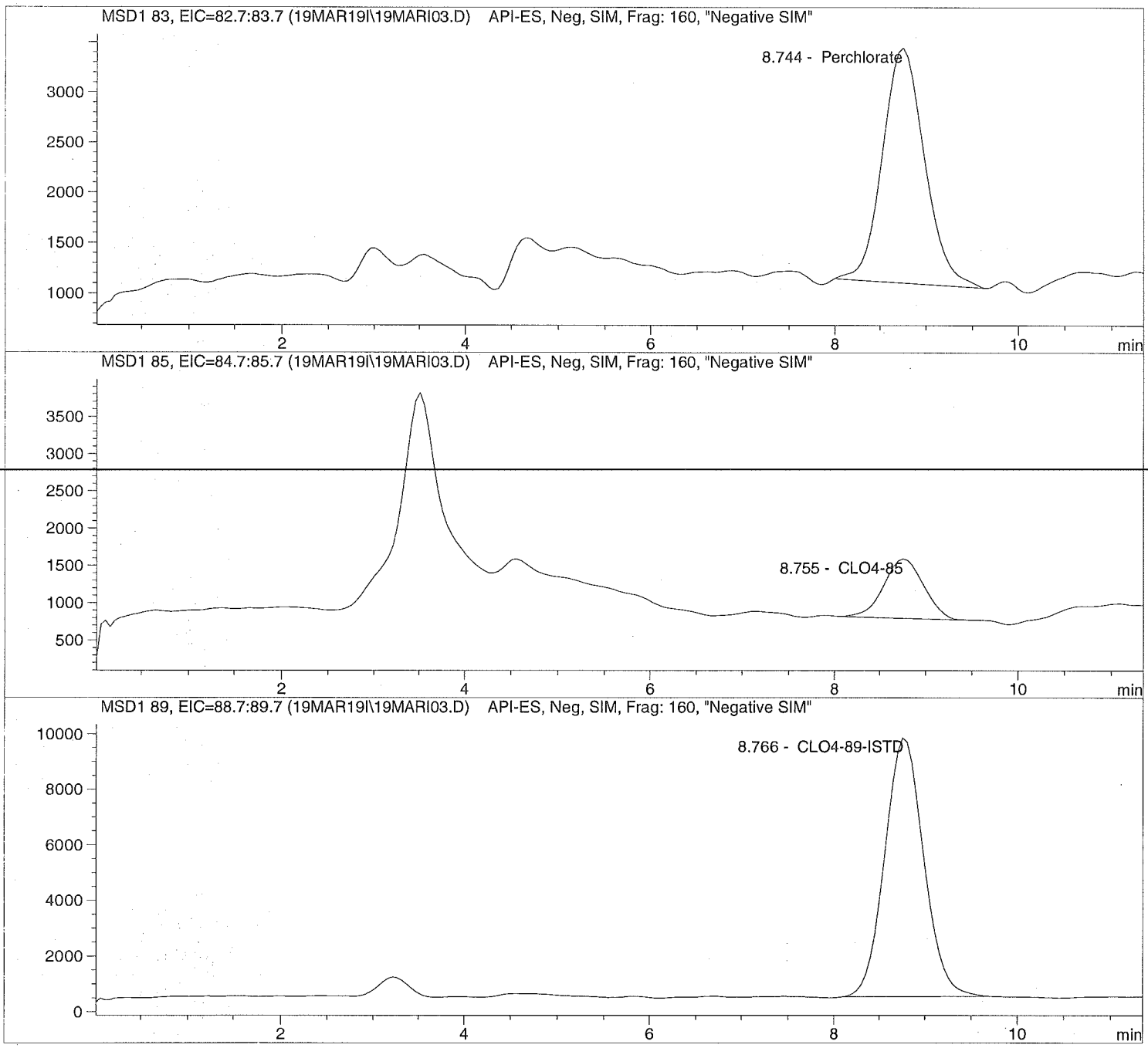
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

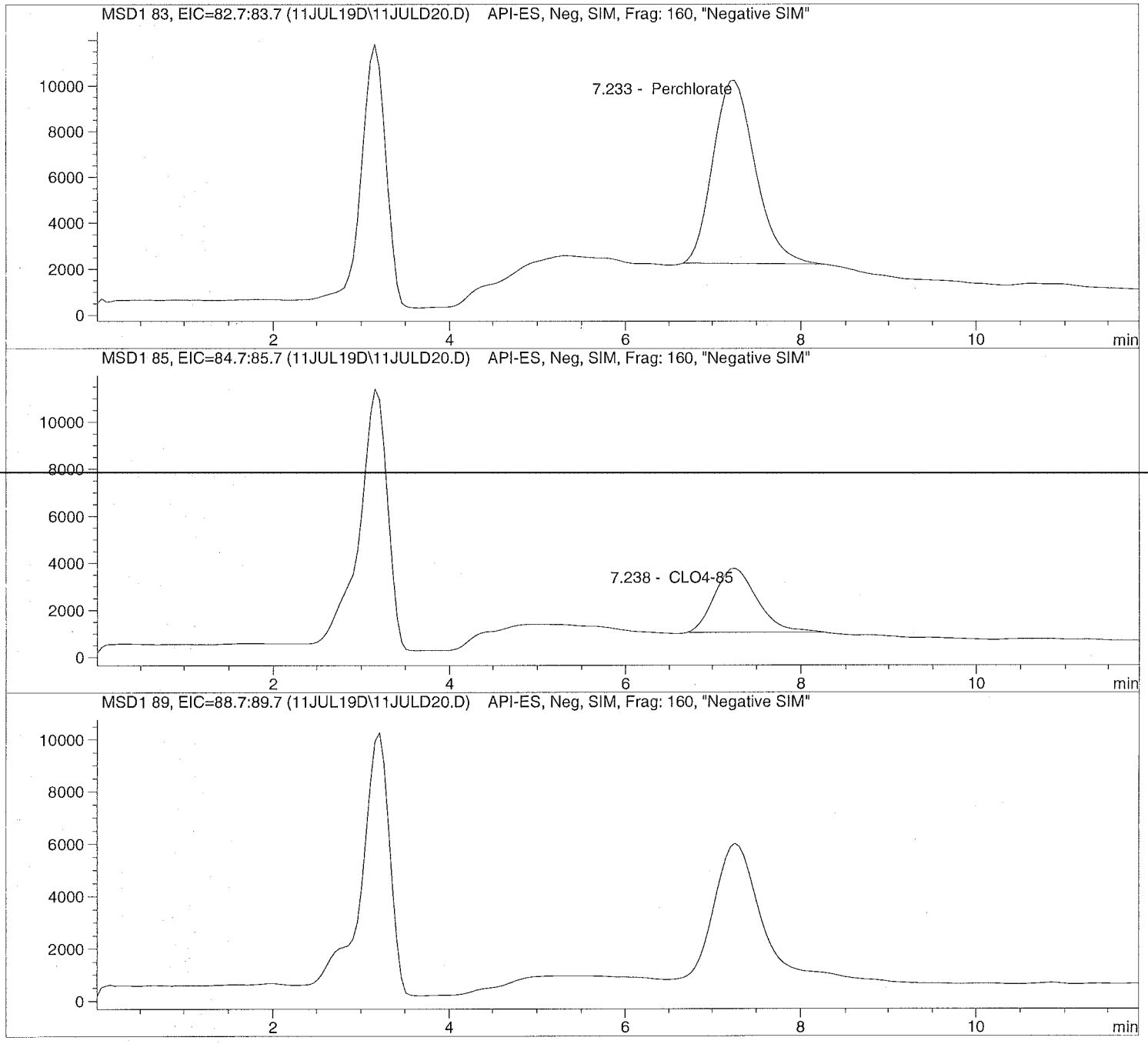
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD20.D Sample Name: 1918705005

Injection Date:	7/11/2019 15:35:52	Seq Line:	20
Sample Name:	1918705005	Location:	Vial 58
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD20.D Sample Name: 1918705005

Injection Date:	7/11/2019 15:35:52	Seq Line:	20
Sample Name:	1918705005	Location:	Vial 58
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.233	PBA	264721.6	0.1573	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.238	BBA	91183.5	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

July 12, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19061482**

Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

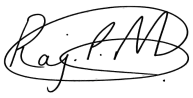
ALS Environmental received 5 sample(s) on Jun 27, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Houston, US Date: 12-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061482

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19061482-01	AWD4_062619	Groundwater		26-Jun-2019 07:55	27-Jun-2019 08:30	☐
HS19061482-02	AWD4_062619_a	Groundwater		26-Jun-2019 07:55	27-Jun-2019 08:30	☐
HS19061482-03	18WW24_062619	Groundwater		26-Jun-2019 09:30	27-Jun-2019 08:30	☐
HS19061482-04	MW16_062619	Groundwater		26-Jun-2019 11:00	27-Jun-2019 08:30	☐
HS19061482-05	MW19_062619	Groundwater		26-Jun-2019 12:30	27-Jun-2019 08:30	☐

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19061482

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142659

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R341869

Sample ID: CCV

- Bromoform, 1,2-Dibromo-3-Chloropropane and 1,2,3-Trichlorobenzene exceeded %D limits for CCV. Samples are ND for these compounds.

Sample ID: HS19061486-01MS

- MS and MSD are for an unrelated sample

Metals by Method SW7470

Batch ID: 142560,142769

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 142541

Sample ID: HS19061486-01SD

- SD is for an unrelated sample

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: AWD4_062619
Collection Date: 26-Jun-2019 07:55

ANALYTICAL REPORT
WorkOrder:HS19061482
Lab ID:HS19061482-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:07
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 22:07
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jul-2019 22:07
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:07
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jul-2019 22:07
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 22:07
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jul-2019 22:07
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

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ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: AWD4_062619
Collection Date: 26-Jun-2019 07:55

ANALYTICAL REPORT
WorkOrder:HS19061482
Lab ID:HS19061482-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	03-Jul-2019 22:07
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 22:07
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 22:07
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:07
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:07
Surr: 1,2-Dichloroethane-d4	*94.5*			**0**	*81-118*	*%REC*	*1*	*03-Jul-2019 22:07*
Surr: 4-Bromofluorobenzene	*91.0*			**0**	*85-114*	*%REC*	*1*	*03-Jul-2019 22:07*
Surr: Dibromofluoromethane	*92.4*			**0**	*80-119*	*%REC*	*1*	*03-Jul-2019 22:07*
Surr: Toluene-d8	*95.7*			**0**	*89-112*	*%REC*	*1*	*03-Jul-2019 22:07*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 02-Jul-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	09-Jul-2019 13:40
Surr: 2-Fluorobiphenyl	*64.0*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 13:40*
Surr: 4-Terphenyl-d14	*84.9*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 13:40*
Surr: Nitrobenzene-d5	*75.9*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 13:40*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

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ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: AWD4_062619
Collection Date: 26-Jun-2019 07:55

ANALYTICAL REPORT
WorkOrder:HS19061482
Lab ID:HS19061482-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**20.1**		**0.180**	**0.500**	**1.00**	**mg/L**	100	08-Jul-2019 14:57
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 17:09
Arsenic	**0.00257**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:09
Barium	**0.267**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:09
Beryllium	**0.000982**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	05-Jul-2019 17:09
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:09
Calcium	**11.3**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	05-Jul-2019 17:09
Chromium	**0.387**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:09
Cobalt	**0.0121**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:09
Copper	**0.0215**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:09
Iron	**22.3**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:09
Lead	**0.00842**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:09
Magnesium	**5.94**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:09
Manganese	**0.0703**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:09
Nickel	**0.240**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:09
Potassium	**1.29**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:09
Selenium	**0.00245**	J	**0.00110**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:09
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jul-2019 17:09
Sodium	**62.6**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:09
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:09
Vanadium	**0.0366**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:09
Zinc	**0.0883**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:09
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 16:38
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Jul-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

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ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: AWD4_062619_a
Collection Date: 26-Jun-2019 07:55

ANALYTICAL REPORT
WorkOrder:HS19061482
Lab ID:HS19061482-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:31
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 22:31
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jul-2019 22:31
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:31
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jul-2019 22:31
Acetone	**6.8**		**0.40**	**1.0**	**2.0**	**UG/L**	1	03-Jul-2019 22:31
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jul-2019 22:31
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: AWD4_062619_a
Collection Date: 26-Jun-2019 07:55

ANALYTICAL REPORT
WorkOrder:HS19061482
Lab ID:HS19061482-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	03-Jul-2019 22:31
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 22:31
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 22:31
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:31
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:31
Surr: 1,2-Dichloroethane-d4	*96.1*			**0**	*81-118*	*%REC*	*1*	*03-Jul-2019 22:31*
Surr: 4-Bromofluorobenzene	*92.5*			**0**	*85-114*	*%REC*	*1*	*03-Jul-2019 22:31*
Surr: Dibromofluoromethane	*92.4*			**0**	*80-119*	*%REC*	*1*	*03-Jul-2019 22:31*
Surr: Toluene-d8	*97.1*			**0**	*89-112*	*%REC*	*1*	*03-Jul-2019 22:31*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 02-Jul-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	09-Jul-2019 14:01
Surr: 2-Fluorobiphenyl	*72.5*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 14:01*
Surr: 4-Terphenyl-d14	*105*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 14:01*
Surr: Nitrobenzene-d5	*90.1*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 14:01*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: AWD4_062619_a
Collection Date: 26-Jun-2019 07:55

ANALYTICAL REPORT
WorkOrder:HS19061482
Lab ID:HS19061482-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**9.41**		**0.180**	**0.500**	**1.00**	**mg/L**	100	08-Jul-2019 14:59
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 17:11
Arsenic	**0.00158**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:11
Barium	**0.239**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:11
Beryllium	**0.000691**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	05-Jul-2019 17:11
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:11
Calcium	**10.7**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	05-Jul-2019 17:11
Chromium	**0.193**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:11
Cobalt	**0.00828**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:11
Copper	**0.0140**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:11
Iron	**11.0**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:11
Lead	**0.00448**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:11
Magnesium	**5.31**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:11
Manganese	**0.0536**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:11
Nickel	**0.227**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:11
Potassium	**0.827**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:11
Selenium	**0.00328**	J	**0.00110**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:11
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jul-2019 17:11
Sodium	**62.3**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:11
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:11
Vanadium	**0.0207**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:11
Zinc	**0.0588**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:11
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 16:40
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Jul-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW24_062619
Collection Date: 26-Jun-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19061482
Lab ID:HS19061482-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:55
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 22:55
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jul-2019 22:55
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:55
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jul-2019 22:55
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 22:55
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jul-2019 22:55
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW24_062619
Collection Date: 26-Jun-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19061482
Lab ID:HS19061482-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	03-Jul-2019 22:55
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 22:55
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 22:55
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 22:55
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 22:55
Surr: 1,2-Dichloroethane-d4	*96.3*			**0**	*81-118*	*%REC*	*1*	*03-Jul-2019 22:55*
Surr: 4-Bromofluorobenzene	*91.6*			**0**	*85-114*	*%REC*	*1*	*03-Jul-2019 22:55*
Surr: Dibromofluoromethane	*91.5*			**0**	*80-119*	*%REC*	*1*	*03-Jul-2019 22:55*
Surr: Toluene-d8	*95.0*			**0**	*89-112*	*%REC*	*1*	*03-Jul-2019 22:55*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW24_062619
Collection Date: 26-Jun-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19061482
Lab ID:HS19061482-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**0.482**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	05-Jul-2019 17:16
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 17:16
Arsenic	**0.000998**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:16
Barium	**0.0582**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:16
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:16
Cadmium	**0.000207**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	05-Jul-2019 17:16
Calcium	**8.52**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	05-Jul-2019 17:16
Chromium	**0.000791**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:16
Cobalt	**0.00641**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:16
Copper	**0.00151**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:16
Iron	**0.483**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:16
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	05-Jul-2019 17:16
Magnesium	**6.41**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:16
Manganese	**2.89**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	08-Jul-2019 15:08
Nickel	**0.206**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:16
Potassium	**1.08**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:16
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jul-2019 17:16
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jul-2019 17:16
Sodium	**208**		**0.140**	**0.500**	**2.00**	**mg/L**	10	08-Jul-2019 15:08
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:16
Vanadium	**0.00210**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:16
Zinc	**0.138**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:16
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 16:42
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Jul-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW16_062619
Collection Date: 26-Jun-2019 11:00

ANALYTICAL REPORT
WorkOrder:HS19061482
Lab ID:HS19061482-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,1-Dichloroethane	**0.89**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Jul-2019 17:44
1,1-Dichloroethene	**15**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Jul-2019 17:44
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,2-Dichloroethane	**84**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Jul-2019 17:44
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:44
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:44
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 17:44
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jul-2019 17:44
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:44
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jul-2019 17:44
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 17:44
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jul-2019 17:44
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:44

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW16_062619
Collection Date: 26-Jun-2019 11:00

ANALYTICAL REPORT
WorkOrder:HS19061482
Lab ID:HS19061482-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:44
cis-1,2-Dichloroethene	**52**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Jul-2019 17:44
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	03-Jul-2019 17:44
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 17:44
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 17:44
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 17:44
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Tetrachloroethene	**1.4**		**0.30**	**0.50**	**1.0**	**UG/L**	1	03-Jul-2019 17:44
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:44
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:44
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Trichloroethene	**1,200**		**5.0**	**12**	**25**	**UG/L**	25	03-Jul-2019 19:44
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 17:44
Vinyl chloride	**2.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Jul-2019 17:44
Surr: 1,2-Dichloroethane-d4	*91.2*			**0**	*81-118*	*%REC*	*1*	*03-Jul-2019 17:44*
Surr: 1,2-Dichloroethane-d4	*99.2*			**0**	*81-118*	*%REC*	*25*	*03-Jul-2019 19:44*
Surr: 4-Bromofluorobenzene	*89.7*			**0**	*85-114*	*%REC*	*1*	*03-Jul-2019 17:44*
Surr: 4-Bromofluorobenzene	*92.4*			**0**	*85-114*	*%REC*	*25*	*03-Jul-2019 19:44*
Surr: Dibromofluoromethane	*88.0*			**0**	*80-119*	*%REC*	*1*	*03-Jul-2019 17:44*
Surr: Dibromofluoromethane	*95.9*			**0**	*80-119*	*%REC*	*25*	*03-Jul-2019 19:44*
Surr: Toluene-d8	*91.7*			**0**	*89-112*	*%REC*	*1*	*03-Jul-2019 17:44*
Surr: Toluene-d8	*96.4*			**0**	*89-112*	*%REC*	*25*	*03-Jul-2019 19:44*
SEMIVOLATILES SIM	**Method:SW8270SIM**					Prep:SW3510 / 02-Jul-2019		Analyst: LG
1,4-Dioxane	**12**		**0.50**	**0.50**	**0.50**	**ug/L**	50	09-Jul-2019 14:42
Surr: 2-Fluorobiphenyl	*123*			**0**	*40-140*	*%REC*	*50*	*09-Jul-2019 14:42*
Surr: 4-Terphenyl-d14	*135*			**0**	*40-140*	*%REC*	*50*	*09-Jul-2019 14:42*
Surr: Nitrobenzene-d5	*133*			**0**	*40-140*	*%REC*	*50*	*09-Jul-2019 14:42*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW16_062619
Collection Date: 26-Jun-2019 11:00

ANALYTICAL REPORT
WorkOrder:HS19061482
Lab ID:HS19061482-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Jul-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW19_062619
Collection Date: 26-Jun-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19061482
Lab ID:HS19061482-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:19
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 23:19
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jul-2019 23:19
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:19
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jul-2019 23:19
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 23:19
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jul-2019 23:19
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW19_062619
Collection Date: 26-Jun-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19061482
Lab ID:HS19061482-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	03-Jul-2019 23:19
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 23:19
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 23:19
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:19
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Trichloroethene	**0.63**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	03-Jul-2019 23:19
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:19
Surr: 1,2-Dichloroethane-d4	*96.1*			**0**	*81-118*	*%REC*	*1*	*03-Jul-2019 23:19*
Surr: 4-Bromofluorobenzene	*90.7*			**0**	*85-114*	*%REC*	*1*	*03-Jul-2019 23:19*
Surr: Dibromofluoromethane	*91.7*			**0**	*80-119*	*%REC*	*1*	*03-Jul-2019 23:19*
Surr: Toluene-d8	*94.8*			**0**	*89-112*	*%REC*	*1*	*03-Jul-2019 23:19*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW19_062619
Collection Date: 26-Jun-2019 12:30

ANALYTICAL REPORT
WorkOrder:HS19061482
Lab ID:HS19061482-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**1.54**		**0.0180**	**0.0500**	**0.100**	**mg/L**	10	08-Jul-2019 15:10
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 17:18
Arsenic	**0.0137**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:18
Barium	**0.467**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:18
Beryllium	**0.000294**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	05-Jul-2019 17:18
Cadmium	**0.00227**		**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	05-Jul-2019 17:18
Calcium	**44.1**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	05-Jul-2019 17:18
Chromium	**0.791**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:18
Cobalt	**0.0171**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:18
Copper	**0.0244**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:18
Iron	**67.1**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:18
Lead	**0.00323**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:18
Magnesium	**26.1**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:18
Manganese	**1.50**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:18
Nickel	**0.214**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:18
Potassium	**4.36**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:18
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jul-2019 17:18
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jul-2019 17:18
Sodium	**453**		**0.140**	**0.500**	**2.00**	**mg/L**	10	08-Jul-2019 15:10
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:18
Vanadium	**0.0102**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:18
Zinc	**0.0441**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:18
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	05-Jul-2019 15:10
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	11-Jul-2019 18:06

Note: See Qualifiers Page for a list of qualifiers and their explanation.

RIGHT SOLUTIONS | RIGHT PARTNER

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

Batch ID: 142541 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061482-01	1	10	10 (mL)	1
HS19061482-02	1	10	10 (mL)	1
HS19061482-03	1	10	10 (mL)	1
HS19061482-05	1	10	10 (mL)	1

Batch ID: 142560 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061482-01	1	10 (mL)	10 (mL)	1
HS19061482-02	1	10 (mL)	10 (mL)	1
HS19061482-03	1	10 (mL)	10 (mL)	1

Batch ID: 142659 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061482-01	1	1000	1 (mL)	0.001
HS19061482-02	1	1000	1 (mL)	0.001
HS19061482-04	1	1000	1 (mL)	0.001

Batch ID: 142769 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061482-05	1	10 (mL)	10 (mL)	1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142541 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19061482-01	AWD4_062619	26 Jun 2019 07:55		28 Jun 2019 11:59	08 Jul 2019 14:57	100
HS19061482-01	AWD4_062619	26 Jun 2019 07:55		28 Jun 2019 11:59	05 Jul 2019 17:09	1
HS19061482-02	AWD4_062619_a	26 Jun 2019 07:55		28 Jun 2019 11:59	08 Jul 2019 14:59	100
HS19061482-02	AWD4_062619_a	26 Jun 2019 07:55		28 Jun 2019 11:59	05 Jul 2019 17:11	1
HS19061482-03	18WW24_062619	26 Jun 2019 09:30		28 Jun 2019 11:59	08 Jul 2019 15:08	10
HS19061482-03	18WW24_062619	26 Jun 2019 09:30		28 Jun 2019 11:59	05 Jul 2019 17:16	1
HS19061482-05	MW19_062619	26 Jun 2019 12:30		28 Jun 2019 11:59	08 Jul 2019 15:10	10
HS19061482-05	MW19_062619	26 Jun 2019 12:30		28 Jun 2019 11:59	05 Jul 2019 17:18	1
Batch ID: 142560 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19061482-01	AWD4_062619	26 Jun 2019 07:55		28 Jun 2019 10:30	28 Jun 2019 16:38	1
HS19061482-02	AWD4_062619_a	26 Jun 2019 07:55		28 Jun 2019 10:30	28 Jun 2019 16:40	1
HS19061482-03	18WW24_062619	26 Jun 2019 09:30		28 Jun 2019 10:30	28 Jun 2019 16:42	1
Batch ID: 142659 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Groundwater	
HS19061482-01	AWD4_062619	26 Jun 2019 07:55		02 Jul 2019 12:18	09 Jul 2019 13:40	1
HS19061482-02	AWD4_062619_a	26 Jun 2019 07:55		02 Jul 2019 12:18	09 Jul 2019 14:01	1
HS19061482-04	MW16_062619	26 Jun 2019 11:00		02 Jul 2019 12:18	09 Jul 2019 14:42	50
Batch ID: 142769 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19061482-05	MW19_062619	26 Jun 2019 12:30		05 Jul 2019 10:30	05 Jul 2019 15:10	1
Batch ID: R341869 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19061482-01	AWD4_062619	26 Jun 2019 07:55			03 Jul 2019 22:07	1
HS19061482-02	AWD4_062619_a	26 Jun 2019 07:55			03 Jul 2019 22:31	1
HS19061482-03	18WW24_062619	26 Jun 2019 09:30			03 Jul 2019 22:55	1
HS19061482-04	MW16_062619	26 Jun 2019 11:00			03 Jul 2019 19:44	25
HS19061482-04	MW16_062619	26 Jun 2019 11:00			03 Jul 2019 17:44	1
HS19061482-05	MW19_062619	26 Jun 2019 12:30			03 Jul 2019 23:19	1
Batch ID: R342274 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19061482-01	AWD4_062619	26 Jun 2019 07:55			11 Jul 2019 18:06	1
HS19061482-02	AWD4_062619_a	26 Jun 2019 07:55			11 Jul 2019 18:06	1
HS19061482-03	18WW24_062619	26 Jun 2019 09:30			11 Jul 2019 18:06	1
HS19061482-04	MW16_062619	26 Jun 2019 11:00			11 Jul 2019 18:06	1
HS19061482-05	MW19_062619	26 Jun 2019 12:30			11 Jul 2019 18:06	1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142541** Units: **mg/L** Analysis Date: **05-Jul-2019 15:49**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5155804** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.004417	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00100	0.00500								U
Iron	0.0500	0.200								U
Magnesium	0.01315	0.200								J
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00250	0.00500								U

MBLK Sample ID: **MBLK-142541** Units: **mg/L** Analysis Date: **08-Jul-2019 13:53**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157125** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.00100	0.00500								U

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142541** Units: **mg/L** Analysis Date: **05-Jul-2019 15:51**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5155805** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09504	0.0100	0.1	0	95.0	84 - 117				
Antimony	0.05029	0.00500	0.05	0	101	85 - 117				
Arsenic	0.05092	0.00500	0.05	0	102	84 - 116				
Barium	0.04966	0.00500	0.05	0	99.3	86 - 114				
Beryllium	0.05036	0.00200	0.05	0	101	83 - 121				
Cadmium	0.0504	0.00200	0.05	0	101	87 - 115				
Calcium	5.026	0.500	5	0	101	87 - 118				
Chromium	0.0522	0.00500	0.05	0	104	85 - 116				
Cobalt	0.05274	0.00500	0.05	0	105	86 - 115				
Copper	0.0545	0.00500	0.05	0	109	85 - 118				
Iron	5.193	0.200	5	0	104	87 - 118				
Lead	0.05298	0.00500	0.05	0	106	88 - 115				
Magnesium	5.5	0.200	5	0	110	83 - 118				
Manganese	0.05088	0.00500	0.05	0	102	87 - 115				
Nickel	0.05412	0.00500	0.05	0	108	85 - 117				
Potassium	5.248	0.200	5	0	105	87 - 115				
Selenium	0.05096	0.00500	0.05	0	102	80 - 120				
Silver	0.05061	0.00500	0.05	0	101	85 - 116				
Sodium	5.358	0.200	5	0	107	85 - 117				
Thallium	0.0498	0.00200	0.05	0	99.6	82 - 116				
Vanadium	0.05244	0.00500	0.05	0	105	86 - 115				
Zinc	0.05376	0.00500	0.05	0	108	83 - 119				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19061486-01MS** Units: **mg/L** Analysis Date: **05-Jul-2019 15:59**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5155808** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.739	0.0100	0.4	0.3697	92.3	84 - 117				
Antimony	0.04732	0.00500	0.05	0.0008	93.0	85 - 117				
Arsenic	0.04842	0.00500	0.05	0	96.8	84 - 116				
Barium	0.2815	0.00500	0.05	0.238	87.0	86 - 114				O
Beryllium	0.04857	0.00200	0.05	0	97.1	83 - 121				
Cadmium	0.04813	0.00200	0.05	0	96.3	87 - 115				
Calcium	81.2	0.500	5	76.32	97.6	87 - 118				O
Chromium	0.05476	0.00500	0.05	0.006591	96.3	85 - 116				
Cobalt	0.04919	0.00500	0.05	0.000529	97.3	86 - 115				
Copper	0.05037	0.00500	0.05	0.001192	98.4	85 - 118				
Iron	5.246	0.200	5	0.3538	97.8	87 - 118				
Magnesium	8.622	0.200	5	3.785	96.7	83 - 118				
Manganese	0.1269	0.00500	0.05	0.07982	94.2	87 - 115				
Nickel	0.05352	0.00500	0.05	0.00408	98.9	85 - 117				
Potassium	5.438	0.200	5	0.5115	98.5	87 - 115				
Selenium	0.04621	0.00500	0.05	0	92.4	80 - 120				
Silver	0.04831	0.00500	0.05	0	96.6	85 - 116				
Sodium	19.1	0.200	5	14.32	95.6	85 - 117				
Thallium	0.04492	0.00200	0.05	0.000881	88.1	82 - 116				
Vanadium	0.05006	0.00500	0.05	0.001987	96.1	86 - 115				
Zinc	0.0719	0.00500	0.05	0.02524	93.3	83 - 119				

MS Sample ID: **HS19061486-01MS** Units: **mg/L** Analysis Date: **08-Jul-2019 13:58**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157127** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.04682	0.00500	0.05	0	93.6	88 - 115				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19061486-01MSD** Units: **mg/L** Analysis Date: **05-Jul-2019 16:01**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5155809** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.7553	0.0100	0.4	0.3697	96.4	84 - 117	0.739	2.18	20	
Antimony	0.04868	0.00500	0.05	0.0008	95.8	85 - 117	0.04732	2.84	20	
Arsenic	0.04954	0.00500	0.05	0	99.1	84 - 116	0.04842	2.27	20	
Barium	0.287	0.00500	0.05	0.238	98.0	86 - 114	0.2815	1.95	20	O
Beryllium	0.0485	0.00200	0.05	0	97.0	83 - 121	0.04857	0.142	20	
Cadmium	0.0486	0.00200	0.05	0	97.2	87 - 115	0.04813	0.966	20	
Calcium	81.29	0.500	5	76.32	99.3	87 - 118	81.2	0.104	20	O
Chromium	0.05662	0.00500	0.05	0.006591	100	85 - 116	0.05476	3.34	20	
Cobalt	0.05007	0.00500	0.05	0.000529	99.1	86 - 115	0.04919	1.76	20	
Copper	0.05145	0.00500	0.05	0.001192	101	85 - 118	0.05037	2.12	20	
Iron	5.285	0.200	5	0.3538	98.6	87 - 118	5.246	0.742	20	
Lead	0.04787	0.00500	0.05	0	95.7	88 - 115	0.04832	0.925	20	
Magnesium	8.77	0.200	5	3.785	99.7	83 - 118	8.622	1.7	20	
Manganese	0.1284	0.00500	0.05	0.07982	97.2	87 - 115	0.1269	1.2	20	
Nickel	0.05428	0.00500	0.05	0.00408	100	85 - 117	0.05352	1.41	20	
Potassium	5.433	0.200	5	0.5115	98.4	87 - 115	5.438	0.0912	20	
Selenium	0.0486	0.00500	0.05	0	97.2	80 - 120	0.04621	5.05	20	
Silver	0.04796	0.00500	0.05	0	95.9	85 - 116	0.04831	0.717	20	
Sodium	19.67	0.200	5	14.32	107	85 - 117	19.1	2.92	20	
Thallium	0.04425	0.00200	0.05	0.000881	86.7	82 - 116	0.04492	1.5	20	
Vanadium	0.05188	0.00500	0.05	0.001987	99.8	86 - 115	0.05006	3.57	20	
Zinc	0.07298	0.00500	0.05	0.02524	95.5	83 - 119	0.0719	1.49	20	

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19061486-01PDS** Units: **mg/L** Analysis Date: **05-Jul-2019 16:03**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5155810** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.487	0.0100	0.1	0.3697	117	80 - 120				
Arsenic	0.09568	0.00500	0.1	0.000356	95.3	80 - 120				
Barium	0.3243	0.00500	0.1	0.238	86.3	80 - 120				
Beryllium	0.08784	0.00200	0.1	0.000034	87.8	80 - 120				
Cadmium	0.09239	0.00200	0.1	0.000163	92.2	80 - 120				
Calcium	84.54	0.500	10	76.32	82.1	80 - 120				O
Chromium	0.1036	0.00500	0.1	0.006591	97.0	80 - 120				
Cobalt	0.0997	0.00500	0.1	0.000529	99.2	80 - 120				
Copper	0.09939	0.00500	0.1	0.001192	98.2	80 - 120				
Iron	10.01	0.200	10	0.3538	96.6	80 - 120				
Lead	0.09928	0.00500	0.1	0.000498	98.8	80 - 120				
Magnesium	13.55	0.200	10	3.785	97.6	80 - 120				
Manganese	0.1738	0.00500	0.1	0.07982	94.0	80 - 120				
Nickel	0.1011	0.00500	0.1	0.00408	97.0	80 - 120				
Potassium	10.21	0.200	10	0.5115	97.0	80 - 120				
Selenium	0.09467	0.00500	0.1	0.000462	94.2	80 - 120				
Silver	0.09272	0.00500	0.1	0.000026	92.7	80 - 120				
Sodium	24.03	0.200	10	14.32	97.1	80 - 120				
Thallium	0.1018	0.00200	0.1	0.000881	101	80 - 120				
Vanadium	0.09888	0.00500	0.1	0.001987	96.9	80 - 120				
Zinc	0.1221	0.00500	0.1	0.02524	96.9	80 - 120				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19061486-01SD** Units: **mg/L** Analysis Date: **05-Jul-2019 15:56**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5155807** PrepDate: **28-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.3834	0.0500					0.3697	3.7	10	
Antimony	0.00250	0.0250					0.0008	0	10	U
Arsenic	0.00250	0.0250					0.000356	0	10	U
Barium	0.2349	0.0250					0.238	1.31	10	
Beryllium	0.00250	0.0100					0.000034	0	10	U
Cadmium	0.00250	0.0100					0.000163	0	10	U
Calcium	73.47	2.50					76.32	3.74	10	
Chromium	0.006325	0.0250					0.006591	0	10	J
Cobalt	0.00250	0.0250					0.000529	0	10	U
Copper	0.00500	0.0250					0.001192	0	10	U
Iron	0.3675	1.00					0.3538	0	10	J
Lead	0.00500	0.0250					0.000498	0	10	U
Magnesium	3.655	1.00					3.785	3.44	10	
Manganese	0.08094	0.0250					0.07982	1.4	10	
Nickel	0.00368	0.0250					0.00408	0	10	J
Potassium	0.6068	1.00					0.5115	0	10	J
Selenium	0.0125	0.0250					0.000462	0	10	U
Silver	0.00250	0.0250					0.000026	0	10	U
Sodium	15.04	1.00					14.32	5.03	10	
Thallium	0.00250	0.0100					0.000881	0	10	U
Vanadium	0.003882	0.0250					0.001987	0	10	J
Zinc	0.02966	0.0250					0.02524	17.5	10	R

The following samples were analyzed in this batch: HS19061482-01 HS19061482-02 HS19061482-03 HS19061482-05

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: 142560 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142560** Units: **mg/L** Analysis Date: **28-Jun-2019 15:56**
Client ID: Run ID: **HG03_341562** SeqNo: **5147053** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142560** Units: **mg/L** Analysis Date: **28-Jun-2019 15:57**
Client ID: Run ID: **HG03_341562** SeqNo: **5147054** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00509	0.000200	0.005	0	102	80 - 120				

MS Sample ID: **HS19061486-01MS** Units: **mg/L** Analysis Date: **28-Jun-2019 16:01**
Client ID: Run ID: **HG03_341562** SeqNo: **5147056** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000513	0.000000200	5e-006	-0.0000000010	103	75 - 125				

MSD Sample ID: **HS19061486-01MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 16:03**
Client ID: Run ID: **HG03_341562** SeqNo: **5147057** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000509	0.000000200	5e-006	-0.0000000010	102	75 - 125	0.000005130	0.783	20	

The following samples were analyzed in this batch: HS19061482-01 HS19061482-02 HS19061482-03

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: 142769 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142769** Units: **mg/L** Analysis Date: **05-Jul-2019 15:01**
Client ID: Run ID: **HG03_341922** SeqNo: **5154872** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142769** Units: **mg/L** Analysis Date: **05-Jul-2019 15:03**
Client ID: Run ID: **HG03_341922** SeqNo: **5154873** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00505	0.000200	0.005	0	101	82 - 119				

MS Sample ID: **HS19070016-09MS** Units: **mg/L** Analysis Date: **05-Jul-2019 15:06**
Client ID: Run ID: **HG03_341922** SeqNo: **5154875** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00527	0.000200	0.005	-0.00001500	106	82 - 119				

MSD Sample ID: **HS19070016-09MSD** Units: **mg/L** Analysis Date: **05-Jul-2019 15:08**
Client ID: Run ID: **HG03_341922** SeqNo: **5154876** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00517	0.000200	0.005	-0.00001500	104	82 - 119	0.005270	1.92	20	

The following samples were analyzed in this batch: HS19061482-05

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: 142659 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142659** Units: **ug/L** Analysis Date: **09-Jul-2019 12:38**
Client ID: Run ID: **SV-5_342071** SeqNo: **5159697** PrepDate: **02-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.05997*	*0*	*0.08*	*0*	*75.0*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.05244*	*0*	*0.08*	*0*	*65.5*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.0849*	*0*	*0.08*	*0*	*106*	*40 - 140*				

LCS Sample ID: **LCS-142659** Units: **ug/L** Analysis Date: **09-Jul-2019 12:59**
Client ID: Run ID: **SV-5_342071** SeqNo: **5159698** PrepDate: **02-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07981	0.010	0.08	0	99.8	40 - 140				
Surr: 2-Fluorobiphenyl	*0.06497*	*0*	*0.08*	*0*	*81.2*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.05228*	*0*	*0.08*	*0*	*65.3*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07798*	*0*	*0.08*	*0*	*97.5*	*40 - 140*				

LCSD Sample ID: **LCSD-142659** Units: **ug/L** Analysis Date: **09-Jul-2019 13:19**
Client ID: Run ID: **SV-5_342071** SeqNo: **5159699** PrepDate: **02-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08031	0.010	0.08	0	100	40 - 140	0.07981	0.627	20	
Surr: 2-Fluorobiphenyl	*0.07017*	*0*	*0.08*	*0*	*87.7*	*40 - 140*	*0.06497*	*7.7*	*20*	
Surr: 4-Terphenyl-d14	*0.05934*	*0*	*0.08*	*0*	*74.2*	*40 - 140*	*0.05228*	*12.7*	*20*	
Surr: Nitrobenzene-d5	*0.08488*	*0*	*0.08*	*0*	*106*	*40 - 140*	*0.07798*	*8.47*	*20*	

The following samples were analyzed in this batch: HS19061482-01 HS19061482-02 HS19061482-04

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190703** Units: **UG/L** Analysis Date: **03-Jul-2019 15:45**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153631** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

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ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190703** Units: **UG/L** Analysis Date: **03-Jul-2019 15:45**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153631** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.09*	*1.0*	*50*	*0*	*92.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.05*	*1.0*	*50*	*0*	*96.1*	*85 - 114*				
Surr: Dibromofluoromethane	*44.95*	*1.0*	*50*	*0*	*89.9*	*80 - 119*				
Surr: Toluene-d8	*48.5*	*1.0*	*50*	*0*	*97.0*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190703** Units: **UG/L** Analysis Date: **03-Jul-2019 14:57**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153630** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.99	1.0	20	0	89.9	78 - 124				
1,1,1-Trichloroethane	18.38	1.0	20	0	91.9	74 - 131				
1,1,2,2-Tetrachloroethane	19.33	1.0	20	0	96.6	71 - 121				
1,1,2-Trichloroethane	19	1.0	20	0	95.0	80 - 119				
1,1-Dichloroethane	17.63	1.0	20	0	88.1	77 - 125				
1,1-Dichloroethene	17.56	1.0	20	0	87.8	71 - 131				
1,1-Dichloropropene	18.07	1.0	20	0	90.4	78 - 125				
1,2,3-Trichlorobenzene	23.54	1.0	20	0	118	69 - 129				
1,2,3-Trichloropropane	19.44	1.0	20	0	97.2	73 - 122				
1,2,4-Trichlorobenzene	21.42	1.0	20	0	107	69 - 130				
1,2,4-Trimethylbenzene	17.67	1.0	20	0	88.3	76 - 124				
1,2-Dibromo-3-chloropropane	21.87	1.0	20	0	109	62 - 128				
1,2-Dibromoethane	18.58	1.0	20	0	92.9	77 - 121				
1,2-Dichlorobenzene	18.25	1.0	20	0	91.3	80 - 119				
1,2-Dichloroethane	17.32	1.0	20	0	86.6	73 - 128				
1,2-Dichloropropane	17.52	1.0	20	0	87.6	78 - 122				
1,3,5-Trimethylbenzene	17.42	1.0	20	0	87.1	75 - 124				
1,3-Dichlorobenzene	17.82	1.0	20	0	89.1	80 - 119				
1,3-Dichloropropane	18.44	1.0	20	0	92.2	80 - 119				
1,4-Dichlorobenzene	18.95	1.0	20	0	94.8	79 - 118				
2,2-Dichloropropane	16.75	1.0	20	0	83.7	60 - 139				
2-Butanone	43.93	2.0	40	0	110	56 - 143				
2-Chlorotoluene	18.48	1.0	20	0	92.4	79 - 122				
2-Hexanone	38.01	2.0	40	0	95.0	57 - 139				
4-Chlorotoluene	18.53	1.0	20	0	92.6	78 - 122				
4-Isopropyltoluene	17.94	1.0	20	0	89.7	77 - 127				
4-Methyl-2-pentanone	36.09	2.0	40	0	90.2	67 - 130				
Acetone	46.53	2.0	40	0	116	39 - 160				
Benzene	18.29	1.0	20	0	91.4	79 - 120				
Bromobenzene	17.41	1.0	20	0	87.1	80 - 120				
Bromochloromethane	17.81	1.0	20	0	89.0	78 - 123				
Bromodichloromethane	18.24	1.0	20	0	91.2	79 - 125				
Bromoform	19.34	1.0	20	0	96.7	66 - 130				
Bromomethane	20.11	1.0	20	0	101	53 - 141				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190703** Units: **UG/L** Analysis Date: **03-Jul-2019 14:57**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153630** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	33.73	2.0	40	0	84.3	64 - 133				
Carbon tetrachloride	18.32	1.0	20	0	91.6	72 - 136				
Chlorobenzene	17.54	1.0	20	0	87.7	82 - 118				
Chloroethane	16.99	1.0	20	0	84.9	60 - 138				
Chloroform	19.05	1.0	20	0	95.2	79 - 124				
Chloromethane	16.14	1.0	20	0	80.7	50 - 139				
cis-1,2-Dichloroethene	18.45	1.0	20	0	92.3	78 - 123				
cis-1,3-Dichloropropene	17.19	1.0	20	0	85.9	75 - 124				
Dibromochloromethane	18.13	1.0	20	0	90.6	74 - 126				
Dibromomethane	18.03	1.0	20	0	90.1	79 - 123				
Dichlorodifluoromethane	17.79	1.0	20	0	88.9	32 - 152				
Ethylbenzene	17.65	1.0	20	0	88.3	79 - 121				
Hexachlorobutadiene	23.03	1.0	20	0	115	66 - 134				
Isopropylbenzene	18.08	1.0	20	0	90.4	72 - 131				
m,p-Xylene	35.62	2.0	40	0	89.0	80 - 121				
Methylene chloride	17.81	2.0	20	0	89.1	74 - 124				
Naphthalene	21.95	1.0	20	0	110	61 - 128				
n-Butylbenzene	17.82	1.0	20	0	89.1	75 - 128				
n-Propylbenzene	18.62	1.0	20	0	93.1	76 - 126				
o-Xylene	17.72	1.0	20	0	88.6	78 - 122				
sec-Butylbenzene	19.01	1.0	20	0	95.1	77 - 126				
Styrene	18.33	1.0	20	0	91.7	78 - 123				
tert-Butylbenzene	18.81	1.0	20	0	94.1	78 - 124				
Tetrachloroethene	17.9	1.0	20	0	89.5	74 - 129				
Toluene	17.39	1.0	20	0	86.9	80 - 121				
trans-1,2-Dichloroethene	18.49	1.0	20	0	92.4	75 - 124				
trans-1,3-Dichloropropene	17.69	1.0	20	0	88.4	73 - 127				
Trichloroethene	17.79	1.0	20	0	89.0	79 - 123				
Trichlorofluoromethane	18.03	1.0	20	0	90.1	65 - 141				
Vinyl chloride	16.88	1.0	20	0	84.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.62*	*1.0*	*50*	*0*	*99.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.98*	*1.0*	*50*	*0*	*96.0*	*85 - 114*				
Surr: Dibromofluoromethane	*49.25*	*1.0*	*50*	*0*	*98.5*	*80 - 119*				
Surr: Toluene-d8	*45.94*	*1.0*	*50*	*0*	*91.9*	*89 - 112*				

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ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061486-01MS** Units: **UG/L** Analysis Date: **03-Jul-2019 18:08**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153637** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	16.51	1.0	20	0	82.5	78 - 124				
1,1,1-Trichloroethane	16.62	1.0	20	0	83.1	74 - 131				
1,1,2,2-Tetrachloroethane	17.57	1.0	20	0	87.9	71 - 121				
1,1,2-Trichloroethane	17.26	1.0	20	0	86.3	80 - 119				
1,1-Dichloroethane	15.31	1.0	20	0	76.5	77 - 125				S
1,1-Dichloroethene	16.44	1.0	20	0	82.2	71 - 131				
1,1-Dichloropropene	17.45	1.0	20	0	87.3	78 - 125				
1,2,3-Trichlorobenzene	20.81	1.0	20	0	104	69 - 129				
1,2,3-Trichloropropane	17.72	1.0	20	0	88.6	73 - 122				
1,2,4-Trichlorobenzene	19.95	1.0	20	0	99.7	69 - 130				
1,2,4-Trimethylbenzene	16.6	1.0	20	0	83.0	76 - 124				
1,2-Dibromo-3-chloropropane	19.76	1.0	20	0	98.8	62 - 128				
1,2-Dibromoethane	16.72	1.0	20	0	83.6	77 - 121				
1,2-Dichlorobenzene	16.97	1.0	20	0	84.9	80 - 119				
1,2-Dichloroethane	15.42	1.0	20	0	77.1	73 - 128				
1,2-Dichloropropane	15.7	1.0	20	0	78.5	78 - 122				
1,3,5-Trimethylbenzene	16.77	1.0	20	0	83.9	75 - 124				
1,3-Dichlorobenzene	16.72	1.0	20	0	83.6	80 - 119				
1,3-Dichloropropane	16.64	1.0	20	0	83.2	80 - 119				
1,4-Dichlorobenzene	17.61	1.0	20	0	88.1	79 - 118				
2,2-Dichloropropane	16.67	1.0	20	0	83.4	60 - 139				
2-Butanone	35.5	2.0	40	0	88.8	56 - 143				
2-Chlorotoluene	17.41	1.0	20	0	87.0	79 - 122				
2-Hexanone	32.54	2.0	40	0	81.4	57 - 139				
4-Chlorotoluene	17.42	1.0	20	0	87.1	78 - 122				
4-Isopropyltoluene	17.75	1.0	20	0	88.7	77 - 127				
4-Methyl-2-pentanone	33.2	2.0	40	0	83.0	67 - 130				
Acetone	37.89	2.0	40	4.161	84.3	39 - 160				
Benzene	16.63	1.0	20	0	83.2	79 - 120				
Bromobenzene	15.78	1.0	20	0	78.9	80 - 120				S
Bromochloromethane	15.16	1.0	20	0	75.8	78 - 123				S
Bromodichloromethane	16.26	1.0	20	0	81.3	79 - 125				
Bromoform	17.61	1.0	20	0	88.1	66 - 130				
Bromomethane	16.43	1.0	20	0	82.1	53 - 141				

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ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061486-01MS** Units: **UG/L** Analysis Date: **03-Jul-2019 18:08**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153637** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	30.33	2.0	40	0	75.8	64 - 133				
Carbon tetrachloride	17.83	1.0	20	0	89.2	72 - 136				
Chlorobenzene	16.32	1.0	20	0	81.6	82 - 118				S
Chloroethane	15.5	1.0	20	0	77.5	60 - 138				
Chloroform	15.88	1.0	20	0	79.4	79 - 124				
Chloromethane	14.92	1.0	20	0	74.6	50 - 139				
cis-1,2-Dichloroethene	15.81	1.0	20	0	79.1	78 - 123				
cis-1,3-Dichloropropene	15.72	1.0	20	0	78.6	75 - 124				
Dibromochloromethane	16.19	1.0	20	0	81.0	74 - 126				
Dibromomethane	16.1	1.0	20	0	80.5	79 - 123				
Dichlorodifluoromethane	15.64	1.0	20	0	78.2	32 - 152				
Ethylbenzene	17	1.0	20	0	85.0	79 - 121				
Hexachlorobutadiene	21.68	1.0	20	0	108	66 - 134				
Isopropylbenzene	17.62	1.0	20	0	88.1	72 - 131				
m,p-Xylene	34.49	2.0	40	0	86.2	80 - 121				
Methylene chloride	15.03	2.0	20	0	75.1	74 - 124				
Naphthalene	19.79	1.0	20	0	98.9	61 - 128				
n-Butylbenzene	17.77	1.0	20	0	88.8	75 - 128				
n-Propylbenzene	18.11	1.0	20	0	90.6	76 - 126				
o-Xylene	16.52	1.0	20	0	82.6	78 - 122				
sec-Butylbenzene	19.08	1.0	20	0	95.4	77 - 126				
Styrene	16.93	1.0	20	0	84.7	78 - 123				
tert-Butylbenzene	18.55	1.0	20	0	92.8	78 - 124				
Tetrachloroethene	17.69	1.0	20	0	88.5	74 - 129				
Toluene	16.65	1.0	20	0	83.3	80 - 121				
trans-1,2-Dichloroethene	16.67	1.0	20	0	83.4	75 - 124				
trans-1,3-Dichloropropene	15.41	1.0	20	0	77.1	73 - 127				
Trichloroethene	19.25	1.0	20	0	96.3	79 - 123				
Trichlorofluoromethane	16.99	1.0	20	0	85.0	65 - 141				
Vinyl chloride	14.99	1.0	20	0	75.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.86*	*1.0*	*50*	*0*	*91.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.41*	*1.0*	*50*	*0*	*96.8*	*85 - 114*				
Surr: Dibromofluoromethane	*45.73*	*1.0*	*50*	*0*	*91.5*	*80 - 119*				
Surr: Toluene-d8	*47.34*	*1.0*	*50*	*0*	*94.7*	*89 - 112*				

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19061486-01MSD** Units: **UG/L** Analysis Date: **03-Jul-2019 18:32**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153638** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	16.57	1.0	20	0	82.9	78 - 124	16.51	0.402	20	
1,1,1-Trichloroethane	16.72	1.0	20	0	83.6	74 - 131	16.62	0.596	20	
1,1,2,2-Tetrachloroethane	17.64	1.0	20	0	88.2	71 - 121	17.57	0.396	20	
1,1,2-Trichloroethane	17.31	1.0	20	0	86.5	80 - 119	17.26	0.254	20	
1,1-Dichloroethane	15.14	1.0	20	0	75.7	77 - 125	15.31	1.12	20	S
1,1-Dichloroethene	15.9	1.0	20	0	79.5	71 - 131	16.44	3.34	20	
1,1-Dichloropropene	17.2	1.0	20	0	86.0	78 - 125	17.45	1.47	20	
1,2,3-Trichlorobenzene	21.62	1.0	20	0	108	69 - 129	20.81	3.79	20	
1,2,3-Trichloropropane	18.13	1.0	20	0	90.7	73 - 122	17.72	2.32	20	
1,2,4-Trichlorobenzene	20.17	1.0	20	0	101	69 - 130	19.95	1.11	20	
1,2,4-Trimethylbenzene	16.82	1.0	20	0	84.1	76 - 124	16.6	1.35	20	
1,2-Dibromo-3-chloropropane	19.64	1.0	20	0	98.2	62 - 128	19.76	0.602	20	
1,2-Dibromoethane	16.91	1.0	20	0	84.6	77 - 121	16.72	1.13	20	
1,2-Dichlorobenzene	17.08	1.0	20	0	85.4	80 - 119	16.97	0.64	20	
1,2-Dichloroethane	15.51	1.0	20	0	77.5	73 - 128	15.42	0.587	20	
1,2-Dichloropropane	15.75	1.0	20	0	78.8	78 - 122	15.7	0.313	20	
1,3,5-Trimethylbenzene	16.61	1.0	20	0	83.1	75 - 124	16.77	0.95	20	
1,3-Dichlorobenzene	16.63	1.0	20	0	83.2	80 - 119	16.72	0.552	20	
1,3-Dichloropropane	16.84	1.0	20	0	84.2	80 - 119	16.64	1.21	20	
1,4-Dichlorobenzene	18.12	1.0	20	0	90.6	79 - 118	17.61	2.81	20	
2,2-Dichloropropane	16.43	1.0	20	0	82.2	60 - 139	16.67	1.45	20	
2-Butanone	36.09	2.0	40	0	90.2	56 - 143	35.5	1.64	20	
2-Chlorotoluene	17.25	1.0	20	0	86.3	79 - 122	17.41	0.897	20	
2-Hexanone	33.5	2.0	40	0	83.8	57 - 139	32.54	2.91	20	
4-Chlorotoluene	17.25	1.0	20	0	86.2	78 - 122	17.42	1.02	20	
4-Isopropyltoluene	17.61	1.0	20	0	88.1	77 - 127	17.75	0.749	20	
4-Methyl-2-pentanone	33.33	2.0	40	0	83.3	67 - 130	33.2	0.392	20	
Acetone	37.8	2.0	40	4.161	84.1	39 - 160	37.89	0.25	20	
Benzene	16.71	1.0	20	0	83.6	79 - 120	16.63	0.479	20	
Bromobenzene	15.97	1.0	20	0	79.8	80 - 120	15.78	1.2	20	S
Bromochloromethane	14.89	1.0	20	0	74.4	78 - 123	15.16	1.82	20	S
Bromodichloromethane	16.58	1.0	20	0	82.9	79 - 125	16.26	1.99	20	
Bromoform	18.12	1.0	20	0	90.6	66 - 130	17.61	2.84	20	
Bromomethane	15.98	1.0	20	0	79.9	53 - 141	16.43	2.73	20	

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ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061482

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061486-01MSD** Units: **UG/L** Analysis Date: **03-Jul-2019 18:32**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153638** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	30.26	2.0	40	0	75.7	64 - 133	30.33	0.215	20	
Carbon tetrachloride	17.75	1.0	20	0	88.7	72 - 136	17.83	0.463	20	
Chlorobenzene	16.44	1.0	20	0	82.2	82 - 118	16.32	0.761	20	
Chloroethane	15.28	1.0	20	0	76.4	60 - 138	15.5	1.42	20	
Chloroform	15.71	1.0	20	0	78.6	79 - 124	15.88	1.07	20	S
Chloromethane	14.69	1.0	20	0	73.4	50 - 139	14.92	1.58	20	
cis-1,2-Dichloroethene	15.7	1.0	20	0	78.5	78 - 123	15.81	0.692	20	
cis-1,3-Dichloropropene	15.68	1.0	20	0	78.4	75 - 124	15.72	0.238	20	
Dibromochloromethane	16.67	1.0	20	0	83.4	74 - 126	16.19	2.91	20	
Dibromomethane	16.2	1.0	20	0	81.0	79 - 123	16.1	0.6	20	
Dichlorodifluoromethane	15.34	1.0	20	0	76.7	32 - 152	15.64	1.95	20	
Ethylbenzene	16.85	1.0	20	0	84.2	79 - 121	17	0.905	20	
Hexachlorobutadiene	22.45	1.0	20	0	112	66 - 134	21.68	3.48	20	
Isopropylbenzene	17.51	1.0	20	0	87.5	72 - 131	17.62	0.618	20	
m,p-Xylene	33.91	2.0	40	0	84.8	80 - 121	34.49	1.71	20	
Methylene chloride	14.82	2.0	20	0	74.1	74 - 124	15.03	1.35	20	
Naphthalene	20.33	1.0	20	0	102	61 - 128	19.79	2.71	20	
n-Butylbenzene	17.71	1.0	20	0	88.6	75 - 128	17.77	0.323	20	
n-Propylbenzene	18.14	1.0	20	0	90.7	76 - 126	18.11	0.153	20	
o-Xylene	16.36	1.0	20	0	81.8	78 - 122	16.52	0.968	20	
sec-Butylbenzene	18.96	1.0	20	0	94.8	77 - 126	19.08	0.607	20	
Styrene	16.9	1.0	20	0	84.5	78 - 123	16.93	0.183	20	
tert-Butylbenzene	18.61	1.0	20	0	93.1	78 - 124	18.55	0.304	20	
Tetrachloroethene	17.87	1.0	20	0	89.3	74 - 129	17.69	0.987	20	
Toluene	16.4	1.0	20	0	82.0	80 - 121	16.65	1.53	20	
trans-1,2-Dichloroethene	16.25	1.0	20	0	81.3	75 - 124	16.67	2.54	20	
trans-1,3-Dichloropropene	15.73	1.0	20	0	78.7	73 - 127	15.41	2.08	20	
Trichloroethene	17.49	1.0	20	0	87.5	79 - 123	19.25	9.57	20	
Trichlorofluoromethane	16.54	1.0	20	0	82.7	65 - 141	16.99	2.69	20	
Vinyl chloride	14.75	1.0	20	0	73.8	58 - 137	14.99	1.6	20	
Surr: 1,2-Dichloroethane-d4	*47.12*	*1.0*	*50*	*0*	*94.2*	*81 - 118*	*45.86*	*2.7*	*20*	
Surr: 4-Bromofluorobenzene	*48.48*	*1.0*	*50*	*0*	*97.0*	*85 - 114*	*48.41*	*0.13*	*20*	
Surr: Dibromofluoromethane	*46.14*	*1.0*	*50*	*0*	*92.3*	*80 - 119*	*45.73*	*0.893*	*20*	
Surr: Toluene-d8	*46.66*	*1.0*	*50*	*0*	*93.3*	*89 - 112*	*47.34*	*1.44*	*20*	

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ALS Houston, US Date: 12-Jul-19

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP 18 24
WorkOrder:	HS19061482

QC BATCH REPORT

Batch ID:	**R341869 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch:	HS19061482-01	HS19061482-02	HS19061482-03	HS19061482-04
	HS19061482-05			

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ALS Houston, US Date: 12-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19061482**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

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ALS Houston, US Date: 12-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19061482
Date/Time Received: **27-Jun-2019 08:30**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 27-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature 28-Jun-2019 Date

Matrices: **Groundwater**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.2c U/c	IR11
Cooler(s)/Kit(s):	44515	
Date/Time sample(s) sent to storage:	6/27/19 17:35	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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bhate
ENVIRONMENTAL CONSTRUCTION LIMITED

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Page: 1 of 1

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Chain of Custody and Analytical Request

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE							Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
AWD4_062619		26 Jun 2019	0755	-			WG	6	✓	✓	✓	✓										
AWD4_062619-01		26 Jun 2019	0755	-			WG	6	✓	✓	✓	✓										
BKW24_062619		26 Jun 2019	0930	-			WG	5	✓	✓	✓											
MW16_062619		26 Jun 2019	1100				WG	5	✓	✓		✓										
MW19_062619		26 Jun 2019	1230				WG	5	✓	✓	✓											
				-																		
				-																		
				-																		
				-																		
				-																		
				-																		

HS19061482
Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS:

Cooler 44515 Temp 2.2 IR11 CF0.0

Custody Transfers Prior to Receipt by Laboratory

	Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1.	Rick Moore	6/26/19	1430	Signature	6/27/19	08:30
2.						
3.						

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped No.:

_____ Method of Shipment: _____

_____ Fed Ex _____ Airbill Number:

_____ Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) [e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

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00941851

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44515

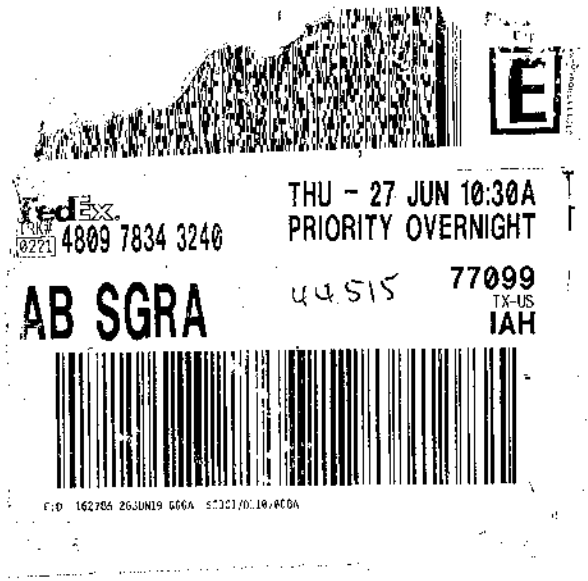
CUSTODY SEAL

Date: 6/26/19 Time: 1930
Name: Scott Beesinger
Company: BJ Hughes

Seal Broken By:

Date: 6/27/19

44515



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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1918373, 1918525, 1918682

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2269 (243227)

General Set Information: There were eighteen field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1918373001 and 1918525004 were analyzed and reported from 1:1,000 dilutions. Field samples 1918373003/08 were analyzed and reported from 1:10,000 dilutions. Field samples 1918373009 and 1918525002 were analyzed and reported from 1:10 dilutions. Field samples 1918525001 and 1918682004 were analyzed and reported from 1:100 dilutions. Sample 1918373004 failed the 50-150% method requirement for ISTD recovery. This sample was re-analyzed and reported from a 1:4 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 662917) was less than 1/2 the CRDL. The recovery for the LCS (662918) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on sample 1918373005 (Client ID: 18WW03_062419). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The MS/MSD percent recoveries and relative percent difference were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 662915) is reported from the analysis of the Laboratory Control Sample (LCS – 662918) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafile 10JULD13.

Thomas Bosch — July 11, 2019
Analyst — Date

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ANALYTICAL REPORT

Report Date: July 11, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1918682**
Project ID: HS19061482
Purchase Order: HS19061482
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
AW04_062619	1918682001	06/26/19	06/28/19	
AW04_062619_a	1918682002	06/26/19	06/28/19	
18WW24_062619	1918682003	06/26/19	06/28/19	
MW16_062619	1918682004	06/26/19	06/28/19	
MW19_062619	1918682005	06/26/19	06/28/19	

ANALYTICAL REPORT

Workorder: 34-1918682
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **AW04_062619** | Sampling Site: NA | Collected: 06/26/2019
Lab ID: 1918682001 | Media: 250 mL Nalgene | Received: 06/28/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 13:53 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**23**	1.0	2.0	4.0	1	

Sample ID: **AW04_062619_a** | Sampling Site: NA | Collected: 06/26/2019
Lab ID: 1918682002 | Media: 250 mL Nalgene | Received: 06/28/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 14:07 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**27**	1.0	2.0	4.0	1	

Sample ID: **18WW24_062619** | Sampling Site: NA | Collected: 06/26/2019
Lab ID: 1918682003 | Media: 250 mL Nalgene | Received: 06/28/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 14:20 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **MW16_062619** | Sampling Site: NA | Collected: 06/26/2019
Lab ID: 1918682004 | Media: 250 mL Nalgene | Received: 06/28/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2269 (HBN: 243227) | **Percent Solid:** NA
Analyzed: 07/10/2019 14:34 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**2900**	100	200	400	100	

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ANALYTICAL REPORT

Workorder: 34-1918682
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **MW19_062619**	Sampling Site: NA	Collected: 06/26/2019
Lab ID: 1918682005	Media: 250 mL Nalgene	Received: 06/28/2019
Matrix: Water	Sampling Parameter: NA	

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:** LCMS04
	Batch: ELMS/2269 (HBN: 243227)	**Percent Solid:** NA
	Analyzed: 07/10/2019 14:48	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Quality Control: EPA 6850, DoD QSM - (HBN: 243227)

Field samples 1918373001 and 1918525004 were analyzed and reported from 1:1,000 dilutions. Field samples 1918373003/08 were analyzed and reported from 1:10,000 dilutions. Field samples 1918373009 and 1918525002 were analyzed and reported from 1:10 dilutions. Field samples 1918525001 and 1918682004 were analyzed and reported from 1:100 dilutions. Sample 1918373004 failed the 50-150% method requirement for ISTD recovery. This sample was re-analyzed and reported from a 1:4 dilution. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/11/2019 10:28	/S/ Stephen Brose 07/11/2019 13:28

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1918682
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1918682

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2269 (HBN: 243227)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 662917
Analyzed: 07/10/2019 09:31
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 662918
Analyzed: 07/10/2019 09:03
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.25	4.00	106	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

	Sample	MS	MSD
	1918373005	662919	662920
Analyzed:	07/10/2019 10:41	07/10/2019 10:55	07/10/2019 11:09
Dilution:	1	1	1
Units:	ug/L	ug/L	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.87	4	122	78.8	123.8	4.01	100	19.3	0.0	20.0

Comments

Field samples 1918373001 and 1918525004 were analyzed and reported from 1:1,000 dilutions. Field samples 1918373003/08 were analyzed and reported from 1:10,000 dilutions. Field samples 1918373009 and 1918525002 were analyzed and reported from 1:10 dilutions. Field samples 1918525001 and 1918682004 were analyzed and reported from 1:100 dilutions. Sample 1918373004 failed the 50-150% method requirement for ISTD recovery. This sample was re-analyzed and reported from a 1:4 dilution. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch 07/11/2019 11:05	/S/ Stephen Brose 07/11/2019 13:28

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19061482	***Split:***	**Workorder ID:** 1918682	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 250Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	06/26/2019 07:55	AW04_062619	1918682001		Water	A	1	A
2	06/26/2019 07:55	AW04_062619_a	1918682002		Water	A	1	A
3	06/26/2019 09:30	18WW24_062619	1918682003		Water	A	1	A
4	06/26/2019 11:00	MW16_062619	1918682004		Water	A	1	A
5	06/26/2019 12:30	MW19_062619	1918682005		Water	A	1	A
6								
7								
8								
9								
10								

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Coates, Gayleen	06/28/2019 09:03	ALS Sample Receiving	Sample Login
R.33.1	6.28.19 13:35	3B	STORAGE
	07.09.19/11:10	T. Bosh	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ **Lab Notebook No.:** _____

Prepared / Analyzed by: _____ **Date / Time:** _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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00941860

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

1918682

SAMPLING STATE: **Texas**

COC ID: **11695**

SUBCONTRACT TO:

18698/2

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19061482
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19061482-01**	**AW04_062619**	**Groundwater**	**26 Jun 2019 07:55**
	SUB_Perch-6850			08 Jul 2019
2.	**HS19061482-02**	**AW04_062619_a**	**Groundwater**	**26 Jun 2019 07:55**
	SUB_Perch-6850			08 Jul 2019
3.	**HS19061482-03**	**18WW24_062619**	**Groundwater**	**26 Jun 2019 09:30**
	SUB_Perch-6850			08 Jul 2019
4.	**HS19061482-04**	**MW16_062619**	**Groundwater**	**26 Jun 2019 11:00**
	SUB_Perch-6850			08 Jul 2019
5.	**HS19061482-05**	**MW19_062619**	**Groundwater**	**26 Jun 2019 12:30**
	SUB_Perch-6850			08 Jul 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **11695**

Relinquished By: _____ Date/Time: 6|27|19 1800

Received By: _____ Date/Time: 6.28.19 0903

Cooler ID(s): _____ Temperature(s): _____

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ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS HOUSTON

Project/Task/Site: HS19061486 & HS19061482

Date/Time of Receipt: 6.28.19 0903

Number of Coolers Received: (1)

Condition of Coolers:	(Acceptable)/Unacceptable	Temperature Control:	(Present)/Not Included
Cooler Custody Seals:	(Present)/Absent/NA		
	(Intact)/Broken/NA	Location Temp Taken:	(Control)/Between Samples
Container Custody Seals:	Present/(Absent)/NA		
	Intact/Broken/(NA)	Are all temperatures within project specific guidelines?	(Yes)/No/NA
Ice Present:	(Yes)/No/NA		
	Frozen/(Melted)/NA	VOA Headspace Present?	Yes/No/(NA)

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9734	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [signature] Signature — GAYLEEN COATES Printed Name — 6.28.19 Date

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Printed Name — Returned to Sample Receipt by: _____ Signature — Date: _____

CRIR.doc — Revised 01/01/2018

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Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159462-484 RIT2 EXP 02/20

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 27JUN19
ACTWGT: 23.90 LB
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19061482/1486 - RJ

FedEx Express

FRI - 28 JUN 3:00P
STANDARD OVERNIGHT

TRK# 0201 4809 7835 4546

AX BTFA

84123
UT-US SLC

551C1/PA210/1C55

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Batch Worklist

Batch: ELMS/ 2269 Created: 7/10/2019 08:39 Instrument: HBN: 243227

Rule: EPA 6850, DoD QSM Water Analyst: T. Bosch Status: WP

Workorder: 1918373 [ENV_LVL4]
Workorder: 1918525 [ENV_LVL4]
Workorder: 1918682 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	662914	CCV for HBN 243227 [ELMS/2269]				CCV	3		E685041C3Q	5311		7/10/2019	
2	662915	RLVS for HBN 243227 [ELMS/2269				RLVS	3		E685041C3Q	5311		7/10/2019	
3	662916	ICS for HBN 243227 [ELMS/2269]				ICS	3		E6850..D3Q	5311		7/10/2019	
4	662917	LMB for HBN 243227 [ELMS/2269]				LMB	3		E6850Q413Q	5311		7/10/2019	
5	662918	LCS for HBN 243227 [ELMS/2269]				LCS	3		E6850Q413Q	5311		7/10/2019	
6	1918373001	129_062419				SAMPLE	3	1918373001-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
7	1918373002	102_062419				SAMPLE	3	1918373002-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
8	1918373003	MW23_062419				SAMPLE	3	1918373003-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
9	1918373004	126_062419				SAMPLE	3	1918373004-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
10	1918373005	18WW03_062419				SAMPLE	3	1918373005-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
11	662919	18WW03_062419(1918373005MS)				MS	3		E6850Q413Q	5311		7/10/2019	
12	662920	18WW03_062419(1918373005MSD)				MSD	3		E6850Q413Q	5311		7/10/2019	
13	1918373006	18WW03_062419_a				SAMPLE	3	1918373006-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
14	1918373007	18WW18_062419				SAMPLE	3	1918373007-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
15	1918373008	18WW17_062419				SAMPLE	3	1918373008-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
16	1918373009	125_062419				SAMPLE	3	1918373009-A	E6850Q41.3	5480	7/22/2019	7/10/2019	
17	1918525001	18CPTMW14_062519				SAMPLE	3	1918525001-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
18	662921	CCV for HBN 243227 [ELMS/2269]				CCV	3		E685041C3Q	5311		7/10/2019	
19	1918525002	18CPTMW24_062519				SAMPLE	3	1918525002-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
20	1918525003	18CPTMW07_062519				SAMPLE	3	1918525003-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
21	1918525004	MW3_062519				SAMPLE	3	1918525004-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
22	1918682001	AW04_062619				SAMPLE	3	1918682001-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
23	1918682002	AW04_062619_a				SAMPLE	3	1918682002-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
24	1918682003	18WW24_062619				SAMPLE	3	1918682003-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
25	1918682004	MW16_062619				SAMPLE	3	1918682004-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
26	1918682005	MW19_062619				SAMPLE	3	1918682005-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
27	662922	CCV for HBN 243227 [ELMS/2269]				CCV	3		E685041C3Q	5311		7/10/2019	

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1918373 (001-09), 1918525 (001-04); 1918682 (001-05)
ELMS Batch/HBN ID: 2269 (243227)
Prep Date: 07/08/2019 Analysis Date: 07/10/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\10JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 662918; Target = 4.0µg/L. ASTM type II water was used for LMB 662917.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1918273005 (Client ID: 18WW03_062419). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1918373001 and 1918525004 were analyzed and reported from 1:1,000 dilutions. Field samples 1918373003/08 were analyzed and reported from 1:10,000 dilutions. Field samples 1918373009 and 1918525002 were analyzed and reported from 1:10 dilutions. Field samples 1918525001 and 1918682004 were analyzed and reported from 1:100 dilutions. Sample 1918373004 failed the 50-150% method requirement for ISTD recovery. This sample was re-analyzed and reported from a 1:4 dilution. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\243227-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 662915) is reported from the analysis of the Laboratory Control Sample (LCS – 662918) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 10JULD13.

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2269 HBN: 243227 Sample Set IDs if Applicable: 1918373/1918525/1918682	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SD
Standards traceability checked and meets criteria	TB	SD
Standard curve coefficients evaluated and meet criteria	TB	SD
ICVs analyzed and meet acceptance criteria	TB	SD
CCVs analyzed and meet acceptance criteria	TB	SD
Method Blanks analyzed and meet acceptance criteria	TB	SD
Retention Time Windows checked	TB	SD
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SD
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SD
RLVS analyzed	TB	SD
Preparation and analysis hold times met	TB	SD
Preparation deviations and re-preparations noted when performed	TB	SD
Analysis deviations and re-analyses noted when performed	TB	SD
Sample dilution factors noted on reports	TB	SD
Electronic records in HBN transcription accuracy and completeness checked	TB	SD
Preparation and analysis calculations checked	TB	SD
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SD
Manual integrations checked	TB	SD

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration 1000 ug/mL
1	14797-73-0	Perchlorate	

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description - 6850 QC WKG STD 100ug/L

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK	Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

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STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK		Description - Perchlorate ISTD Stock
Standard: 43729	Created By: Thomas Bosch	Amount: 1 mL
MFG: Cambridge Isotope	Create Date: 09/20/2018 09:09AM	Expires: 04/28/2026
MFG Lot: SDFF-012A	Verified By: Thomas Bosch	Usable: Yes
Part ID: OLM-7310-S	Verify Date:	Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ANAB

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Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: JCC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

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125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

AccuStandard

Page 1 of 1

For use in routine laboratory analysis.

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Report: C:\HPCHEM\1\DATA\10JUL19D\10JUL19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	662914 CCV@25	Vial 71	1	Control	1	2.68575e6	8.115	26.05294
#*	662915 QC@4.0	Vial 72	1	Control	2	4.44100e5	7.955	4.24940
#*	662916 ICS@4.0	Vial 73	1	Control	3	3.60514e5	7.907	3.90243
#*	662917 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1918373001 1K	Vial 75	1	Sample	5	4.64595e5	8.475	4196.25594
#*	1918373002	Vial 76	1	Sample	6	2.67439e6	8.256	32.95864
#*	1918373003 10K	Vial 77	1	Sample	7	7.50173e5	8.471	6.69552e4
#*	1918373004	Vial 78	1	Sample	8	9.59698e4	7.479	3.07958 RERUN
#*	1918373005	Vial 79	1	Sample	9	0.00000	0.000	0.00000
#*	662919 183735S	Vial 80	1	Sample	10	3.55093e5	7.925	4.86521
#*	662920 183735D	Vial 81	1	Sample	11	3.66789e5	7.925	4.01055
#*	1918373006	Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1918373007	Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	1918373008 10K	Vial 84	1	Sample	14	7.80844e5	8.547	8.50126e4
#*	1918373009 10	Vial 85	1	Sample	15	2.50033e6	8.517	259.32134
#*	1918525001 100	Vial 86	1	Sample	16	1.50160e6	8.459	1335.16188
#*	1918525002 10	Vial 87	1	Sample	18	8.01472e5	7.834	89.40283
#*	1918525003	Vial 88	1	Sample	19	9.97190e4	7.920	1.35329
#*	662921 CCV@25	Vial 71	1	Control	20	2.50454e6	8.326	26.47813
#*	1918525004 1K	Vial 89	1	Sample	21	9.11871e5	8.541	1.14090e4
#*	1918682001	Vial 90	1	Sample	22	2.47257e6	7.964	22.97557
#*	1918682002	Vial 91	1	Sample	23	2.64966e6	7.956	27.09987
#*	1918682003	Vial 92	1	Sample	24	0.00000	0.000	0.00000
#*	1918682004 100	Vial 93	1	Sample	25	3.17764e6	8.495	2867.69131
#*	1918682005	Vial 94	1	Sample	26	0.00000	0.000	0.00000
#*	1918373004 4X	Vial 95	1	Sample	27	1.13898e5	7.615	5.92026
*	662922 CCV@25	Vial 71	1	Control	28	2.33580e6	8.325	25.58048

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	662914 CCV@25	Vial 71	1	Control	1	8.00069e5	8.120	26.14885
#*	662915 QC@4.0	Vial 72	1	Control	2	1.43143e5	7.988	4.46175
#*	662916 ICS@4.0	Vial 73	1	Control	3	1.13240e5	7.926	3.97989
#*	662917 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
#*	1918373001 1K	Vial 75	1	Sample	5	1.47350e5	8.502	4333.79914
#*	1918373002	Vial 76	1	Sample	6	8.00737e5	8.266	33.28426
#*	1918373003 10K	Vial 77	1	Sample	7	2.30473e5	8.475	6.80005e4
#*	1918373004	Vial 78	1	Sample	8	4.60480e4	7.515	4.72828
#*	1918373005	Vial 79	1	Sample	9	0.00000	0.000	0.00000
#*	662919 183735S	Vial 80	1	Sample	10	1.12035e5	7.945	5.02607
#*	662920 183735D	Vial 81	1	Sample	11	1.15347e5	7.933	4.09972
#*	1918373006	Vial 82	1	Sample	12	0.00000	0.000	0.00000
#*	1918373007	Vial 83	1	Sample	13	0.00000	0.000	0.00000
#*	1918373008 10K	Vial 84	1	Sample	14	2.43153e5	8.561	8.79445e4
#*	1918373009 10	Vial 85	1	Sample	15	7.49555e5	8.537	261.83216
#*	1918525001 100	Vial 86	1	Sample	16	4.61812e5	8.478	1373.76036
#*	1918525002 10	Vial 87	1	Sample	18	2.59266e5	7.849	96.09405
#*	1918525003	Vial 88	1	Sample	19	3.44592e4	7.913	1.39474
#*	662921 CCV@25	Vial 71	1	Control	20	7.43673e5	8.350	26.49691
#*	1918525004 1K	Vial 89	1	Sample	21	2.92673e5	8.563	1.22133e4
#*	1918682001	Vial 90	1	Sample	22	7.38653e5	7.982	23.10212
#*	1918682002	Vial 91	1	Sample	23	7.84495e5	7.975	27.04927
#*	1918682003	Vial 92	1	Sample	24	0.00000	0.000	0.00000
#*	1918682004 100	Vial 93	1	Sample	25	9.49732e5	8.511	2888.99473
#*	1918682005	Vial 94	1	Sample	26	0.00000	0.000	0.00000
#*	1918373004 4X	Vial 95	1	Sample	27	4.50105e4	7.626	7.05823
*	662922 CCV@25	Vial 71	1	Control	28	6.93327e5	8.339	25.58423

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Batch Report: C:\HPCHEM\1\DATA\10JUL19D\10JUL19S.B

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	662914 CCV@25	Vial 71	1	Control	1	3.12850e5	8.129	5.00000
#*	662915 QC@4.0	Vial 72	1	Control	2	3.43351e5	7.987	5.00000
#*	662916 ICS@4.0	Vial 73	1	Control	3	3.04788e5	7.926	5.00000
#*	662917 LMB	Vial 74	1	Control	4	3.48541e5	8.334	5.00000
#*	1918373001 1K	Vial 75	1	Sample	5	3.63966e5	8.508	5000.00000
#*	1918373002	Vial 76	1	Sample	6	2.42366e5	8.286	5.00000
#*	1918373003 10K	Vial 77	1	Sample	7	3.61021e5	8.485	5.00000e4
#*	1918373004	Vial 78	1	Sample	8	1.04173e5	7.500	5.00000
#*	1918373005	Vial 79	1	Sample	9	2.68459e5	7.947	5.00000
#*	662919 183735S	Vial 80	1	Sample	10	2.38297e5	7.944	5.00000
#*	662920 183735D	Vial 81	1	Sample	11	3.01318e5	7.949	5.00000
#*	1918373006	Vial 82	1	Sample	12	2.95413e5	7.964	5.00000
#*	1918373007	Vial 83	1	Sample	13	2.56579e5	7.688	5.00000
#*	1918373008 10K	Vial 84	1	Sample	14	2.93278e5	8.572	5.00000e4
#*	1918373009 10	Vial 85	1	Sample	15	2.92692e5	8.542	50.00000
#*	1918525001 100	Vial 86	1	Sample	16	3.52862e5	8.475	500.00000
#*	1918525002 10	Vial 87	1	Sample	18	2.85701e5	7.853	50.00000
#*	1918525003	Vial 88	1	Sample	19	2.65508e5	7.924	5.00000
#*	662921 CCV@25	Vial 71	1	Control	20	2.86769e5	8.351	5.00000
#*	1918525004 1K	Vial 89	1	Sample	21	2.52353e5	8.562	5000.00000
#*	1918682001	Vial 90	1	Sample	22	3.29023e5	7.998	5.00000
#*	1918682002	Vial 91	1	Sample	23	2.95991e5	7.971	5.00000
#*	1918682003	Vial 92	1	Sample	24	3.47869e5	7.583	5.00000
#*	1918682004 100	Vial 93	1	Sample	25	3.34219e5	8.521	500.00000
#*	1918682005	Vial 94	1	Sample	26	2.68839e5	7.545	5.00000
#*	1918373004 4X	Vial 95	1	Sample	27	2.74118e5	7.639	20.00000
*	662922 CCV@25	Vial 71	1	Control	28	2.77422e5	8.334	5.00000

*** End of Report ***

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Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\10JUL19D.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	662914 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	662915 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	662916 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	662917 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1918373001 1K	CLO4-AQN	1	Sample		
6	Vial 76	1918373002	CLO4-AQN	1	Sample		
7	Vial 77	1918373003 10K	CLO4-AQN	1	Sample		
8	Vial 78	1918373004	CLO4-AQN	1	Sample		
9	Vial 79	1918373005	CLO4-AQN	1	Sample		
10	Vial 80	662919 183735S	CLO4-AQN	1	Sample		
11	Vial 81	662920 183735D	CLO4-AQN	1	Sample		
12	Vial 82	1918373006	CLO4-AQN	1	Sample		
13	Vial 83	1918373007	CLO4-AQN	1	Sample		
14	Vial 84	1918373008 10K	CLO4-AQN	1	Sample		
15	Vial 85	1918373009 10	CLO4-AQN	1	Sample		
16	Vial 86	1918525001 100	CLO4-AQN	1	Sample		
17	Vial 71	662921 CCV@25	CLO4-AQN	1	Ctrl Samp		
18	Vial 87	1918525002 10	CLO4-AQN	1	Sample		
19	Vial 88	1918525003	CLO4-AQN	1	Sample		
20	Vial 71	662921 CCV@25	CLO4-AQN	1	Ctrl Samp		
21	Vial 89	1918525004 1K	CLO4-AQN	1	Sample		
22	Vial 90	1918682001	CLO4-AQN	1	Sample		
23	Vial 91	1918682002	CLO4-AQN	1	Sample		
24	Vial 92	1918682003	CLO4-AQN	1	Sample		
25	Vial 93	1918682004 100	CLO4-AQN	1	Sample		
26	Vial 94	1918682005	CLO4-AQN	1	Sample		
27	Vial 95	1918373004 4X	CLO4-AQN	1	Sample		
28	Vial 71	662922 CCV@25	CLO4-AQN	1	Ctrl Samp		

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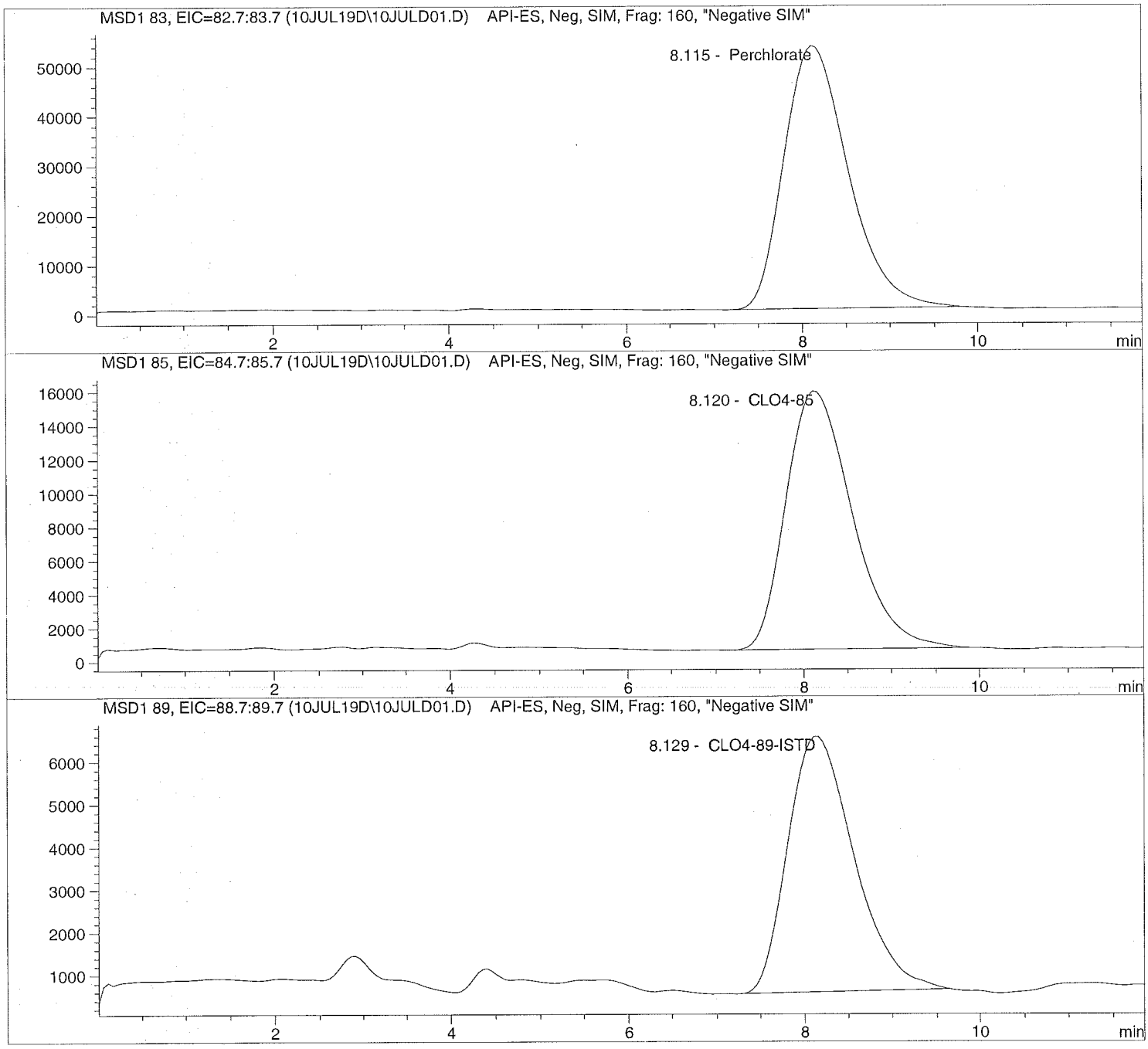
Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD01.D Sample Name: 662914 CCV@25

Injection Date:	7/10/2019 08:48:22	Seq Line:	1
Sample Name:	662914 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD01.D Sample Name: 662914 CCV@25

Injection Date:	7/10/2019 08:48:22	Seq Line:	1
Sample Name:	662914 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.115	PBA	2685752.5	26.0529	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.120	PBA	800069.3	26.1488	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.129	PBA	312850.3	5.0000	CLO4-89-ISTD

*** End of Report ***

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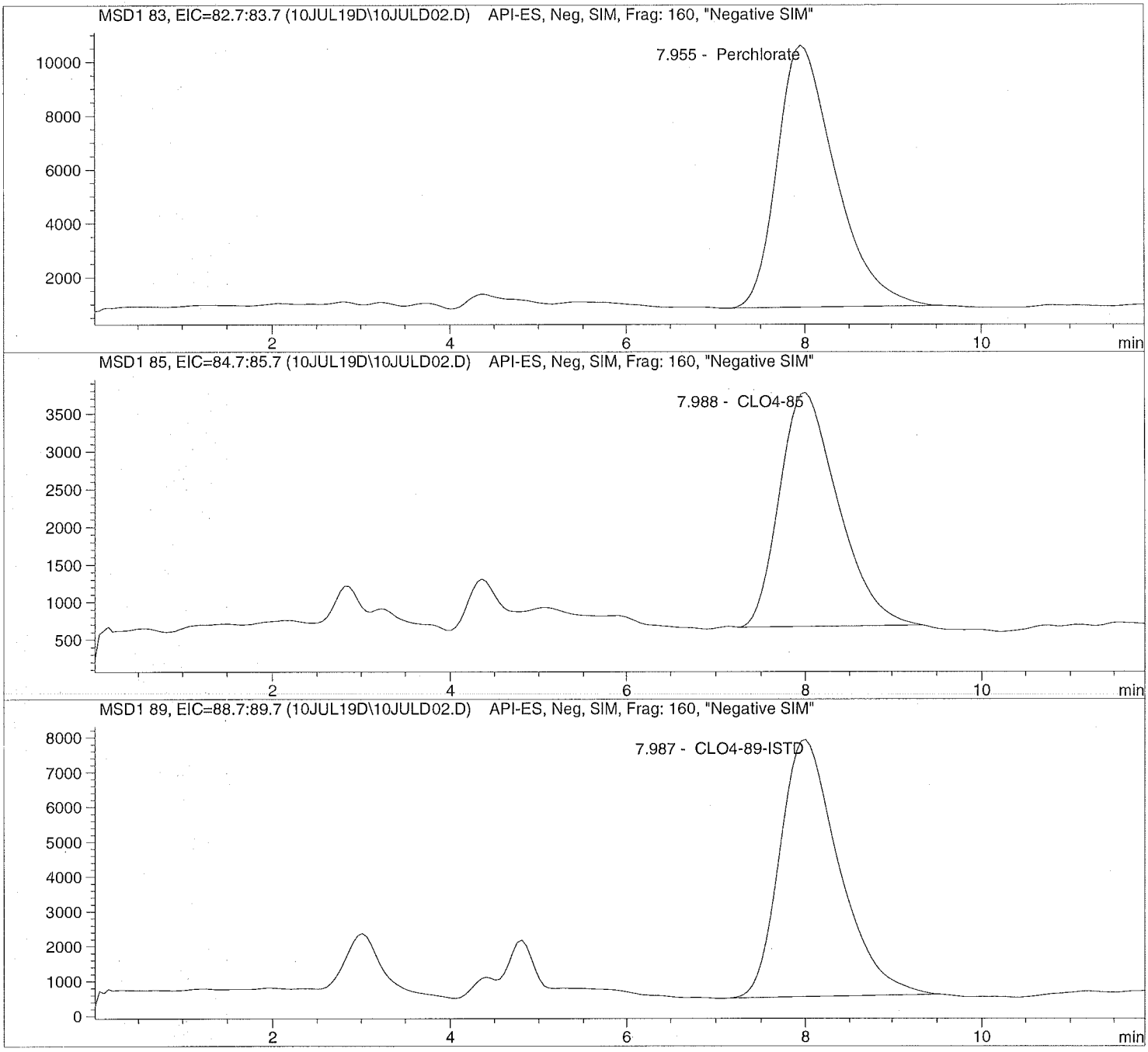
Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD02.D Sample Name: 662915 QC@4.0

Injection Date:	7/10/2019 09:03:50	Seq Line:	2
Sample Name:	662915 QC@4.0	Location:	Vial 72
Acq Operator:	TNB RLVS	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD02.D Sample Name: 662915 QC@4.0

Injection Date:	7/10/2019 09:03:50	Seq Line:	2
Sample Name:	662915 QC@4.0	Location:	Vial 72
Acq Operator:	TNB RLVS	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.955	PBA	444100.1	4.2494	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.988	PBA	143143.3	4.4618	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.987	PBA	343351.4	5.0000	CLO4-89-ISTD

*** End of Report ***

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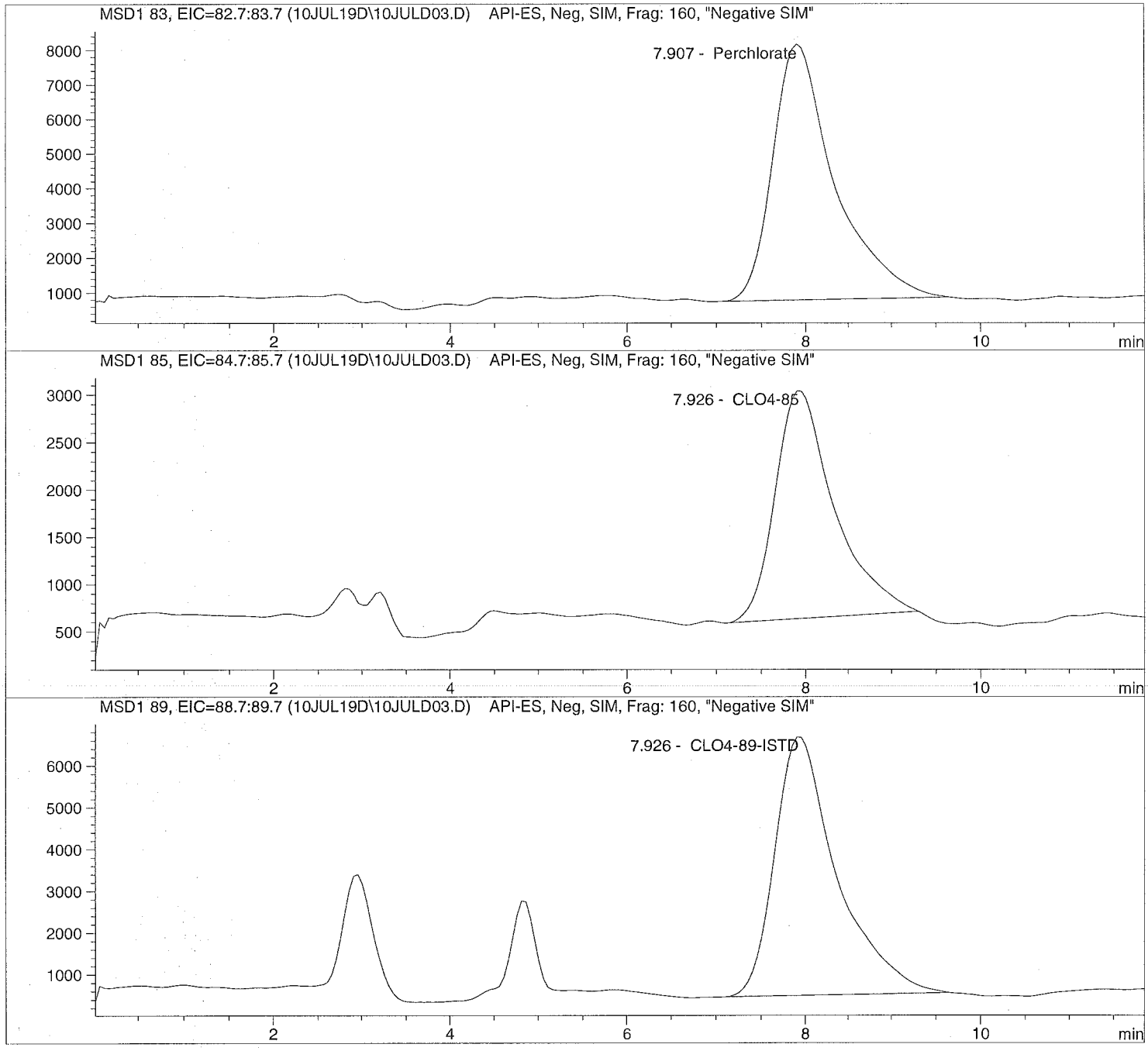
Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD03.D Sample Name: 662916 ICS@4.0

Injection Date:	7/10/2019 09:17:42	Seq Line:	3
Sample Name:	662916 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD03.D Sample Name: 662916 ICS@4.0

Injection Date:	7/10/2019 09:17:42	Seq Line:	3
Sample Name:	662916 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.907	PBA	360514.4	3.9024	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.926	PBA	113239.5	3.9799	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.926	PBA	304787.5	5.0000	CLO4-89-ISTD

*** End of Report ***

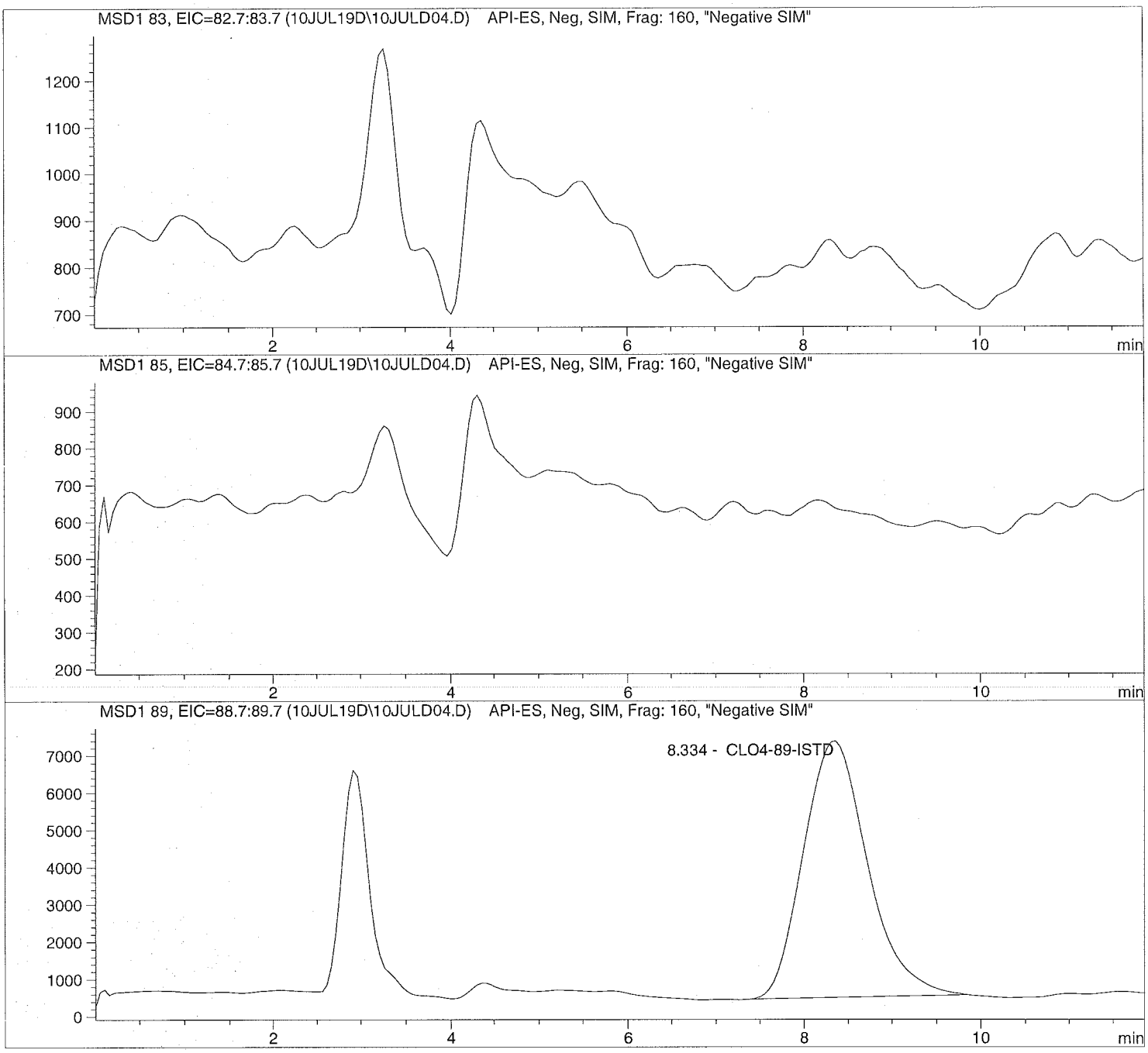
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD04.D Sample Name: 662917 LMB

Injection Date:	7/10/2019 09:31:38	Seq Line:	4
Sample Name:	662917 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD04.D Sample Name: 662917 LMB

Injection Date:	7/10/2019 09:31:38	Seq Line:	4
Sample Name:	662917 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.334	PBA	348541.0	5.0000	CLO4-89-ISTD

*** End of Report ***

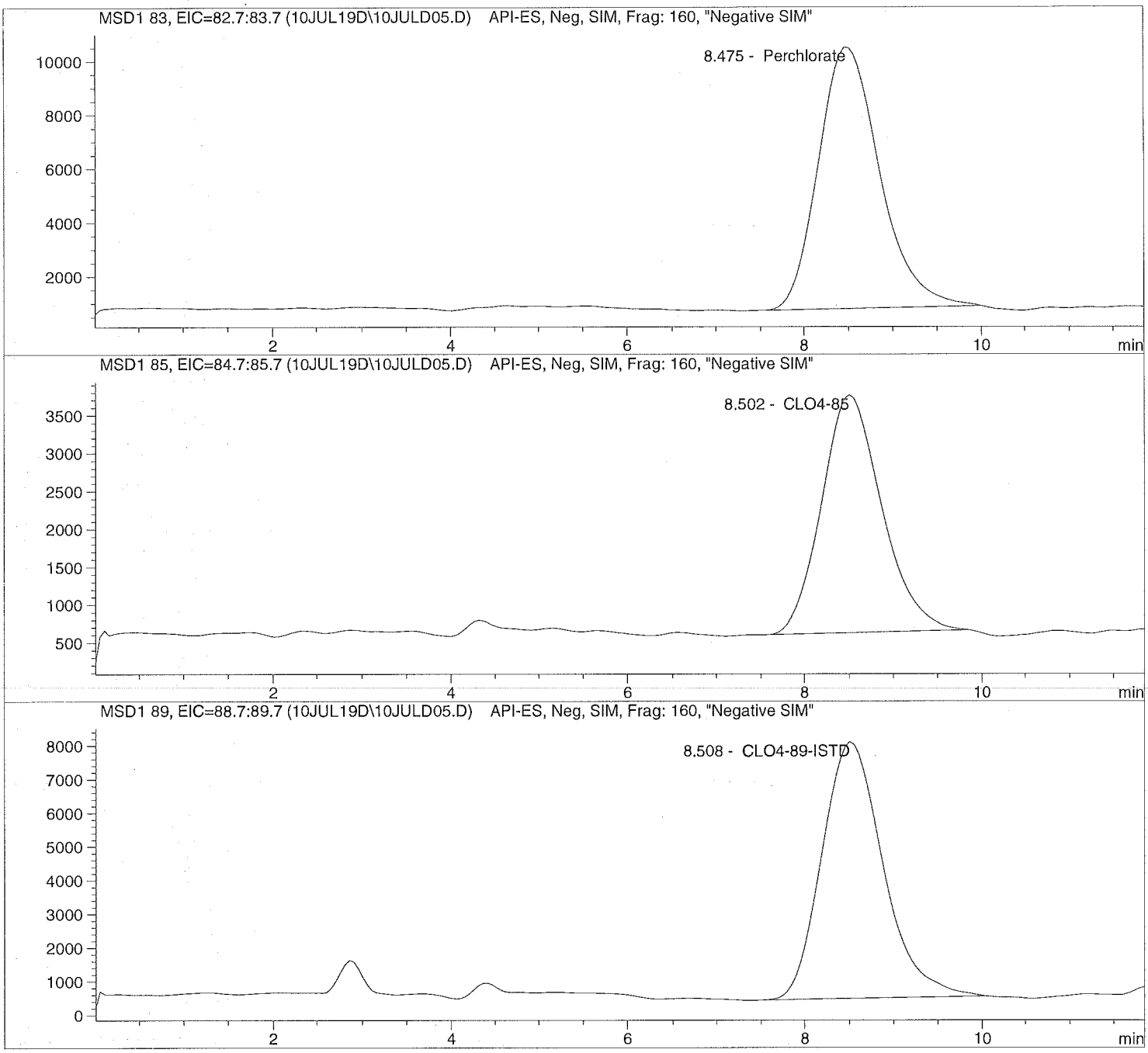
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD05.D Sample Name: 1918373001 1K

Injection Date:	7/10/2019 09:45:31	Seq Line:	5
Sample Name:	1918373001 1K	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD05.D Sample Name: 1918373001 1K

Injection Date:	7/10/2019 09:45:31	Seq Line:	5
Sample Name:	1918373001 1K	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.475	PBA	464595.3	4196.2559	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.502	PBA	147349.9	4333.7991	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.508	PBA	363966.2	5000.0000	CLO4-89-ISTD

*** End of Report ***

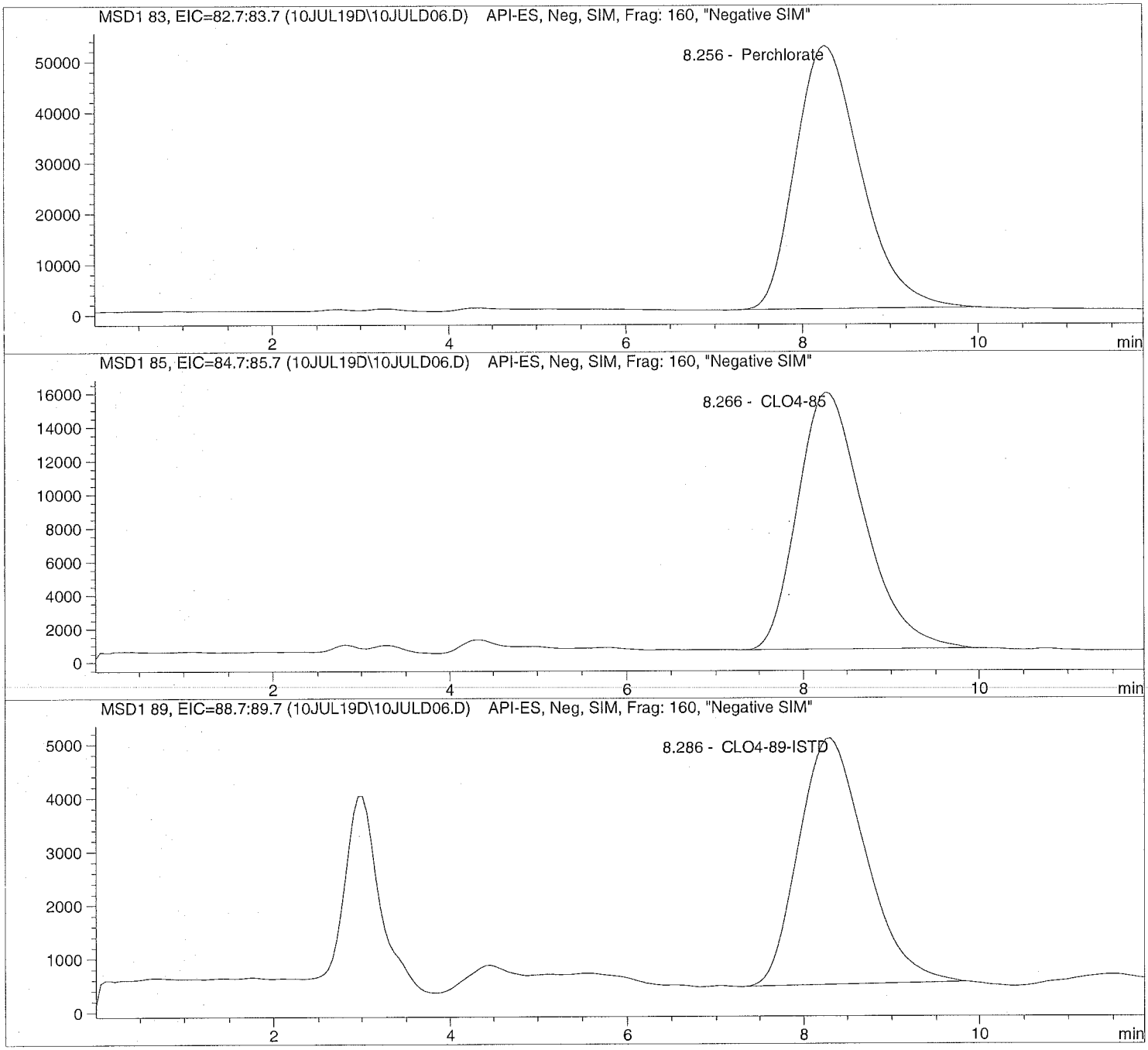
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD06.D Sample Name: 1918373002

Injection Date:	7/10/2019 09:59:30	Seq Line:	6
Sample Name:	1918373002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD06.D Sample Name: 1918373002

Injection Date:	7/10/2019 09:59:30	Seq Line:	6
Sample Name:	1918373002	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.256	PBA	2674385.0	32.9586	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.266	PBA	800737.1	33.2843	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.286	PBA	242366.0	5.0000	CLO4-89-ISTD

*** End of Report ***

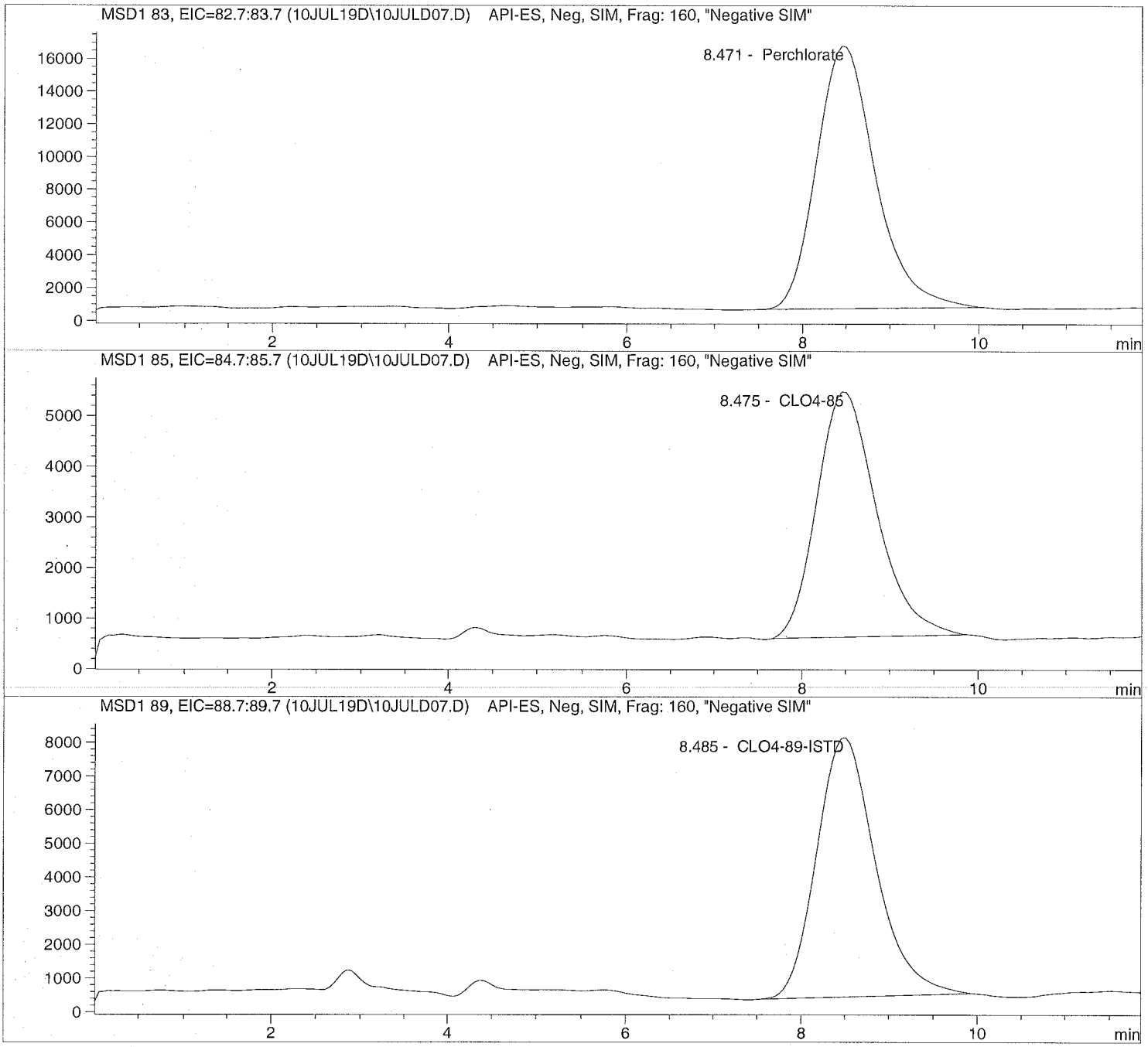
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD07.D Sample Name: 1918373003 10K

Injection Date:	7/10/2019 10:13:27	Seq Line:	7
Sample Name:	1918373003 10K	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD07.D Sample Name: 1918373003 10K

Injection Date:	7/10/2019 10:13:27	Seq Line:	7
Sample Name:	1918373003 10K	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.471	PBA	750172.8	66955.2143	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.475	PBA	230473.2	68000.4573	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.485	PBA	361021.3	50000.0000	CLO4-89-ISTD

*** End of Report ***

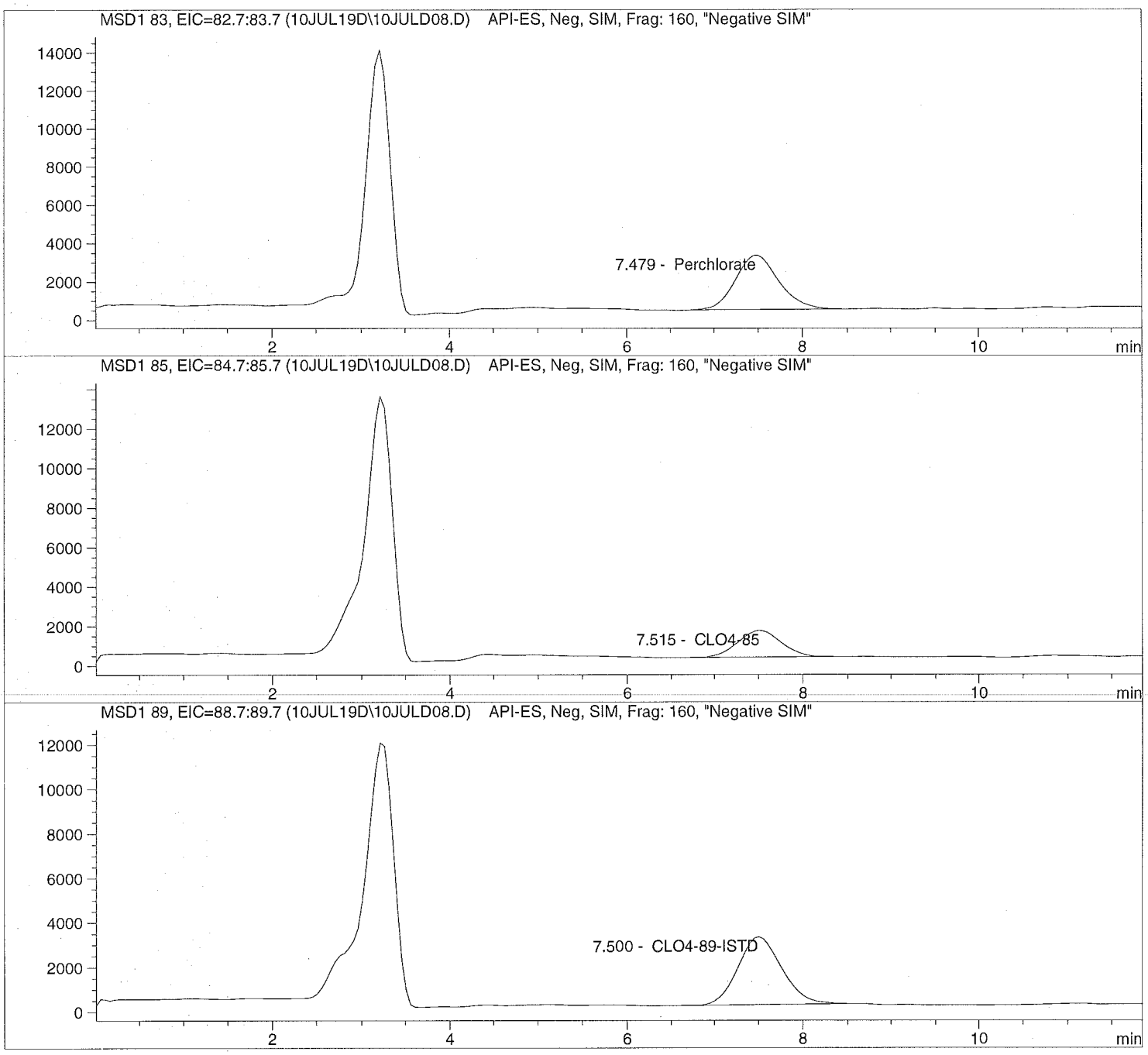
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD08.D Sample Name: 1918373004

Injection Date:	7/10/2019 10:27:21	Seq Line:	8
Sample Name:	1918373004	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD08.D Sample Name: 1918373004

Injection Date:	7/10/2019 10:27:21	Seq Line:	8
Sample Name:	1918373004	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.479	PBA	95969.8	3.0796	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.515	PBA	46048.0	4.7283	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.500	PBA	104173.2	5.0000	CLO4-89-ISTD

*** End of Report ***

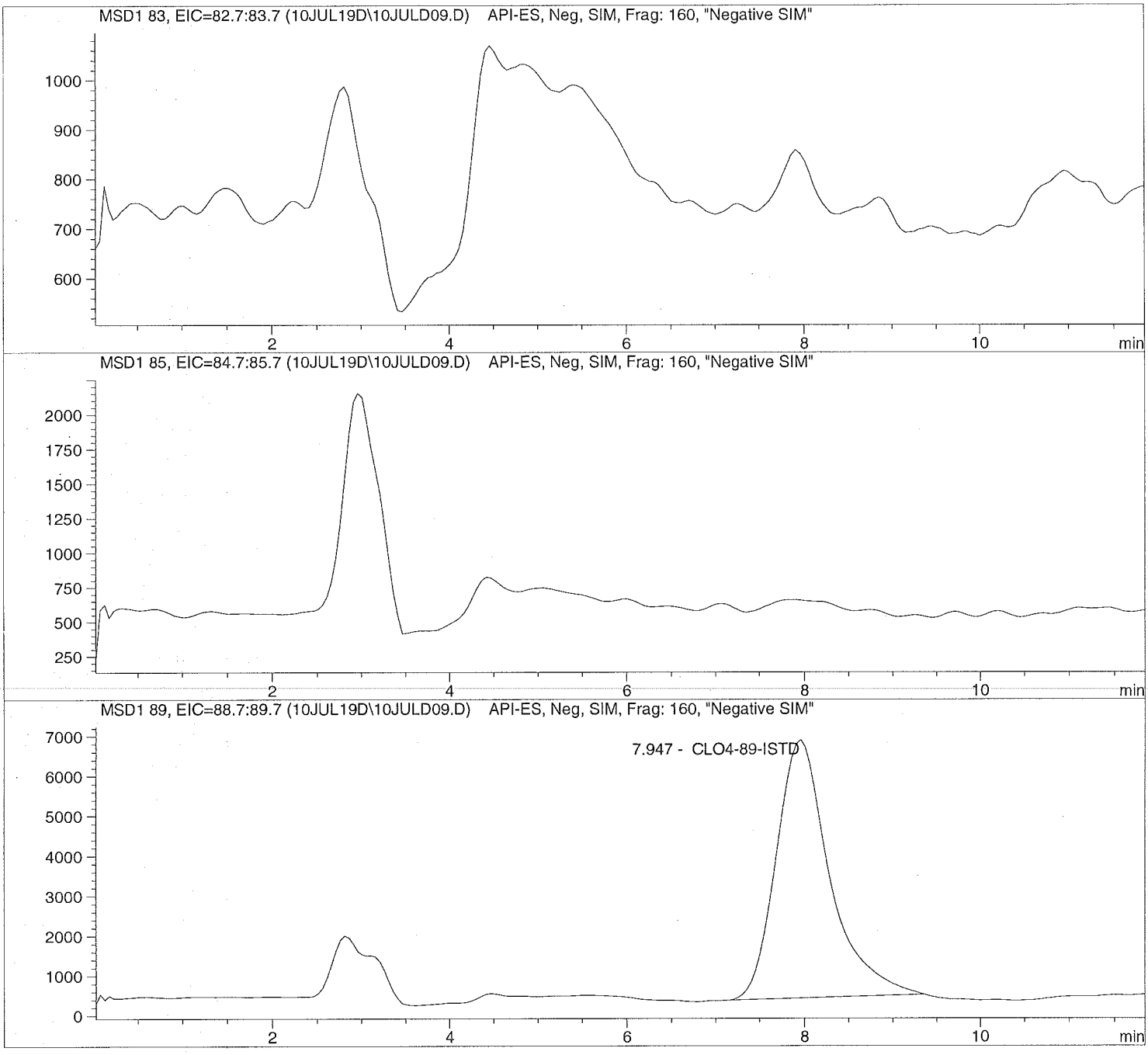
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD09.D Sample Name: 1918373005

Injection Date:	7/10/2019 10:41:15	Seq Line:	9
Sample Name:	1918373005	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD09.D Sample Name: 1918373005

Injection Date:	7/10/2019 10:41:15	Seq Line:	9
Sample Name:	1918373005	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.947	PBA	268458.6	5.0000	CLO4-89-ISTD

*** End of Report ***

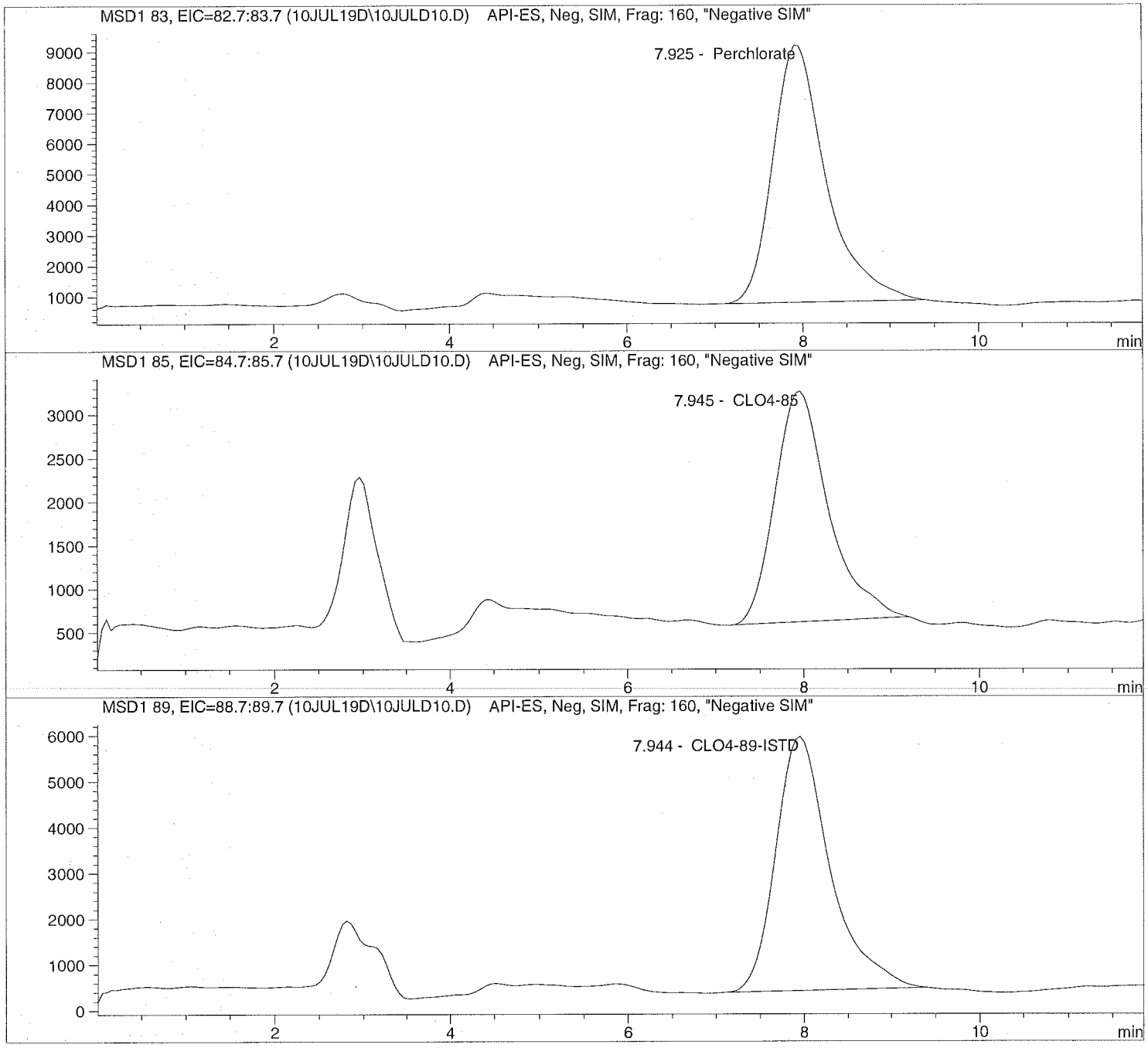
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD10.D Sample Name: 662919 183735S

Injection Date:	7/10/2019 10:55:10	Seq Line:	10
Sample Name:	662919 183735S	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD10.D Sample Name: 662919 183735S

Injection Date:	7/10/2019 10:55:10	Seq Line:	10
Sample Name:	662919 183735S	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.925	PBA	355093.0	4.8652	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.945	PBA	112035.2	5.0261	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.944	PBA	238297.3	5.0000	CLO4-89-ISTD

*** End of Report ***

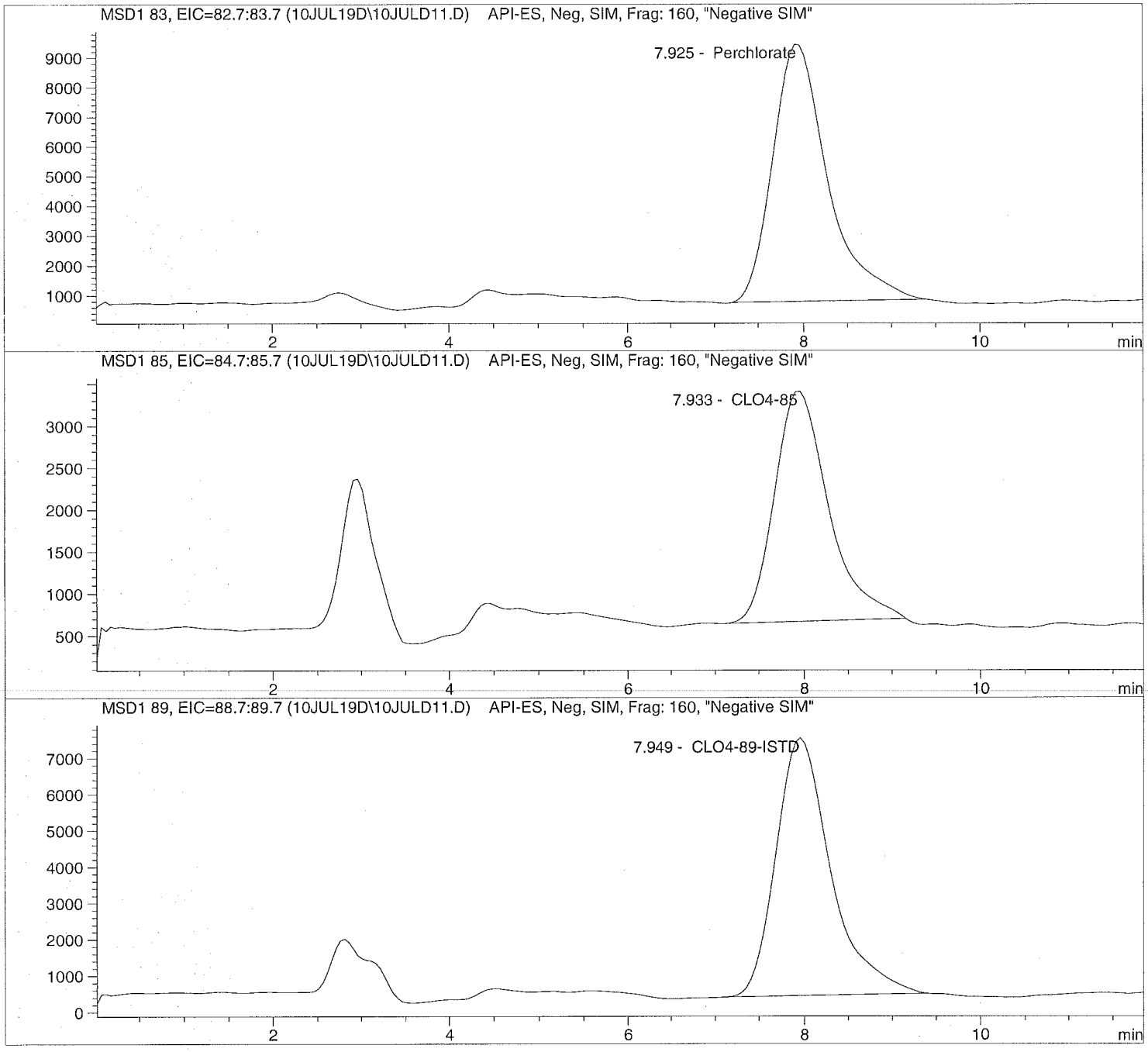
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD11.D Sample Name: 662920 183735D

Injection Date:	7/10/2019 11:09:12	Seq Line:	11
Sample Name:	662920 183735D	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD11.D Sample Name: 662920 183735D

Injection Date:	7/10/2019 11:09:12	Seq Line:	11
Sample Name:	662920 183735D	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.925	PBA	366789.0	4.0106	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.933	BBA	115346.9	4.0997	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.949	PBA	301317.7	5.0000	CLO4-89-ISTD

*** End of Report ***

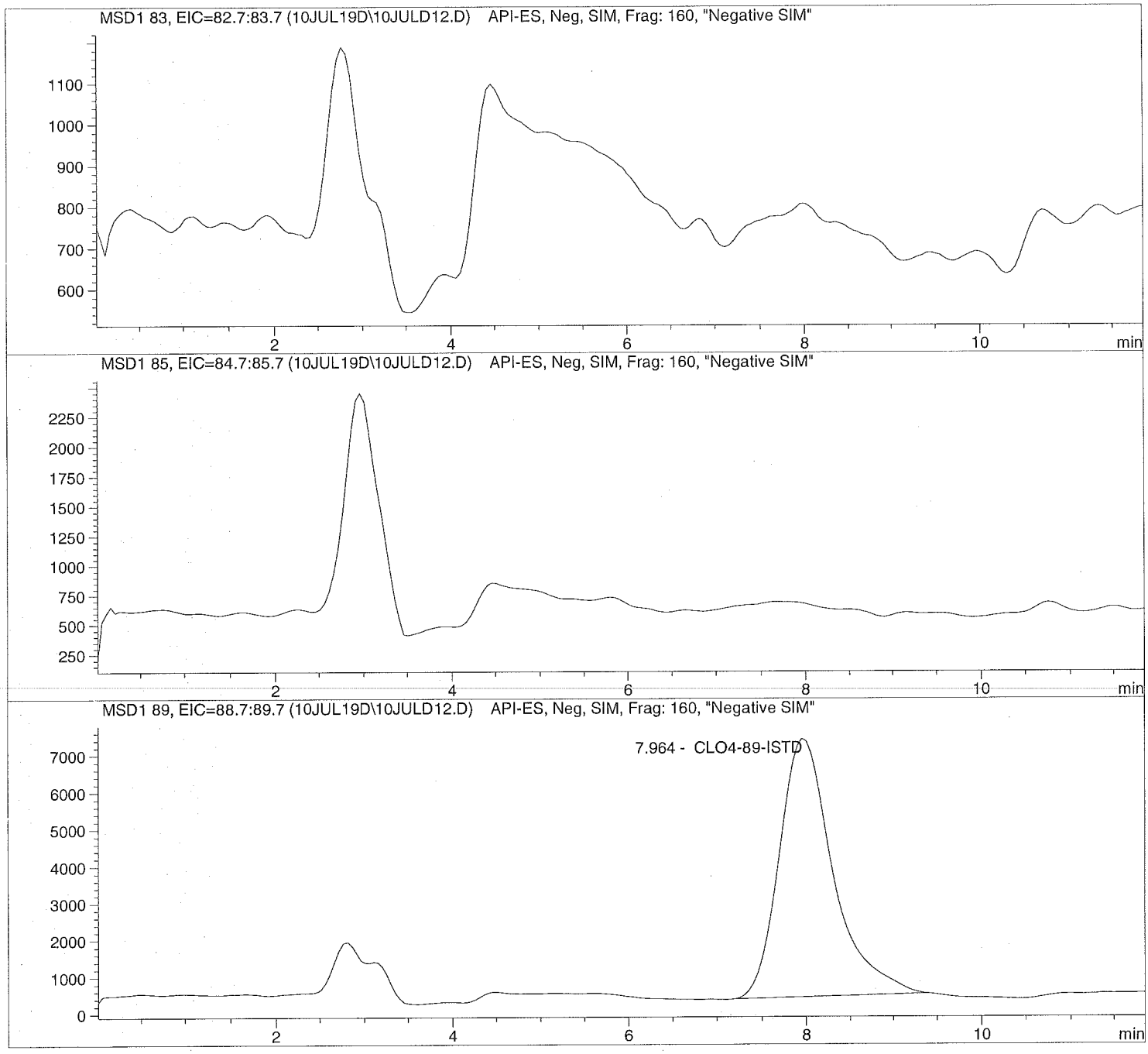
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD12.D Sample Name: 1918373006

Injection Date:	7/10/2019 11:23:04	Seq Line:	12
Sample Name:	1918373006	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD12.D Sample Name: 1918373006

Injection Date:	7/10/2019 11:23:04	Seq Line:	12
Sample Name:	1918373006	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.964	PBA	295412.9	5.0000	CLO4-89-ISTD

*** End of Report ***

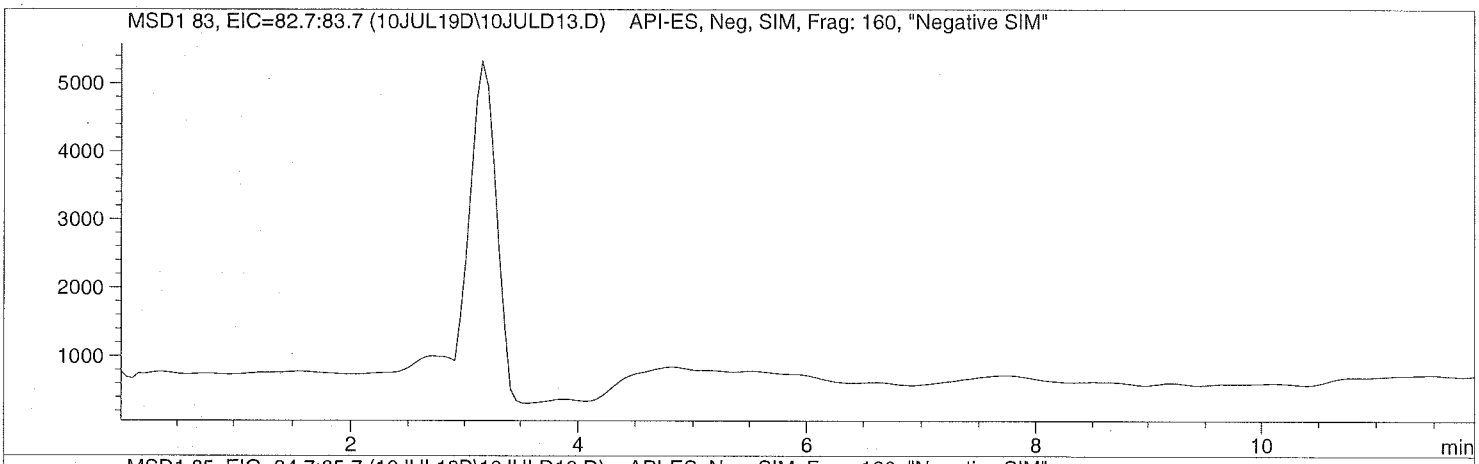
RIGHT SOLUTIONS | RIGHT PARTNER

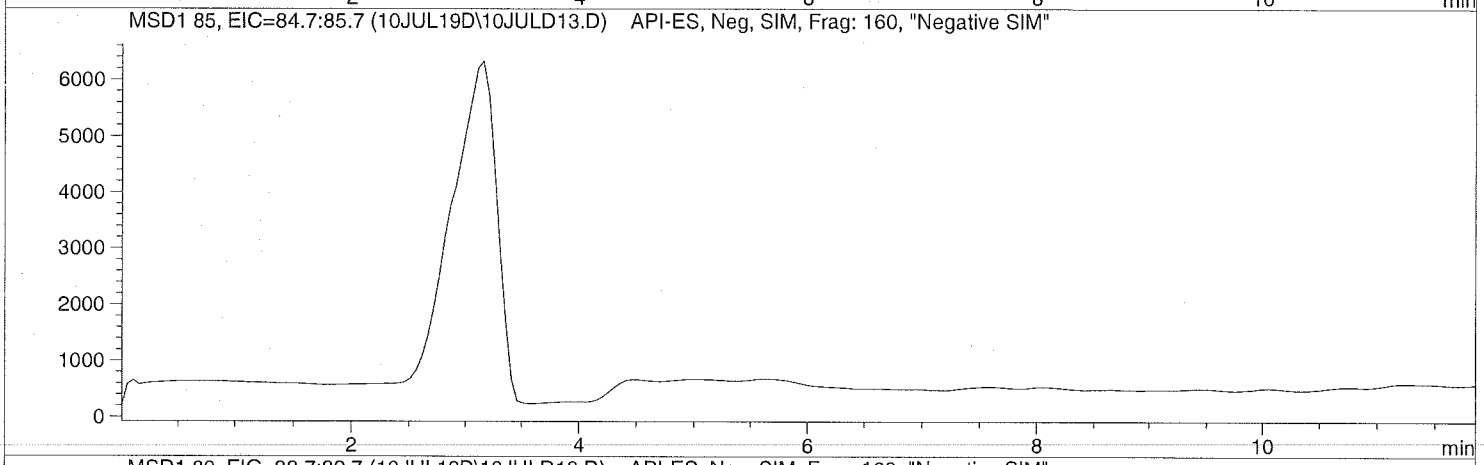
Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD13.D Sample Name: 1918373007

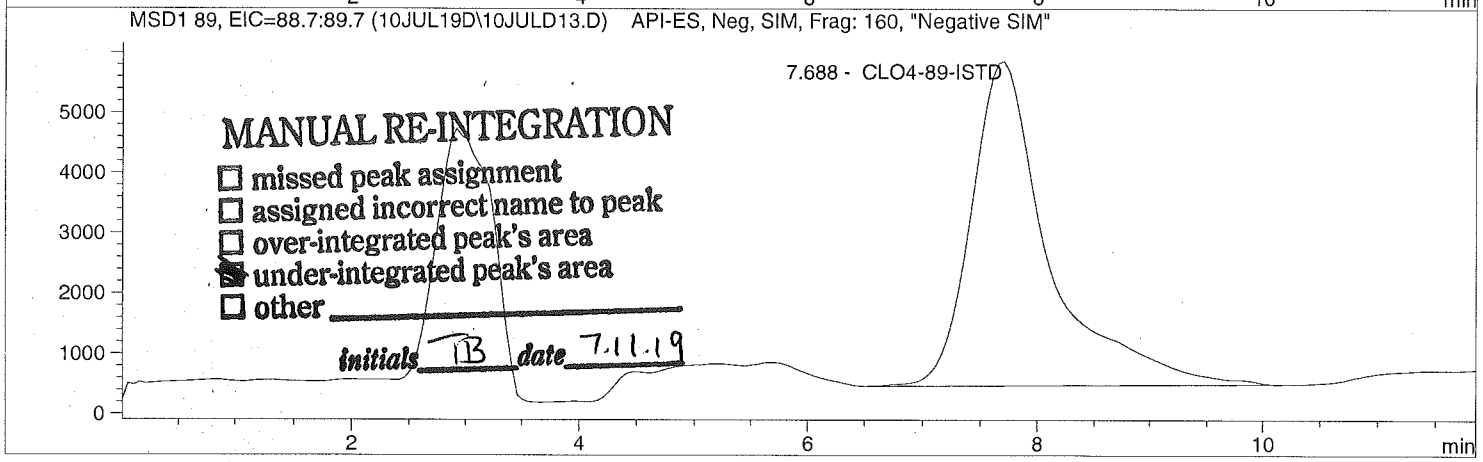
Injection Date:	7/10/2019 11:36:55	Seq Line:	13
Sample Name:	1918373007	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD13.D Sample Name: 1918373007

Injection Date:	7/10/2019 11:36:55	Seq Line:	13
Sample Name:	1918373007	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.688	MM	256579.0	5.0000	CLO4-89-ISTD

*** End of Report ***

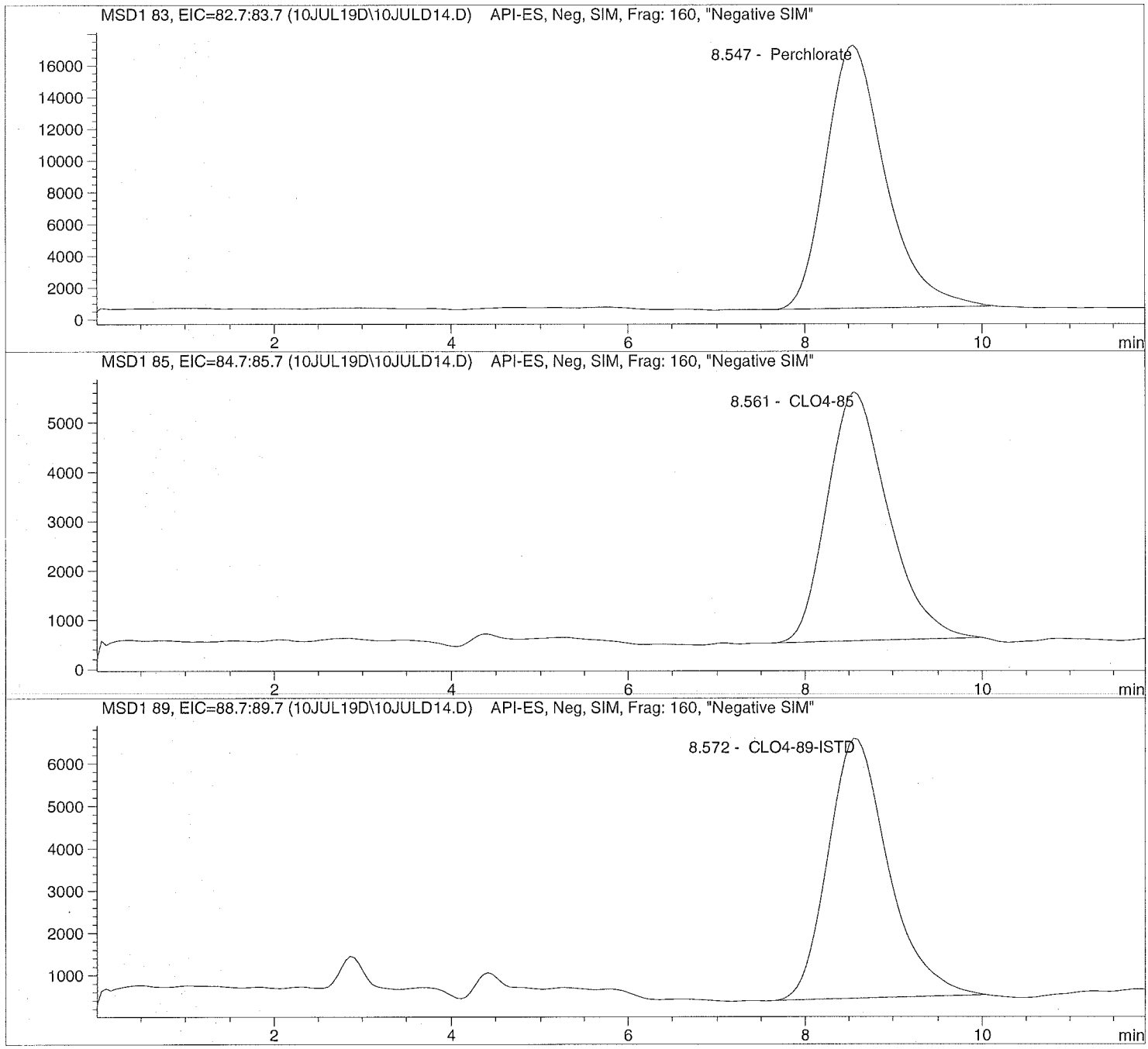
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD14.D Sample Name: 1918373008 10K

Injection Date:	7/10/2019 11:50:45	Seq Line:	14
Sample Name:	1918373008 10K	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD14.D Sample Name: 1918373008 10K

Injection Date:	7/10/2019 11:50:45	Seq Line:	14
Sample Name:	1918373008 10K	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 10000.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.547	PBA	780844.1	85012.5764	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.561	PBA	243152.5	87944.5239	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.572	PBA	293278.4	50000.0000	CLO4-89-ISTD

*** End of Report ***

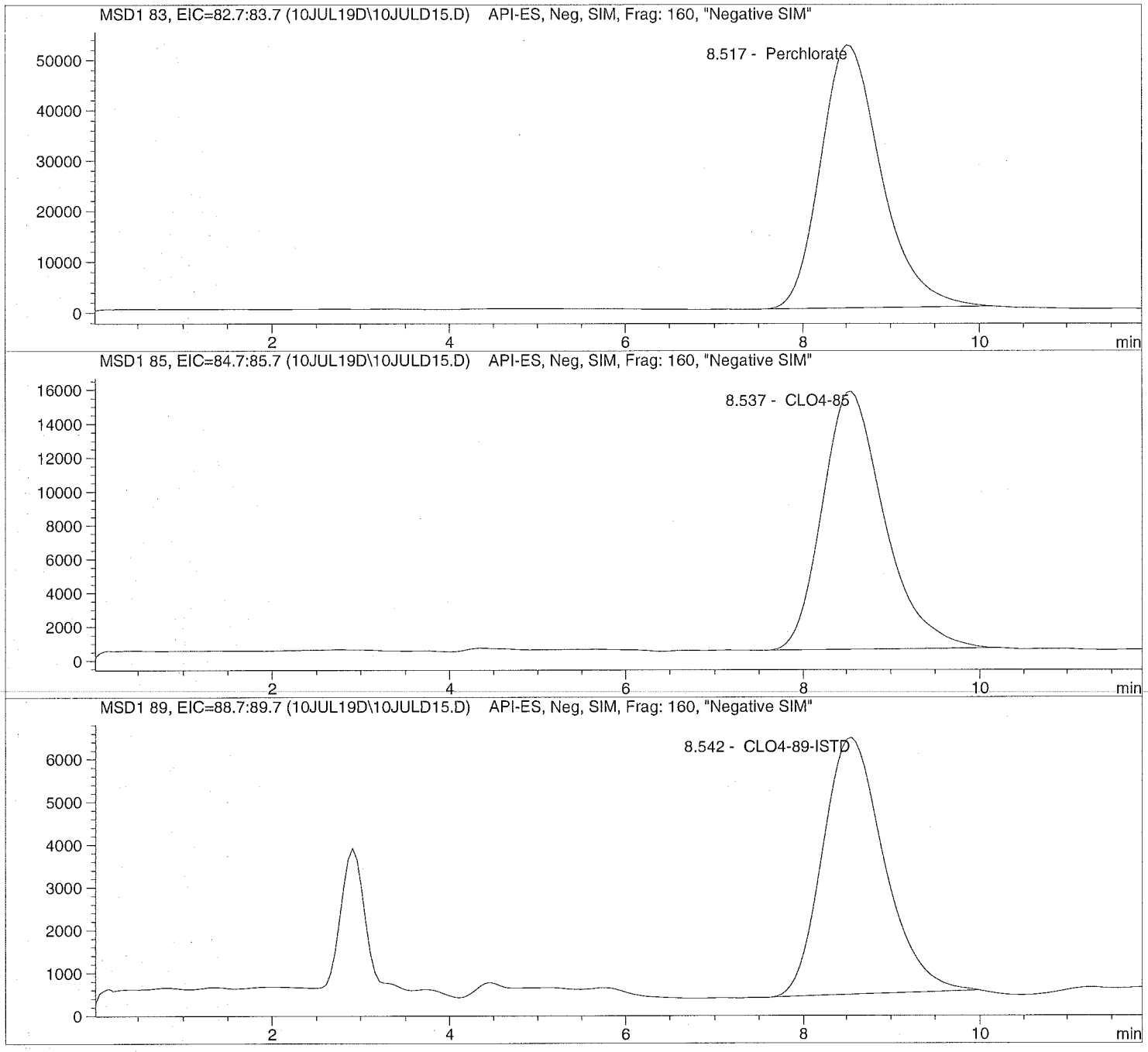
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD15.D Sample Name: 1918373009 10

Injection Date:	7/10/2019 12:04:37	Seq Line:	15
Sample Name:	1918373009 10	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD15.D Sample Name: 1918373009 10

Injection Date:	7/10/2019 12:04:37	Seq Line:	15
Sample Name:	1918373009 10	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.517	PBA	2500331.5	259.3213	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.537	PBA	749555.3	261.8322	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.542	PBA	292692.1	50.0000	CLO4-89-ISTD

*** End of Report ***

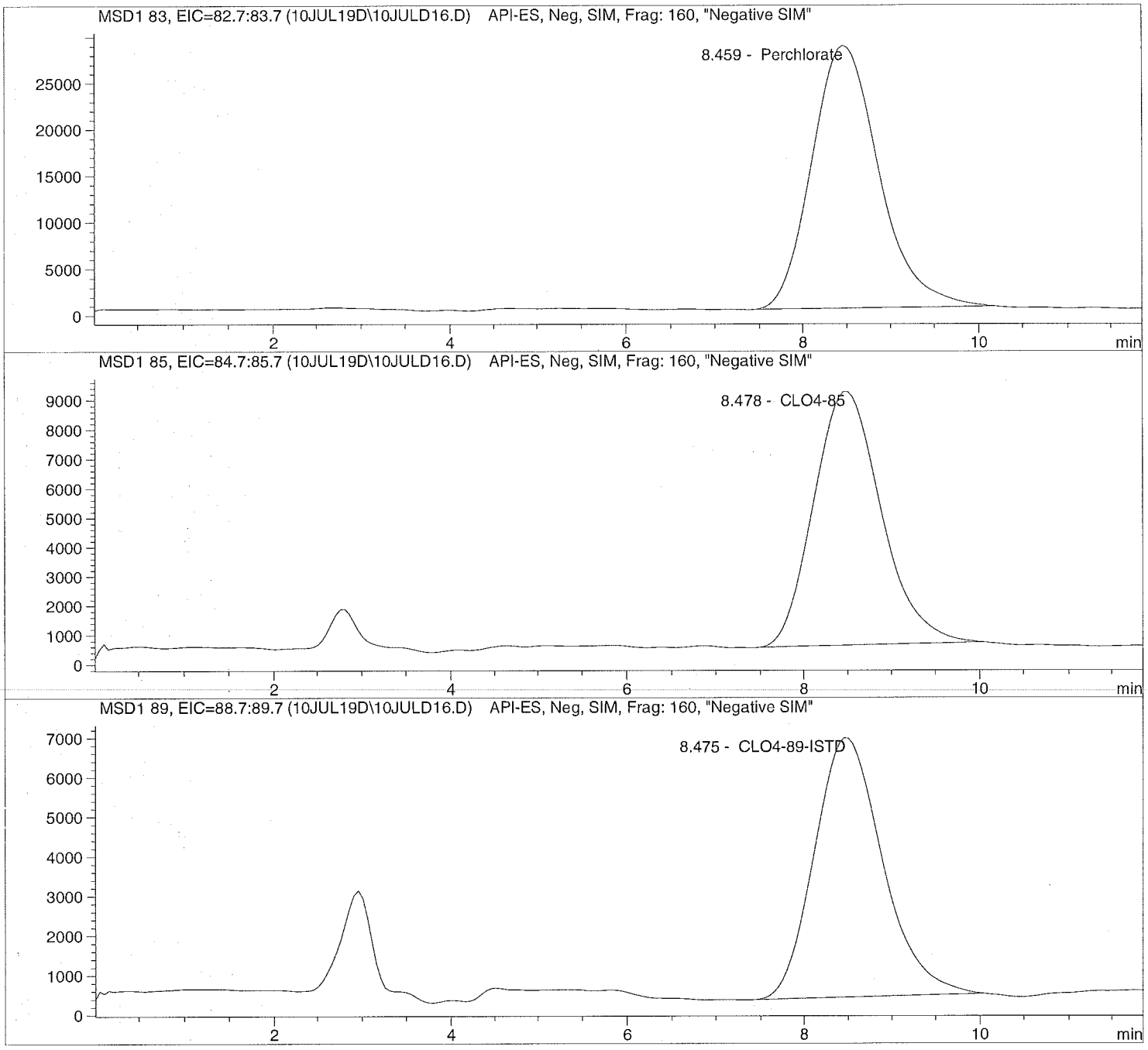
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD16.D Sample Name: 1918525001 100

Injection Date:	7/10/2019 12:18:38	Seq Line:	16
Sample Name:	1918525001 100	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD16.D Sample Name: 1918525001 100

Injection Date:	7/10/2019 12:18:38	Seq Line:	16
Sample Name:	1918525001 100	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.459	PBA	1501595.1	1335.1619	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.478	PBA	461811.6	1373.7604	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.475	PBA	352862.3	500.0000	CLO4-89-ISTD

*** End of Report ***

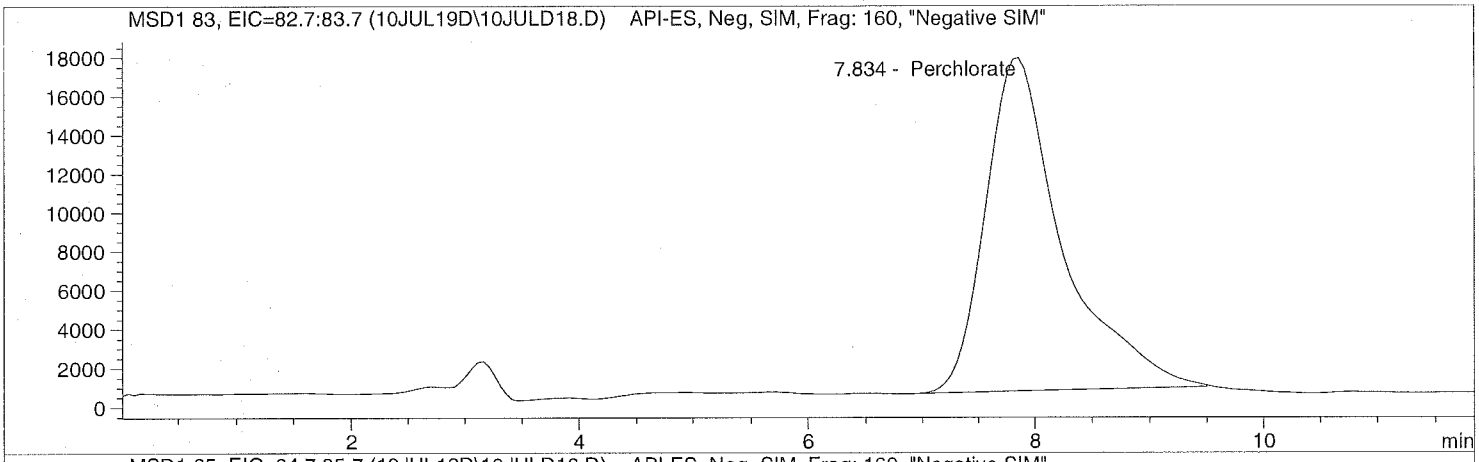
RIGHT SOLUTIONS | RIGHT PARTNER

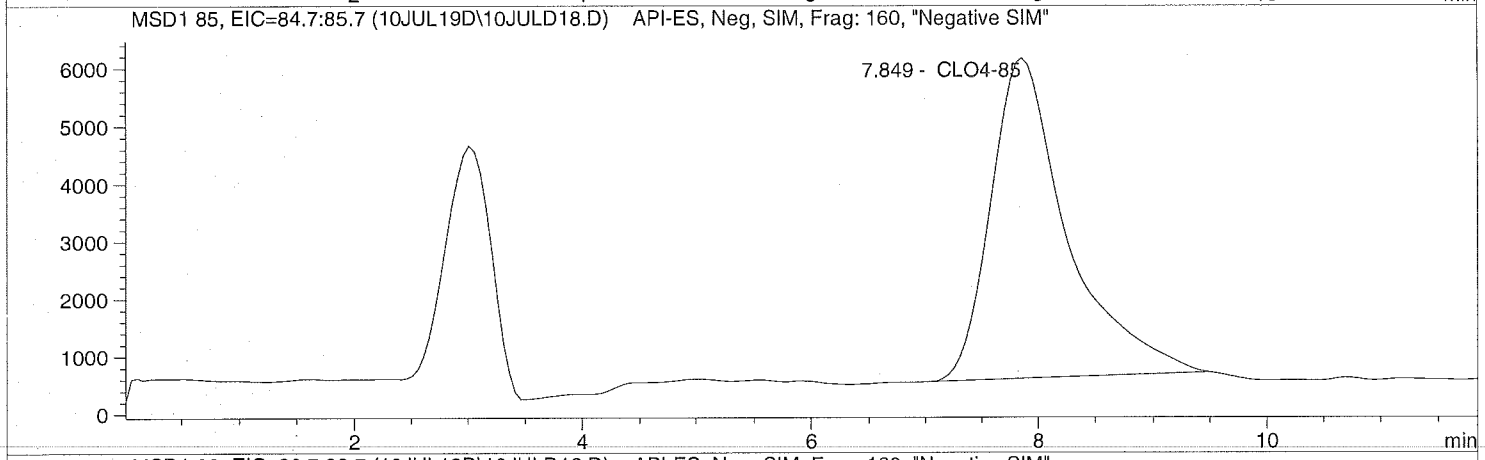
Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD18.D Sample Name: 1918525002 10

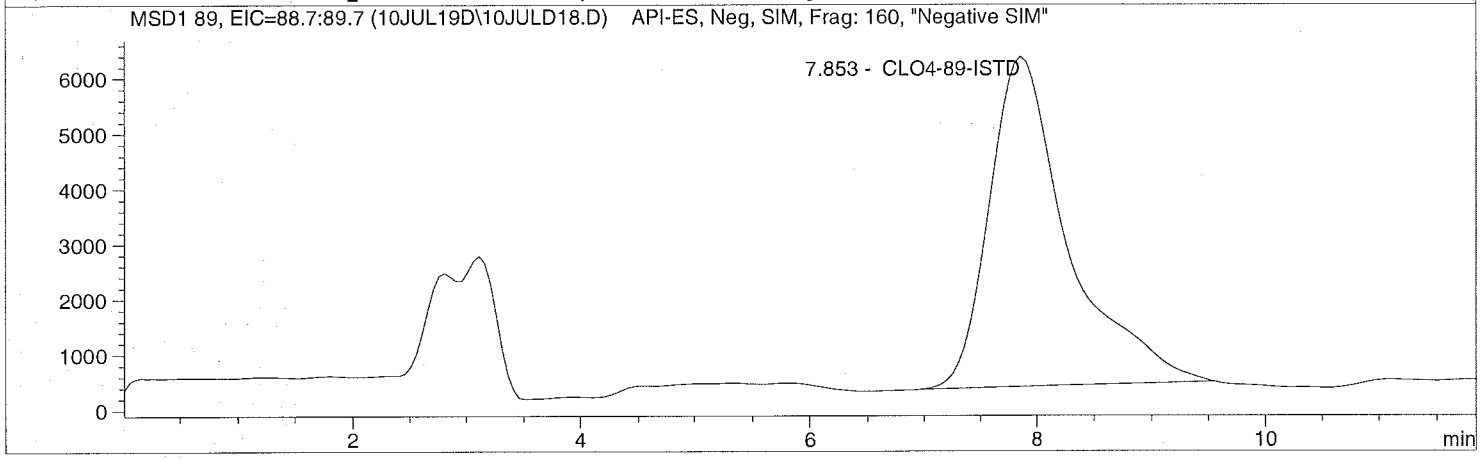
Injection Date:	7/10/2019 12:46:22	Seq Line:	18
Sample Name:	1918525002 10	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD18.D Sample Name: 1918525002 10

Injection Date:	7/10/2019 12:46:22	Seq Line:	18
Sample Name:	1918525002 10	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.834	PBA	801472.4	89.4028	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.849	PBA	259266.4	96.0941	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.853	PBA	285700.9	50.0000	CLO4-89-ISTD

*** End of Report ***

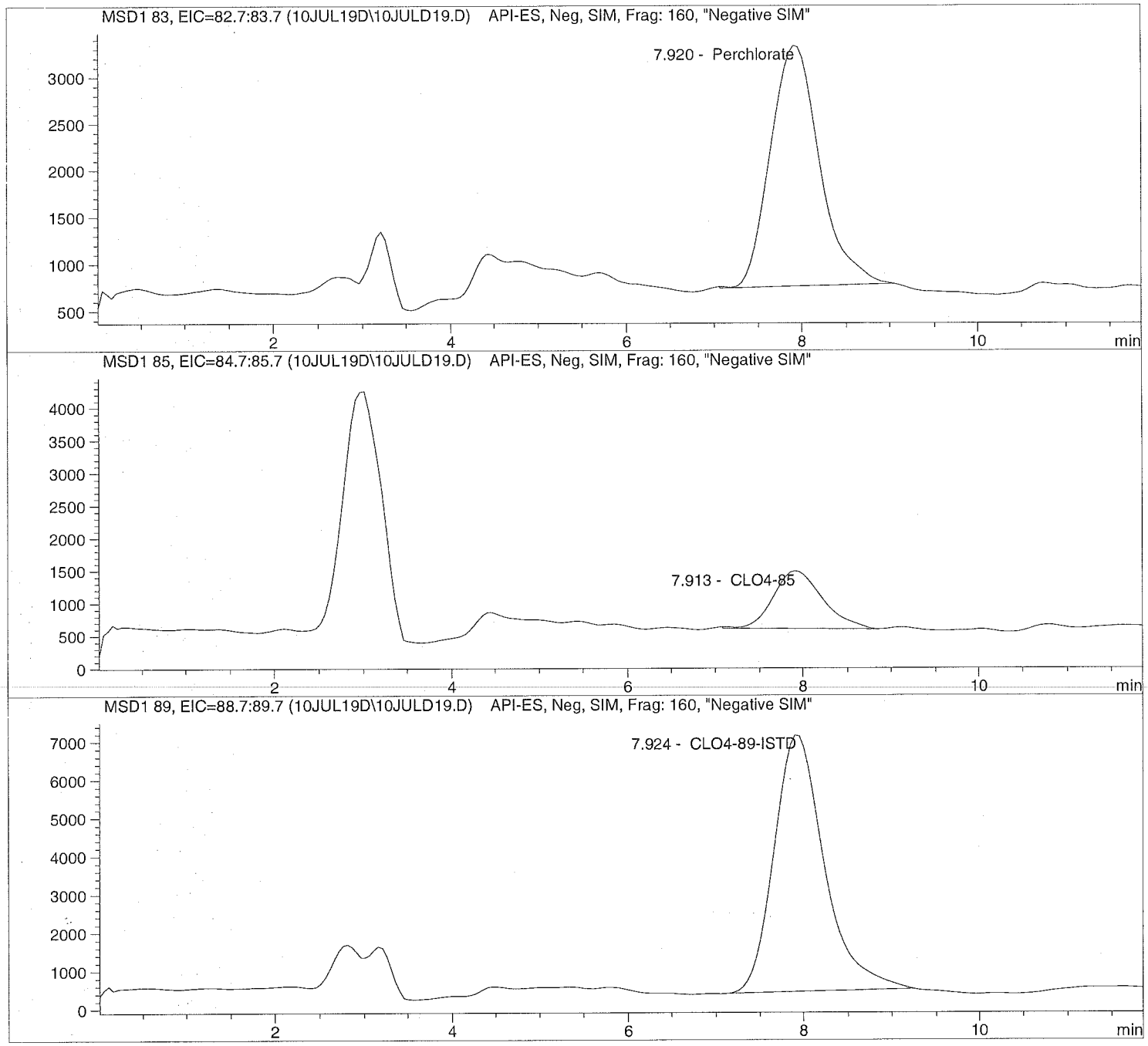
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD19.D Sample Name: 1918525003

Injection Date:	7/10/2019 13:00:15	Seq Line:	19
Sample Name:	1918525003	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD19.D Sample Name: 1918525003

Injection Date:	7/10/2019 13:00:15	Seq Line:	19
Sample Name:	1918525003	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.920	BBA	99719.0	1.3533	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.913	BBA	34459.2	1.3947	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.924	PBA	265508.1	5.0000	CLO4-89-ISTD

*** End of Report ***

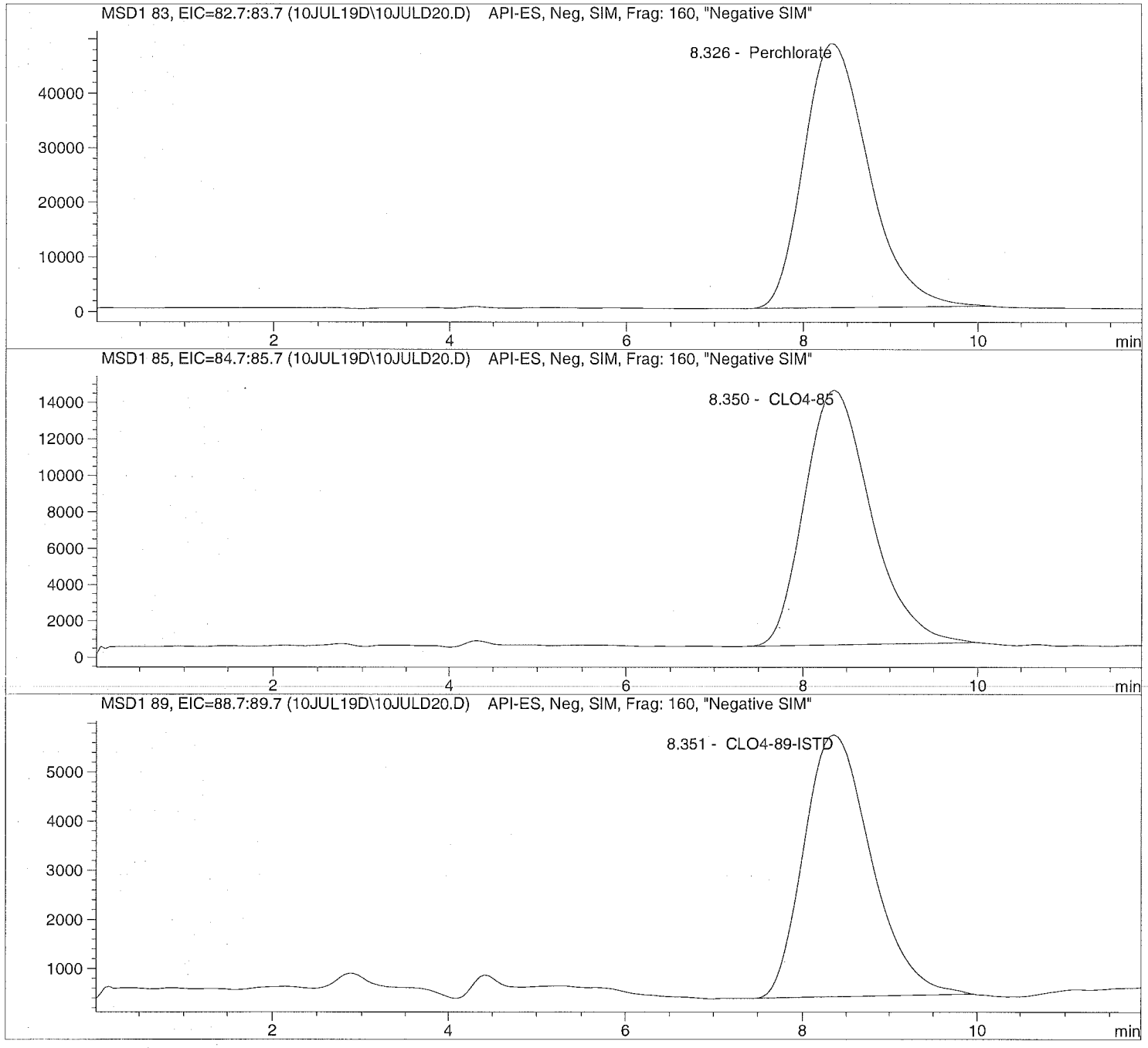
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD20.D Sample Name: 662921 CCV@25

Injection Date:	7/10/2019 13:15:33	Seq Line:	20
Sample Name:	662921 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD20.D Sample Name: 662921 CCV@25

Injection Date:	7/10/2019 13:15:33	Seq Line:	20
Sample Name:	662921 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.326	PBA	2504544.8	26.4781	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.350	PBA	743673.1	26.4969	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.351	PBA	286769.0	5.0000	CLO4-89-ISTD

*** End of Report ***

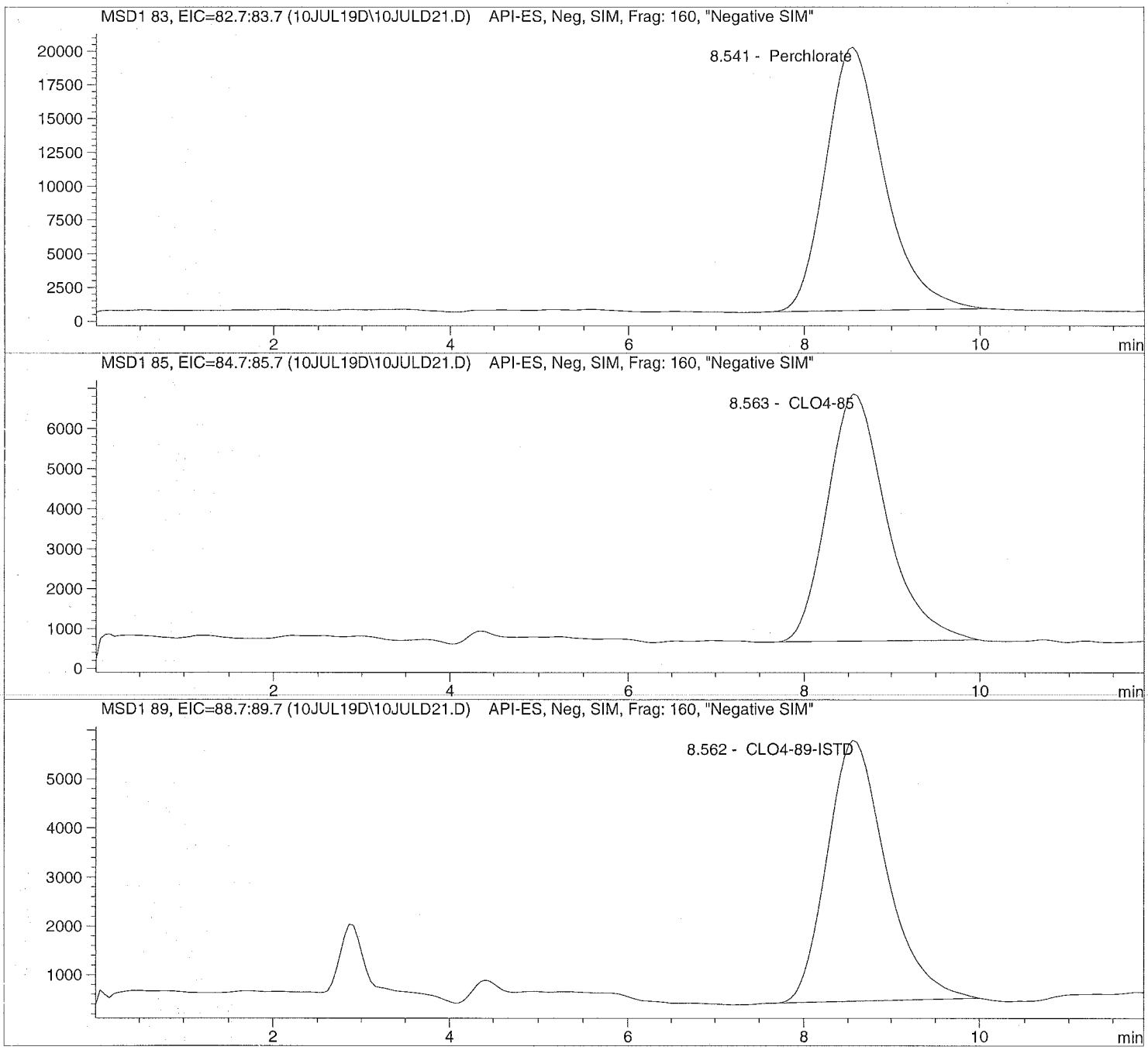
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD21.D Sample Name: 1918525004 1K

Injection Date:	7/10/2019 13:39:18	Seq Line:	21
Sample Name:	1918525004 1K	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



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RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD21.D Sample Name: 1918525004 1K

Injection Date:	7/10/2019 13:39:18	Seq Line:	21
Sample Name:	1918525004 1K	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.541	PBA	911870.8	11409.0284	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.563	PBA	292673.1	12213.3165	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.562	PBA	252353.5	5000.0000	CLO4-89-ISTD

*** End of Report ***

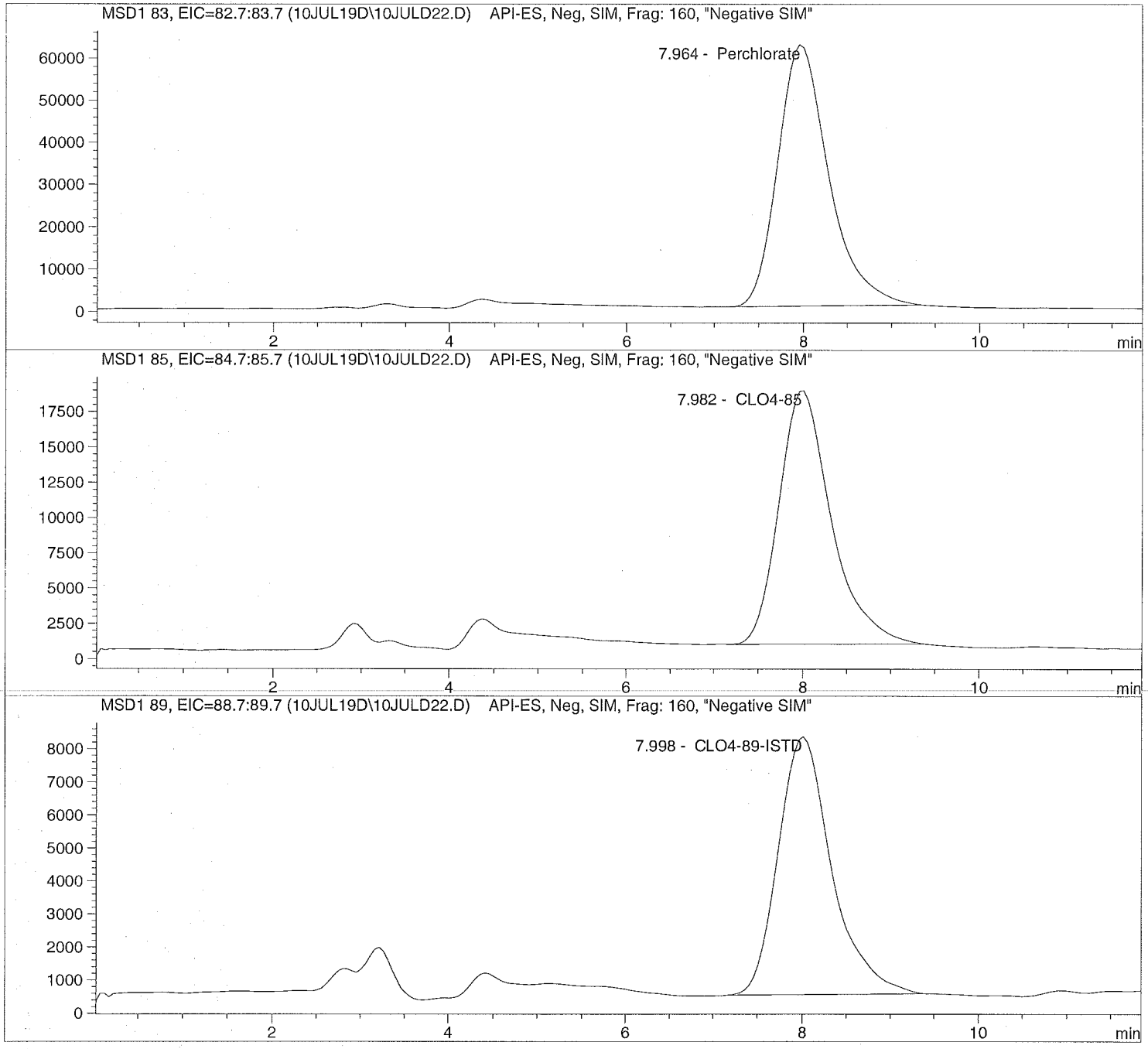
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD22.D Sample Name: 1918682001

Injection Date:	7/10/2019 13:53:14	Seq Line:	22
Sample Name:	1918682001	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD22.D Sample Name: 1918682001

Injection Date:	7/10/2019 13:53:14	Seq Line:	22
Sample Name:	1918682001	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.964	PBA	2472569.8	22.9756	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.982	PBA	738653.3	23.1021	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.998	PBA	329023.1	5.0000	CLO4-89-ISTD

*** End of Report ***

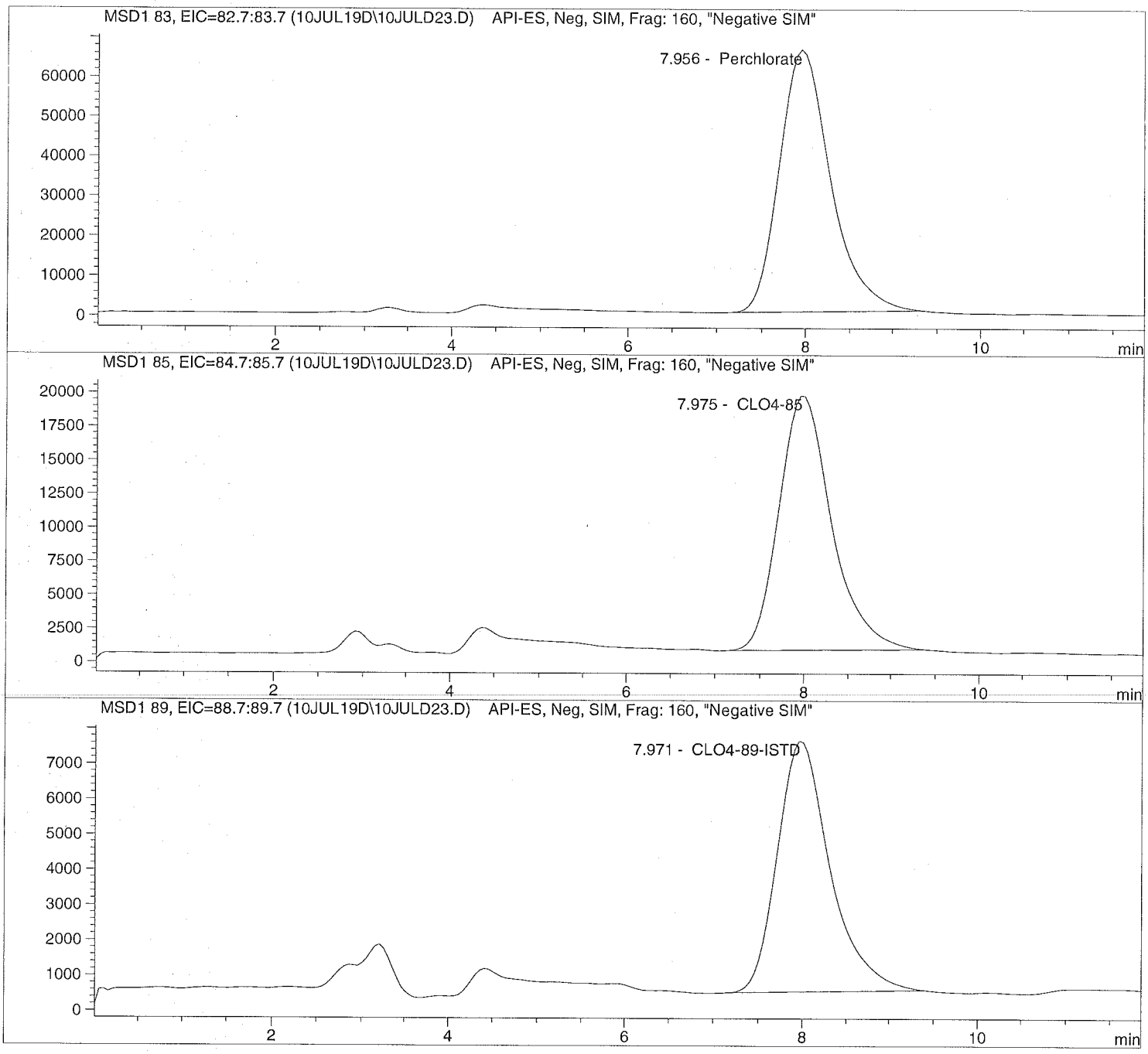
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD23.D Sample Name: 1918682002

Injection Date:	7/10/2019 14:07:09	Seq Line:	23
Sample Name:	1918682002	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD23.D Sample Name: 1918682002

Injection Date:	7/10/2019 14:07:09	Seq Line:	23
Sample Name:	1918682002	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.956	PBA	2649661.3	27.0999	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.975	PBA	784495.3	27.0493	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.971	PBA	295991.2	5.0000	CLO4-89-ISTD

*** End of Report ***

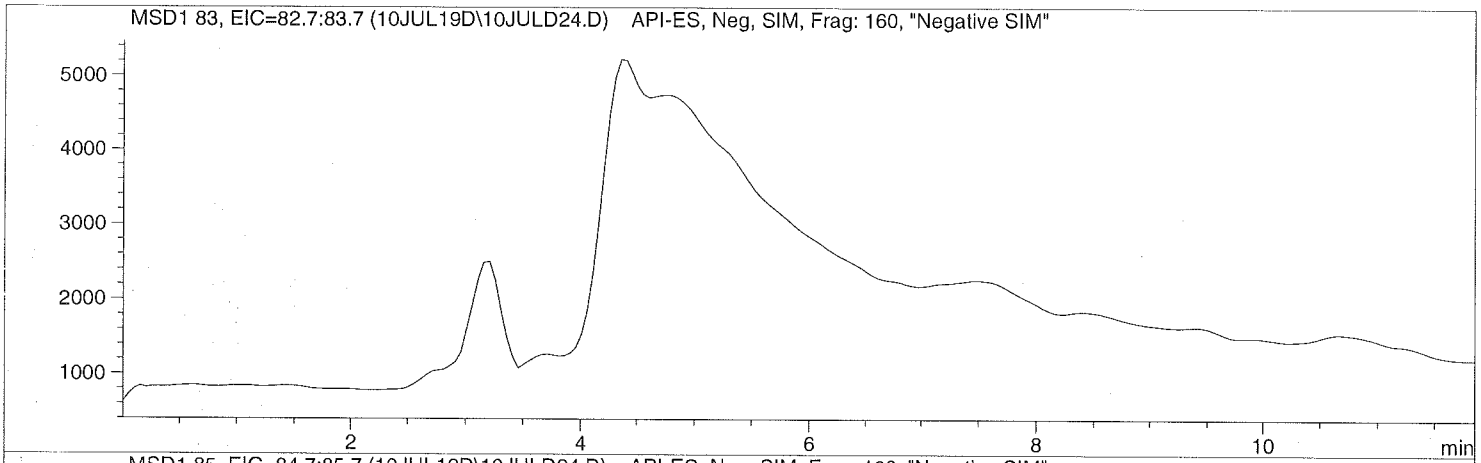
RIGHT SOLUTIONS | RIGHT PARTNER

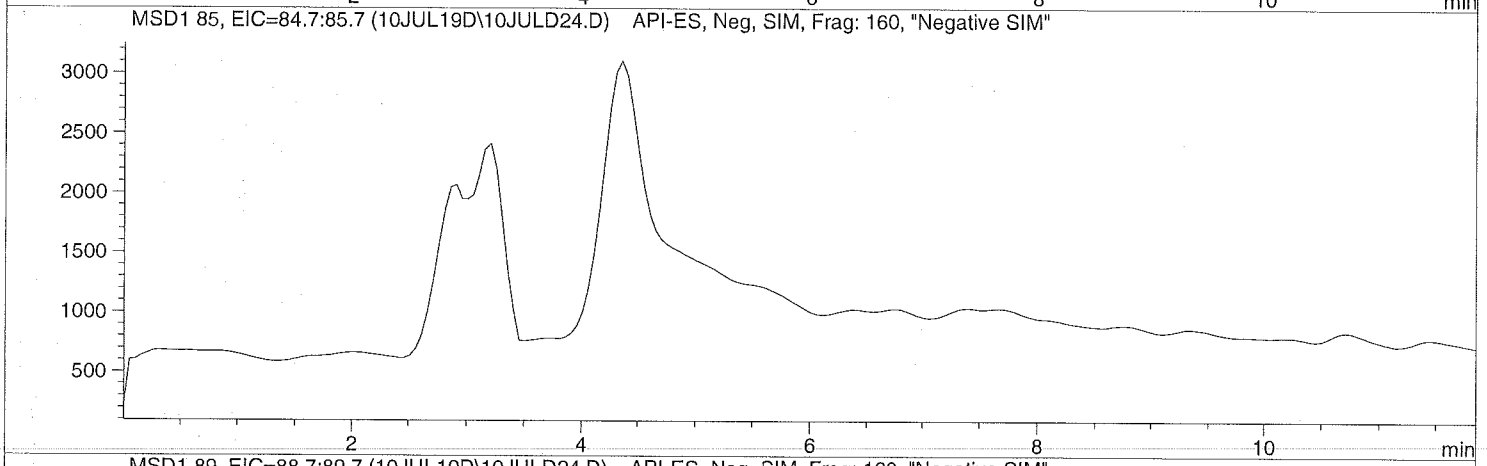
Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD24.D Sample Name: 1918682003

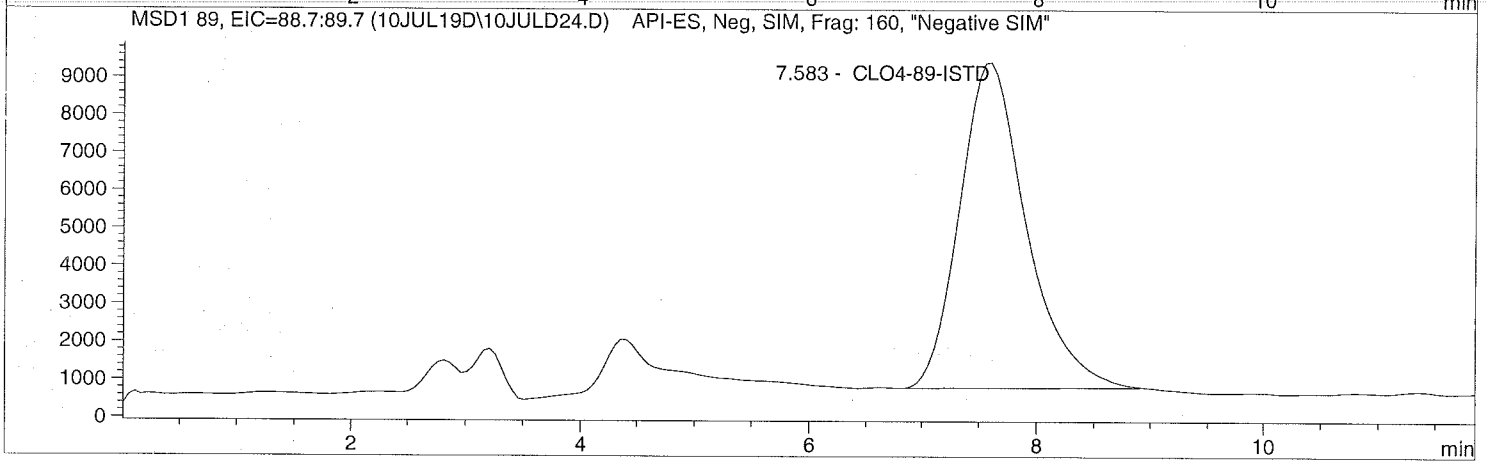
Injection Date:	7/10/2019 14:20:59	Seq Line:	24
Sample Name:	1918682003	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD24.D Sample Name: 1918682003

Injection Date:	7/10/2019 14:20:59	Seq Line:	24
Sample Name:	1918682003	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.583	PBA	347868.7	5.0000	CLO4-89-ISTD

*** End of Report ***

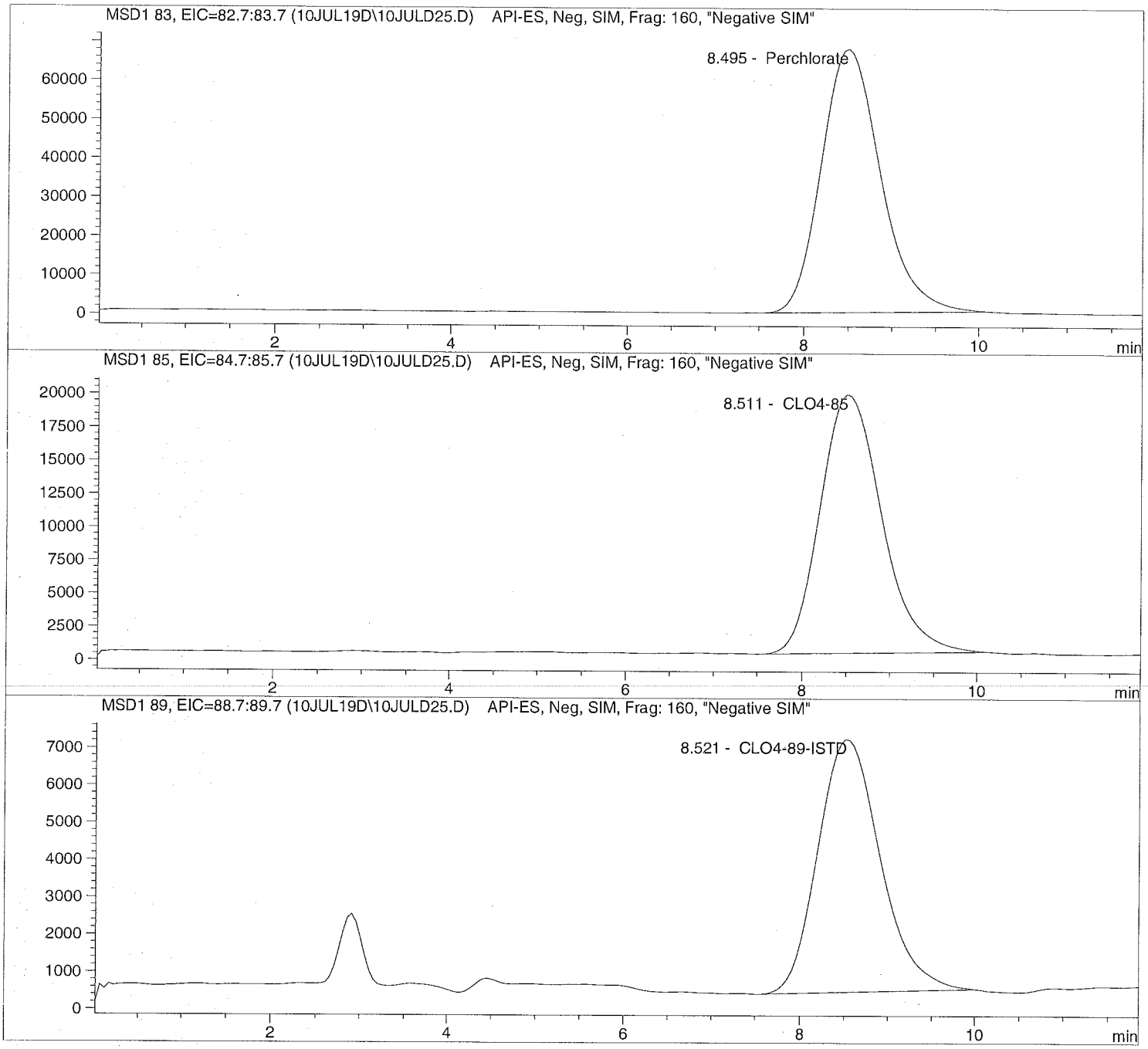
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD25.D Sample Name: 1918682004 100

Injection Date:	7/10/2019 14:34:49	Seq Line:	25
Sample Name:	1918682004 100	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD25.D Sample Name: 1918682004 100

Injection Date:	7/10/2019 14:34:49	Seq Line:	25
Sample Name:	1918682004 100	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.495	PBA	3177637.5	2867.6913	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.511	PBA	949731.6	2888.9947	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.521	PBA	334219.0	500.0000	CLO4-89-ISTD

*** End of Report ***

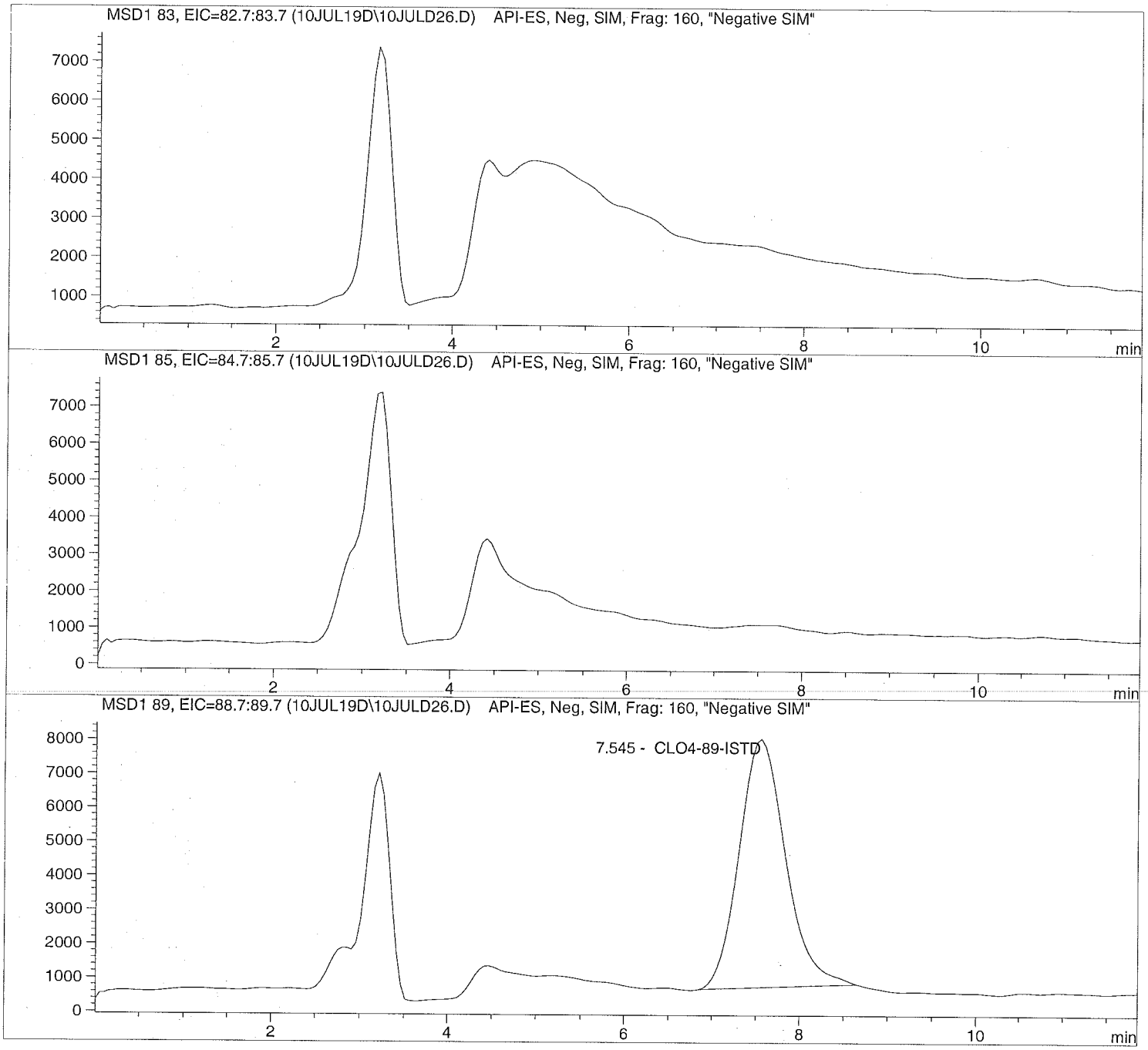
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD26.D Sample Name: 1918682005

Injection Date:	7/10/2019 14:48:53	Seq Line:	26
Sample Name:	1918682005	Location:	Vial 94
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD26.D Sample Name: 1918682005

Injection Date:	7/10/2019 14:48:53	Seq Line:	26
Sample Name:	1918682005	Location:	Vial 94
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.545	PBA	268838.9	5.0000	CLO4-89-ISTD

*** End of Report ***

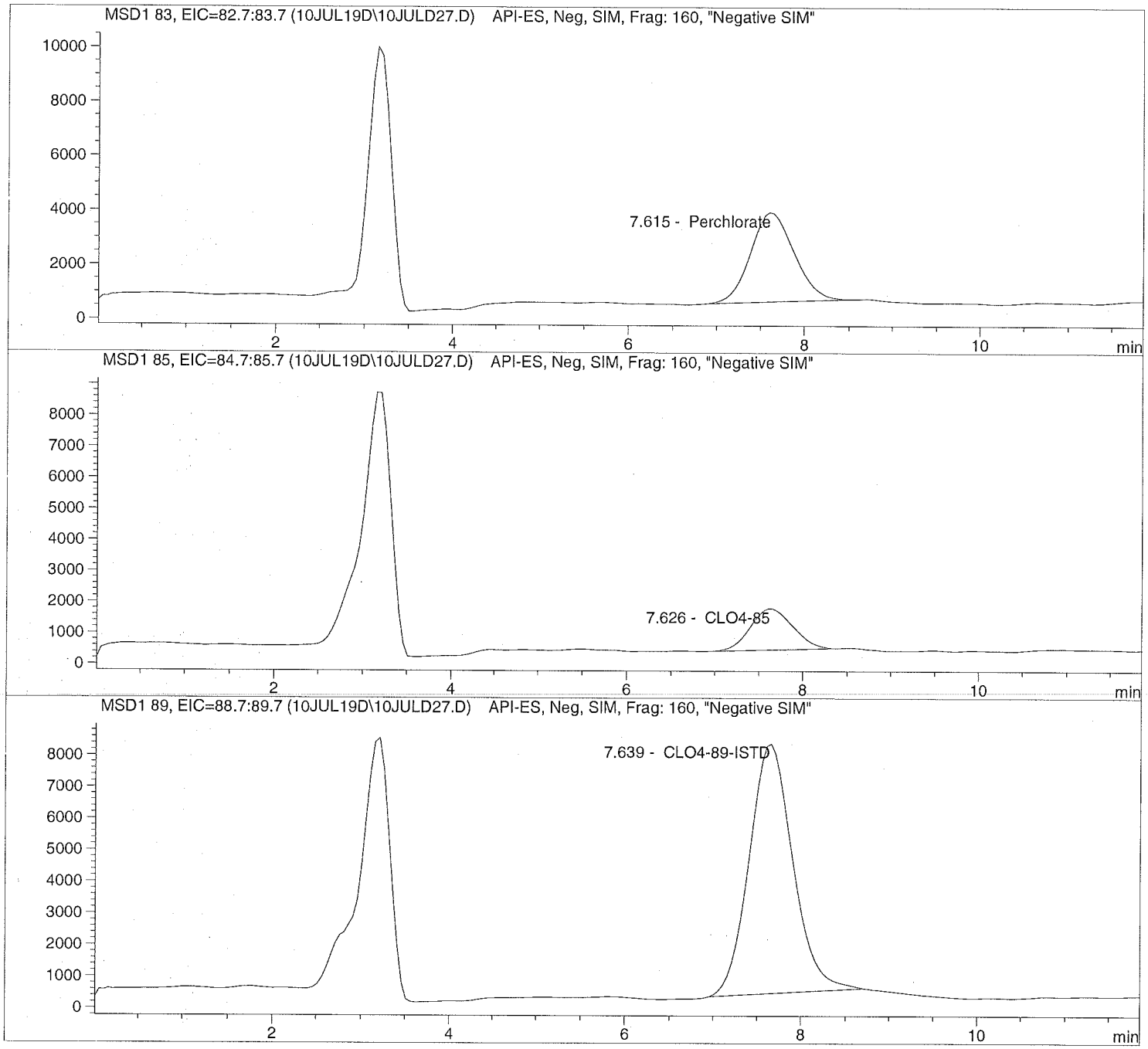
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD27.D Sample Name: 1918373004 4X

Injection Date:	7/10/2019 15:02:46	Seq Line:	27
Sample Name:	1918373004 4X	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD27.D Sample Name: 1918373004 4X

Injection Date:	7/10/2019 15:02:46	Seq Line:	27
Sample Name:	1918373004 4X	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	4.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.615	PBA	113897.9	5.9203	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.626	PBA	45010.5	7.0582	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.639	PBA	274117.7	20.0000	CLO4-89-ISTD

*** End of Report ***

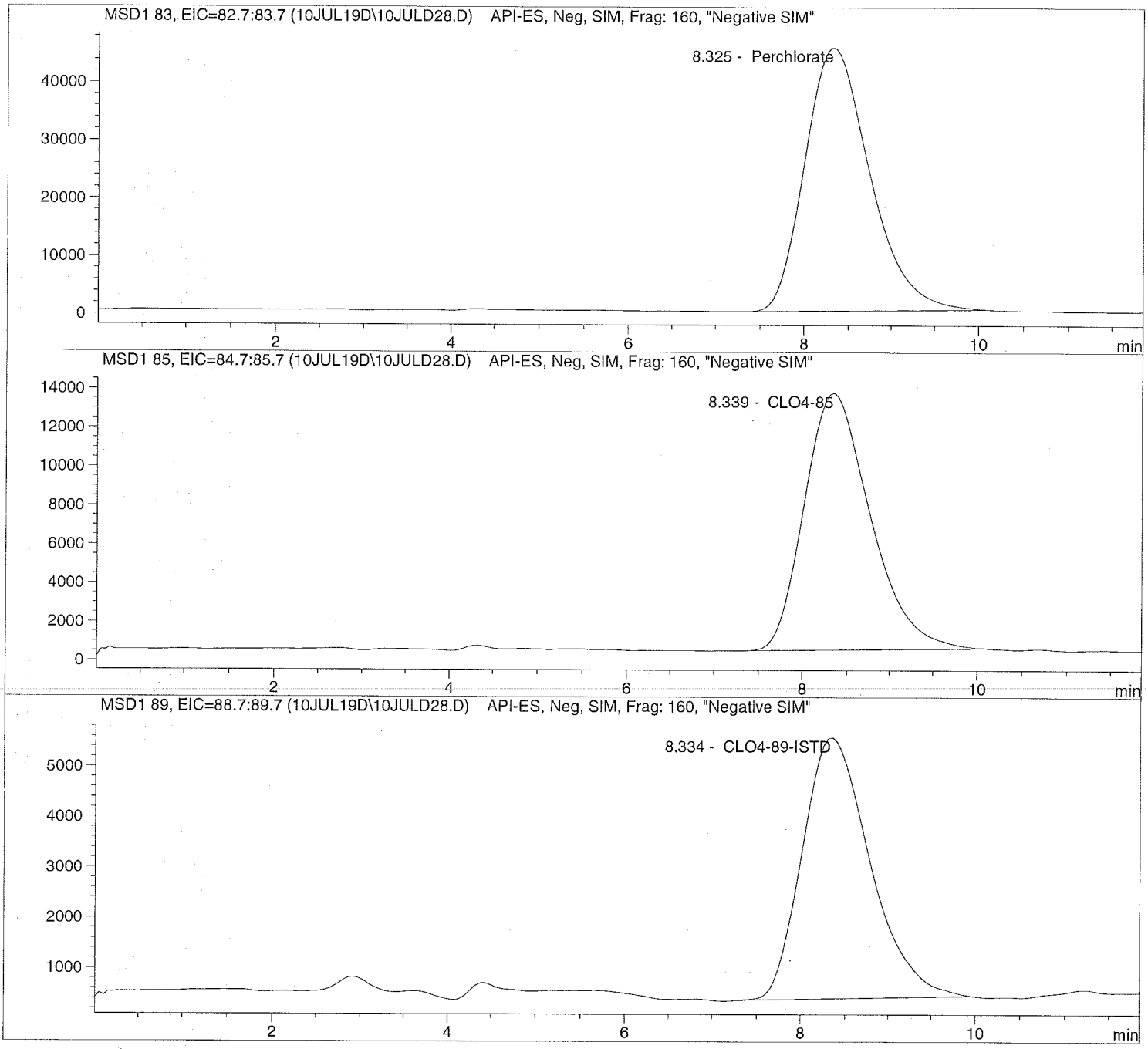
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD28.D Sample Name: 662922 CCV@25

Injection Date:	7/10/2019 15:16:39	Seq Line:	28
Sample Name:	662922 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD28.D Sample Name: 662922 CCV@25

Injection Date:	7/10/2019 15:16:39	Seq Line:	28
Sample Name:	662922 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.325	PBA	2335796.8	25.5805	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.339	PBA	693327.1	25.5842	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.334	PBA	277421.9	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

RIGHT SOLUTIONS | RIGHT PARTNER

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RIGHT SOLUTIONS | RIGHT PARTNER

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

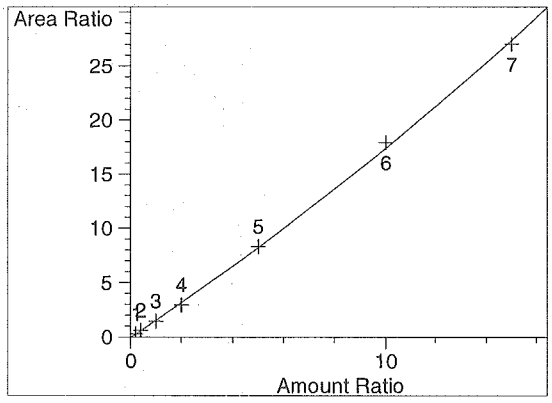
Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

Peak Sum Table

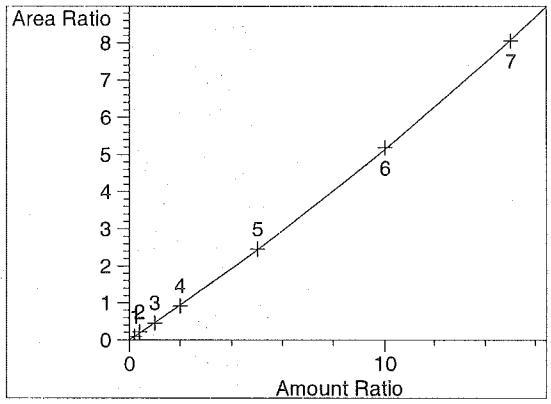
No Entries in table

RIGHT SOLUTIONS | RIGHT PARTNER

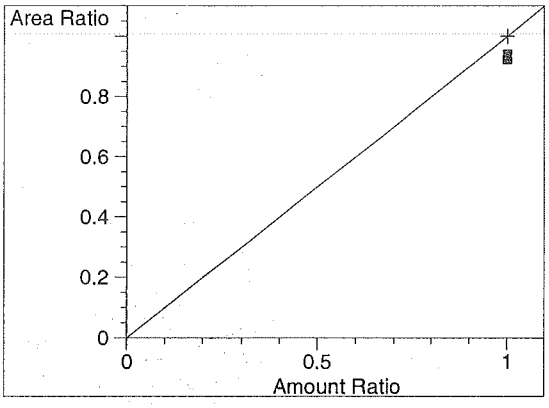
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

RIGHT SOLUTIONS | RIGHT PARTNER

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

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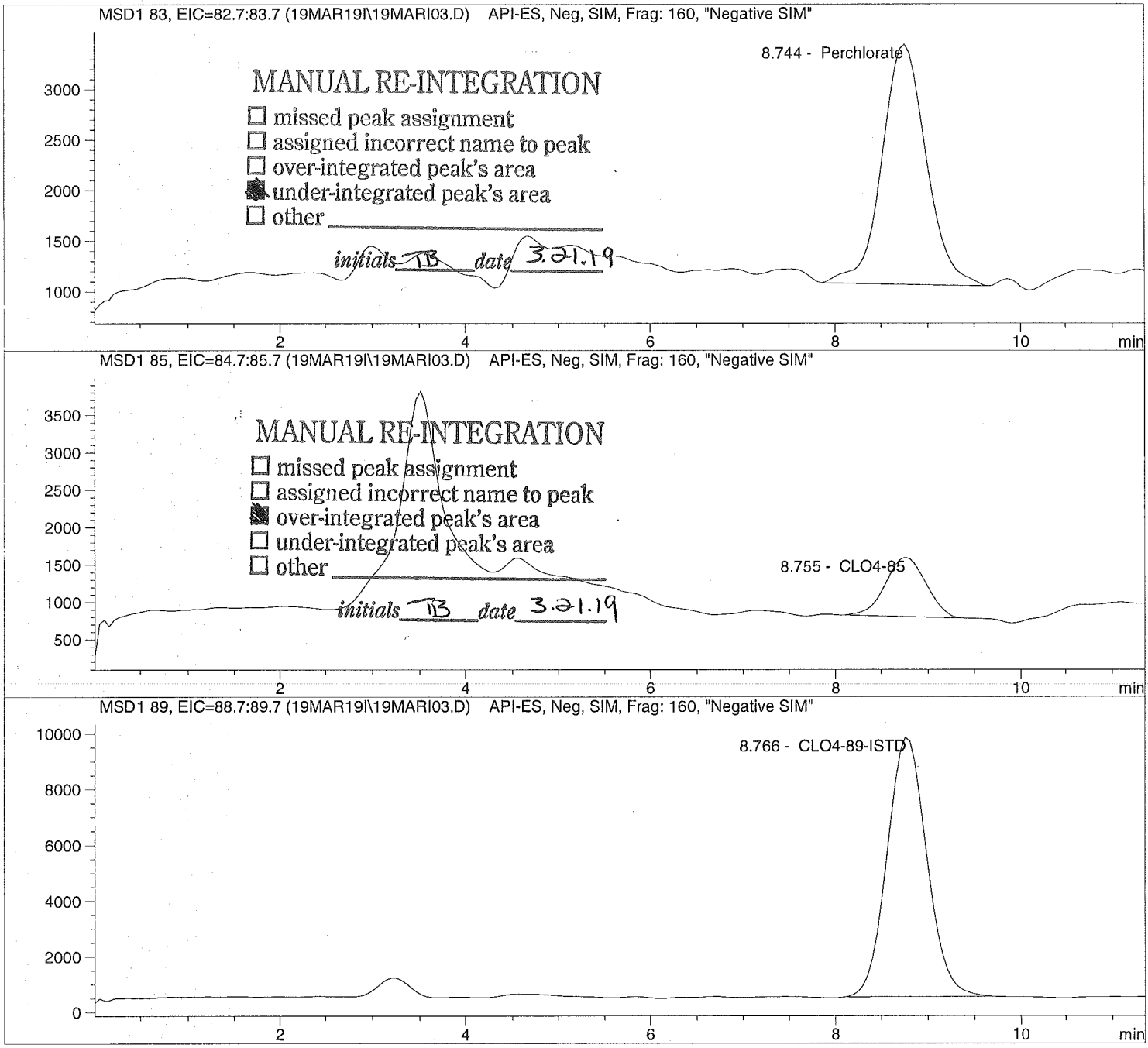
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

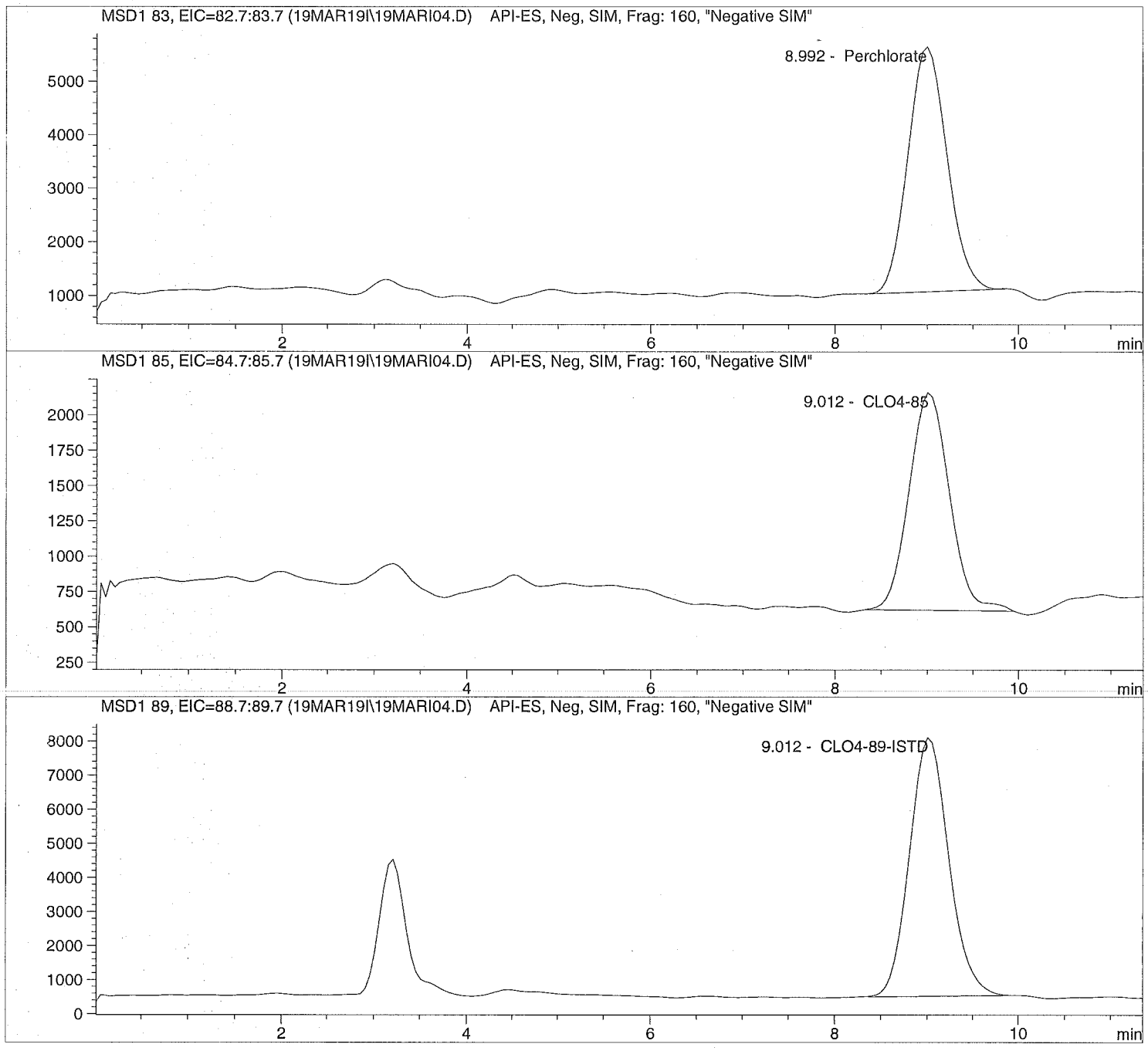
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

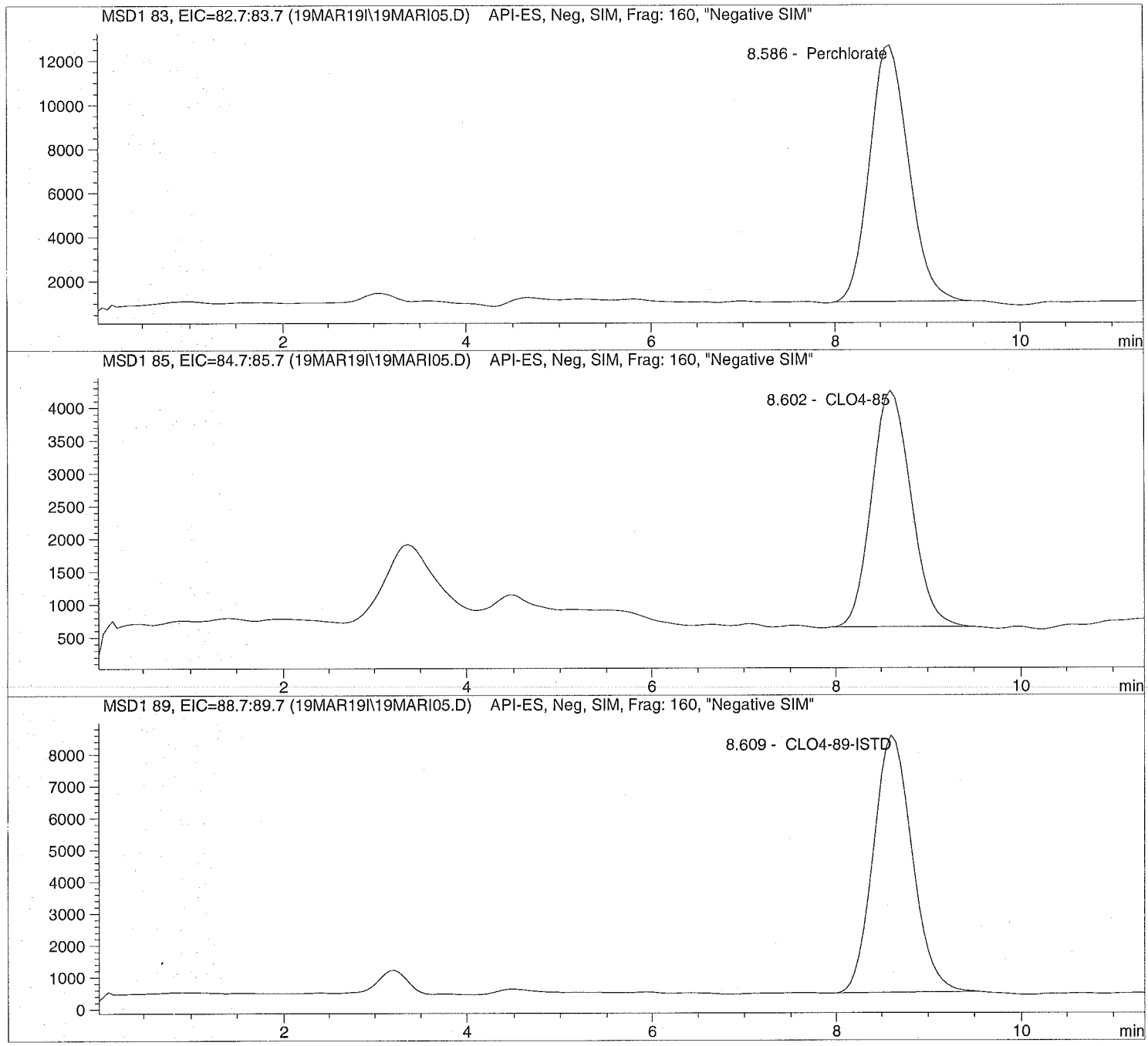
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

*** End of Report ***

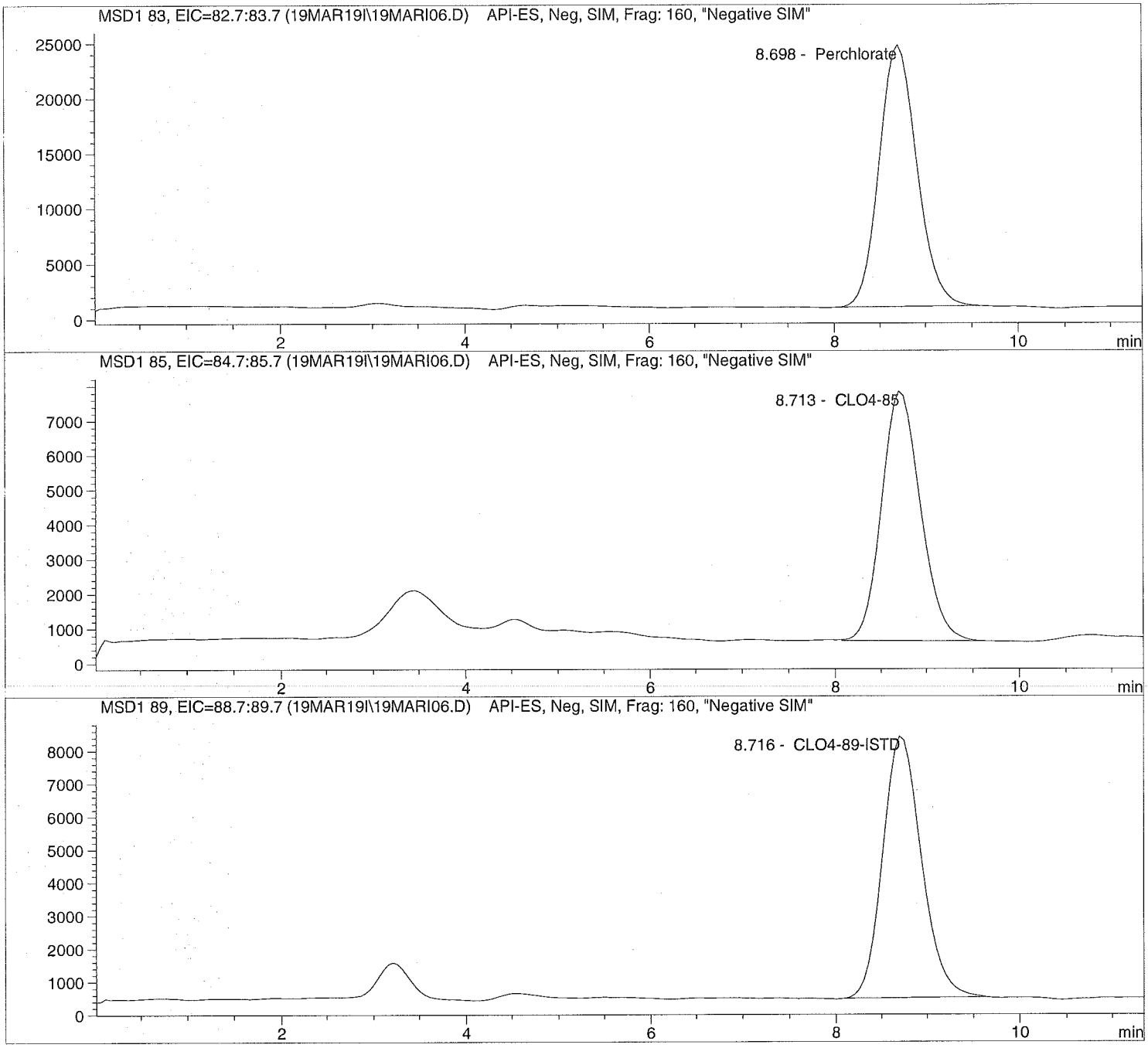
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

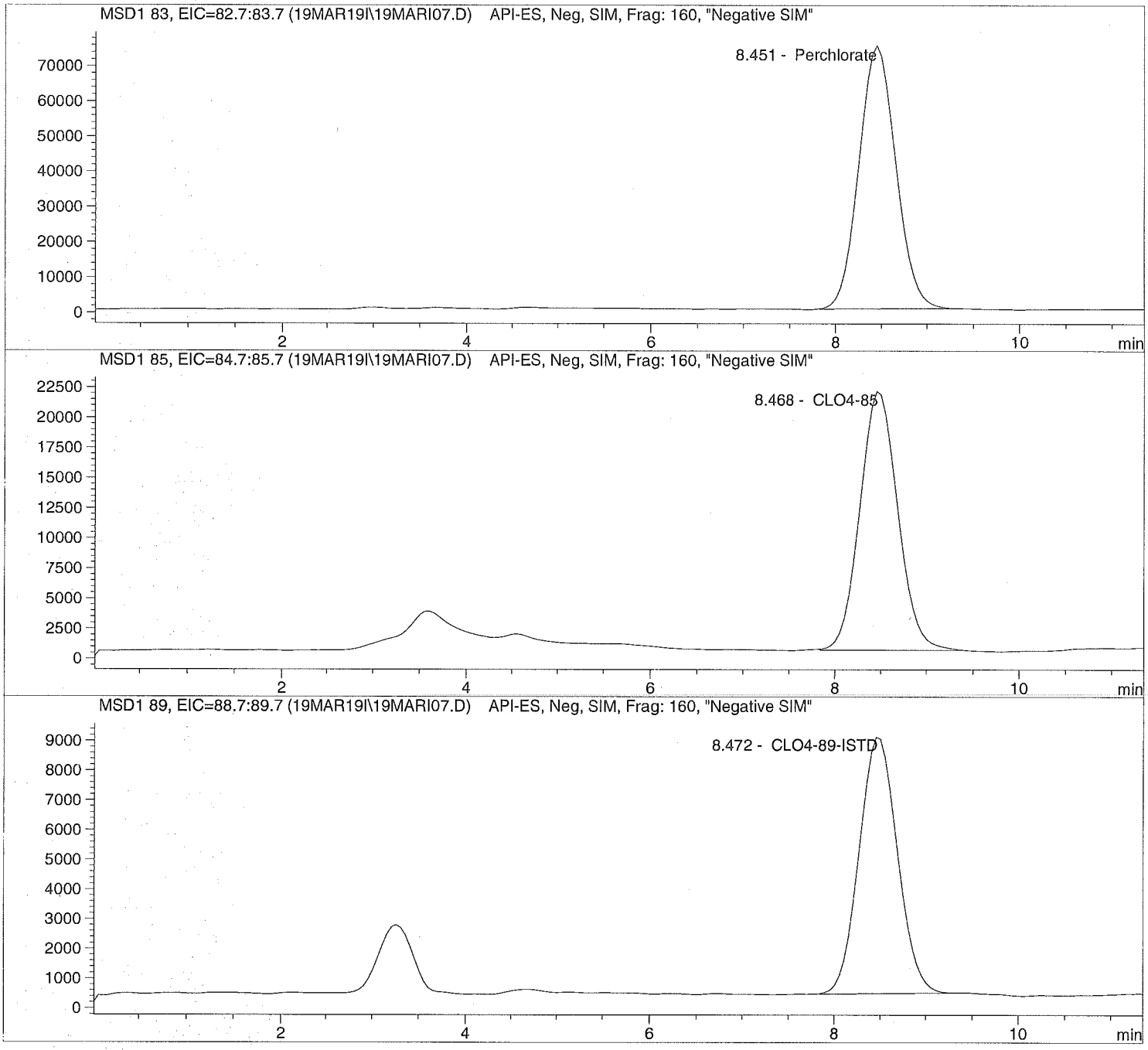
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

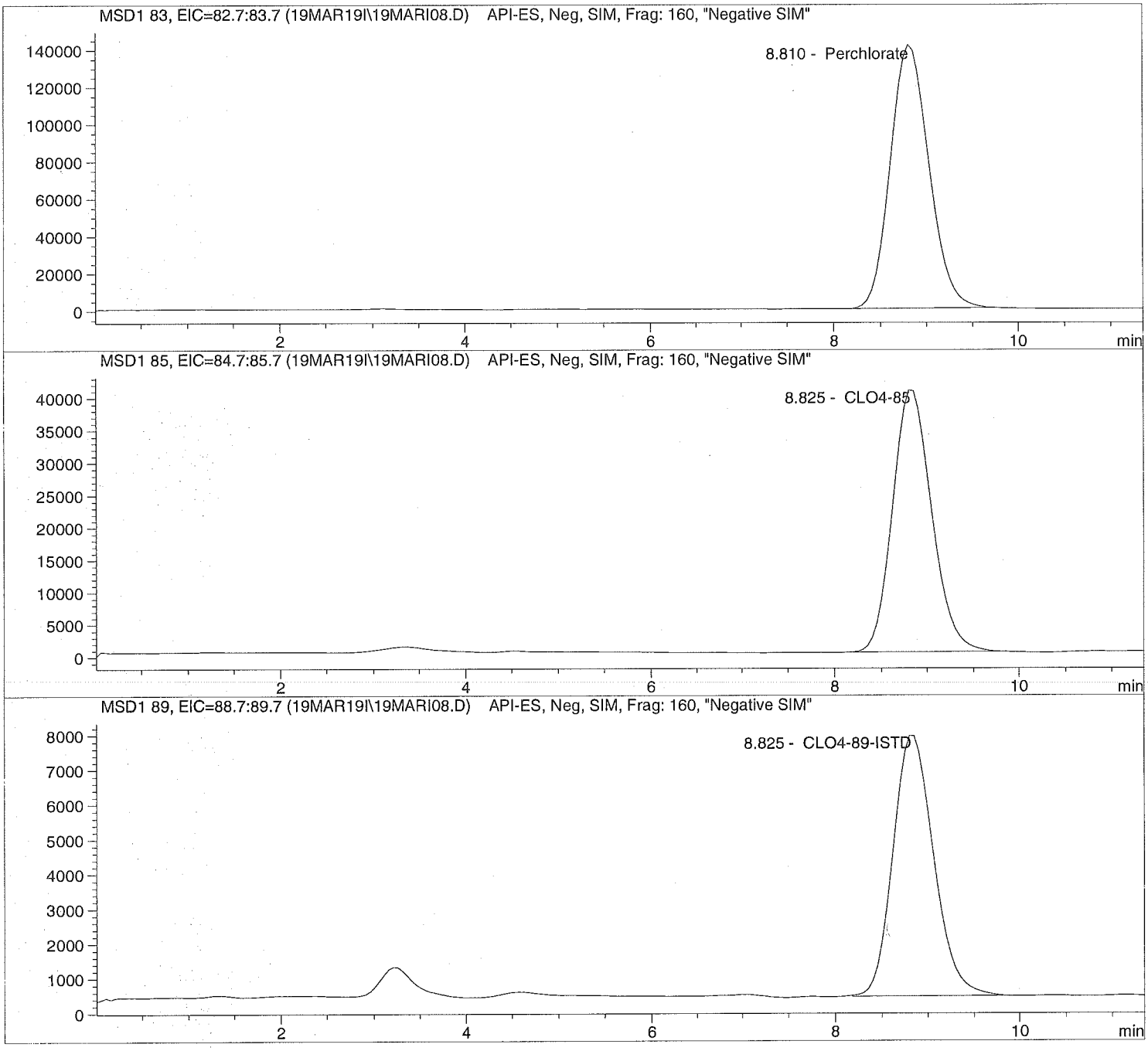
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

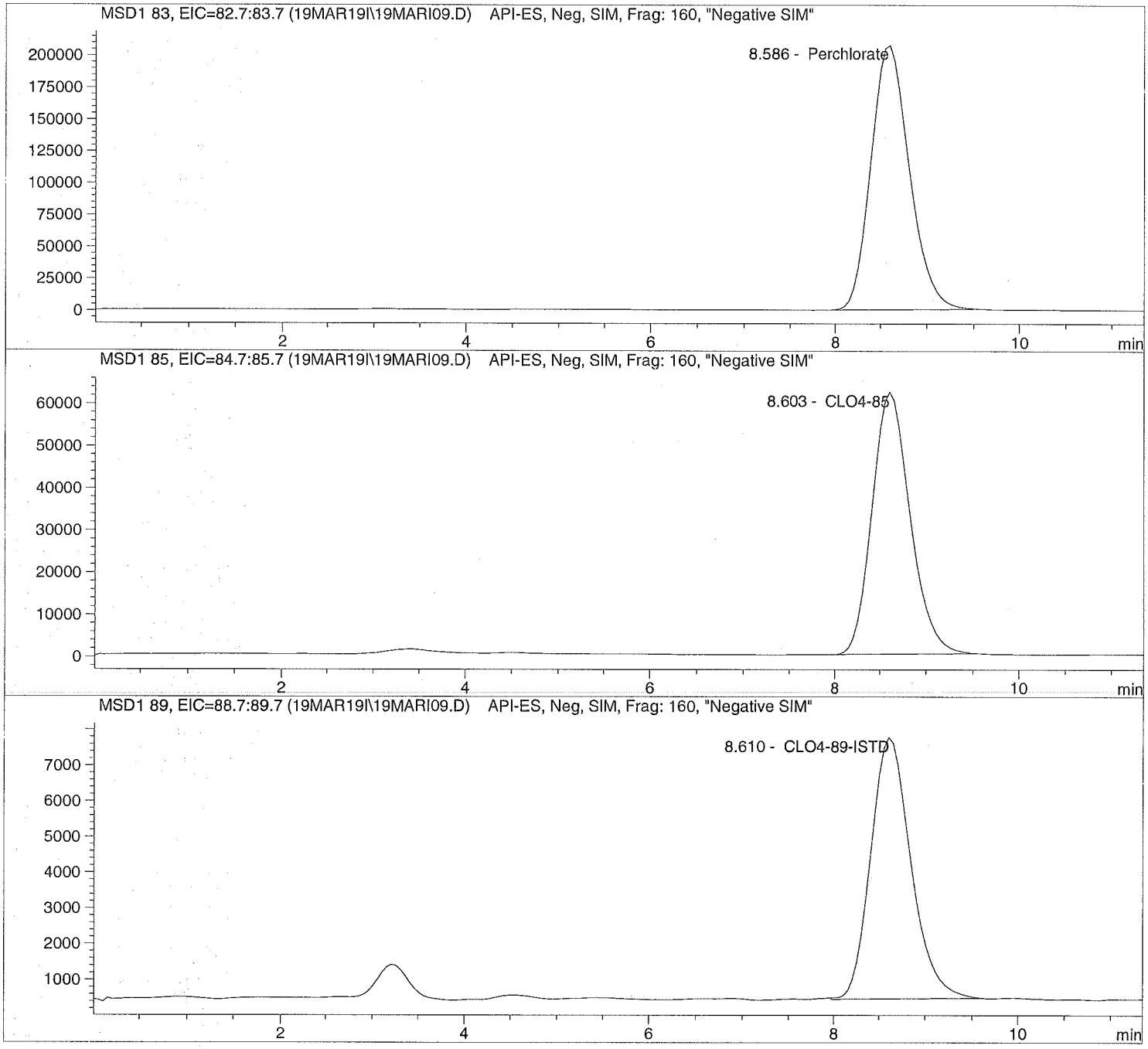
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

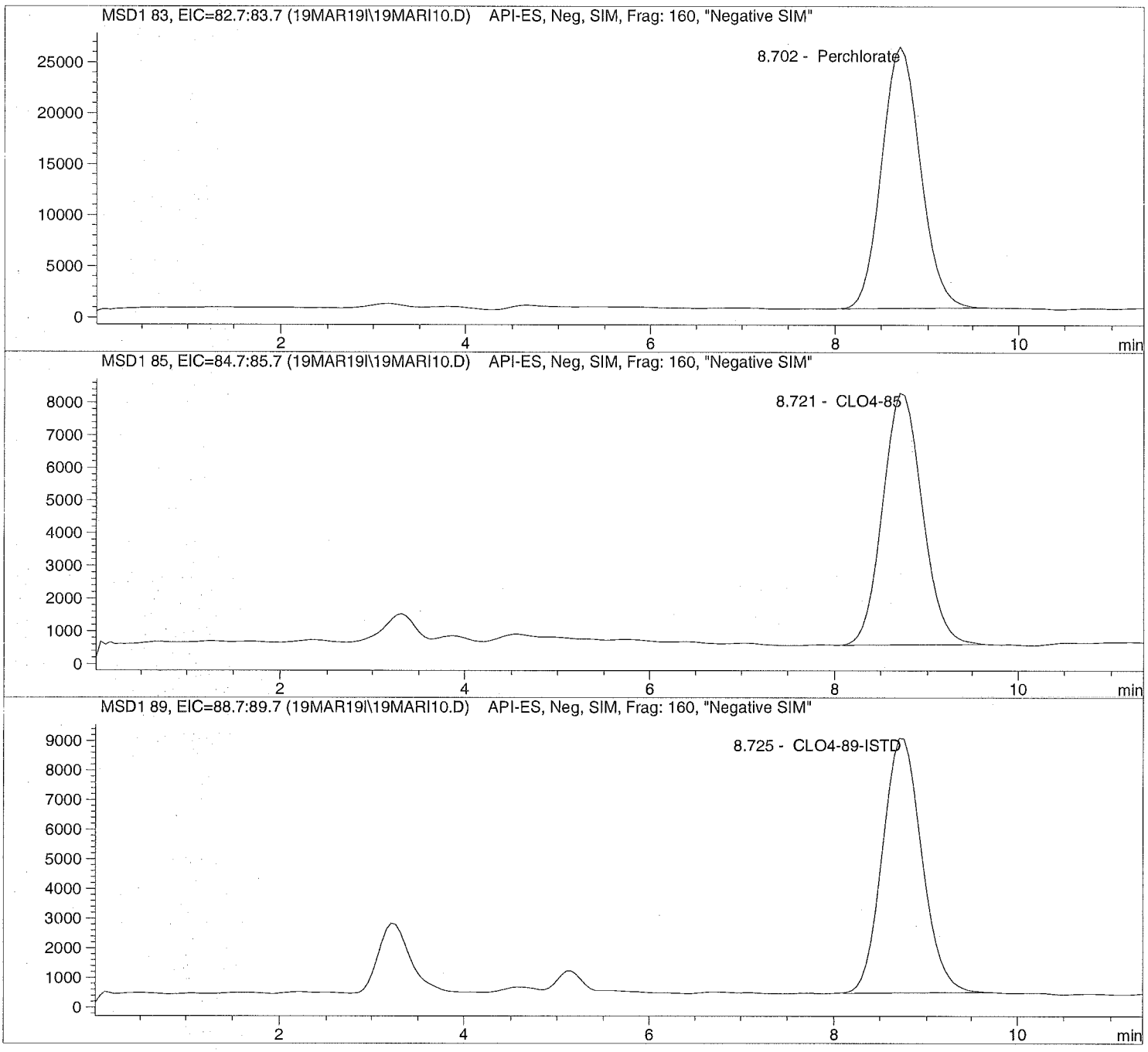
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

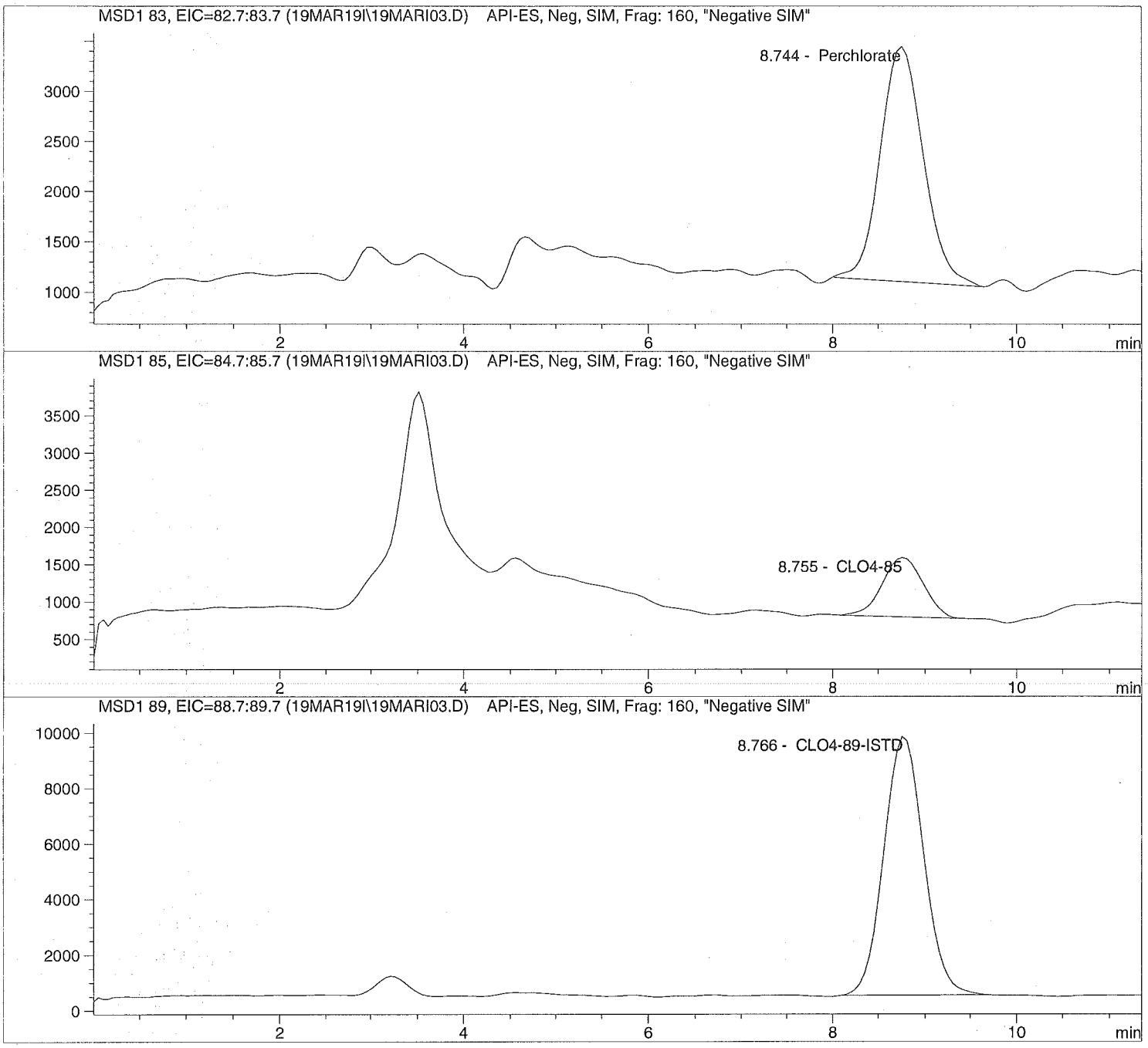
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

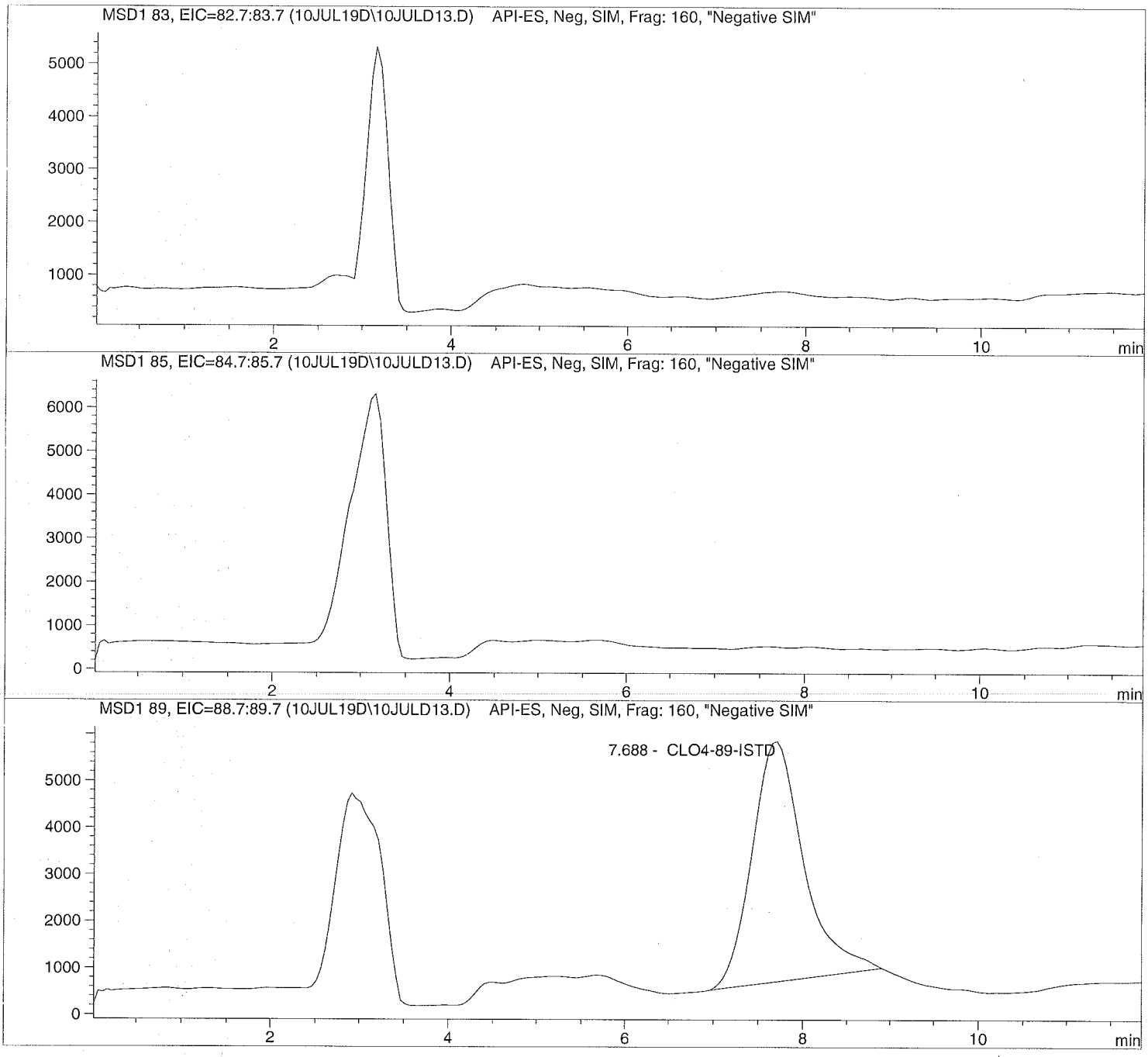
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD13.D Sample Name: 1918373007

Injection Date:	7/10/2019 11:36:55	Seq Line:	13
Sample Name:	1918373007	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\10JUL19D\10JULD13.D Sample Name: 1918373007

Injection Date:	7/10/2019 11:36:55	Seq Line:	13
Sample Name:	1918373007	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.688	PBA	206768.2	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

July 17, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19061486**

Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

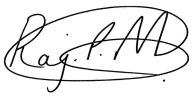
ALS Environmental received 7 sample(s) on Jun 27, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,



Generated By: DAYNA.FISHER
RJ Modashia
Project Manager

ALS Houston, US Date: 17-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061486

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19061486-01	CO9_062619	Groundwater		26-Jun-2019 07:35	27-Jun-2019 08:30	☐
HS19061486-02	CO6_062619	Groundwater		26-Jun-2019 08:30	27-Jun-2019 08:30	☐
HS19061486-03	18WW16_062619	Groundwater		26-Jun-2019 09:00	27-Jun-2019 08:30	☐
HS19061486-04	18CPTMW18_062619	Groundwater		26-Jun-2019 10:05	27-Jun-2019 08:30	☐
HS19061486-05	CO3_062619	Groundwater		26-Jun-2019 11:00	27-Jun-2019 08:30	☐
HS19061486-06	MW18_062619	Groundwater		26-Jun-2019 11:55	27-Jun-2019 08:30	☐
HS19061486-07	Trip Blank	Water	C&G-050119-174	26-Jun-2019 00:00	27-Jun-2019 08:30	☐

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19061486

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142659

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R342165

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Batch ID: R341869

Sample ID: CCV

• Bromoform, 1,2-Dibromo-3-Chloropropane and 1,2,3-Trichlorobenzene exceeded %D limits for CCV. Samples are ND for these compounds.

Sample ID: CO9_062619 (HS19061486-01MS)

• MS and/or MSD recovered outside control limits for multiple compounds

Metals by Method SW7470

Batch ID: 142560,142769

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 142541

Sample ID: CO9_062619 (HS19061486-01SD)

• The percent difference between the results of the sample and the serial dilution were greater than 10%. Zinc

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: CO9_062619
Collection Date: 26-Jun-2019 07:35

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:56
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 16:56
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jul-2019 16:56
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:56
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jul-2019 16:56
Acetone	**4.2**		**0.40**	**1.0**	**2.0**	**UG/L**	1	03-Jul-2019 16:56
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jul-2019 16:56
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: CO9_062619
Collection Date: 26-Jun-2019 07:35

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	03-Jul-2019 16:56
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 16:56
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 16:56
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 16:56
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 16:56
Surr: 1,2-Dichloroethane-d4	*89.4*			**0**	*81-118*	*%REC*	*1*	*03-Jul-2019 16:56*
Surr: 4-Bromofluorobenzene	*91.0*			**0**	*85-114*	*%REC*	*1*	*03-Jul-2019 16:56*
Surr: Dibromofluoromethane	*87.0*			**0**	*80-119*	*%REC*	*1*	*03-Jul-2019 16:56*
Surr: Toluene-d8	*92.9*			**0**	*89-112*	*%REC*	*1*	*03-Jul-2019 16:56*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: CO9_062619
Collection Date: 26-Jun-2019 07:35

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**0.370**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	05-Jul-2019 15:54
Antimony	**0.000800**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 15:54
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 15:54
Barium	**0.238**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 15:54
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 15:54
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 15:54
Calcium	**76.3**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	05-Jul-2019 15:54
Chromium	**0.00659**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 15:54
Cobalt	**0.000529**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 15:54
Copper	**0.00119**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 15:54
Iron	**0.354**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 15:54
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	08-Jul-2019 13:56
Magnesium	**3.79**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 15:54
Manganese	**0.0798**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 15:54
Nickel	**0.00408**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 15:54
Potassium	**0.511**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 15:54
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jul-2019 15:54
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jul-2019 15:54
Sodium	**14.3**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 15:54
Thallium	**0.000881**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	05-Jul-2019 15:54
Vanadium	**0.00199**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 15:54
Zinc	**0.0252**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 15:54
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 28-Jun-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	28-Jun-2019 15:59
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	16-Jul-2019 16:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: CO6_062619
Collection Date: 26-Jun-2019 08:30

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:43
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 23:43
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	03-Jul-2019 23:43
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:43
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	03-Jul-2019 23:43
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 23:43
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	03-Jul-2019 23:43
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: CO6_062619
Collection Date: 26-Jun-2019 08:30

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	03-Jul-2019 23:43
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	03-Jul-2019 23:43
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	03-Jul-2019 23:43
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	03-Jul-2019 23:43
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	03-Jul-2019 23:43
Surr: 1,2-Dichloroethane-d4	*99.8*			**0**	*81-118*	*%REC*	*1*	*03-Jul-2019 23:43*
Surr: 4-Bromofluorobenzene	*91.4*			**0**	*85-114*	*%REC*	*1*	*03-Jul-2019 23:43*
Surr: Dibromofluoromethane	*96.6*			**0**	*80-119*	*%REC*	*1*	*03-Jul-2019 23:43*
Surr: Toluene-d8	*95.3*			**0**	*89-112*	*%REC*	*1*	*03-Jul-2019 23:43*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: CO6_062619
Collection Date: 26-Jun-2019 08:30

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**0.0222**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	05-Jul-2019 17:20
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 17:20
Arsenic	**0.00101**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:20
Barium	**1.03**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:20
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:20
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:20
Calcium	**19.7**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	05-Jul-2019 17:20
Chromium	**0.000674**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:20
Cobalt	**0.00214**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:20
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	05-Jul-2019 17:20
Iron	**63.2**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:20
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	05-Jul-2019 17:20
Magnesium	**12.4**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:20
Manganese	**0.994**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:20
Nickel	**0.00170**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:20
Potassium	**4.20**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:20
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jul-2019 17:20
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jul-2019 17:20
Sodium	**233**		**0.140**	**0.500**	**2.00**	**mg/L**	10	08-Jul-2019 15:12
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:20
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	05-Jul-2019 17:20
Zinc	**0.0188**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:20
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	05-Jul-2019 15:11
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	16-Jul-2019 16:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW16_062619
Collection Date: 26-Jun-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:07
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jul-2019 00:07
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	04-Jul-2019 00:07
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:07
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	04-Jul-2019 00:07
Acetone	**11**		**0.40**	**1.0**	**2.0**	**UG/L**	1	04-Jul-2019 00:07
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	04-Jul-2019 00:07
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW16_062619
Collection Date: 26-Jun-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	04-Jul-2019 00:07
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jul-2019 00:07
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jul-2019 00:07
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:07
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:07
Surr: 1,2-Dichloroethane-d4	*95.0*			**0**	*81-118*	*%REC*	*1*	*04-Jul-2019 00:07*
Surr: 4-Bromofluorobenzene	*89.4*			**0**	*85-114*	*%REC*	*1*	*04-Jul-2019 00:07*
Surr: Dibromofluoromethane	*91.5*			**0**	*80-119*	*%REC*	*1*	*04-Jul-2019 00:07*
Surr: Toluene-d8	*93.5*			**0**	*89-112*	*%REC*	*1*	*04-Jul-2019 00:07*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW16_062619
Collection Date: 26-Jun-2019 09:00

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**0.649**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	05-Jul-2019 17:22
Antimony	**0.00244**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:22
Arsenic	**0.00640**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:22
Barium	**0.141**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:22
Beryllium	**0.00310**		**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	05-Jul-2019 17:22
Cadmium	**0.00858**		**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	05-Jul-2019 17:22
Calcium	**182**		**0.680**	**1.00**	**10.0**	**mg/L**	20	08-Jul-2019 15:15
Chromium	**9.14**		**0.00800**	**0.0100**	**0.100**	**mg/L**	20	08-Jul-2019 15:15
Cobalt	**0.418**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:22
Copper	**0.755**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:22
Iron	**29.7**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:22
Lead	**0.00364**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:22
Magnesium	**166**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:22
Manganese	**3.12**		**0.0140**	**0.0200**	**0.100**	**mg/L**	20	08-Jul-2019 15:15
Nickel	**14.3**		**0.0120**	**0.0200**	**0.100**	**mg/L**	20	08-Jul-2019 15:15
Potassium	**4.36**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:22
Selenium	**0.0130**		**0.00110**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:22
Silver	**0.000338**	J	**0.000200**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:22
Sodium	**532**		**0.280**	**1.00**	**4.00**	**mg/L**	20	08-Jul-2019 15:15
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:22
Vanadium	**0.0771**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:22
Zinc	**0.175**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:22
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	**0.0000520**	J	**0.0000300**	**0.000100**	**0.000200**	**mg/L**	1	05-Jul-2019 15:13
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	16-Jul-2019 16:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW18_062619
Collection Date: 26-Jun-2019 10:05

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:31
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jul-2019 00:31
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	04-Jul-2019 00:31
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:31
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	04-Jul-2019 00:31
Acetone	**5.6**		**0.40**	**1.0**	**2.0**	**UG/L**	1	04-Jul-2019 00:31
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	04-Jul-2019 00:31
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW18_062619
Collection Date: 26-Jun-2019 10:05

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	04-Jul-2019 00:31
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	04-Jul-2019 00:31
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	04-Jul-2019 00:31
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	04-Jul-2019 00:31
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	04-Jul-2019 00:31
Surr: 1,2-Dichloroethane-d4	*94.3*			**0**	*81-118*	*%REC*	*1*	*04-Jul-2019 00:31*
Surr: 4-Bromofluorobenzene	*86.2*			**0**	*85-114*	*%REC*	*1*	*04-Jul-2019 00:31*
Surr: Dibromofluoromethane	*90.8*			**0**	*80-119*	*%REC*	*1*	*04-Jul-2019 00:31*
Surr: Toluene-d8	*91.0*			**0**	*89-112*	*%REC*	*1*	*04-Jul-2019 00:31*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 02-Jul-2019		Analyst: LG
1,4-Dioxane	**0.021**		**0.010**	**0.010**	**0.010**	**ug/L**	1	09-Jul-2019 15:03
Surr: 2-Fluorobiphenyl	*67.8*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 15:03*
Surr: 4-Terphenyl-d14	*76.4*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 15:03*
Surr: Nitrobenzene-d5	*87.8*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 15:03*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW18_062619
Collection Date: 26-Jun-2019 10:05

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**0.0122**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	08-Jul-2019 14:00
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 17:31
Arsenic	**0.00127**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:31
Barium	**0.608**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:31
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:31
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:31
Calcium	**281**		**0.680**	**1.00**	**10.0**	**mg/L**	20	08-Jul-2019 15:01
Chromium	**0.00200**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:31
Cobalt	**0.0139**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:31
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	05-Jul-2019 17:31
Iron	**1.06**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:31
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	05-Jul-2019 17:31
Magnesium	**194**		**0.200**	**1.00**	**4.00**	**mg/L**	20	08-Jul-2019 15:01
Manganese	**2.21**		**0.0140**	**0.0200**	**0.100**	**mg/L**	20	08-Jul-2019 15:01
Nickel	**0.0131**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:31
Potassium	**2.98**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:31
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jul-2019 17:31
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jul-2019 17:31
Sodium	**746**		**0.280**	**1.00**	**4.00**	**mg/L**	20	08-Jul-2019 15:01
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:31
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	05-Jul-2019 17:31
Zinc	**0.0225**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:31
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	05-Jul-2019 15:15
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	16-Jul-2019 16:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: CO3_062619
Collection Date: 26-Jun-2019 11:00

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:02
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	09-Jul-2019 20:02
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	09-Jul-2019 20:02
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:02
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	09-Jul-2019 20:02
Acetone	**5.7**		**0.40**	**1.0**	**2.0**	**UG/L**	1	09-Jul-2019 20:02
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	09-Jul-2019 20:02
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: CO3_062619
Collection Date: 26-Jun-2019 11:00

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	09-Jul-2019 20:02
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	09-Jul-2019 20:02
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	09-Jul-2019 20:02
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:02
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:02
Surr: 1,2-Dichloroethane-d4	*98.6*			**0**	*81-118*	*%REC*	*1*	*09-Jul-2019 20:02*
Surr: 4-Bromofluorobenzene	*97.5*			**0**	*85-114*	*%REC*	*1*	*09-Jul-2019 20:02*
Surr: Dibromofluoromethane	*97.9*			**0**	*80-119*	*%REC*	*1*	*09-Jul-2019 20:02*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*09-Jul-2019 20:02*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 02-Jul-2019		Analyst: LG
1,4-Dioxane	**0.012**		**0.010**	**0.010**	**0.010**	**ug/L**	1	09-Jul-2019 15:24
Surr: 2-Fluorobiphenyl	*80.5*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 15:24*
Surr: 4-Terphenyl-d14	*115*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 15:24*
Surr: Nitrobenzene-d5	*94.9*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 15:24*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: CO3_062619
Collection Date: 26-Jun-2019 11:00

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 28-Jun-2019		Analyst: JHD
Aluminum	**0.00694**	J	**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	08-Jul-2019 14:04
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 17:33
Arsenic	**0.00318**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:33
Barium	**1.39**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:33
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:33
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:33
Calcium	**46.7**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	05-Jul-2019 17:33
Chromium	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	05-Jul-2019 17:33
Cobalt	**0.000279**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	05-Jul-2019 17:33
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	05-Jul-2019 17:33
Iron	**87.5**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:33
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	05-Jul-2019 17:33
Magnesium	**30.1**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:33
Manganese	**1.52**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	05-Jul-2019 17:33
Nickel	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	05-Jul-2019 17:33
Potassium	**3.38**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:33
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	05-Jul-2019 17:33
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	05-Jul-2019 17:33
Sodium	**168**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	05-Jul-2019 17:33
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	05-Jul-2019 17:33
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	05-Jul-2019 17:33
Zinc	**0.0216**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	05-Jul-2019 17:33
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	05-Jul-2019 15:16
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	16-Jul-2019 16:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW18_062619
Collection Date: 26-Jun-2019 11:55

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:25
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	09-Jul-2019 20:25
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	09-Jul-2019 20:25
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:25
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	09-Jul-2019 20:25
Acetone	**3.3**		**0.40**	**1.0**	**2.0**	**UG/L**	1	09-Jul-2019 20:25
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	09-Jul-2019 20:25
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: MW18_062619
Collection Date: 26-Jun-2019 11:55

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
cis-1,2-Dichloroethene	**1.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	09-Jul-2019 20:25
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	09-Jul-2019 20:25
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	09-Jul-2019 20:25
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	09-Jul-2019 20:25
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 20:25
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Trichloroethene	**25**		**0.20**	**0.50**	**1.0**	**UG/L**	1	09-Jul-2019 20:25
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 20:25
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*1*	*09-Jul-2019 20:25*
Surr: 4-Bromofluorobenzene	*98.7*			**0**	*85-114*	*%REC*	*1*	*09-Jul-2019 20:25*
Surr: Dibromofluoromethane	*98.7*			**0**	*80-119*	*%REC*	*1*	*09-Jul-2019 20:25*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*09-Jul-2019 20:25*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	16-Jul-2019 16:49

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 26-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-07
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 19:38
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	09-Jul-2019 19:38
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	09-Jul-2019 19:38
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 19:38
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	09-Jul-2019 19:38
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	09-Jul-2019 19:38
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	09-Jul-2019 19:38
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 26-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061486
Lab ID:HS19061486-07
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	09-Jul-2019 19:38
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	09-Jul-2019 19:38
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	09-Jul-2019 19:38
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	09-Jul-2019 19:38
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	09-Jul-2019 19:38
Surr: 1,2-Dichloroethane-d4	*99.5*			**0**	*81-118*	*%REC*	*1*	*09-Jul-2019 19:38*
Surr: 4-Bromofluorobenzene	*96.9*			**0**	*85-114*	*%REC*	*1*	*09-Jul-2019 19:38*
Surr: Dibromofluoromethane	*99.2*			**0**	*80-119*	*%REC*	*1*	*09-Jul-2019 19:38*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*09-Jul-2019 19:38*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

Batch ID: 142541 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061486-01	1	10	10 (mL)	1
HS19061486-02	1	10	10 (mL)	1
HS19061486-03	1	10	10 (mL)	1
HS19061486-04	1	10	10 (mL)	1
HS19061486-05	1	10	10 (mL)	1

Batch ID: 142560 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061486-01	1	10 (mL)	10 (mL)	1

Batch ID: 142659 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061486-04	1	1000	1 (mL)	0.001
HS19061486-05	1	1000	1 (mL)	0.001

Batch ID: 142769 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061486-02	1	10 (mL)	10 (mL)	1
HS19061486-03	1	10 (mL)	10 (mL)	1
HS19061486-04	1	10 (mL)	10 (mL)	1
HS19061486-05	1	10 (mL)	10 (mL)	1

ALS Houston, US Date: 17-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142541 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19061486-01	CO9_062619	26 Jun 2019 07:35		28 Jun 2019 11:59	08 Jul 2019 13:56	1
HS19061486-01	CO9_062619	26 Jun 2019 07:35		28 Jun 2019 11:59	05 Jul 2019 15:54	1
HS19061486-02	CO6_062619	26 Jun 2019 08:30		28 Jun 2019 11:59	08 Jul 2019 15:12	10
HS19061486-02	CO6_062619	26 Jun 2019 08:30		28 Jun 2019 11:59	05 Jul 2019 17:20	1
HS19061486-03	18WW16_062619	26 Jun 2019 09:00		28 Jun 2019 11:59	08 Jul 2019 15:15	20
HS19061486-03	18WW16_062619	26 Jun 2019 09:00		28 Jun 2019 11:59	05 Jul 2019 17:22	1
HS19061486-04	18CPTMW18_062619	26 Jun 2019 10:05		28 Jun 2019 11:59	08 Jul 2019 15:01	20
HS19061486-04	18CPTMW18_062619	26 Jun 2019 10:05		28 Jun 2019 11:59	08 Jul 2019 14:00	1
HS19061486-04	18CPTMW18_062619	26 Jun 2019 10:05		28 Jun 2019 11:59	05 Jul 2019 17:31	1
HS19061486-05	CO3_062619	26 Jun 2019 11:00		28 Jun 2019 11:59	08 Jul 2019 14:04	1
HS19061486-05	CO3_062619	26 Jun 2019 11:00		28 Jun 2019 11:59	05 Jul 2019 17:33	1
Batch ID: 142560 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19061486-01	CO9_062619	26 Jun 2019 07:35		28 Jun 2019 10:30	28 Jun 2019 15:59	1
Batch ID: 142659 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Groundwater	
HS19061486-04	18CPTMW18_062619	26 Jun 2019 10:05		02 Jul 2019 12:18	09 Jul 2019 15:03	1
HS19061486-05	CO3_062619	26 Jun 2019 11:00		02 Jul 2019 12:18	09 Jul 2019 15:24	1
Batch ID: 142769 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19061486-02	CO6_062619	26 Jun 2019 08:30		05 Jul 2019 10:30	05 Jul 2019 15:11	1
HS19061486-03	18WW16_062619	26 Jun 2019 09:00		05 Jul 2019 10:30	05 Jul 2019 15:13	1
HS19061486-04	18CPTMW18_062619	26 Jun 2019 10:05		05 Jul 2019 10:30	05 Jul 2019 15:15	1
HS19061486-05	CO3_062619	26 Jun 2019 11:00		05 Jul 2019 10:30	05 Jul 2019 15:16	1
Batch ID: R341869 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19061486-01	CO9_062619	26 Jun 2019 07:35			03 Jul 2019 16:56	1
HS19061486-02	CO6_062619	26 Jun 2019 08:30			03 Jul 2019 23:43	1
HS19061486-03	18WW16_062619	26 Jun 2019 09:00			04 Jul 2019 00:07	1
HS19061486-04	18CPTMW18_062619	26 Jun 2019 10:05			04 Jul 2019 00:31	1
Batch ID: R342165 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19061486-07	Trip Blank	26 Jun 2019 00:00			09 Jul 2019 19:38	1
Batch ID: R342165 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19061486-05	CO3_062619	26 Jun 2019 11:00			09 Jul 2019 20:02	1
HS19061486-06	MW18_062619	26 Jun 2019 11:55			09 Jul 2019 20:25	1

ALS Houston, US Date: 17-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R342540 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19061486-01	CO9_062619	26 Jun 2019 07:35			16 Jul 2019 16:49	1
HS19061486-02	CO6_062619	26 Jun 2019 08:30			16 Jul 2019 16:49	1
HS19061486-03	18WW16_062619	26 Jun 2019 09:00			16 Jul 2019 16:49	1
HS19061486-04	18CPTMW18_062619	26 Jun 2019 10:05			16 Jul 2019 16:49	1
HS19061486-05	CO3_062619	26 Jun 2019 11:00			16 Jul 2019 16:49	1
HS19061486-06	MW18_062619	26 Jun 2019 11:55			16 Jul 2019 16:49	1

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142541** Units: **mg/L** Analysis Date: **05-Jul-2019 15:49**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5155804** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.004417	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00100	0.00500								U
Iron	0.0500	0.200								U
Magnesium	0.01315	0.200								J
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00250	0.00500								U

MBLK Sample ID: **MBLK-142541** Units: **mg/L** Analysis Date: **08-Jul-2019 13:53**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157125** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.00100	0.00500								U

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142541** Units: **mg/L** Analysis Date: **05-Jul-2019 15:51**
Client ID: Run ID: **ICPMS05_341886** SeqNo: **5155805** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09504	0.0100	0.1	0	95.0	84 - 117				
Antimony	0.05029	0.00500	0.05	0	101	85 - 117				
Arsenic	0.05092	0.00500	0.05	0	102	84 - 116				
Barium	0.04966	0.00500	0.05	0	99.3	86 - 114				
Beryllium	0.05036	0.00200	0.05	0	101	83 - 121				
Cadmium	0.0504	0.00200	0.05	0	101	87 - 115				
Calcium	5.026	0.500	5	0	101	87 - 118				
Chromium	0.0522	0.00500	0.05	0	104	85 - 116				
Cobalt	0.05274	0.00500	0.05	0	105	86 - 115				
Copper	0.0545	0.00500	0.05	0	109	85 - 118				
Iron	5.193	0.200	5	0	104	87 - 118				
Lead	0.05298	0.00500	0.05	0	106	88 - 115				
Magnesium	5.5	0.200	5	0	110	83 - 118				
Manganese	0.05088	0.00500	0.05	0	102	87 - 115				
Nickel	0.05412	0.00500	0.05	0	108	85 - 117				
Potassium	5.248	0.200	5	0	105	87 - 115				
Selenium	0.05096	0.00500	0.05	0	102	80 - 120				
Silver	0.05061	0.00500	0.05	0	101	85 - 116				
Sodium	5.358	0.200	5	0	107	85 - 117				
Thallium	0.0498	0.00200	0.05	0	99.6	82 - 116				
Vanadium	0.05244	0.00500	0.05	0	105	86 - 115				
Zinc	0.05376	0.00500	0.05	0	108	83 - 119				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19061486-01MS** Units: **mg/L** Analysis Date: **05-Jul-2019 15:59**
Client ID: **CO9_062619** Run ID: **ICPMS05_341886** SeqNo: **5155808** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.739	0.0100	0.4	0.3697	92.3	84 - 117				
Antimony	0.04732	0.00500	0.05	0.0008	93.0	85 - 117				
Arsenic	0.04842	0.00500	0.05	0	96.8	84 - 116				
Barium	0.2815	0.00500	0.05	0.238	87.0	86 - 114				O
Beryllium	0.04857	0.00200	0.05	0	97.1	83 - 121				
Cadmium	0.04813	0.00200	0.05	0	96.3	87 - 115				
Calcium	81.2	0.500	5	76.32	97.6	87 - 118				O
Chromium	0.05476	0.00500	0.05	0.006591	96.3	85 - 116				
Cobalt	0.04919	0.00500	0.05	0.000529	97.3	86 - 115				
Copper	0.05037	0.00500	0.05	0.001192	98.4	85 - 118				
Iron	5.246	0.200	5	0.3538	97.8	87 - 118				
Magnesium	8.622	0.200	5	3.785	96.7	83 - 118				
Manganese	0.1269	0.00500	0.05	0.07982	94.2	87 - 115				
Nickel	0.05352	0.00500	0.05	0.00408	98.9	85 - 117				
Potassium	5.438	0.200	5	0.5115	98.5	87 - 115				
Selenium	0.04621	0.00500	0.05	0	92.4	80 - 120				
Silver	0.04831	0.00500	0.05	0	96.6	85 - 116				
Sodium	19.1	0.200	5	14.32	95.6	85 - 117				
Thallium	0.04492	0.00200	0.05	0.000881	88.1	82 - 116				
Vanadium	0.05006	0.00500	0.05	0.001987	96.1	86 - 115				
Zinc	0.0719	0.00500	0.05	0.02524	93.3	83 - 119				

MS Sample ID: **HS19061486-01MS** Units: **mg/L** Analysis Date: **08-Jul-2019 13:58**
Client ID: **CO9_062619** Run ID: **ICPMS05_341995** SeqNo: **5157127** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Lead	0.04682	0.00500	0.05	0	93.6	88 - 115				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19061486-01MSD** Units: **mg/L** Analysis Date: **05-Jul-2019 16:01**
Client ID: **CO9_062619** Run ID: **ICPMS05_341886** SeqNo: **5155809** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.7553	0.0100	0.4	0.3697	96.4	84 - 117	0.739	2.18	20	
Antimony	0.04868	0.00500	0.05	0.0008	95.8	85 - 117	0.04732	2.84	20	
Arsenic	0.04954	0.00500	0.05	0	99.1	84 - 116	0.04842	2.27	20	
Barium	0.287	0.00500	0.05	0.238	98.0	86 - 114	0.2815	1.95	20	O
Beryllium	0.0485	0.00200	0.05	0	97.0	83 - 121	0.04857	0.142	20	
Cadmium	0.0486	0.00200	0.05	0	97.2	87 - 115	0.04813	0.966	20	
Calcium	81.29	0.500	5	76.32	99.3	87 - 118	81.2	0.104	20	O
Chromium	0.05662	0.00500	0.05	0.006591	100	85 - 116	0.05476	3.34	20	
Cobalt	0.05007	0.00500	0.05	0.000529	99.1	86 - 115	0.04919	1.76	20	
Copper	0.05145	0.00500	0.05	0.001192	101	85 - 118	0.05037	2.12	20	
Iron	5.285	0.200	5	0.3538	98.6	87 - 118	5.246	0.742	20	
Lead	0.04787	0.00500	0.05	0	95.7	88 - 115	0.04832	0.925	20	
Magnesium	8.77	0.200	5	3.785	99.7	83 - 118	8.622	1.7	20	
Manganese	0.1284	0.00500	0.05	0.07982	97.2	87 - 115	0.1269	1.2	20	
Nickel	0.05428	0.00500	0.05	0.00408	100	85 - 117	0.05352	1.41	20	
Potassium	5.433	0.200	5	0.5115	98.4	87 - 115	5.438	0.0912	20	
Selenium	0.0486	0.00500	0.05	0	97.2	80 - 120	0.04621	5.05	20	
Silver	0.04796	0.00500	0.05	0	95.9	85 - 116	0.04831	0.717	20	
Sodium	19.67	0.200	5	14.32	107	85 - 117	19.1	2.92	20	
Thallium	0.04425	0.00200	0.05	0.000881	86.7	82 - 116	0.04492	1.5	20	
Vanadium	0.05188	0.00500	0.05	0.001987	99.8	86 - 115	0.05006	3.57	20	
Zinc	0.07298	0.00500	0.05	0.02524	95.5	83 - 119	0.0719	1.49	20	

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19061486-01PDS** Units: **mg/L** Analysis Date: **05-Jul-2019 16:03**
Client ID: **CO9_062619** Run ID: **ICPMS05_341886** SeqNo: **5155810** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.487	0.0100	0.1	0.3697	117	80 - 120				
Arsenic	0.09568	0.00500	0.1	0.000356	95.3	80 - 120				
Barium	0.3243	0.00500	0.1	0.238	86.3	80 - 120				
Beryllium	0.08784	0.00200	0.1	0.000034	87.8	80 - 120				
Cadmium	0.09239	0.00200	0.1	0.000163	92.2	80 - 120				
Calcium	84.54	0.500	10	76.32	82.1	80 - 120				O
Chromium	0.1036	0.00500	0.1	0.006591	97.0	80 - 120				
Cobalt	0.0997	0.00500	0.1	0.000529	99.2	80 - 120				
Copper	0.09939	0.00500	0.1	0.001192	98.2	80 - 120				
Iron	10.01	0.200	10	0.3538	96.6	80 - 120				
Lead	0.09928	0.00500	0.1	0.000498	98.8	80 - 120				
Magnesium	13.55	0.200	10	3.785	97.6	80 - 120				
Manganese	0.1738	0.00500	0.1	0.07982	94.0	80 - 120				
Nickel	0.1011	0.00500	0.1	0.00408	97.0	80 - 120				
Potassium	10.21	0.200	10	0.5115	97.0	80 - 120				
Selenium	0.09467	0.00500	0.1	0.000462	94.2	80 - 120				
Silver	0.09272	0.00500	0.1	0.000026	92.7	80 - 120				
Sodium	24.03	0.200	10	14.32	97.1	80 - 120				
Thallium	0.1018	0.00200	0.1	0.000881	101	80 - 120				
Vanadium	0.09888	0.00500	0.1	0.001987	96.9	80 - 120				
Zinc	0.1221	0.00500	0.1	0.02524	96.9	80 - 120				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: 142541 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19061486-01SD** Units: **mg/L** Analysis Date: **05-Jul-2019 15:56**
Client ID: **CO9_062619** Run ID: **ICPMS05_341886** SeqNo: **5155807** PrepDate: **28-Jun-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.3834	0.0500					0.3697	3.7	10	
Antimony	0.00250	0.0250					0.0008	0	10	U
Arsenic	0.00250	0.0250					0.000356	0	10	U
Barium	0.2349	0.0250					0.238	1.31	10	
Beryllium	0.00250	0.0100					0.000034	0	10	U
Cadmium	0.00250	0.0100					0.000163	0	10	U
Calcium	73.47	2.50					76.32	3.74	10	
Chromium	0.006325	0.0250					0.006591	0	10	J
Cobalt	0.00250	0.0250					0.000529	0	10	U
Copper	0.00500	0.0250					0.001192	0	10	U
Iron	0.3675	1.00					0.3538	0	10	J
Lead	0.00500	0.0250					0.000498	0	10	U
Magnesium	3.655	1.00					3.785	3.44	10	
Manganese	0.08094	0.0250					0.07982	1.4	10	
Nickel	0.00368	0.0250					0.00408	0	10	J
Potassium	0.6068	1.00					0.5115	0	10	J
Selenium	0.0125	0.0250					0.000462	0	10	U
Silver	0.00250	0.0250					0.000026	0	10	U
Sodium	15.04	1.00					14.32	5.03	10	
Thallium	0.00250	0.0100					0.000881	0	10	U
Vanadium	0.003882	0.0250					0.001987	0	10	J
Zinc	0.02966	0.0250					0.02524	17.5	10	R

The following samples were analyzed in this batch: HS19061486-01 HS19061486-02 HS19061486-03 HS19061486-04 HS19061486-05

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: 142560 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142560** Units: **mg/L** Analysis Date: **28-Jun-2019 15:56**
Client ID: Run ID: **HG03_341562** SeqNo: **5147053** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142560** Units: **mg/L** Analysis Date: **28-Jun-2019 15:57**
Client ID: Run ID: **HG03_341562** SeqNo: **5147054** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00509	0.000200	0.005	0	102	80 - 120				

MS Sample ID: **HS19061486-01MS** Units: **mg/L** Analysis Date: **28-Jun-2019 16:01**
Client ID: **CO9_062619** Run ID: **HG03_341562** SeqNo: **5147056** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000513	0.000000200	5e-006	-0.0000000010	103	75 - 125				

MSD Sample ID: **HS19061486-01MSD** Units: **mg/L** Analysis Date: **28-Jun-2019 16:03**
Client ID: **CO9_062619** Run ID: **HG03_341562** SeqNo: **5147057** PrepDate: **28-Jun-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00000509	0.000000200	5e-006	-0.0000000010	102	75 - 125	0.000005130	0.783	20	

The following samples were analyzed in this batch: HS19061486-01

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: 142769 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142769** Units: **mg/L** Analysis Date: **05-Jul-2019 15:01**
Client ID: Run ID: **HG03_341922** SeqNo: **5154872** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142769** Units: **mg/L** Analysis Date: **05-Jul-2019 15:03**
Client ID: Run ID: **HG03_341922** SeqNo: **5154873** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00505	0.000200	0.005	0	101	82 - 119				

MS Sample ID: **HS19070016-09MS** Units: **mg/L** Analysis Date: **05-Jul-2019 15:06**
Client ID: Run ID: **HG03_341922** SeqNo: **5154875** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00527	0.000200	0.005	-0.00001500	106	82 - 119				

MSD Sample ID: **HS19070016-09MSD** Units: **mg/L** Analysis Date: **05-Jul-2019 15:08**
Client ID: Run ID: **HG03_341922** SeqNo: **5154876** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00517	0.000200	0.005	-0.00001500	104	82 - 119	0.005270	1.92	20	

The following samples were analyzed in this batch: HS19061486-02 HS19061486-03 HS19061486-04 HS19061486-05

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: 142659 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142659** Units: **ug/L** Analysis Date: **09-Jul-2019 12:38**
Client ID: Run ID: **SV-5_342071** SeqNo: **5159697** PrepDate: **02-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.05997*	*0*	*0.08*	*0*	*75.0*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.05244*	*0*	*0.08*	*0*	*65.5*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.0849*	*0*	*0.08*	*0*	*106*	*40 - 140*				

LCS Sample ID: **LCS-142659** Units: **ug/L** Analysis Date: **09-Jul-2019 12:59**
Client ID: Run ID: **SV-5_342071** SeqNo: **5159698** PrepDate: **02-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07981	0.010	0.08	0	99.8	40 - 140				
Surr: 2-Fluorobiphenyl	*0.06497*	*0*	*0.08*	*0*	*81.2*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.05228*	*0*	*0.08*	*0*	*65.3*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07798*	*0*	*0.08*	*0*	*97.5*	*40 - 140*				

LCSD Sample ID: **LCSD-142659** Units: **ug/L** Analysis Date: **09-Jul-2019 13:19**
Client ID: Run ID: **SV-5_342071** SeqNo: **5159699** PrepDate: **02-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08031	0.010	0.08	0	100	40 - 140	0.07981	0.627	20	
Surr: 2-Fluorobiphenyl	*0.07017*	*0*	*0.08*	*0*	*87.7*	*40 - 140*	*0.06497*	*7.7*	*20*	
Surr: 4-Terphenyl-d14	*0.05934*	*0*	*0.08*	*0*	*74.2*	*40 - 140*	*0.05228*	*12.7*	*20*	
Surr: Nitrobenzene-d5	*0.08488*	*0*	*0.08*	*0*	*106*	*40 - 140*	*0.07798*	*8.47*	*20*	

The following samples were analyzed in this batch: HS19061486-04 HS19061486-05

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190703** Units: **UG/L** Analysis Date: **03-Jul-2019 15:45**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153631** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190703** Units: **UG/L** Analysis Date: **03-Jul-2019 15:45**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153631** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.09*	*1.0*	*50*	*0*	*92.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.05*	*1.0*	*50*	*0*	*96.1*	*85 - 114*				
Surr: Dibromofluoromethane	*44.95*	*1.0*	*50*	*0*	*89.9*	*80 - 119*				
Surr: Toluene-d8	*48.5*	*1.0*	*50*	*0*	*97.0*	*89 - 112*				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190703** Units: **UG/L** Analysis Date: **03-Jul-2019 14:57**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153630** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	17.99	1.0	20	0	89.9	78 - 124				
1,1,1-Trichloroethane	18.38	1.0	20	0	91.9	74 - 131				
1,1,2,2-Tetrachloroethane	19.33	1.0	20	0	96.6	71 - 121				
1,1,2-Trichloroethane	19	1.0	20	0	95.0	80 - 119				
1,1-Dichloroethane	17.63	1.0	20	0	88.1	77 - 125				
1,1-Dichloroethene	17.56	1.0	20	0	87.8	71 - 131				
1,1-Dichloropropene	18.07	1.0	20	0	90.4	78 - 125				
1,2,3-Trichlorobenzene	23.54	1.0	20	0	118	69 - 129				
1,2,3-Trichloropropane	19.44	1.0	20	0	97.2	73 - 122				
1,2,4-Trichlorobenzene	21.42	1.0	20	0	107	69 - 130				
1,2,4-Trimethylbenzene	17.67	1.0	20	0	88.3	76 - 124				
1,2-Dibromo-3-chloropropane	21.87	1.0	20	0	109	62 - 128				
1,2-Dibromoethane	18.58	1.0	20	0	92.9	77 - 121				
1,2-Dichlorobenzene	18.25	1.0	20	0	91.3	80 - 119				
1,2-Dichloroethane	17.32	1.0	20	0	86.6	73 - 128				
1,2-Dichloropropane	17.52	1.0	20	0	87.6	78 - 122				
1,3,5-Trimethylbenzene	17.42	1.0	20	0	87.1	75 - 124				
1,3-Dichlorobenzene	17.82	1.0	20	0	89.1	80 - 119				
1,3-Dichloropropane	18.44	1.0	20	0	92.2	80 - 119				
1,4-Dichlorobenzene	18.95	1.0	20	0	94.8	79 - 118				
2,2-Dichloropropane	16.75	1.0	20	0	83.7	60 - 139				
2-Butanone	43.93	2.0	40	0	110	56 - 143				
2-Chlorotoluene	18.48	1.0	20	0	92.4	79 - 122				
2-Hexanone	38.01	2.0	40	0	95.0	57 - 139				
4-Chlorotoluene	18.53	1.0	20	0	92.6	78 - 122				
4-Isopropyltoluene	17.94	1.0	20	0	89.7	77 - 127				
4-Methyl-2-pentanone	36.09	2.0	40	0	90.2	67 - 130				
Acetone	46.53	2.0	40	0	116	39 - 160				
Benzene	18.29	1.0	20	0	91.4	79 - 120				
Bromobenzene	17.41	1.0	20	0	87.1	80 - 120				
Bromochloromethane	17.81	1.0	20	0	89.0	78 - 123				
Bromodichloromethane	18.24	1.0	20	0	91.2	79 - 125				
Bromoform	19.34	1.0	20	0	96.7	66 - 130				
Bromomethane	20.11	1.0	20	0	101	53 - 141				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190703** Units: **UG/L** Analysis Date: **03-Jul-2019 14:57**
Client ID: Run ID: **VOA6_341869** SeqNo: **5153630** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	33.73	2.0	40	0	84.3	64 - 133				
Carbon tetrachloride	18.32	1.0	20	0	91.6	72 - 136				
Chlorobenzene	17.54	1.0	20	0	87.7	82 - 118				
Chloroethane	16.99	1.0	20	0	84.9	60 - 138				
Chloroform	19.05	1.0	20	0	95.2	79 - 124				
Chloromethane	16.14	1.0	20	0	80.7	50 - 139				
cis-1,2-Dichloroethene	18.45	1.0	20	0	92.3	78 - 123				
cis-1,3-Dichloropropene	17.19	1.0	20	0	85.9	75 - 124				
Dibromochloromethane	18.13	1.0	20	0	90.6	74 - 126				
Dibromomethane	18.03	1.0	20	0	90.1	79 - 123				
Dichlorodifluoromethane	17.79	1.0	20	0	88.9	32 - 152				
Ethylbenzene	17.65	1.0	20	0	88.3	79 - 121				
Hexachlorobutadiene	23.03	1.0	20	0	115	66 - 134				
Isopropylbenzene	18.08	1.0	20	0	90.4	72 - 131				
m,p-Xylene	35.62	2.0	40	0	89.0	80 - 121				
Methylene chloride	17.81	2.0	20	0	89.1	74 - 124				
Naphthalene	21.95	1.0	20	0	110	61 - 128				
n-Butylbenzene	17.82	1.0	20	0	89.1	75 - 128				
n-Propylbenzene	18.62	1.0	20	0	93.1	76 - 126				
o-Xylene	17.72	1.0	20	0	88.6	78 - 122				
sec-Butylbenzene	19.01	1.0	20	0	95.1	77 - 126				
Styrene	18.33	1.0	20	0	91.7	78 - 123				
tert-Butylbenzene	18.81	1.0	20	0	94.1	78 - 124				
Tetrachloroethene	17.9	1.0	20	0	89.5	74 - 129				
Toluene	17.39	1.0	20	0	86.9	80 - 121				
trans-1,2-Dichloroethene	18.49	1.0	20	0	92.4	75 - 124				
trans-1,3-Dichloropropene	17.69	1.0	20	0	88.4	73 - 127				
Trichloroethene	17.79	1.0	20	0	89.0	79 - 123				
Trichlorofluoromethane	18.03	1.0	20	0	90.1	65 - 141				
Vinyl chloride	16.88	1.0	20	0	84.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.62*	*1.0*	*50*	*0*	*99.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*47.98*	*1.0*	*50*	*0*	*96.0*	*85 - 114*				
Surr: Dibromofluoromethane	*49.25*	*1.0*	*50*	*0*	*98.5*	*80 - 119*				
Surr: Toluene-d8	*45.94*	*1.0*	*50*	*0*	*91.9*	*89 - 112*				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19061486-01MS** Units: **UG/L** Analysis Date: **03-Jul-2019 18:08**
Client ID: **CO9_062619** Run ID: **VOA6_341869** SeqNo: **5153637** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	16.51	1.0	20	0	82.5	78 - 124				
1,1,1-Trichloroethane	16.62	1.0	20	0	83.1	74 - 131				
1,1,2,2-Tetrachloroethane	17.57	1.0	20	0	87.9	71 - 121				
1,1,2-Trichloroethane	17.26	1.0	20	0	86.3	80 - 119				
1,1-Dichloroethane	15.31	1.0	20	0	76.5	77 - 125				S
1,1-Dichloroethene	16.44	1.0	20	0	82.2	71 - 131				
1,1-Dichloropropene	17.45	1.0	20	0	87.3	78 - 125				
1,2,3-Trichlorobenzene	20.81	1.0	20	0	104	69 - 129				
1,2,3-Trichloropropane	17.72	1.0	20	0	88.6	73 - 122				
1,2,4-Trichlorobenzene	19.95	1.0	20	0	99.7	69 - 130				
1,2,4-Trimethylbenzene	16.6	1.0	20	0	83.0	76 - 124				
1,2-Dibromo-3-chloropropane	19.76	1.0	20	0	98.8	62 - 128				
1,2-Dibromoethane	16.72	1.0	20	0	83.6	77 - 121				
1,2-Dichlorobenzene	16.97	1.0	20	0	84.9	80 - 119				
1,2-Dichloroethane	15.42	1.0	20	0	77.1	73 - 128				
1,2-Dichloropropane	15.7	1.0	20	0	78.5	78 - 122				
1,3,5-Trimethylbenzene	16.77	1.0	20	0	83.9	75 - 124				
1,3-Dichlorobenzene	16.72	1.0	20	0	83.6	80 - 119				
1,3-Dichloropropane	16.64	1.0	20	0	83.2	80 - 119				
1,4-Dichlorobenzene	17.61	1.0	20	0	88.1	79 - 118				
2,2-Dichloropropane	16.67	1.0	20	0	83.4	60 - 139				
2-Butanone	35.5	2.0	40	0	88.8	56 - 143				
2-Chlorotoluene	17.41	1.0	20	0	87.0	79 - 122				
2-Hexanone	32.54	2.0	40	0	81.4	57 - 139				
4-Chlorotoluene	17.42	1.0	20	0	87.1	78 - 122				
4-Isopropyltoluene	17.75	1.0	20	0	88.7	77 - 127				
4-Methyl-2-pentanone	33.2	2.0	40	0	83.0	67 - 130				
Acetone	37.89	2.0	40	4.161	84.3	39 - 160				
Benzene	16.63	1.0	20	0	83.2	79 - 120				
Bromobenzene	15.78	1.0	20	0	78.9	80 - 120				S
Bromochloromethane	15.16	1.0	20	0	75.8	78 - 123				S
Bromodichloromethane	16.26	1.0	20	0	81.3	79 - 125				
Bromoform	17.61	1.0	20	0	88.1	66 - 130				
Bromomethane	16.43	1.0	20	0	82.1	53 - 141				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19061486-01MS** Units: **UG/L** Analysis Date: **03-Jul-2019 18:08**
Client ID: **CO9_062619** Run ID: **VOA6_341869** SeqNo: **5153637** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	30.33	2.0	40	0	75.8	64 - 133				
Carbon tetrachloride	17.83	1.0	20	0	89.2	72 - 136				
Chlorobenzene	16.32	1.0	20	0	81.6	82 - 118				S
Chloroethane	15.5	1.0	20	0	77.5	60 - 138				
Chloroform	15.88	1.0	20	0	79.4	79 - 124				
Chloromethane	14.92	1.0	20	0	74.6	50 - 139				
cis-1,2-Dichloroethene	15.81	1.0	20	0	79.1	78 - 123				
cis-1,3-Dichloropropene	15.72	1.0	20	0	78.6	75 - 124				
Dibromochloromethane	16.19	1.0	20	0	81.0	74 - 126				
Dibromomethane	16.1	1.0	20	0	80.5	79 - 123				
Dichlorodifluoromethane	15.64	1.0	20	0	78.2	32 - 152				
Ethylbenzene	17	1.0	20	0	85.0	79 - 121				
Hexachlorobutadiene	21.68	1.0	20	0	108	66 - 134				
Isopropylbenzene	17.62	1.0	20	0	88.1	72 - 131				
m,p-Xylene	34.49	2.0	40	0	86.2	80 - 121				
Methylene chloride	15.03	2.0	20	0	75.1	74 - 124				
Naphthalene	19.79	1.0	20	0	98.9	61 - 128				
n-Butylbenzene	17.77	1.0	20	0	88.8	75 - 128				
n-Propylbenzene	18.11	1.0	20	0	90.6	76 - 126				
o-Xylene	16.52	1.0	20	0	82.6	78 - 122				
sec-Butylbenzene	19.08	1.0	20	0	95.4	77 - 126				
Styrene	16.93	1.0	20	0	84.7	78 - 123				
tert-Butylbenzene	18.55	1.0	20	0	92.8	78 - 124				
Tetrachloroethene	17.69	1.0	20	0	88.5	74 - 129				
Toluene	16.65	1.0	20	0	83.3	80 - 121				
trans-1,2-Dichloroethene	16.67	1.0	20	0	83.4	75 - 124				
trans-1,3-Dichloropropene	15.41	1.0	20	0	77.1	73 - 127				
Trichloroethene	19.25	1.0	20	0	96.3	79 - 123				
Trichlorofluoromethane	16.99	1.0	20	0	85.0	65 - 141				
Vinyl chloride	14.99	1.0	20	0	75.0	58 - 137				
Surr: 1,2-Dichloroethane-d4	*45.86*	*1.0*	*50*	*0*	*91.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.41*	*1.0*	*50*	*0*	*96.8*	*85 - 114*				
Surr: Dibromofluoromethane	*45.73*	*1.0*	*50*	*0*	*91.5*	*80 - 119*				
Surr: Toluene-d8	*47.34*	*1.0*	*50*	*0*	*94.7*	*89 - 112*				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061486-01MSD** Units: **UG/L** Analysis Date: **03-Jul-2019 18:32**
Client ID: **CO9_062619** Run ID: **VOA6_341869** SeqNo: **5153638** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	16.57	1.0	20	0	82.9	78 - 124	16.51	0.402	20	
1,1,1-Trichloroethane	16.72	1.0	20	0	83.6	74 - 131	16.62	0.596	20	
1,1,2,2-Tetrachloroethane	17.64	1.0	20	0	88.2	71 - 121	17.57	0.396	20	
1,1,2-Trichloroethane	17.31	1.0	20	0	86.5	80 - 119	17.26	0.254	20	
1,1-Dichloroethane	15.14	1.0	20	0	75.7	77 - 125	15.31	1.12	20	S
1,1-Dichloroethene	15.9	1.0	20	0	79.5	71 - 131	16.44	3.34	20	
1,1-Dichloropropene	17.2	1.0	20	0	86.0	78 - 125	17.45	1.47	20	
1,2,3-Trichlorobenzene	21.62	1.0	20	0	108	69 - 129	20.81	3.79	20	
1,2,3-Trichloropropane	18.13	1.0	20	0	90.7	73 - 122	17.72	2.32	20	
1,2,4-Trichlorobenzene	20.17	1.0	20	0	101	69 - 130	19.95	1.11	20	
1,2,4-Trimethylbenzene	16.82	1.0	20	0	84.1	76 - 124	16.6	1.35	20	
1,2-Dibromo-3-chloropropane	19.64	1.0	20	0	98.2	62 - 128	19.76	0.602	20	
1,2-Dibromoethane	16.91	1.0	20	0	84.6	77 - 121	16.72	1.13	20	
1,2-Dichlorobenzene	17.08	1.0	20	0	85.4	80 - 119	16.97	0.64	20	
1,2-Dichloroethane	15.51	1.0	20	0	77.5	73 - 128	15.42	0.587	20	
1,2-Dichloropropane	15.75	1.0	20	0	78.8	78 - 122	15.7	0.313	20	
1,3,5-Trimethylbenzene	16.61	1.0	20	0	83.1	75 - 124	16.77	0.95	20	
1,3-Dichlorobenzene	16.63	1.0	20	0	83.2	80 - 119	16.72	0.552	20	
1,3-Dichloropropane	16.84	1.0	20	0	84.2	80 - 119	16.64	1.21	20	
1,4-Dichlorobenzene	18.12	1.0	20	0	90.6	79 - 118	17.61	2.81	20	
2,2-Dichloropropane	16.43	1.0	20	0	82.2	60 - 139	16.67	1.45	20	
2-Butanone	36.09	2.0	40	0	90.2	56 - 143	35.5	1.64	20	
2-Chlorotoluene	17.25	1.0	20	0	86.3	79 - 122	17.41	0.897	20	
2-Hexanone	33.5	2.0	40	0	83.8	57 - 139	32.54	2.91	20	
4-Chlorotoluene	17.25	1.0	20	0	86.2	78 - 122	17.42	1.02	20	
4-Isopropyltoluene	17.61	1.0	20	0	88.1	77 - 127	17.75	0.749	20	
4-Methyl-2-pentanone	33.33	2.0	40	0	83.3	67 - 130	33.2	0.392	20	
Acetone	37.8	2.0	40	4.161	84.1	39 - 160	37.89	0.25	20	
Benzene	16.71	1.0	20	0	83.6	79 - 120	16.63	0.479	20	
Bromobenzene	15.97	1.0	20	0	79.8	80 - 120	15.78	1.2	20	S
Bromochloromethane	14.89	1.0	20	0	74.4	78 - 123	15.16	1.82	20	S
Bromodichloromethane	16.58	1.0	20	0	82.9	79 - 125	16.26	1.99	20	
Bromoform	18.12	1.0	20	0	90.6	66 - 130	17.61	2.84	20	
Bromomethane	15.98	1.0	20	0	79.9	53 - 141	16.43	2.73	20	

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R341869 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061486-01MSD** Units: **UG/L** Analysis Date: **03-Jul-2019 18:32**
Client ID: **CO9_062619** Run ID: **VOA6_341869** SeqNo: **5153638** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	30.26	2.0	40	0	75.7	64 - 133	30.33	0.215	20	
Carbon tetrachloride	17.75	1.0	20	0	88.7	72 - 136	17.83	0.463	20	
Chlorobenzene	16.44	1.0	20	0	82.2	82 - 118	16.32	0.761	20	
Chloroethane	15.28	1.0	20	0	76.4	60 - 138	15.5	1.42	20	
Chloroform	15.71	1.0	20	0	78.6	79 - 124	15.88	1.07	20	S
Chloromethane	14.69	1.0	20	0	73.4	50 - 139	14.92	1.58	20	
cis-1,2-Dichloroethene	15.7	1.0	20	0	78.5	78 - 123	15.81	0.692	20	
cis-1,3-Dichloropropene	15.68	1.0	20	0	78.4	75 - 124	15.72	0.238	20	
Dibromochloromethane	16.67	1.0	20	0	83.4	74 - 126	16.19	2.91	20	
Dibromomethane	16.2	1.0	20	0	81.0	79 - 123	16.1	0.6	20	
Dichlorodifluoromethane	15.34	1.0	20	0	76.7	32 - 152	15.64	1.95	20	
Ethylbenzene	16.85	1.0	20	0	84.2	79 - 121	17	0.905	20	
Hexachlorobutadiene	22.45	1.0	20	0	112	66 - 134	21.68	3.48	20	
Isopropylbenzene	17.51	1.0	20	0	87.5	72 - 131	17.62	0.618	20	
m,p-Xylene	33.91	2.0	40	0	84.8	80 - 121	34.49	1.71	20	
Methylene chloride	14.82	2.0	20	0	74.1	74 - 124	15.03	1.35	20	
Naphthalene	20.33	1.0	20	0	102	61 - 128	19.79	2.71	20	
n-Butylbenzene	17.71	1.0	20	0	88.6	75 - 128	17.77	0.323	20	
n-Propylbenzene	18.14	1.0	20	0	90.7	76 - 126	18.11	0.153	20	
o-Xylene	16.36	1.0	20	0	81.8	78 - 122	16.52	0.968	20	
sec-Butylbenzene	18.96	1.0	20	0	94.8	77 - 126	19.08	0.607	20	
Styrene	16.9	1.0	20	0	84.5	78 - 123	16.93	0.183	20	
tert-Butylbenzene	18.61	1.0	20	0	93.1	78 - 124	18.55	0.304	20	
Tetrachloroethene	17.87	1.0	20	0	89.3	74 - 129	17.69	0.987	20	
Toluene	16.4	1.0	20	0	82.0	80 - 121	16.65	1.53	20	
trans-1,2-Dichloroethene	16.25	1.0	20	0	81.3	75 - 124	16.67	2.54	20	
trans-1,3-Dichloropropene	15.73	1.0	20	0	78.7	73 - 127	15.41	2.08	20	
Trichloroethene	17.49	1.0	20	0	87.5	79 - 123	19.25	9.57	20	
Trichlorofluoromethane	16.54	1.0	20	0	82.7	65 - 141	16.99	2.69	20	
Vinyl chloride	14.75	1.0	20	0	73.8	58 - 137	14.99	1.6	20	
Surr: 1,2-Dichloroethane-d4	*47.12*	*1.0*	*50*	*0*	*94.2*	*81 - 118*	*45.86*	*2.7*	*20*	
Surr: 4-Bromofluorobenzene	*48.48*	*1.0*	*50*	*0*	*97.0*	*85 - 114*	*48.41*	*0.13*	*20*	
Surr: Dibromofluoromethane	*46.14*	*1.0*	*50*	*0*	*92.3*	*80 - 119*	*45.73*	*0.893*	*20*	
Surr: Toluene-d8	*46.66*	*1.0*	*50*	*0*	*93.3*	*89 - 112*	*47.34*	*1.44*	*20*	

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R341869 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:	HS19061486-01	HS19061486-02	HS19061486-03	HS19061486-04

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R342165 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190709** Units: **UG/L** Analysis Date: **09-Jul-2019 17:38**
Client ID: Run ID: **VOA6_342165** SeqNo: **5160801** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R342165 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190709** Units: **UG/L** Analysis Date: **09-Jul-2019 17:38**
Client ID: Run ID: **VOA6_342165** SeqNo: **5160801** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*48.05*	*1.0*	*50*	*0*	*96.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.27*	*1.0*	*50*	*0*	*96.5*	*85 - 114*				
Surr: Dibromofluoromethane	*48.28*	*1.0*	*50*	*0*	*96.6*	*80 - 119*				
Surr: Toluene-d8	*50.86*	*1.0*	*50*	*0*	*102*	*89 - 112*				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R342165 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190709** Units: **UG/L** Analysis Date: **09-Jul-2019 16:50**
Client ID: Run ID: **VOA6_342165** SeqNo: **5160800** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.4	1.0	20	0	97.0	78 - 124				
1,1,1-Trichloroethane	17.26	1.0	20	0	86.3	74 - 131				
1,1,2,2-Tetrachloroethane	20.41	1.0	20	0	102	71 - 121				
1,1,2-Trichloroethane	19.21	1.0	20	0	96.0	80 - 119				
1,1-Dichloroethane	17.56	1.0	20	0	87.8	77 - 125				
1,1-Dichloroethene	16.29	1.0	20	0	81.4	71 - 131				
1,1-Dichloropropene	16.89	1.0	20	0	84.5	78 - 125				
1,2,3-Trichlorobenzene	21.97	1.0	20	0	110	69 - 129				
1,2,3-Trichloropropane	18.73	1.0	20	0	93.6	73 - 122				
1,2,4-Trichlorobenzene	20.3	1.0	20	0	102	69 - 130				
1,2,4-Trimethylbenzene	18.28	1.0	20	0	91.4	76 - 124				
1,2-Dibromo-3-chloropropane	22.61	1.0	20	0	113	62 - 128				
1,2-Dibromoethane	19.91	1.0	20	0	99.5	77 - 121				
1,2-Dichlorobenzene	19.35	1.0	20	0	96.8	80 - 119				
1,2-Dichloroethane	18.57	1.0	20	0	92.9	73 - 128				
1,2-Dichloropropane	19.04	1.0	20	0	95.2	78 - 122				
1,3,5-Trimethylbenzene	17.85	1.0	20	0	89.3	75 - 124				
1,3-Dichlorobenzene	19.33	1.0	20	0	96.7	80 - 119				
1,3-Dichloropropane	19.31	1.0	20	0	96.5	80 - 119				
1,4-Dichlorobenzene	18.59	1.0	20	0	92.9	79 - 118				
2,2-Dichloropropane	18.07	1.0	20	0	90.4	60 - 139				
2-Butanone	43.08	2.0	40	0	108	56 - 143				
2-Chlorotoluene	18.02	1.0	20	0	90.1	79 - 122				
2-Hexanone	41.65	2.0	40	0	104	57 - 139				
4-Chlorotoluene	17.85	1.0	20	0	89.3	78 - 122				
4-Isopropyltoluene	17.06	1.0	20	0	85.3	77 - 127				
4-Methyl-2-pentanone	41.1	2.0	40	0	103	67 - 130				
Acetone	46.08	2.0	40	0	115	39 - 160				
Benzene	18.21	1.0	20	0	91.0	79 - 120				
Bromobenzene	19.61	1.0	20	0	98.1	80 - 120				
Bromochloromethane	18.28	1.0	20	0	91.4	78 - 123				
Bromodichloromethane	19.08	1.0	20	0	95.4	79 - 125				
Bromoform	20.96	1.0	20	0	105	66 - 130				
Bromomethane	20.81	1.0	20	0	104	53 - 141				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R342165 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190709** Units: **UG/L** Analysis Date: **09-Jul-2019 16:50**
Client ID: Run ID: **VOA6_342165** SeqNo: **5160800** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	35.24	2.0	40	0	88.1	64 - 133				
Carbon tetrachloride	16.46	1.0	20	0	82.3	72 - 136				
Chlorobenzene	18.61	1.0	20	0	93.1	82 - 118				
Chloroethane	16.68	1.0	20	0	83.4	60 - 138				
Chloroform	18.98	1.0	20	0	94.9	79 - 124				
Chloromethane	17.52	1.0	20	0	87.6	50 - 139				
cis-1,2-Dichloroethene	17.85	1.0	20	0	89.2	78 - 123				
cis-1,3-Dichloropropene	19.48	1.0	20	0	97.4	75 - 124				
Dibromochloromethane	20.05	1.0	20	0	100	74 - 126				
Dibromomethane	19.31	1.0	20	0	96.5	79 - 123				
Dichlorodifluoromethane	17.07	1.0	20	0	85.4	32 - 152				
Ethylbenzene	18.49	1.0	20	0	92.5	79 - 121				
Hexachlorobutadiene	17.95	1.0	20	0	89.8	66 - 134				
Isopropylbenzene	18.03	1.0	20	0	90.2	72 - 131				
m,p-Xylene	37.17	2.0	40	0	92.9	80 - 121				
Methylene chloride	17.73	2.0	20	0	88.7	74 - 124				
Naphthalene	21.48	1.0	20	0	107	61 - 128				
n-Butylbenzene	17.96	1.0	20	0	89.8	75 - 128				
n-Propylbenzene	17.28	1.0	20	0	86.4	76 - 126				
o-Xylene	18.59	1.0	20	0	92.9	78 - 122				
sec-Butylbenzene	16.57	1.0	20	0	82.8	77 - 126				
Styrene	19.34	1.0	20	0	96.7	78 - 123				
tert-Butylbenzene	17.04	1.0	20	0	85.2	78 - 124				
Tetrachloroethene	18.37	1.0	20	0	91.9	74 - 129				
Toluene	18.55	1.0	20	0	92.7	80 - 121				
trans-1,2-Dichloroethene	18.04	1.0	20	0	90.2	75 - 124				
trans-1,3-Dichloropropene	19.72	1.0	20	0	98.6	73 - 127				
Trichloroethene	17.97	1.0	20	0	89.9	79 - 123				
Trichlorofluoromethane	16.21	1.0	20	0	81.1	65 - 141				
Vinyl chloride	16.29	1.0	20	0	81.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*51.19*	*1.0*	*50*	*0*	*102*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.07*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*51.1*	*1.0*	*50*	*0*	*102*	*80 - 119*				
Surr: Toluene-d8	*50.3*	*1.0*	*50*	*0*	*101*	*89 - 112*				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R342165 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19061486-06MS** Units: **UG/L** Analysis Date: **09-Jul-2019 20:49**
Client ID: **MW18_062619** Run ID: **VOA6_342165** SeqNo: **5160805** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.21	1.0	20	0	96.1	78 - 124				
1,1,1-Trichloroethane	18.37	1.0	20	0	91.9	74 - 131				
1,1,2,2-Tetrachloroethane	18.34	1.0	20	0	91.7	71 - 121				
1,1,2-Trichloroethane	17.96	1.0	20	0	89.8	80 - 119				
1,1-Dichloroethane	17.03	1.0	20	0	85.2	77 - 125				
1,1-Dichloroethene	18.14	1.0	20	0	90.7	71 - 131				
1,1-Dichloropropene	18.6	1.0	20	0	93.0	78 - 125				
1,2,3-Trichlorobenzene	17.53	1.0	20	0	87.7	69 - 129				
1,2,3-Trichloropropane	18.85	1.0	20	0	94.2	73 - 122				
1,2,4-Trichlorobenzene	18.15	1.0	20	0	90.8	69 - 130				
1,2,4-Trimethylbenzene	19.15	1.0	20	0	95.8	76 - 124				
1,2-Dibromo-3-chloropropane	18.13	1.0	20	0	90.6	62 - 128				
1,2-Dibromoethane	18.01	1.0	20	0	90.1	77 - 121				
1,2-Dichlorobenzene	18.57	1.0	20	0	92.8	80 - 119				
1,2-Dichloroethane	17.4	1.0	20	0	87.0	73 - 128				
1,2-Dichloropropane	17.68	1.0	20	0	88.4	78 - 122				
1,3,5-Trimethylbenzene	19.37	1.0	20	0	96.9	75 - 124				
1,3-Dichlorobenzene	18.96	1.0	20	0	94.8	80 - 119				
1,3-Dichloropropane	17.88	1.0	20	0	89.4	80 - 119				
1,4-Dichlorobenzene	18.16	1.0	20	0	90.8	79 - 118				
2,2-Dichloropropane	16.95	1.0	20	0	84.7	60 - 139				
2-Butanone	34.21	2.0	40	0	85.5	56 - 143				
2-Chlorotoluene	18.42	1.0	20	0	92.1	79 - 122				
2-Hexanone	34.97	2.0	40	0	87.4	57 - 139				
4-Chlorotoluene	17.9	1.0	20	0	89.5	78 - 122				
4-Isopropyltoluene	19.85	1.0	20	0	99.2	77 - 127				
4-Methyl-2-pentanone	34.82	2.0	40	0	87.0	67 - 130				
Acetone	41.99	2.0	40	3.335	96.6	39 - 160				
Benzene	18.13	1.0	20	0	90.6	79 - 120				
Bromobenzene	18.8	1.0	20	0	94.0	80 - 120				
Bromochloromethane	16.73	1.0	20	0	83.7	78 - 123				
Bromodichloromethane	17.95	1.0	20	0	89.7	79 - 125				
Bromoform	19.09	1.0	20	0	95.4	66 - 130				
Bromomethane	17.8	1.0	20	0	89.0	53 - 141				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R342165 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19061486-06MS** Units: **UG/L** Analysis Date: **09-Jul-2019 20:49**
Client ID: **MW18_062619** Run ID: **VOA6_342165** SeqNo: **5160805** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	36.46	2.0	40	0	91.2	64 - 133				
Carbon tetrachloride	18.84	1.0	20	0	94.2	72 - 136				
Chlorobenzene	18.46	1.0	20	0	92.3	82 - 118				
Chloroethane	16.76	1.0	20	0	83.8	60 - 138				
Chloroform	17.66	1.0	20	0	88.3	79 - 124				
Chloromethane	17.89	1.0	20	0	89.5	50 - 139				
cis-1,2-Dichloroethene	18.31	1.0	20	1.168	85.7	78 - 123				
cis-1,3-Dichloropropene	17.77	1.0	20	0	88.8	75 - 124				
Dibromochloromethane	18.54	1.0	20	0	92.7	74 - 126				
Dibromomethane	17.71	1.0	20	0	88.6	79 - 123				
Dichlorodifluoromethane	13.74	1.0	20	0	68.7	32 - 152				
Ethylbenzene	19.77	1.0	20	0	98.9	79 - 121				
Hexachlorobutadiene	19.63	1.0	20	0	98.1	66 - 134				
Isopropylbenzene	20.32	1.0	20	0	102	72 - 131				
m,p-Xylene	38.99	2.0	40	0	97.5	80 - 121				
Methylene chloride	16.67	2.0	20	0	83.3	74 - 124				
Naphthalene	17.21	1.0	20	0	86.0	61 - 128				
n-Butylbenzene	21.33	1.0	20	0	107	75 - 128				
n-Propylbenzene	19.43	1.0	20	0	97.2	76 - 126				
o-Xylene	18.8	1.0	20	0	94.0	78 - 122				
sec-Butylbenzene	20.42	1.0	20	0	102	77 - 126				
Styrene	18.96	1.0	20	0	94.8	78 - 123				
tert-Butylbenzene	19.92	1.0	20	0	99.6	78 - 124				
Tetrachloroethene	20.72	1.0	20	0	104	74 - 129				
Toluene	19.12	1.0	20	0	95.6	80 - 121				
trans-1,2-Dichloroethene	17.92	1.0	20	0	89.6	75 - 124				
trans-1,3-Dichloropropene	17.7	1.0	20	0	88.5	73 - 127				
Trichloroethene	44.23	1.0	20	24.81	97.1	79 - 123				
Trichlorofluoromethane	17.42	1.0	20	0	87.1	65 - 141				
Vinyl chloride	15.68	1.0	20	0	78.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.92*	*1.0*	*50*	*0*	*95.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*49.66*	*1.0*	*50*	*0*	*99.3*	*85 - 114*				
Surr: Dibromofluoromethane	*48.39*	*1.0*	*50*	*0*	*96.8*	*80 - 119*				
Surr: Toluene-d8	*51*	*1.0*	*50*	*0*	*102*	*89 - 112*				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R342165 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061486-06MSD** Units: **UG/L** Analysis Date: **09-Jul-2019 21:13**
Client ID: **MW18_062619** Run ID: **VOA6_342165** SeqNo: **5160806** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.04	1.0	20	0	95.2	78 - 124	19.21	0.912	20	
1,1,1-Trichloroethane	18.28	1.0	20	0	91.4	74 - 131	18.37	0.539	20	
1,1,2,2-Tetrachloroethane	18.93	1.0	20	0	94.6	71 - 121	18.34	3.15	20	
1,1,2-Trichloroethane	18.44	1.0	20	0	92.2	80 - 119	17.96	2.64	20	
1,1-Dichloroethane	17.06	1.0	20	0	85.3	77 - 125	17.03	0.174	20	
1,1-Dichloroethene	17.61	1.0	20	0	88.0	71 - 131	18.14	2.98	20	
1,1-Dichloropropene	18.44	1.0	20	0	92.2	78 - 125	18.6	0.83	20	
1,2,3-Trichlorobenzene	18.54	1.0	20	0	92.7	69 - 129	17.53	5.57	20	
1,2,3-Trichloropropane	19.37	1.0	20	0	96.9	73 - 122	18.85	2.73	20	
1,2,4-Trichlorobenzene	18.99	1.0	20	0	94.9	69 - 130	18.15	4.49	20	
1,2,4-Trimethylbenzene	19.2	1.0	20	0	96.0	76 - 124	19.15	0.241	20	
1,2-Dibromo-3-chloropropane	18.47	1.0	20	0	92.4	62 - 128	18.13	1.88	20	
1,2-Dibromoethane	18.34	1.0	20	0	91.7	77 - 121	18.01	1.8	20	
1,2-Dichlorobenzene	18.92	1.0	20	0	94.6	80 - 119	18.57	1.87	20	
1,2-Dichloroethane	17.48	1.0	20	0	87.4	73 - 128	17.4	0.494	20	
1,2-Dichloropropane	17.83	1.0	20	0	89.2	78 - 122	17.68	0.853	20	
1,3,5-Trimethylbenzene	19.51	1.0	20	0	97.5	75 - 124	19.37	0.717	20	
1,3-Dichlorobenzene	19.33	1.0	20	0	96.6	80 - 119	18.96	1.93	20	
1,3-Dichloropropane	18.06	1.0	20	0	90.3	80 - 119	17.88	1.04	20	
1,4-Dichlorobenzene	18.21	1.0	20	0	91.0	79 - 118	18.16	0.254	20	
2,2-Dichloropropane	16.77	1.0	20	0	83.9	60 - 139	16.95	1.04	20	
2-Butanone	35.16	2.0	40	0	87.9	56 - 143	34.21	2.73	20	
2-Chlorotoluene	18.45	1.0	20	0	92.3	79 - 122	18.42	0.179	20	
2-Hexanone	35.51	2.0	40	0	88.8	57 - 139	34.97	1.53	20	
4-Chlorotoluene	18.33	1.0	20	0	91.6	78 - 122	17.9	2.35	20	
4-Isopropyltoluene	20.06	1.0	20	0	100	77 - 127	19.85	1.08	20	
4-Methyl-2-pentanone	36.29	2.0	40	0	90.7	67 - 130	34.82	4.13	20	
Acetone	41.68	2.0	40	3.335	95.9	39 - 160	41.99	0.736	20	
Benzene	18.22	1.0	20	0	91.1	79 - 120	18.13	0.484	20	
Bromobenzene	19	1.0	20	0	95.0	80 - 120	18.8	1.08	20	
Bromochloromethane	17.59	1.0	20	0	87.9	78 - 123	16.73	5	20	
Bromodichloromethane	18.21	1.0	20	0	91.1	79 - 125	17.95	1.46	20	
Bromoform	18.92	1.0	20	0	94.6	66 - 130	19.09	0.889	20	
Bromomethane	16.97	1.0	20	0	84.9	53 - 141	17.8	4.75	20	

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061486

QC BATCH REPORT

Batch ID: R342165 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19061486-06MSD** Units: **UG/L** Analysis Date: **09-Jul-2019 21:13**
Client ID: **MW18_062619** Run ID: **VOA6_342165** SeqNo: **5160806** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	35.88	2.0	40	0	89.7	64 - 133	36.46	1.62	20	
Carbon tetrachloride	18.62	1.0	20	0	93.1	72 - 136	18.84	1.2	20	
Chlorobenzene	18.38	1.0	20	0	91.9	82 - 118	18.46	0.416	20	
Chloroethane	16.35	1.0	20	0	81.8	60 - 138	16.76	2.47	20	
Chloroform	17.74	1.0	20	0	88.7	79 - 124	17.66	0.439	20	
Chloromethane	16.52	1.0	20	0	82.6	50 - 139	17.89	7.96	20	
cis-1,2-Dichloroethene	18.44	1.0	20	1.168	86.4	78 - 123	18.31	0.705	20	
cis-1,3-Dichloropropene	18.21	1.0	20	0	91.1	75 - 124	17.77	2.46	20	
Dibromochloromethane	18.84	1.0	20	0	94.2	74 - 126	18.54	1.58	20	
Dibromomethane	18.03	1.0	20	0	90.1	79 - 123	17.71	1.78	20	
Dichlorodifluoromethane	13.61	1.0	20	0	68.0	32 - 152	13.74	0.95	20	
Ethylbenzene	19.42	1.0	20	0	97.1	79 - 121	19.77	1.79	20	
Hexachlorobutadiene	20.48	1.0	20	0	102	66 - 134	19.63	4.28	20	
Isopropylbenzene	19.95	1.0	20	0	99.8	72 - 131	20.32	1.83	20	
m,p-Xylene	38.73	2.0	40	0	96.8	80 - 121	38.99	0.653	20	
Methylene chloride	16.64	2.0	20	0	83.2	74 - 124	16.67	0.171	20	
Naphthalene	17.64	1.0	20	0	88.2	61 - 128	17.21	2.48	20	
n-Butylbenzene	21.62	1.0	20	0	108	75 - 128	21.33	1.35	20	
n-Propylbenzene	19.27	1.0	20	0	96.4	76 - 126	19.43	0.819	20	
o-Xylene	18.9	1.0	20	0	94.5	78 - 122	18.8	0.507	20	
sec-Butylbenzene	20.53	1.0	20	0	103	77 - 126	20.42	0.574	20	
Styrene	18.86	1.0	20	0	94.3	78 - 123	18.96	0.511	20	
tert-Butylbenzene	20.08	1.0	20	0	100	78 - 124	19.92	0.779	20	
Tetrachloroethene	20.53	1.0	20	0	103	74 - 129	20.72	0.942	20	
Toluene	18.85	1.0	20	0	94.2	80 - 121	19.12	1.44	20	
trans-1,2-Dichloroethene	17.87	1.0	20	0	89.4	75 - 124	17.92	0.264	20	
trans-1,3-Dichloropropene	17.68	1.0	20	0	88.4	73 - 127	17.7	0.0757	20	
Trichloroethene	44.08	1.0	20	24.81	96.3	79 - 123	44.23	0.334	20	
Trichlorofluoromethane	17.21	1.0	20	0	86.0	65 - 141	17.42	1.24	20	
Vinyl chloride	15.43	1.0	20	0	77.1	58 - 137	15.68	1.62	20	
Surr: 1,2-Dichloroethane-d4	*48.88*	*1.0*	*50*	*0*	*97.8*	*81 - 118*	*47.92*	*1.99*	*20*	
Surr: 4-Bromofluorobenzene	*49.66*	*1.0*	*50*	*0*	*99.3*	*85 - 114*	*49.66*	*0*	*20*	
Surr: Dibromofluoromethane	*48.5*	*1.0*	*50*	*0*	*97.0*	*80 - 119*	*48.39*	*0.22*	*20*	
Surr: Toluene-d8	*49.88*	*1.0*	*50*	*0*	*99.8*	*89 - 112*	*51*	*2.23*	*20*	

ALS Houston, US Date: 17-Jul-19

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP 18 24
WorkOrder:	HS19061486

QC BATCH REPORT

Batch ID:	**R342165 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch:	HS19061486-05	HS19061486-06	HS19061486-07

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19061486**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

ALS Houston, US Date: 17-Jul-19

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 17-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19061486
Date/Time Received: **27-Jun-2019 08:30**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* 27-Jun-2019
eSignature | Date

Reviewed by: _____
eSignature | Date

Matrices: **Groundwater/Water**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.2c U/c	IR11
Cooler(s)/Kit(s):	44515	
Date/Time sample(s) sent to storage:	6/27/19 18:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

bhate

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE								Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
09-062619		26 Jun 2019	0735	-	N		WG	5	X	X	X												
C09_062619_MS		26 Jun 2019	0735	-	MS		WG	5	X	X	X												
C09_062619_MSD		26 Jun 2019	0735	-	SD		WG	5	X	X	X												
C06_062619		26 Jun 2019	0830	-	N		WG	5	X	X	X												
MW16_062619		26 Jun 2019	0900	-	N		WG	5	X	X	X												
18PTMW18_062619		26 Jun 2019	1005	-	N		WG	6	X	X	X	X											
C03_062619		26 Jun 2019	1100	-	N		WG	6	X	X	X	X											
MW18_062619		26 Jun 2019	1155	-	N		WG	4	X	X													
MW18_062619_MS		26 Jun 2019	1155	-	MS		WG	4	X	X													
MW18_062619_MSD		26 Jun 2019	1155	-	SD		WG	4	X	X													
TRIP BLANK		26 Jun 2019		-	TB		W	2	X														

Sample Analysis Requested (5) | Quality Assurance Samples (6)

HS19061486
Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS:

Cooler 44515 Temp 2.2 IR11 CF-0.0

Custody Transfers Prior to Receipt by Laboratory

	Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1.	Scott Beesinger	6/26/19	1430	J WHARTON	6/27/19	08:30
2.						
3.						

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped No.:

Method of Shipment: _____

_____ Fed Ex _____ Airbill Number:

Analytical Lab: ALS 10450 Stanckff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected - custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SD = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

00942023

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44515

CUSTODY SEAL

Date: 6/26/19 Time: 1930
Name: Scott Beesinger
Company: BHPTS

Seal Broken By:

Date: 6/27/19

44515

FedEx
Express
4809 7834 3240

THU - 27 JUN 10:30A
PRIORITY OVERNIGHT

AB SGRA

44515

77099
TX-US
IAH

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1918528, 1918705, 1918871

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2270 (243267)

General Set Information: There were twenty-four field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1918705007 was analyzed and reported from a 1:10 dilution. Field sample 1918528010 was analyzed and reported from a 1:100 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 663033) was less than 1/2 the CRDL. The recovery for the LCS (663034) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 1918705002/03 and 1918705009/10 (Client ID's: CO9_062619 and MW18_062619). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The MS/MSD percent recoveries and relative percent difference were within the performance limits. The MS (1918705002MS) failed QC acceptance criteria for percent recovery. MS/MSD 1918705002/03 also failed the relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 663031) is reported from the analysis of the Laboratory Control Sample (LCS – 663034) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafile 11JULD20.

Thomas Bosch July 12, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: July 12, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1918705**
Project ID: HS19061486
Purchase Order: HS19061486
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
CO9_062619	1918705001	06/26/19	06/28/19	
C06_062619	1918705004	06/26/19	06/28/19	
18WW16_062619	1918705005	06/26/19	06/28/19	
18CPTMW18_062619	1918705006	06/26/19	06/28/19	
CO3_062619	1918705007	06/26/19	06/28/19	
MW18_062619	1918705008	06/26/19	06/28/19	

Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
CO9_062619 MS	1918705002	06/26/19	06/28/19	
CO9_062619 MSD	1918705003	06/26/19	06/28/19	
MW18_062619 MS	1918705009	06/26/19	06/28/19	
MW18_062619 MSD	1918705010	06/26/19	06/28/19	

***Client QC is reported as part of the Quality Control results report, if requested.**

ANALYTICAL REPORT

Workorder: 34-1918705
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **CO9_062619** | Sampling Site: NA | Collected: 06/26/2019
Lab ID: 1918705001 | Media: 250 mL Nalgene | Received: 06/28/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 14:39 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **C06_062619** | Sampling Site: NA | Collected: 06/26/2019
Lab ID: 1918705004 | Media: 250 mL Nalgene | Received: 06/28/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 15:21 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18WW16_062619** | Sampling Site: NA | Collected: 06/26/2019
Lab ID: 1918705005 | Media: 250 mL Nalgene | Received: 06/28/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 15:35 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**4.4**	1.0	2.0	4.0	1	

Sample ID: **18CPTMW18_062619** | Sampling Site: NA | Collected: 06/26/2019
Lab ID: 1918705006 | Media: 250 mL Nalgene | Received: 06/28/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 15:49 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

ANALYTICAL REPORT

Workorder: 34-1918705
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **CO3_062619** | Sampling Site: NA | Collected: 06/26/2019
Lab ID: 1918705007 | Media: 250 mL Nalgene | Received: 06/28/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 16:03 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**54**	10	20	40	10	

Sample ID: **MW18_062619** | Sampling Site: NA | Collected: 06/26/2019
Lab ID: 1918705008 | Media: 250 mL Nalgene | Received: 06/28/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 16:17 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/12/2019 10:14	/S/ Stephen Brose 07/12/2019 11:30

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1918705
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1918705

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2270 (HBN: 243267)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 663033
Analyzed: 07/11/2019 11:53
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 663034
Analyzed: 07/11/2019 11:26
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.41	4.00	110	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

	Sample: 1918705001	MS: 1918705002	MSD: 1918705003
	Analyzed: 07/11/2019 14:39	Analyzed: 07/11/2019 14:52	Analyzed: 07/11/2019 15:06
	Dilution: 1	Dilution: 1	Dilution: 1
	Units: ug/L	Units: ug/L	Units: ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	5.21	4	# 130	78.8	123.8	4.09	102	# 24	0.0	20.0

	Sample: 1918705008	MS: 1918705009	MSD: 1918705010
	Analyzed: 07/11/2019 16:17	Analyzed: 07/11/2019 16:31	Analyzed: 07/11/2019 16:45
	Dilution: 1	Dilution: 1	Dilution: 1
	Units: ug/L	Units: ug/L	Units: ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.4	4	110	78.8	123.8	3.92	98.0	11.5	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/12/2019 10:17	07/12/2019 11:30

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19061486	***Split:***	**Workorder ID:** 1918705	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 250Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 8850, DoD QSM
1	06/26/2019 07:35	CO9_062619	1918705001		Water	A	1	A
2	06/26/2019 07:35	CO9_062619 MS	1918705002	MS	Water	A	1	A
3	06/26/2019 07:35	CO9_062619 MSD	1918705003	MSD	Water	A	1	A
4	06/26/2019 08:30	C06_062619	1918705004		Water	A	1	A
5	06/26/2019 09:00	18WW16_062619	1918705005		Water	A	1	A
6	06/26/2019 10:05	18CPTMW18_062619	1918705006		Water	A	1	A
7	06/26/2019 11:00	CO3_062619	1918705007		Water	A	1	A
8	06/26/2019 11:55	MW18_062619	1918705008		Water	A	1	A
9	06/26/2019 11:55	MW18_062619 MS	1918705009	MS	Water	A	1	A
10	06/26/2019 11:55	MW18_062619 MSD	1918705010	MSD	Water	A	1	A

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Cortes, Gayleen	06/28/2019 09:03	ALS Sample Receiving	Sample Login
R331	6.28.19 1335	3B	STORAGE
	7.10.19/10:25	T. Bosch	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00942032

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

18698/2

COC ID: **11696**

1918705

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19061486
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
(3) 1.	**HS19061486-01**	**CO9_062619**	**Groundwater**	**26 Jun 2019 07:35**
	SUB_Perch-6850			08 Jul 2019
2.	**HS19061486-02**	**CO6_062619**	**Groundwater**	**26 Jun 2019 08:30**
	SUB_Perch-6850			08 Jul 2019
3.	**HS19061486-03**	**18WW16_062619**	**Groundwater**	**26 Jun 2019 09:00**
	SUB_Perch-6850			08 Jul 2019
4.	**HS19061486-04**	**18CPTMW18_062619**	**Groundwater**	**26 Jun 2019 10:05**
	SUB_Perch-6850			08 Jul 2019
5.	**HS19061486-05**	**CO3_062619**	**Groundwater**	**26 Jun 2019 11:00**
	SUB_Perch-6850			08 Jul 2019
(3) 6.	**HS19061486-06**	**MW18_062619**	**Groundwater**	**26 Jun 2019 11:55**
	SUB_Perch-6850			08 Jul 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
Use HS19061486-01 & HS19061486-06 as MS/MSD

QC Level: DOD IV (DoD Data Package)

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **11696**

Relinquished By: [signature] Date/Time: 6/27/19 1800

Received By: [signature] Date/Time: 6.28.19 0903

Cooler ID(s): Temperature(s):

ALS-SALT LAKE CITY-RELATED INFORMATION REPORT (CRIR)

COOLER OR CONTAINER INFORMATION CHECKLIST (Fill In or Circle)

Client Name: ALS HOUSTON

Project/Task/Site: HS19061486 & HS19061482

Date/Time of Receipt: 6.28.19 0903

Number of Coolers Received: (1)

Condition of Coolers:	(Acceptable)/Unacceptable	Temperature Control:	(Present)/Not Included
Cooler Custody Seals:	(Present)/Absent/NA		
	(Intact)/Broken/NA	Location Temp Taken:	(Control)/Between Samples
Container Custody Seals:	Present/(Absent)/NA		
	Intact/Broken/(NA)	Are all temperatures within project specific guidelines?	(Yes)/No/NA
Ice Present:	(Yes)/No/NA		
	Frozen/(Melted)/NA	VOA Headspace Present?	Yes/(No)/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9734	1 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: [signature] Signature — GAYLEEN COATES Printed Name — 6.28.19 Date

CLIENT-RELATED INFORMATION

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

BRIEFLY DESCRIBE THE PROBLEM AND THE ACTION TAKEN:

Client Notified? YES ☐ NO ☐

Response Required Within 24 Hours

PROJECT MANAGEMENT

PROJECT MANAGER COMMENTS:

ALS Project Manager: _____ Printed Name — Returned to Sample Receipt by: _____ Signature — Date: _____

00942036

Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 159469-4334 RIT2 EXP 02/20

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 27JUN19
ACTWGT: 23.90 LB
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

BILL THIRD PARTY

JC04/1022/TJCS5

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19061482/1486 - RJ

FedEx Express

J1811180805111

FRI - 28 JUN 3:00P
STANDARD OVERNIGHT

TRK# 0201 4809 7835 4546

AX BTFA

84123
UT-US SLC

Batch Worklist

Batch: ELMS/ 2270 Created: 7/10/2019 13:34 Instrument: HBN: 243267
Rule: EPA 6850, DoD QSM Water Analyst: T. Bosch Status: WP

Workorder: 1918528 [ENV_LVL4]
Workorder: 1918705 [ENV_LVL4]
Workorder: 1918871 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	663030	CCV for HBN 243267 [ELMS/2270]				CCV	3		E685041C3Q	5311		7/11/2019	
2	663031	RLVS for HBN 243267 [ELMS/2270				RLVS	3		E685041C3Q	5311		7/11/2019	
3	663032	ICS for HBN 243267 [ELMS/2270]				ICS	3		E6850..D3Q	5311		7/11/2019	
4	663033	LMB for HBN 243267 [ELMS/2270]				LMB	3		E6850Q413Q	5311		7/11/2019	
5	663034	LCS for HBN 243267 [ELMS/2270]				LCS	3		E6850Q413Q	5311		7/11/2019	
6	1918528001	17WW08_062519				SAMPLE	3	1918528001-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
7	1918528002	130_062519				SAMPLE	3	1918528002-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
8	1918528003	130_062519_a				SAMPLE	3	1918528003-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
9	1918528004	MW10_062519				SAMPLE	3	1918528004-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
10	1918528005	MW13_062519				SAMPLE	3	1918528005-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
11	1918528006	CO2_062519				SAMPLE	3	1918528006-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
12	1918528007	MW17_062519				SAMPLE	3	1918528007-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
13	1918528008	18WW10_062519				SAMPLE	3	1918528008-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
14	1918528009	18WW10_062519_a				SAMPLE	3	1918528009-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
15	1918528010	MW9_062519				SAMPLE	3	1918528010-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
16	663035	CCV for HBN 243267 [ELMS/2270]				CCV	3		E685041C3Q	5311		7/11/2019	
17	1918705001	CO9_062619				SAMPLE	3	1918705001-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
18	1918705002	CO9_062619 MS				MS	3	1918705002-A	E6850Q413Q	5480		7/11/2019	
19	1918705003	CO9_062619 MSD				MSD	3	1918705003-A	E6850Q413Q	5480		7/11/2019	
20	1918705004	C06_062619				SAMPLE	3	1918705004-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
21	1918705005	18WW16_062619				SAMPLE	3	1918705005-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
22	1918705006	18CPTMW18_062619				SAMPLE	3	1918705006-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
23	1918705007	CO3_062619				SAMPLE	3	1918705007-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
24	1918705008	MW18_062619				SAMPLE	3	1918705008-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
25	1918705009	MW18_062619 MS				MS	3	1918705009-A	E6850Q413Q	5480		7/11/2019	
26	1918705010	MW18_062619 MSD				MSD	3	1918705010-A	E6850Q413Q	5480		7/11/2019	
27	663036	CCV for HBN 243267 [ELMS/2270]				CCV	3		E685041C3Q	5311		7/11/2019	

00942037

Batch Worklist

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
28	1918871001	18WW08_062719				SAMPLE	3	1918871001-A	E6850Q41.3	5480	7/25/2019	7/12/2019	
29	1918871002	18WW09_062719				SAMPLE	3	1918871002-A	E6850Q41.3	5480	7/25/2019	7/12/2019	
30	1918871003	18CPTMW16_062719				SAMPLE	3	1918871003-A	E6850Q41.3	5480	7/25/2019	7/12/2019	
31	1918871004	18WW2516_062719				SAMPLE	3	1918871004-A	E6850Q41.3	5480	7/25/2019	7/12/2019	
32	663037	CCV for HBN 243267 [ELMS/2270]				CCV	3		E685041C3Q	5311		7/11/2019	

00942038

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1918528 (001-10), 1918705 (001-10); 1918871 (001-04)
ELMS Batch/HBN ID: 2270 (243267)
Prep Date: 07/10/2019 Analysis Date: 07/11/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\11JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 30µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 663034; Target = 4.0µg/L. ASTM type II water was used for LMB 663033.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on samples 1918705002/03 and 1918705009/10 (Client ID's: CO9_062619 and MW18_062619). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field sample 1918705007 was analyzed and reported from a 1:10 dilution. Field sample 1918528010 was analyzed and reported from a 1:100 dilution. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS (1918705002MS) failed QC acceptance criteria for percent recovery. MS/MSD 1918705002/03 also failed the relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\243267-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 663031) is reported from the analysis of the Laboratory Control Sample (LCS – 663034) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 11JULD20.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2270 HBN: 243267 Sample Set IDs if Applicable: 1918528/1918705/1918871	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SD
Standards traceability checked and meets criteria	TB	SD
Standard curve coefficients evaluated and meet criteria	TB	SD
ICVs analyzed and meet acceptance criteria	TB	SD
CCVs analyzed and meet acceptance criteria	TB	SD
Method Blanks analyzed and meet acceptance criteria	TB	SD
Retention Time Windows checked	TB	SD
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SD
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SD
RLVS analyzed	TB	SD
Preparation and analysis hold times met	TB	SD
Preparation deviations and re-preparations noted when performed	TB	SD
Analysis deviations and re-analyses noted when performed	TB	SD
Sample dilution factors noted on reports	TB	SD
Electronic records in HBN transcription accuracy and completeness checked	TB	SD
Preparation and analysis calculations checked	TB	SD
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SD
Manual integrations checked	TB	SD

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP—0861

Last Issued Date: 29-Feb 2016
Expiration Date: 31-Mar2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material {RM} was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials *used* for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyteconcentrationswere verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity[%]	Calculated Value	True Value	Traceability & Method
Perchlorate	Potassium perchlorate	RM079B7	100	1001± 5 µg/ml	976±6 µg/ml	NIST SRM 3141A; ICP-DES

Solvent: water {low TDC, < 50 ppb)

Storage: Store at Room Temperature {15" to 30°C}.

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated dass A glassware is used for volumetric measurements. Thennometers are calibrated against a NIST traceable thermometer In accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration bf instruments, Vc1lidation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at ZO·C to 25"C immediately after opening and should be processed without delay for the true value to be valid wtthin the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, INithin the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED TESTING LABORATORY

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

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New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number . Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Report: C:\HPCHEM\1\DATA\11JUL19D\11JUL19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	663030 CCV@25	Vial 71	1	Control	1	2.11871e6	8.255	26.67636
*	663034 QC@4.0	Vial 41	1	Control	2	3.99419e5	7.994	4.40774
*	663032 ICS@4.0	Vial 42	1	Control	3	3.13185e5	7.844	3.89337
*	663033 LMB	Vial 43	1	Control	4	0.00000	0.000	0.00000
*	1918528001	Vial 44	1	Sample	5	0.00000	0.000	0.00000
*	1918528002	Vial 45	1	Sample	6	0.00000	0.000	0.00000
*	1918528003	Vial 46	1	Sample	7	0.00000	0.000	0.00000
*	1918528004	Vial 47	1	Sample	8	0.00000	0.000	0.00000
*	1918528005	Vial 48	1	Sample	9	0.00000	0.000	0.00000
*	1918528006	Vial 49	1	Sample	10	0.00000	0.000	0.00000
*	1918528007	Vial 50	1	Sample	11	0.00000	0.000	0.00000
*	1918528008	Vial 51	1	Sample	12	0.00000	0.000	0.00000
*	1918528009	Vial 52	1	Sample	13	0.00000	0.000	0.00000
*	1918528010 100	Vial 53	1	Sample	14	4.15809e5	8.321	518.23230
*	663035 CCV@25	Vial 71	1	Control	15	2.05306e6	8.245	25.67471
*	1918705001	Vial 54	1	Sample	16	0.00000	0.000	0.00000
*	1918705002 MS	Vial 55	1	Sample	17	3.65014e5	7.751	5.20905
*	1918705003 MSD	Vial 56	1	Sample	18	3.50062e5	7.740	4.09212
*	1918705004	Vial 57	1	Sample	19	0.00000	0.000	0.00000
*	1918705005	Vial 58	1	Sample	20	2.64722e5	7.233	4.40918
*	1918705006	Vial 59	1	Sample	21	0.00000	0.000	0.00000
*	1918705007 10X	Vial 60	1	Sample	22	4.80293e5	8.237	53.73554
*	1918705008	Vial 61	1	Sample	23	0.00000	0.000	0.00000
*	1918705009 MS	Vial 62	1	Sample	24	2.88361e5	7.509	4.39917
*	1918705010 MSD	Vial 63	1	Sample	25	2.77079e5	7.505	3.92076
*	663036 CCV@25	Vial 71	1	Control	26	1.87786e6	8.284	25.56775
*	1918871001	Vial 64	1	Sample	27	0.00000	0.000	0.00000
*	1918871002	Vial 65	1	Sample	28	0.00000	0.000	0.00000
*	1918871003	Vial 66	1	Sample	29	0.00000	0.000	0.00000
*	1918871004	Vial 67	1	Sample	30	0.00000	0.000	0.00000
*	663037 CCV@25	Vial 71	1	Control	31	1.97048e6	8.269	25.87251

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	663030 CCV@25	Vial 71	1	Control	1	6.24075e5	8.272	26.49423
*	663034 QC@4.0	Vial 41	1	Control	2	1.31480e5	7.999	4.73215
*	663032 ICS@4.0	Vial 42	1	Control	3	1.02079e5	7.839	4.11867
*	663033 LMB	Vial 43	1	Control	4	0.00000	0.000	0.00000
*	1918528001	Vial 44	1	Sample	5	0.00000	0.000	0.00000
*	1918528002	Vial 45	1	Sample	6	0.00000	0.000	0.00000
*	1918528003	Vial 46	1	Sample	7	0.00000	0.000	0.00000
*	1918528004	Vial 47	1	Sample	8	0.00000	0.000	0.00000
*	1918528005	Vial 48	1	Sample	9	0.00000	0.000	0.00000
*	1918528006	Vial 49	1	Sample	10	0.00000	0.000	0.00000
*	1918528007	Vial 50	1	Sample	11	0.00000	0.000	0.00000
*	1918528008	Vial 51	1	Sample	12	0.00000	0.000	0.00000
*	1918528009	Vial 52	1	Sample	13	0.00000	0.000	0.00000
*	1918528010 100	Vial 53	1	Sample	14	1.37449e5	8.342	561.78024
*	663035 CCV@25	Vial 71	1	Control	15	6.14214e5	8.269	25.87142
*	1918705001	Vial 54	1	Sample	16	0.00000	0.000	0.00000
*	1918705002 MS	Vial 55	1	Sample	17	1.12801e5	7.762	5.28376
*	1918705003 MSD	Vial 56	1	Sample	18	1.10963e5	7.755	4.21966
*	1918705004	Vial 57	1	Sample	19	0.00000	0.000	0.00000
*	1918705005	Vial 58	1	Sample	20	9.11835e4	7.238	4.95128
*	1918705006	Vial 59	1	Sample	21	0.00000	0.000	0.00000
*	1918705007 10X	Vial 60	1	Sample	22	1.65863e5	8.254	60.89054
*	1918705008	Vial 61	1	Sample	23	0.00000	0.000	0.00000
*	1918705009 MS	Vial 62	1	Sample	24	9.39754e4	7.516	4.67594
*	1918705010 MSD	Vial 63	1	Sample	25	9.16631e4	7.522	4.21052
*	663036 CCV@25	Vial 71	1	Control	26	5.59339e5	8.296	25.65584

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#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	1918871001	Vial 64	1	Sample	27	0.00000	0.000	0.00000
*	1918871002	Vial 65	1	Sample	28	0.00000	0.000	0.00000
*	1918871003	Vial 66	1	Sample	29	0.00000	0.000	0.00000
*	1918871004	Vial 67	1	Sample	30	0.00000	0.000	0.00000
*	663037 CCV@25	Vial 71	1	Control	31	5.83651e5	8.278	25.82631

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	663030 CCV@25	Vial 71	1	Control	1	2.40676e5	8.290	5.00000
*	663034 QC@4.0	Vial 41	1	Control	2	2.97198e5	8.012	5.00000
*	663032 ICS@4.0	Vial 42	1	Control	3	2.65421e5	7.859	5.00000
*	663033 LMB	Vial 43	1	Control	4	3.18343e5	8.270	5.00000
*	1918528001	Vial 44	1	Sample	5	2.09428e5	7.499	5.00000
*	1918528002	Vial 45	1	Sample	6	2.27592e5	7.803	5.00000
*	1918528003	Vial 46	1	Sample	7	2.83805e5	7.792	5.00000
*	1918528004	Vial 47	1	Sample	8	2.31744e5	7.766	5.00000
*	1918528005	Vial 48	1	Sample	9	2.65465e5	7.949	5.00000
*	1918528006	Vial 49	1	Sample	10	3.02483e5	7.805	5.00000
*	1918528007	Vial 50	1	Sample	11	2.39370e5	7.809	5.00000
*	1918528008	Vial 51	1	Sample	12	2.57536e5	7.582	5.00000
*	1918528009	Vial 52	1	Sample	13	3.47245e5	7.601	5.00000
*	1918528010 100	Vial 53	1	Sample	14	2.61248e5	8.355	500.00000
*	663035 CCV@25	Vial 71	1	Control	15	2.42892e5	8.260	5.00000
*	1918705001	Vial 54	1	Sample	16	3.40152e5	7.747	5.00000
*	1918705002 MS	Vial 55	1	Sample	17	2.28107e5	7.767	5.00000
*	1918705003 MSD	Vial 56	1	Sample	18	2.81563e5	7.755	5.00000
*	1918705004	Vial 57	1	Sample	19	2.40535e5	7.689	5.00000
*	1918705005	Vial 58	1	Sample	20	1.96905e5	7.258	5.00000
*	1918705006	Vial 59	1	Sample	21	1.63865e5	7.481	5.00000
*	1918705007 10X	Vial 60	1	Sample	22	2.90576e5	8.248	50.00000
*	1918705008	Vial 61	1	Sample	23	2.37165e5	7.528	5.00000
*	1918705009 MS	Vial 62	1	Sample	24	2.14999e5	7.533	5.00000
*	1918705010 MSD	Vial 63	1	Sample	25	2.33099e5	7.524	5.00000
*	663036 CCV@25	Vial 71	1	Control	26	2.23151e5	8.308	5.00000
*	1918871001	Vial 64	1	Sample	27	2.17462e5	7.475	5.00000
*	1918871002	Vial 65	1	Sample	28	2.52228e5	7.881	5.00000
*	1918871003	Vial 66	1	Sample	29	2.97108e5	7.854	5.00000
*	1918871004	Vial 67	1	Sample	30	2.73039e5	7.829	5.00000
*	663037 CCV@25	Vial 71	1	Control	31	2.31231e5	8.296	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\11JUL19D.S

Sequence Table:

Method and Injection Info Part:

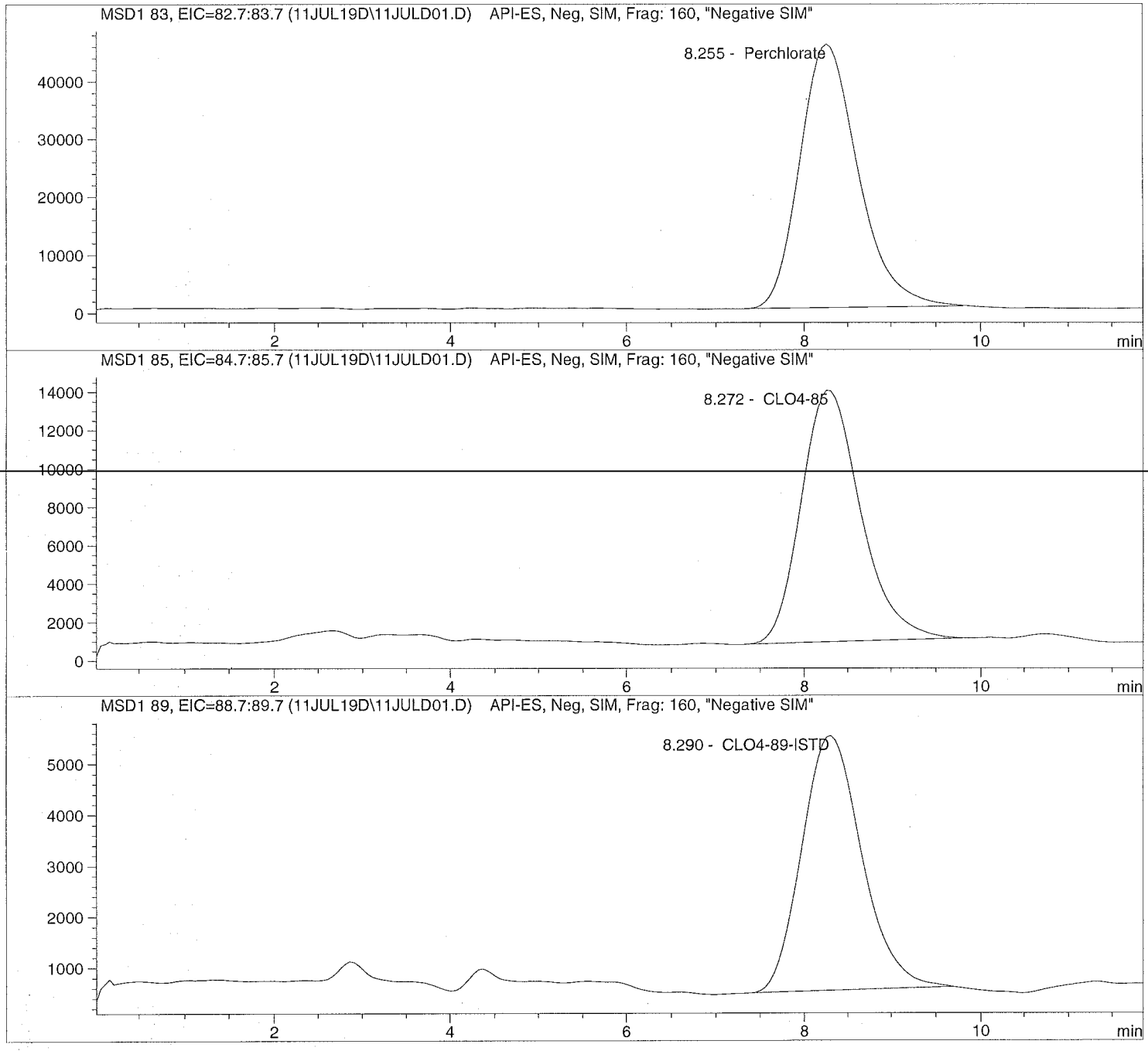
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	663030	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 41	663034	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 42	663032	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 43	663033	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 44	1918528001		CLO4-AQN	1	Sample		
6	Vial 45	1918528002		CLO4-AQN	1	Sample		
7	Vial 46	1918528003		CLO4-AQN	1	Sample		
8	Vial 47	1918528004		CLO4-AQN	1	Sample		
9	Vial 48	1918528005		CLO4-AQN	1	Sample		
10	Vial 49	1918528006		CLO4-AQN	1	Sample		
11	Vial 50	1918528007		CLO4-AQN	1	Sample		
12	Vial 51	1918528008		CLO4-AQN	1	Sample		
13	Vial 52	1918528009		CLO4-AQN	1	Sample		
14	Vial 53	1918528010	100	CLO4-AQN	1	Sample		
15	Vial 71	663035	CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 54	1918705001		CLO4-AQN	1	Sample		
17	Vial 55	1918705002	MS	CLO4-AQN	1	Sample		
18	Vial 56	1918705003	MSD	CLO4-AQN	1	Sample		
19	Vial 57	1918705004		CLO4-AQN	1	Sample		
20	Vial 58	1918705005		CLO4-AQN	1	Sample		
21	Vial 59	1918705006		CLO4-AQN	1	Sample		
22	Vial 60	1918705007	10X	CLO4-AQN	1	Sample		
23	Vial 61	1918705008		CLO4-AQN	1	Sample		
24	Vial 62	1918705009	MS	CLO4-AQN	1	Sample		
25	Vial 63	1918705010	MSD	CLO4-AQN	1	Sample		
26	Vial 71	663036	CCV@25	CLO4-AQN	1	Ctrl Samp		
27	Vial 64	1918871001		CLO4-AQN	1	Sample		
28	Vial 65	1918871002		CLO4-AQN	1	Sample		
29	Vial 66	1918871003		CLO4-AQN	1	Sample		
30	Vial 67	1918871004		CLO4-AQN	1	Sample		
31	Vial 71	663037	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD01.D Sample Name: 663030 CCV@25

Injection Date:	7/11/2019 11:12:20	Seq Line:	1
Sample Name:	663030 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD01.D Sample Name: 663030 CCV@25

Injection Date:	7/11/2019 11:12:20	Seq Line:	1
Sample Name:	663030 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.255	PBA	2118713.0	26.6764	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.272	PBA	624075.3	26.4942	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.290	PBA	240676.4	5.0000	CLO4-89-ISTD

*** End of Report ***

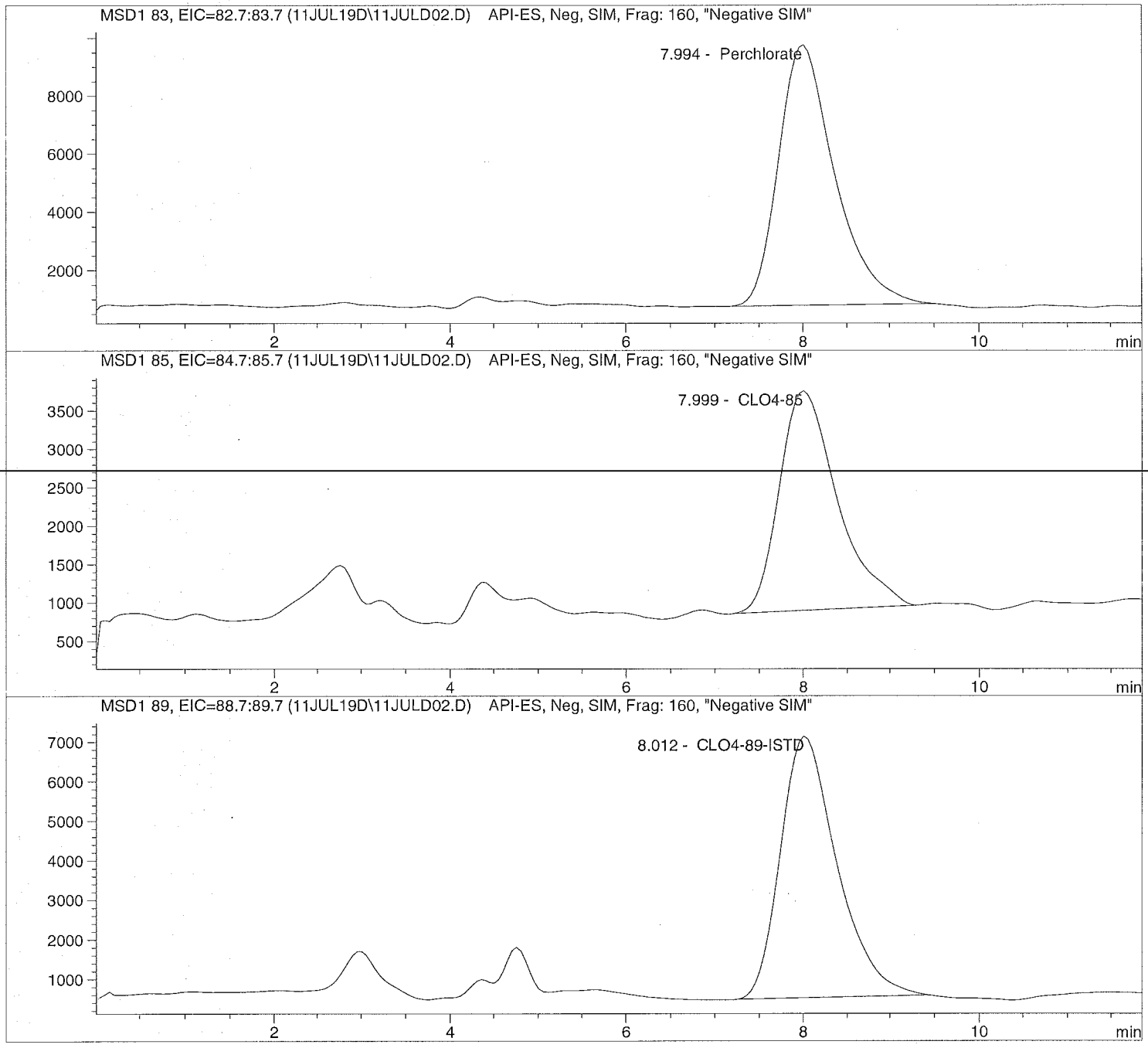
00942062

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD02.D Sample Name: 663034 QC@4.0

Injection Date:	7/11/2019 11:26:05	Seq Line:	2
Sample Name:	663034 QC@4.0	Location:	Vial 41
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD02.D Sample Name: 663034 QC@4.0

Injection Date:	7/11/2019 11:26:05	Seq Line:	2
Sample Name:	663034 QC@4.0	Location:	Vial 41
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.994	PBA	399419.3	4.4077	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.999	PBA	131479.8	4.7322	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.012	PBA	297197.6	5.0000	CLO4-89-ISTD

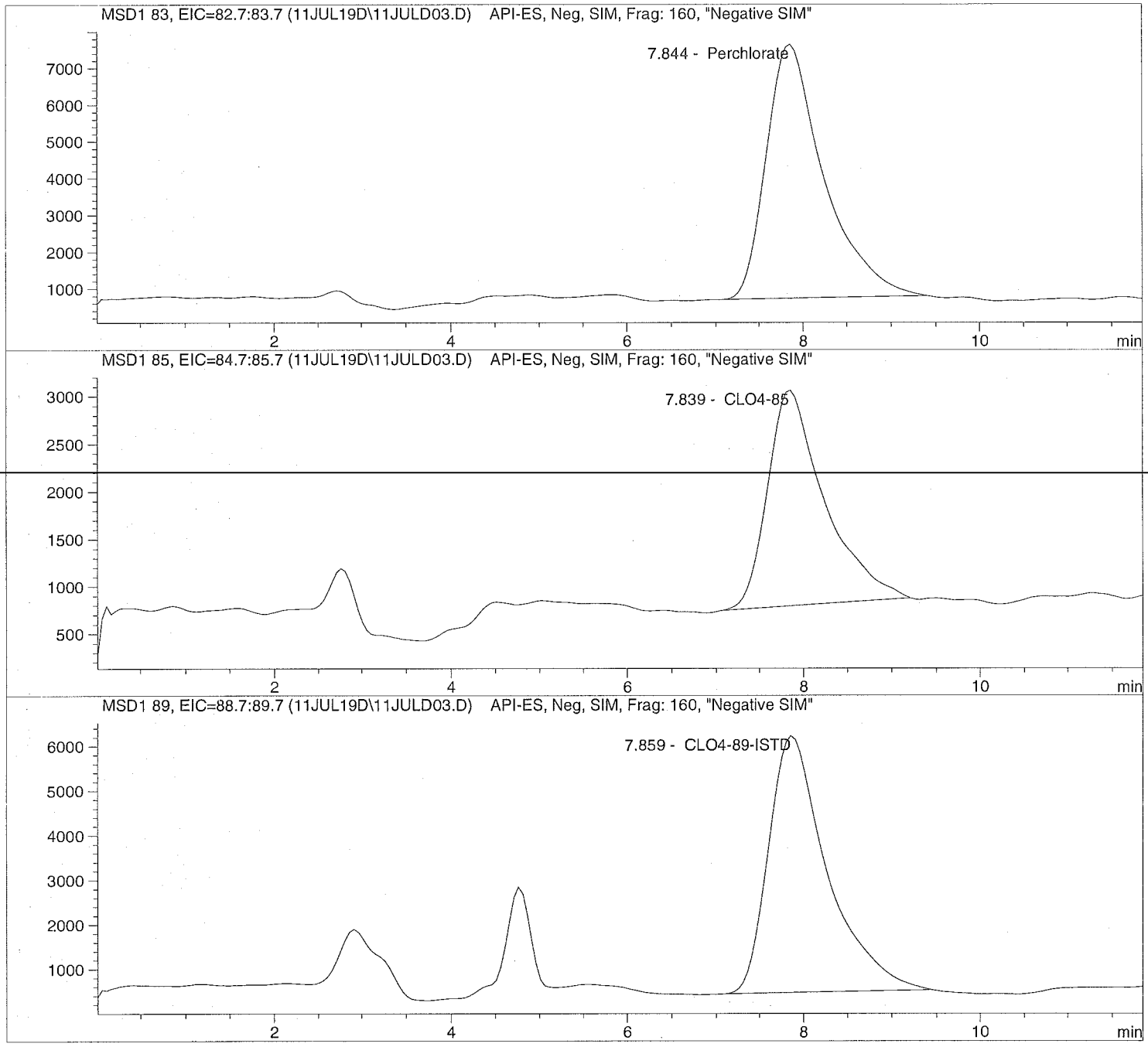
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD03.D Sample Name: 663032 ICS@4.0

Injection Date:	7/11/2019 11:39:52	Seq Line:	3
Sample Name:	663032 ICS@4.0	Location:	Vial 42
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD03.D Sample Name: 663032 ICS@4.0

Injection Date:	7/11/2019 11:39:52	Seq Line:	3
Sample Name:	663032 ICS@4.0	Location:	Vial 42
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.844	PBA	313184.6	3.8934	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.839	PBA	102078.9	4.1187	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.859	PBA	265421.4	5.0000	CLO4-89-ISTD

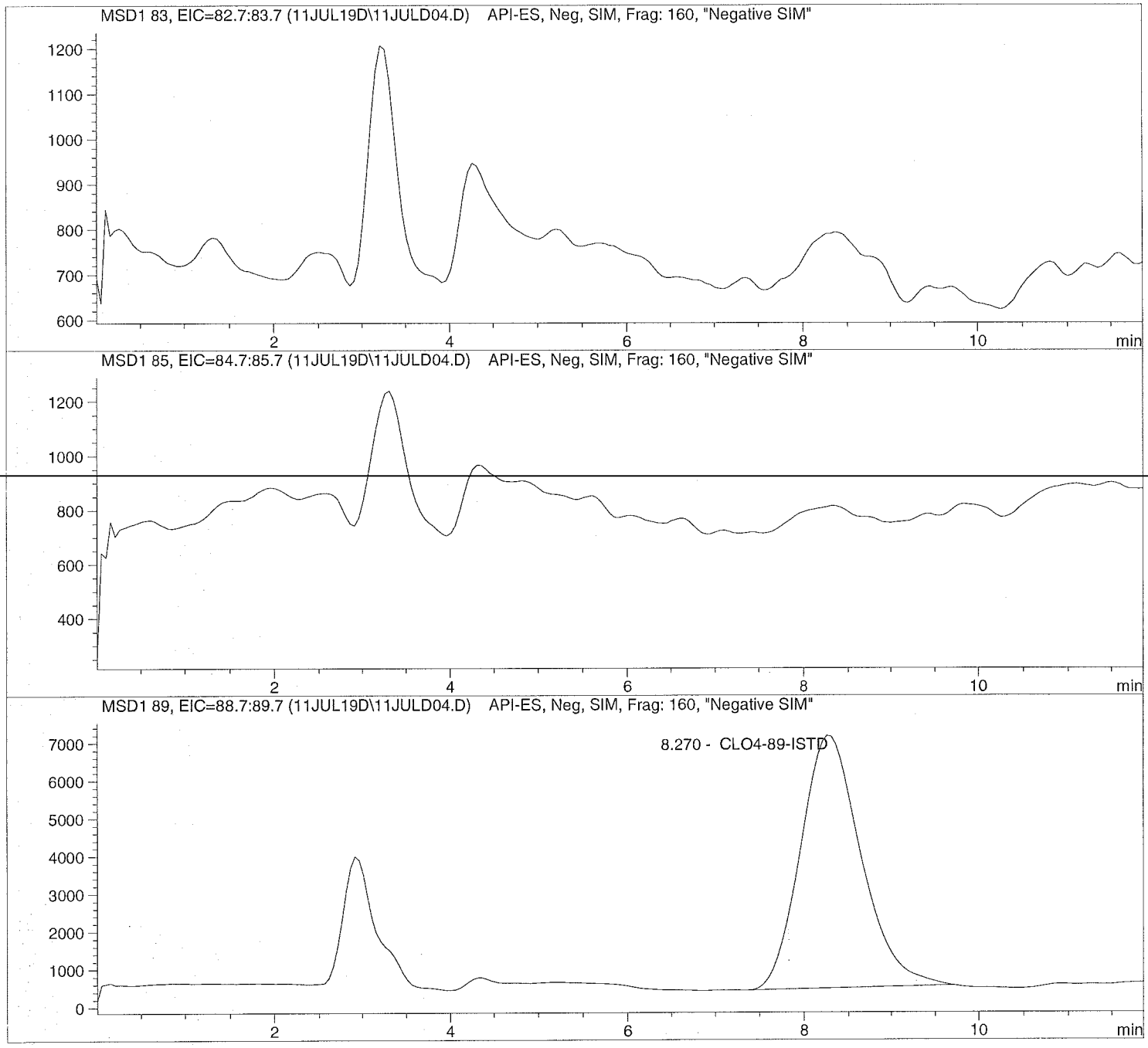
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD04.D Sample Name: 663033 LMB

Injection Date:	7/11/2019 11:53:41	Seq Line:	4
Sample Name:	663033 LMB	Location:	Vial 43
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD04.D Sample Name: 663033 LMB

Injection Date:	7/11/2019 11:53:41	Seq Line:	4
Sample Name:	663033 LMB	Location:	Vial 43
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.270	PBA	318342.8	5.0000	CLO4-89-ISTD

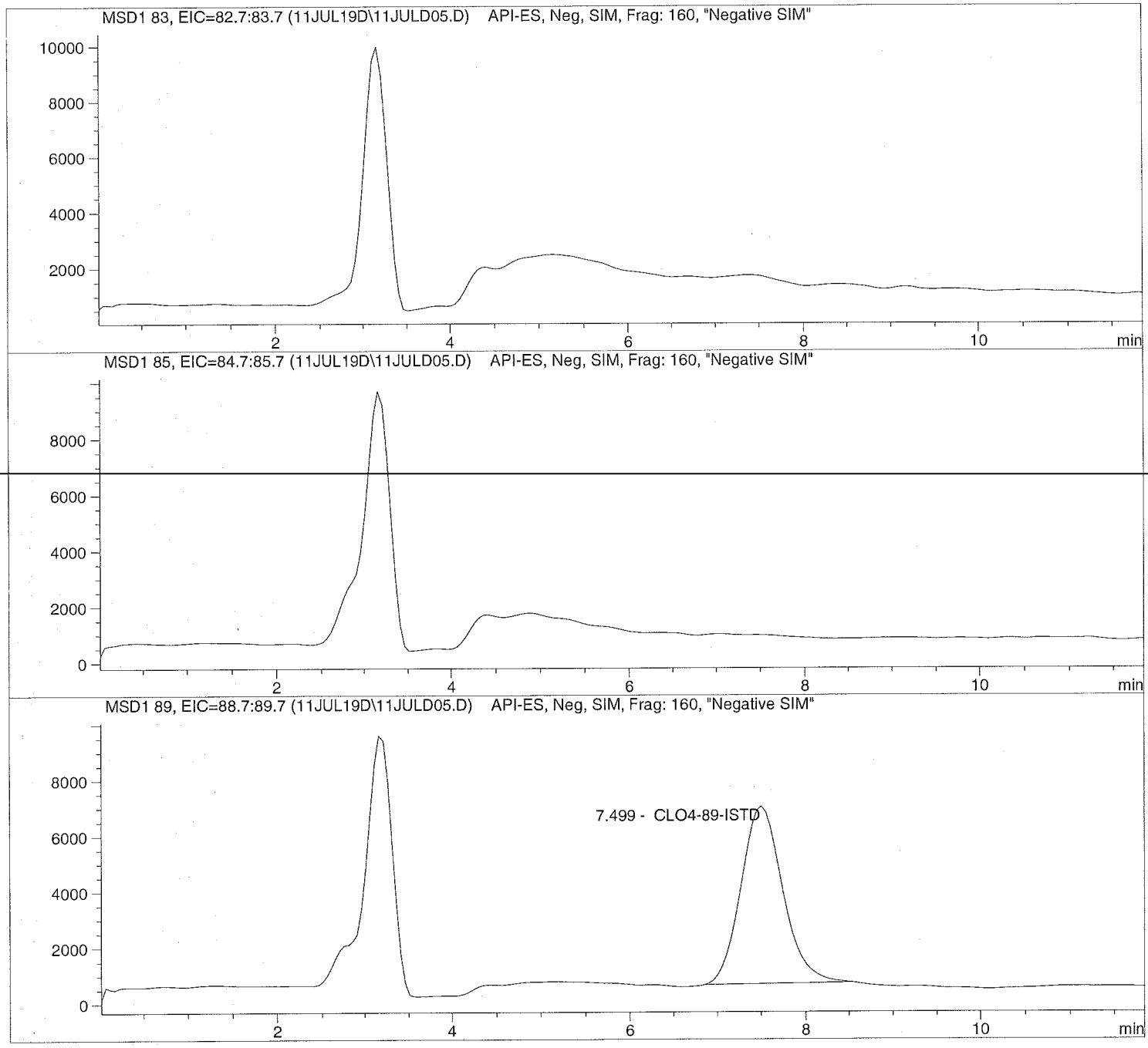
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD05.D Sample Name: 1918528001

Injection Date:	7/11/2019 12:07:26	Seq Line:	5
Sample Name:	1918528001	Location:	Vial 44
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD05.D Sample Name: 1918528001

Injection Date:	7/11/2019 12:07:26	Seq Line:	5
Sample Name:	1918528001	Location:	Vial 44
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.499	PBA	209428.4	5.0000	CLO4-89-ISTD

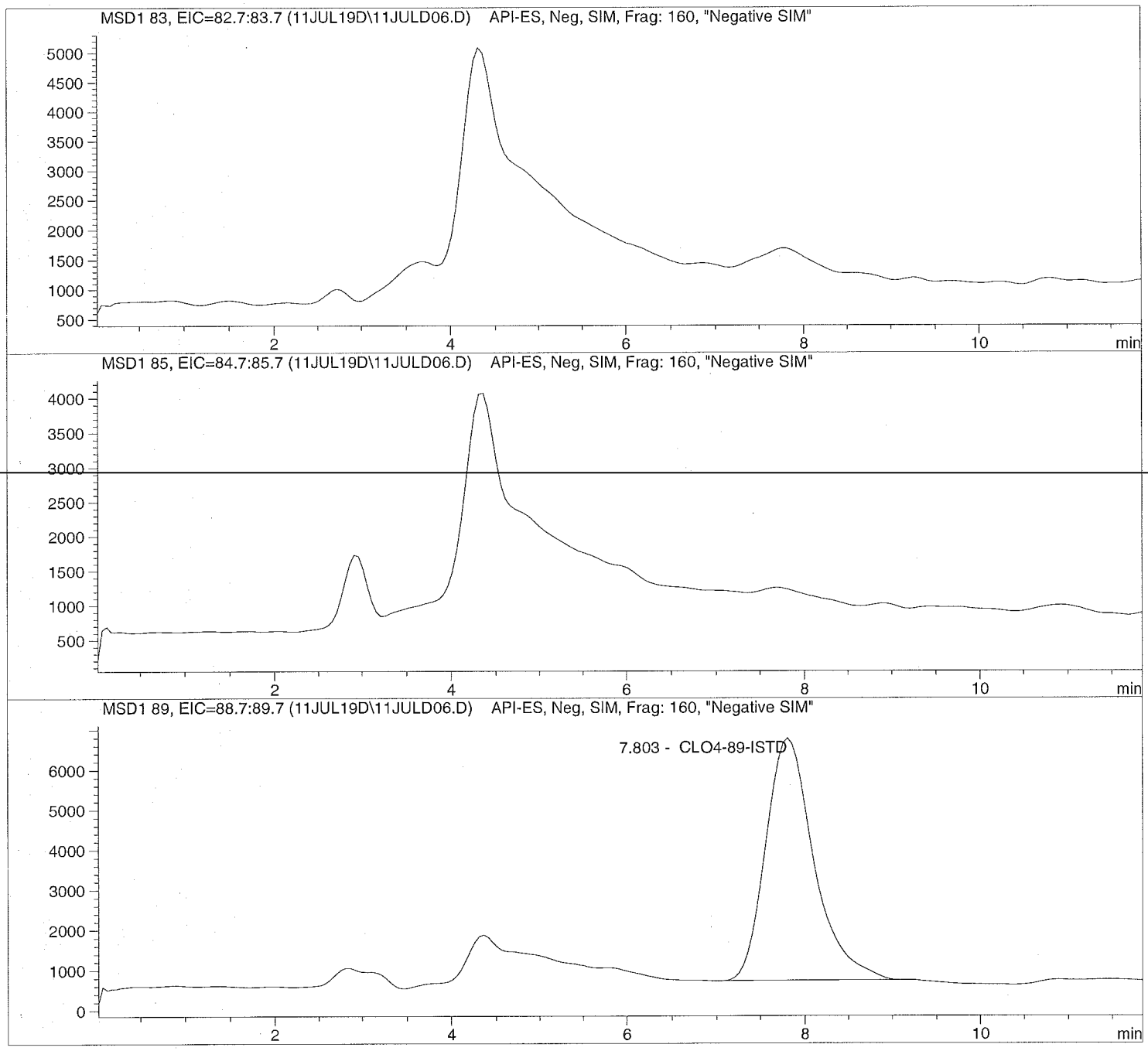
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD06.D Sample Name: 1918528002

Injection Date:	7/11/2019 12:21:11	Seq Line:	6
Sample Name:	1918528002	Location:	Vial 45
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD06.D Sample Name: 1918528002

Injection Date:	7/11/2019 12:21:11	Seq Line:	6
Sample Name:	1918528002	Location:	Vial 45
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.803	PBA	227591.6	5.0000	CLO4-89-ISTD

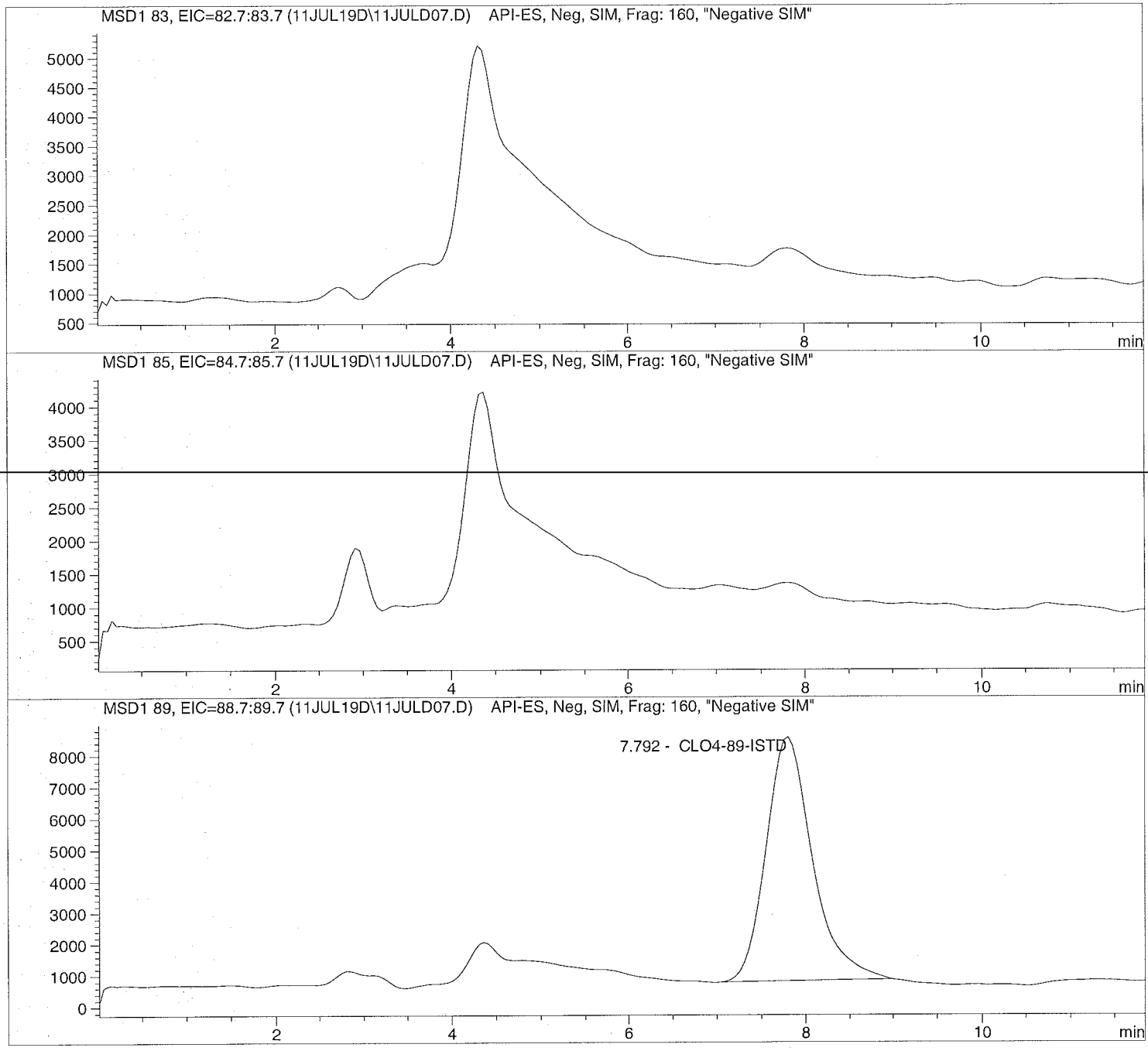
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD07.D Sample Name: 1918528003

Injection Date:	7/11/2019 12:34:58	Seq Line:	7
Sample Name:	1918528003	Location:	Vial 46
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD07.D Sample Name: 1918528003

Injection Date:	7/11/2019 12:34:58	Seq Line:	7
Sample Name:	1918528003	Location:	Vial 46
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.792	PBA	283804.7	5.0000	CLO4-89-ISTD

*** End of Report ***

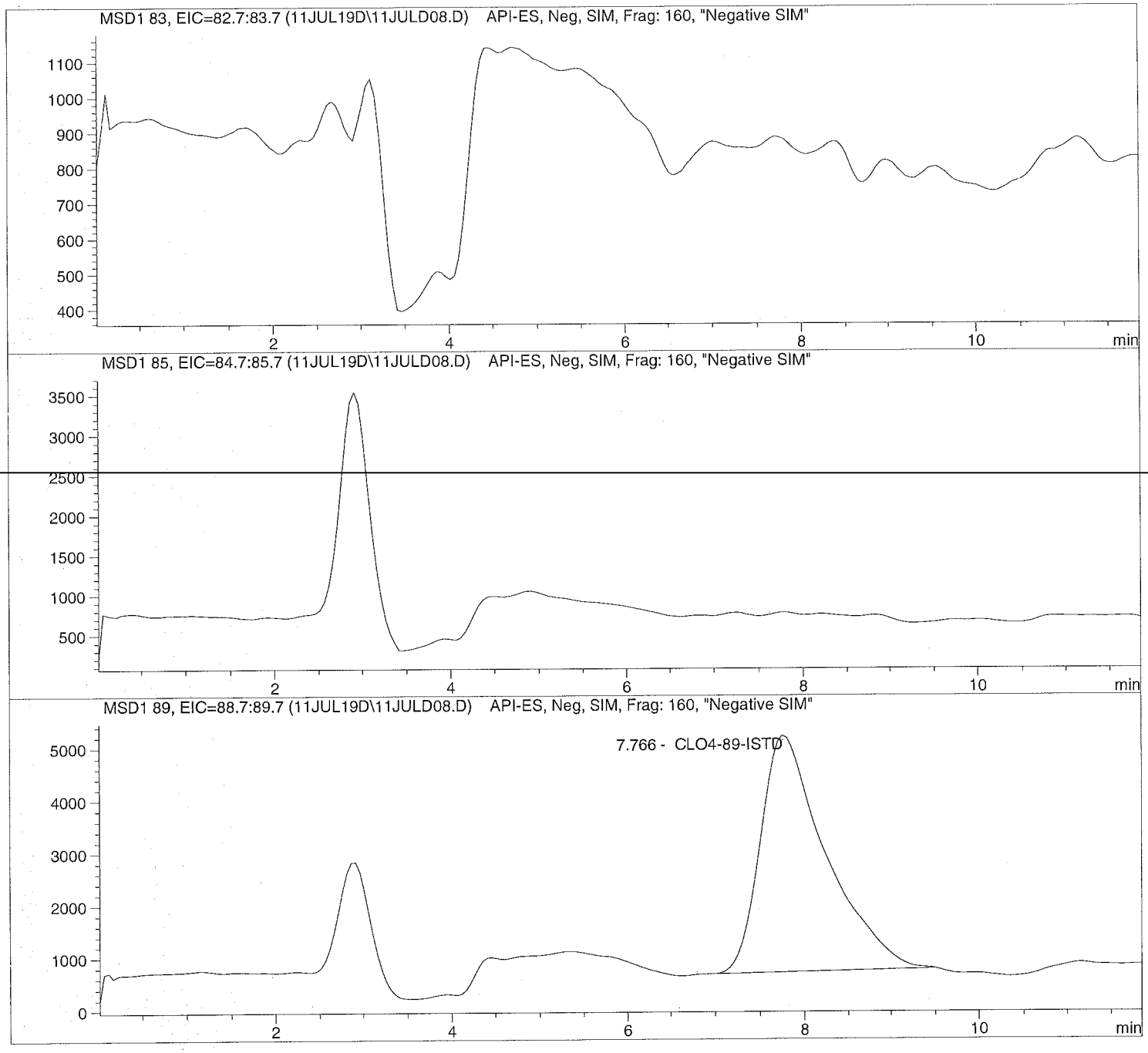
00942074

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD08.D Sample Name: 1918528004

Injection Date:	7/11/2019 12:48:44	Seq Line:	8
Sample Name:	1918528004	Location:	Vial 47
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD08.D Sample Name: 1918528004

Injection Date:	7/11/2019 12:48:44	Seq Line:	8
Sample Name:	1918528004	Location:	Vial 47
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.766	PBA	231743.6	5.0000	CLO4-89-ISTD

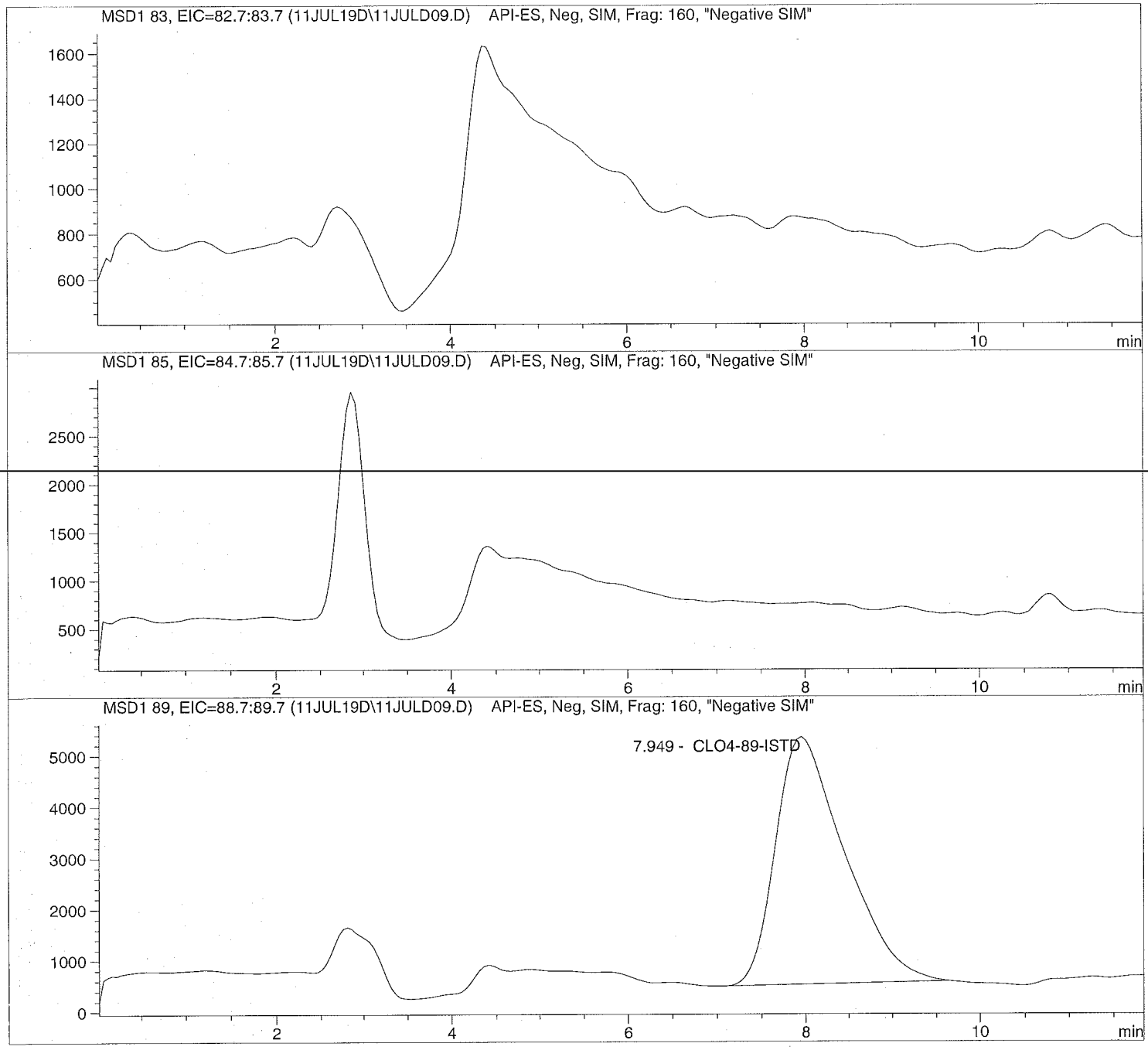
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD09.D Sample Name: 1918528005

Injection Date:	7/11/2019 13:02:32	Seq Line:	9
Sample Name:	1918528005	Location:	Vial 48
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD09.D Sample Name: 1918528005

Injection Date:	7/11/2019 13:02:32	Seq Line:	9
Sample Name:	1918528005	Location:	Vial 48
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.949	PBA	265464.7	5.0000	CLO4-89-ISTD

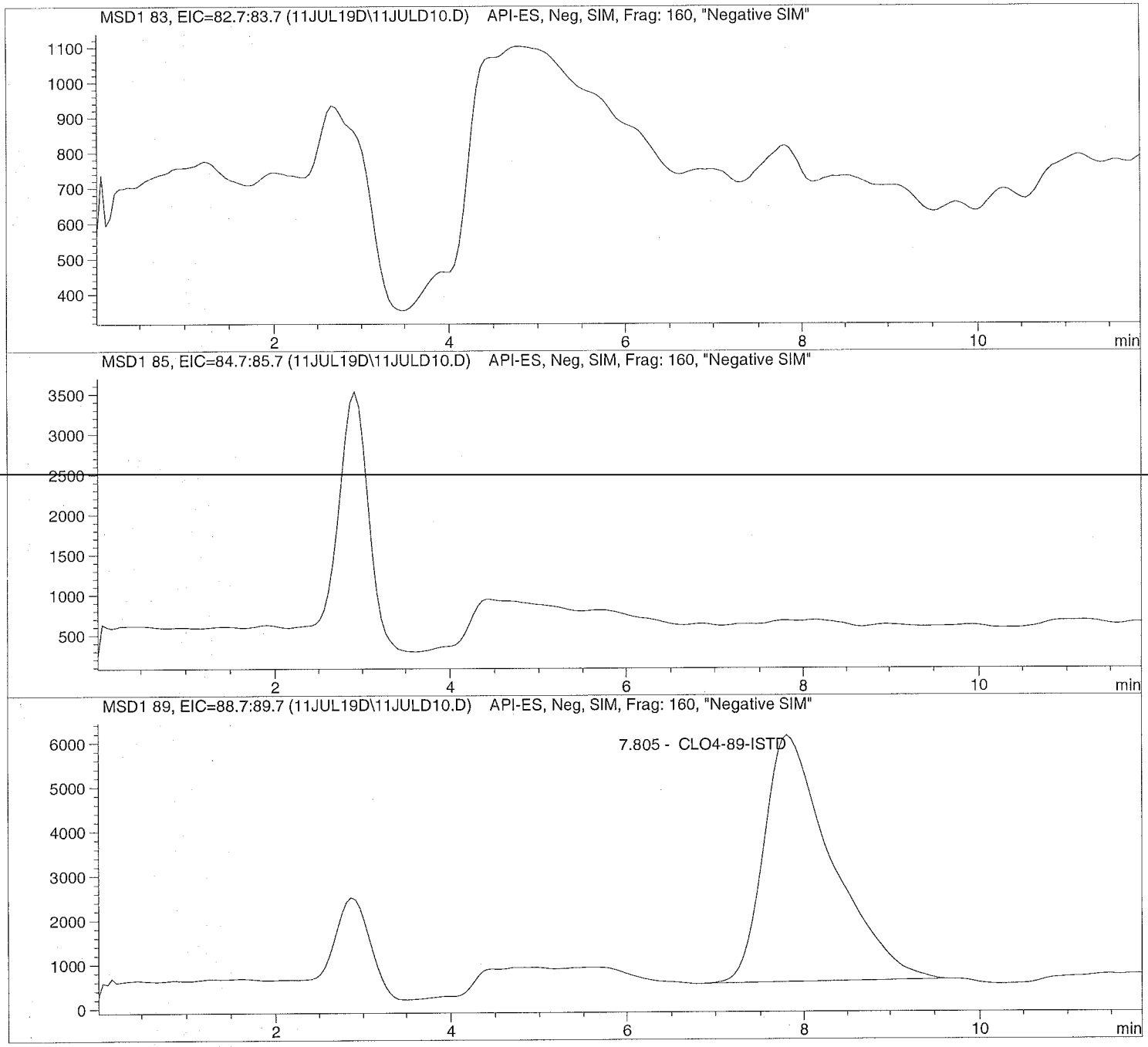
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD10.D Sample Name: 1918528006

Injection Date:	7/11/2019 13:16:18	Seq Line:	10
Sample Name:	1918528006	Location:	Vial 49
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD10.D Sample Name: 1918528006

Injection Date:	7/11/2019 13:16:18	Seq Line:	10
Sample Name:	1918528006	Location:	Vial 49
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	302483.2	5.0000	CLO4-89-ISTD

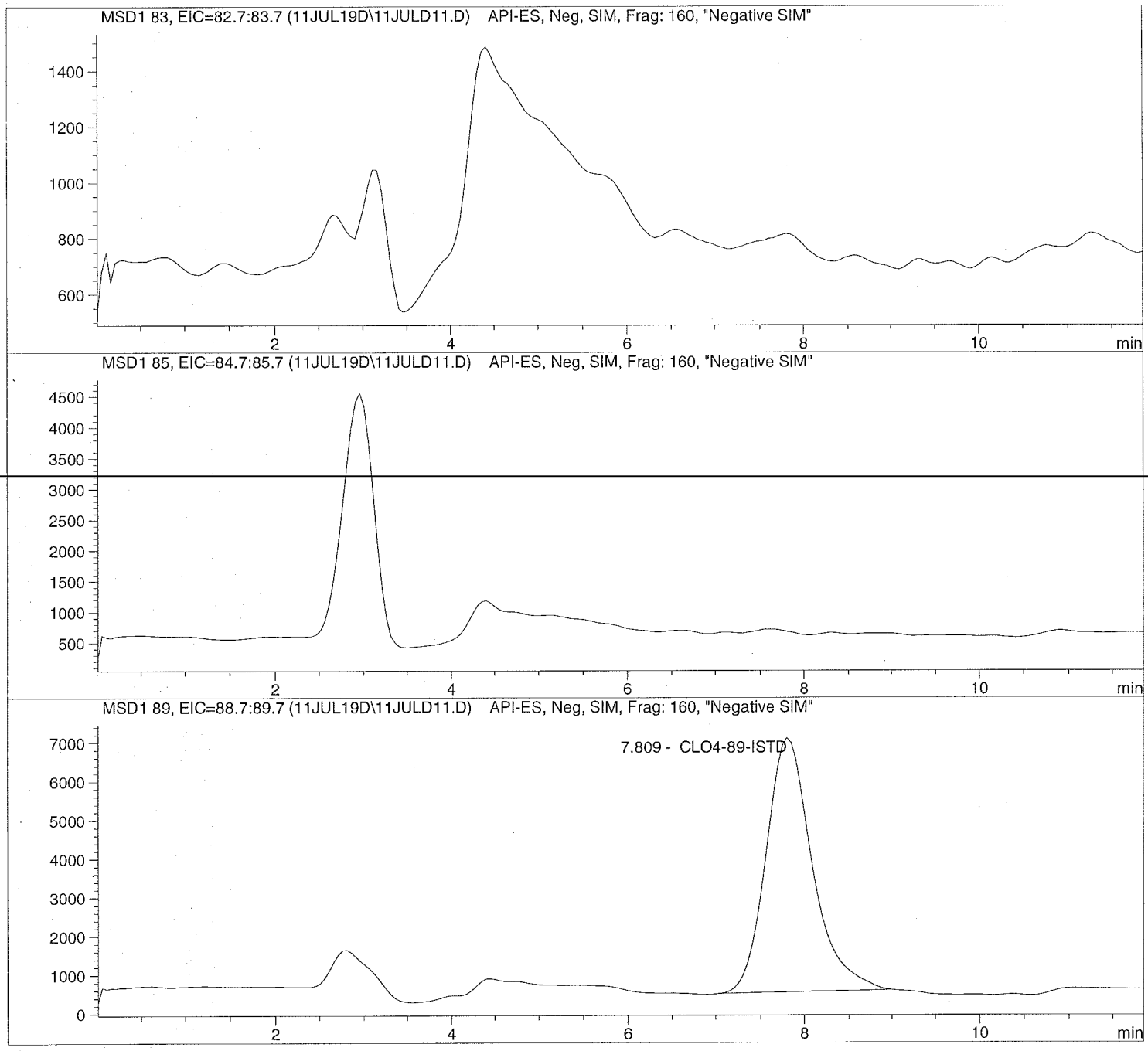
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD11.D Sample Name: 1918528007

Injection Date:	7/11/2019 13:30:12	Seq Line:	11
Sample Name:	1918528007	Location:	Vial 50
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD11.D Sample Name: 1918528007

Injection Date:	7/11/2019 13:30:12	Seq Line:	11
Sample Name:	1918528007	Location:	Vial 50
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.809	PBA	239369.6	5.0000	CLO4-89-ISTD

*** End of Report ***

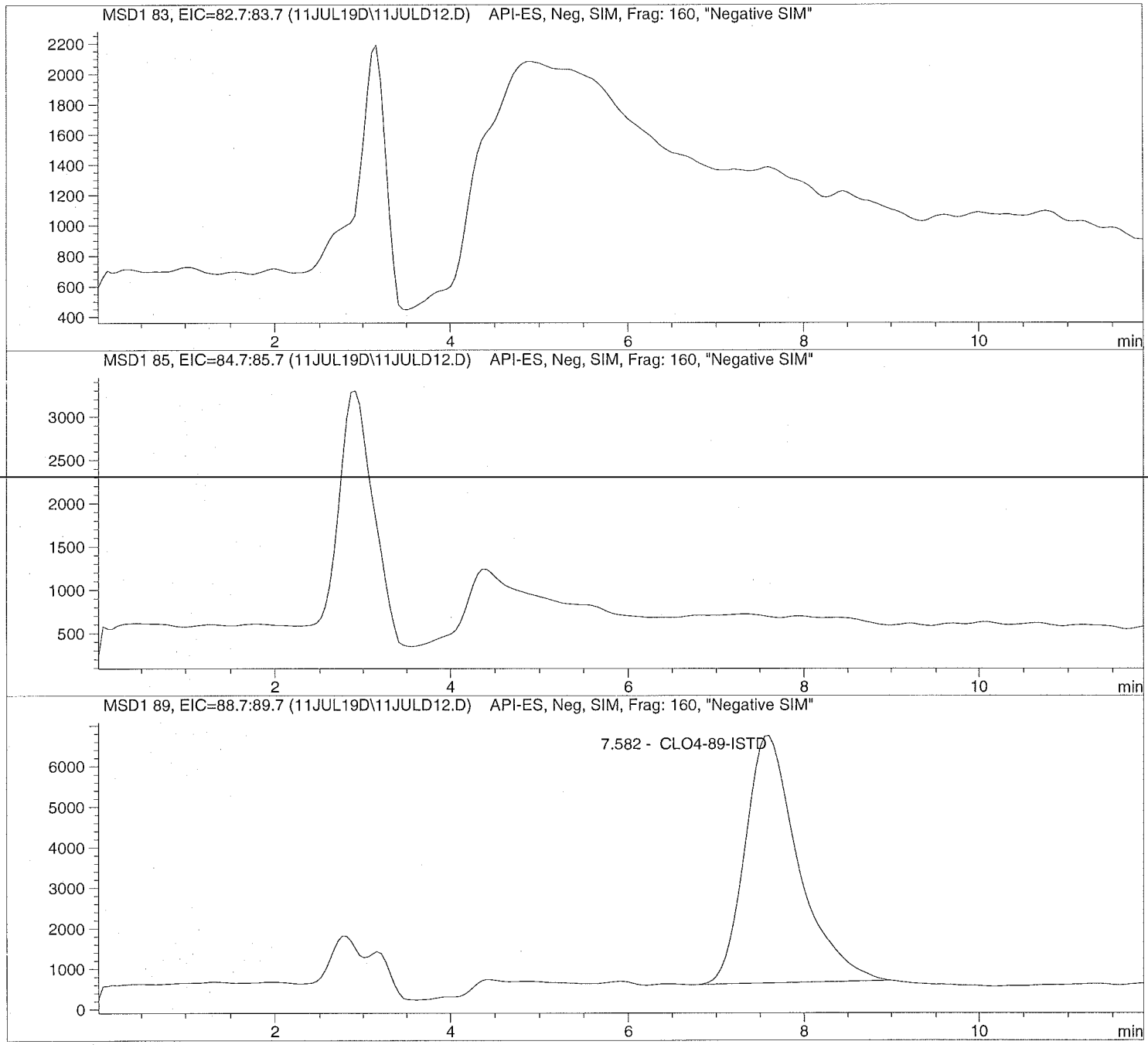
00942082

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD12.D Sample Name: 1918528008

Injection Date:	7/11/2019 13:43:59	Seq Line:	12
Sample Name:	1918528008	Location:	Vial 51
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD12.D Sample Name: 1918528008

Injection Date:	7/11/2019 13:43:59	Seq Line:	12
Sample Name:	1918528008	Location:	Vial 51
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.582	PBA	257536.2	5.0000	CLO4-89-ISTD

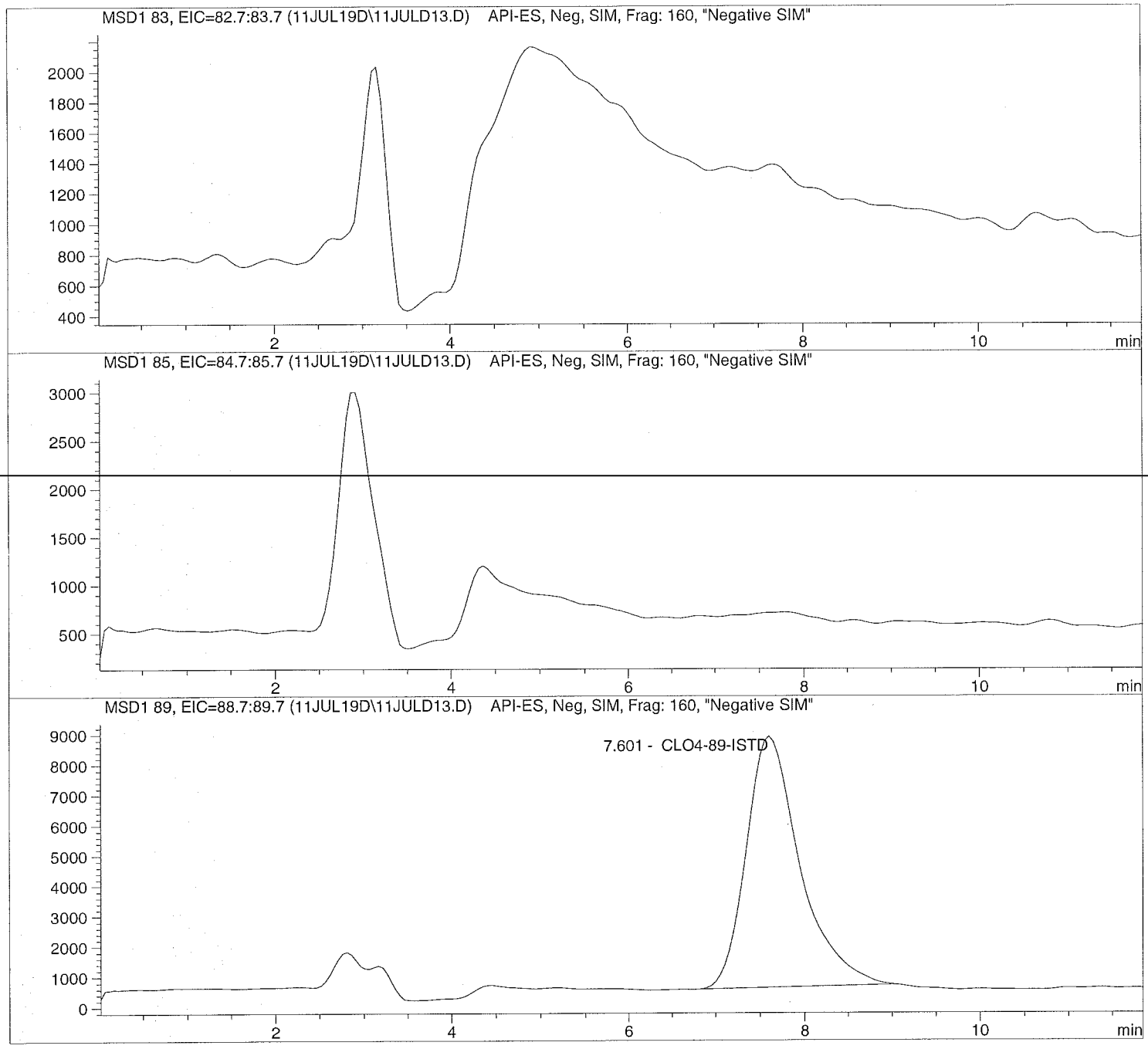
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD13.D Sample Name: 1918528009

Injection Date:	7/11/2019 13:57:45	Seq Line:	13
Sample Name:	1918528009	Location:	Vial 52
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD13.D Sample Name: 1918528009

Injection Date:	7/11/2019 13:57:45	Seq Line:	13
Sample Name:	1918528009	Location:	Vial 52
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.601	PBA	347244.5	5.0000	CLO4-89-ISTD

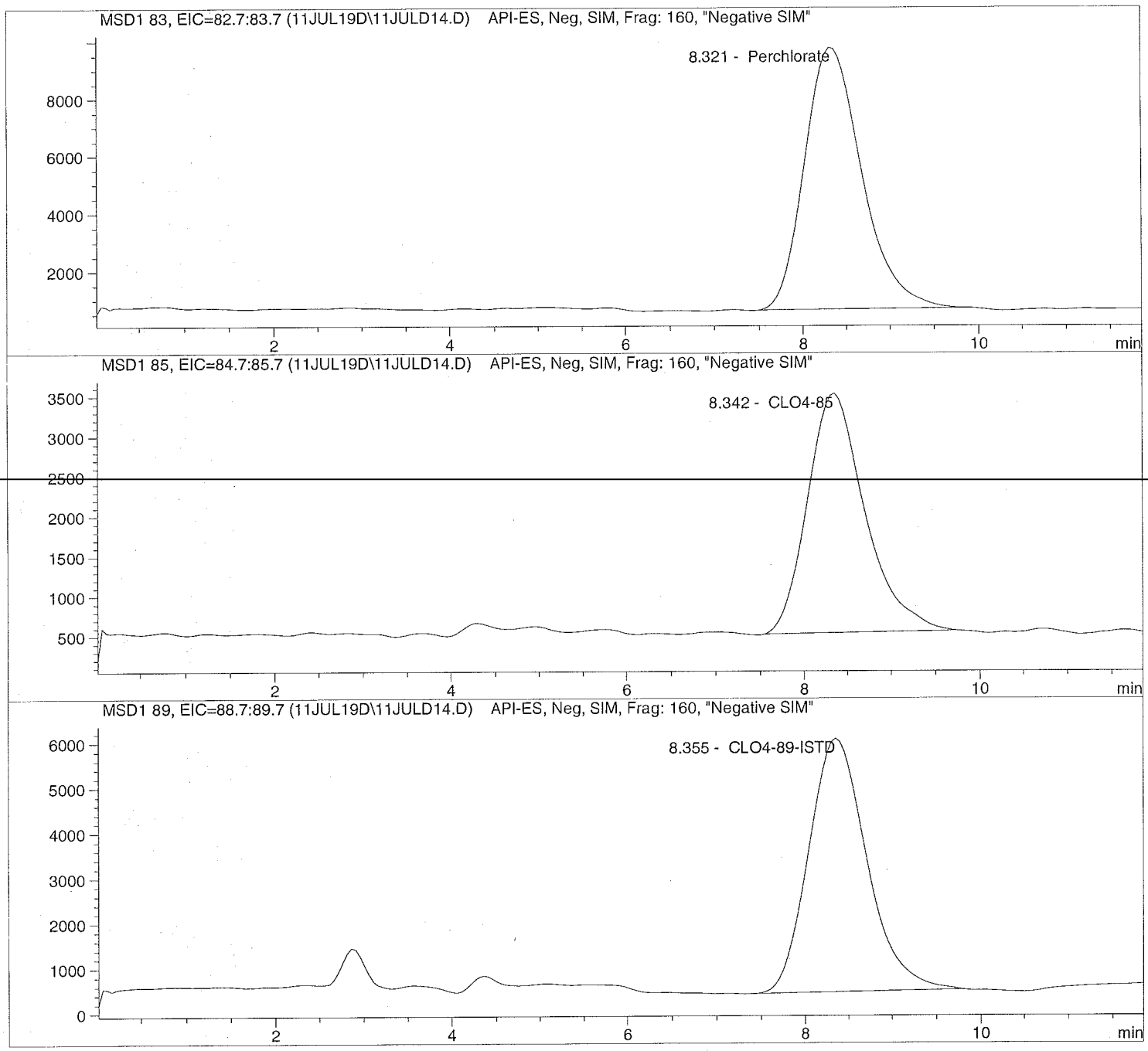
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD14.D Sample Name: 1918528010 100

Injection Date:	7/11/2019 14:11:32	Seq Line:	14
Sample Name:	1918528010 100	Location:	Vial 53
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD14.D Sample Name: 1918528010 100

Injection Date:	7/11/2019 14:11:32	Seq Line:	14
Sample Name:	1918528010 100	Location:	Vial 53
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 100.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.321	BBA	415809.4	518.2323	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.342	PBA	137449.3	561.7802	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.355	PBA	261248.4	500.0000	CLO4-89-ISTD

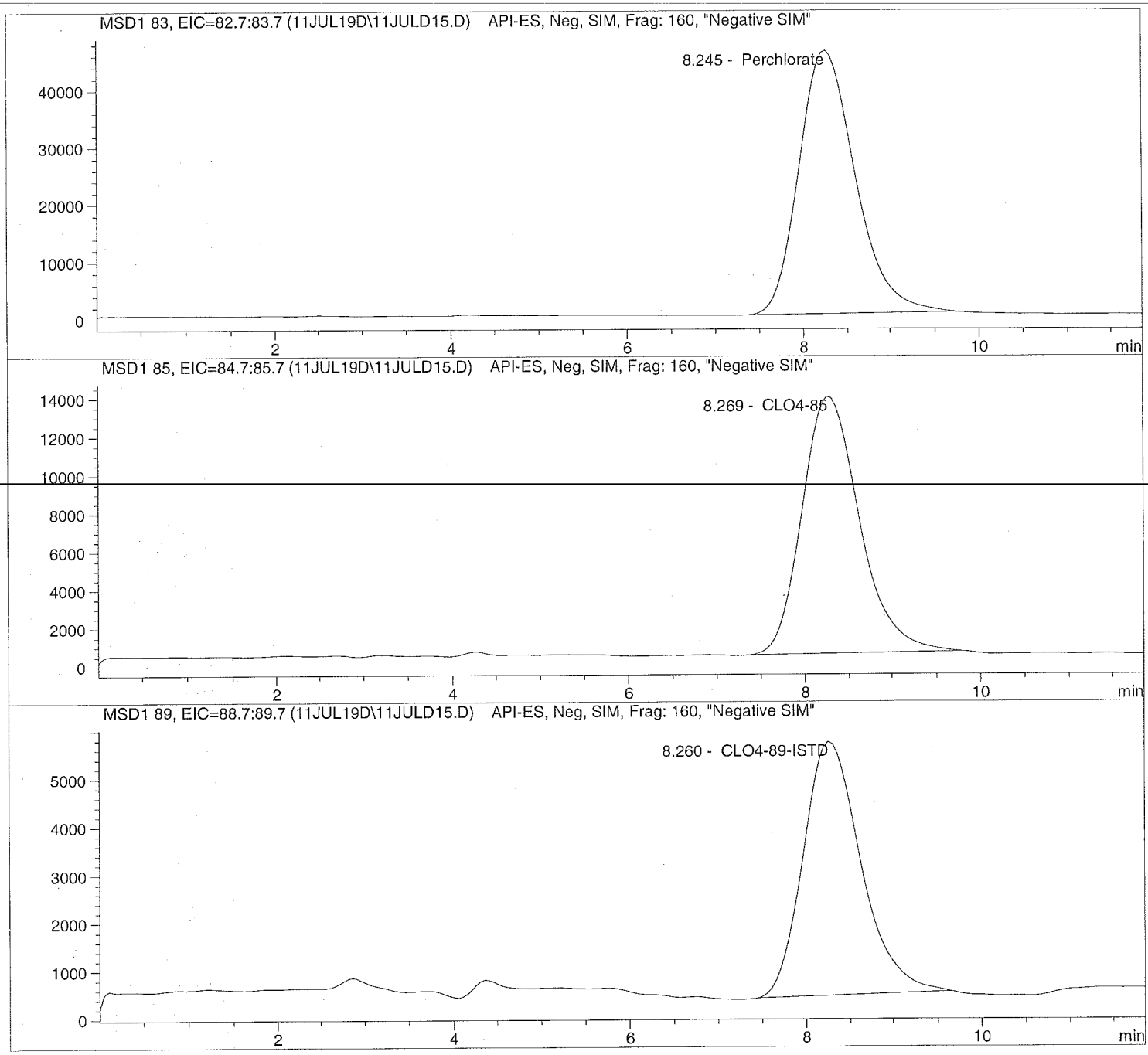
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD15.D Sample Name: 663035 CCV@25

Injection Date:	7/11/2019 14:25:24	Seq Line:	15
Sample Name:	663035 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD15.D Sample Name: 663035 CCV@25

Injection Date:	7/11/2019 14:25:24	Seq Line:	15
Sample Name:	663035 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.245	PBA	2053058.0	25.6747	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.269	PBA	614213.5	25.8714	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.260	PBA	242891.8	5.0000	CLO4-89-ISTD

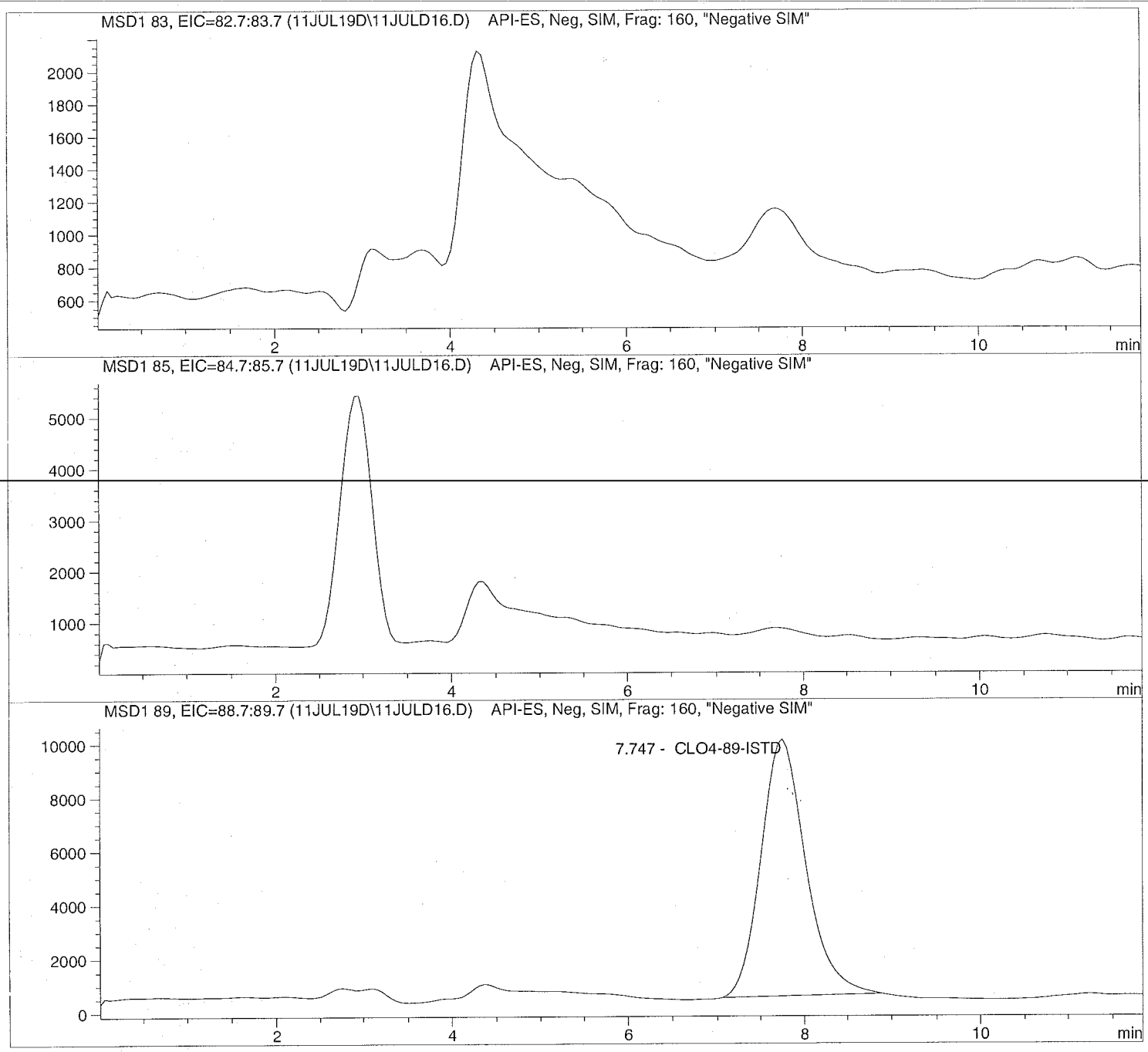
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD16.D Sample Name: 1918705001

Injection Date:	7/11/2019 14:39:13	Seq Line:	16
Sample Name:	1918705001	Location:	Vial 54
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD16.D Sample Name: 1918705001

Injection Date:	7/11/2019 14:39:13	Seq Line:	16
Sample Name:	1918705001	Location:	Vial 54
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.747	PBA	340152.4	5.0000	CLO4-89-ISTD

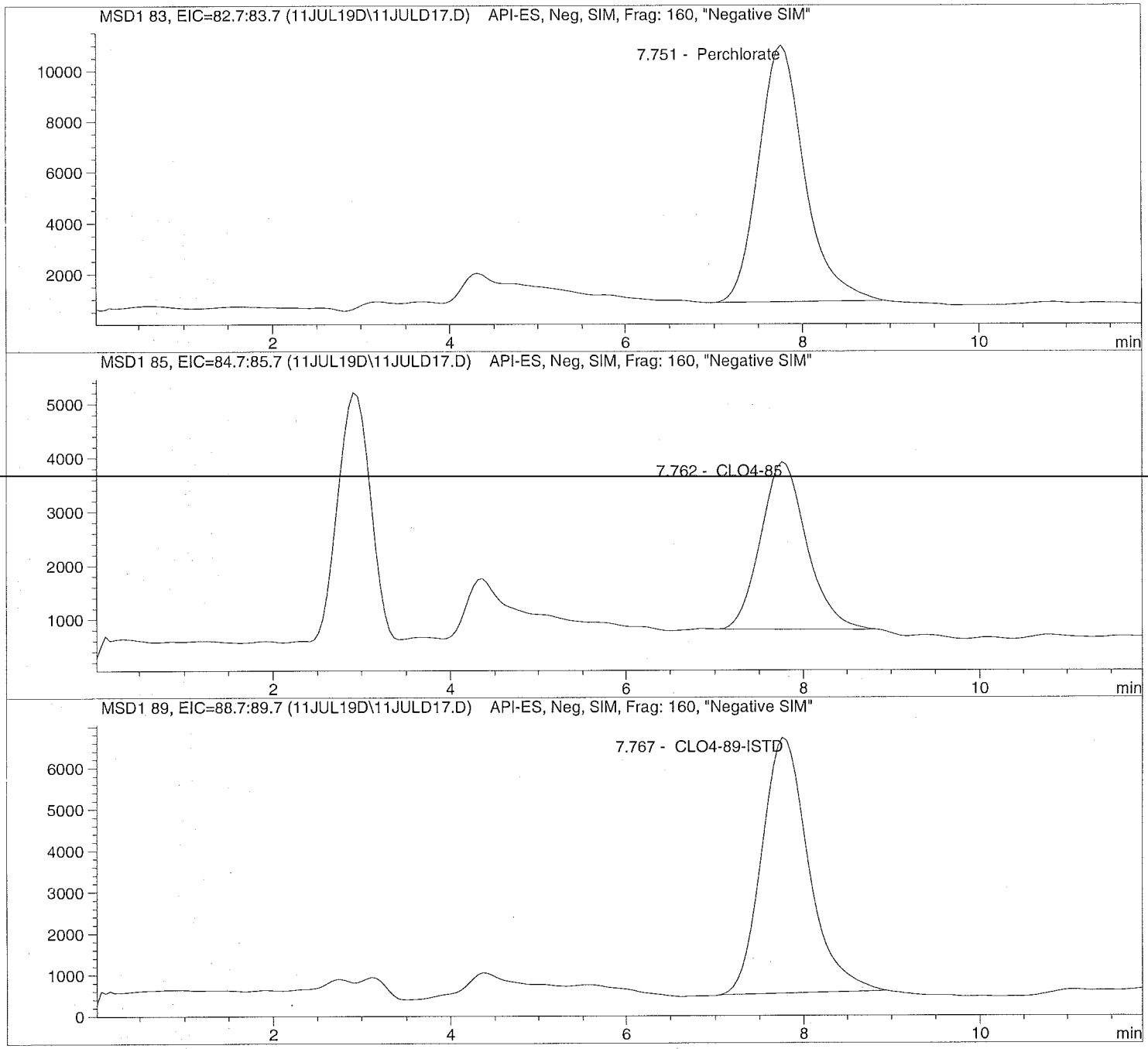
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD17.D Sample Name: 1918705002 MS

Injection Date:	7/11/2019 14:52:59	Seq Line:	17
Sample Name:	1918705002 MS	Location:	Vial 55
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD17.D Sample Name: 1918705002 MS

Injection Date:	7/11/2019 14:52:59	Seq Line:	17
Sample Name:	1918705002 MS	Location:	Vial 55
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.751	PBA	365013.6	5.2090	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.762	BBA	112800.8	5.2838	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	228107.2	5.0000	CLO4-89-ISTD

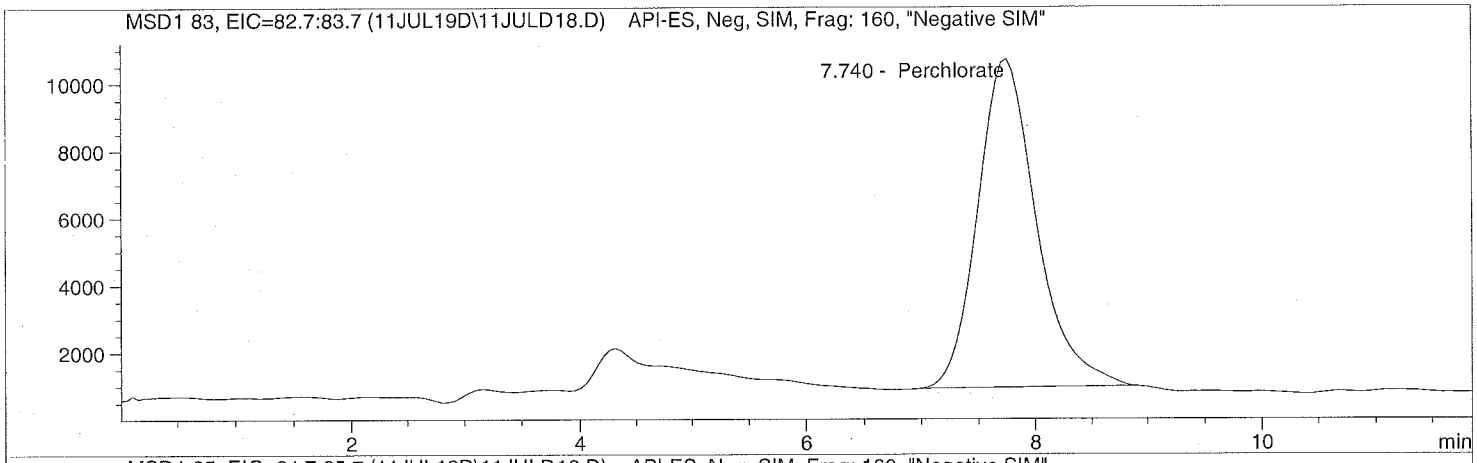
*** End of Report ***

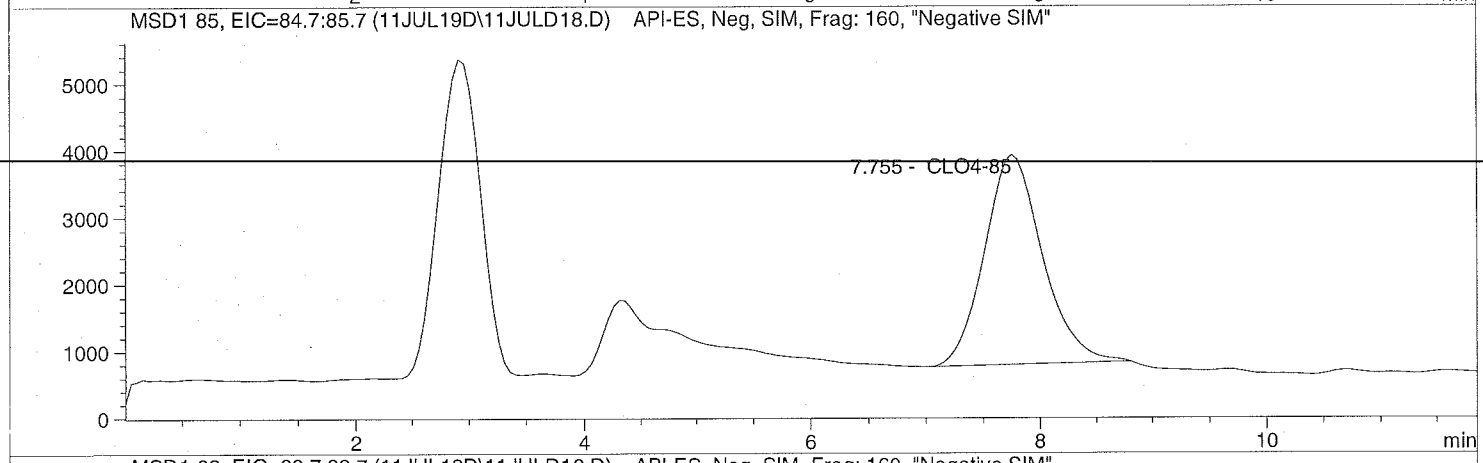
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD18.D Sample Name: 1918705003 MSD

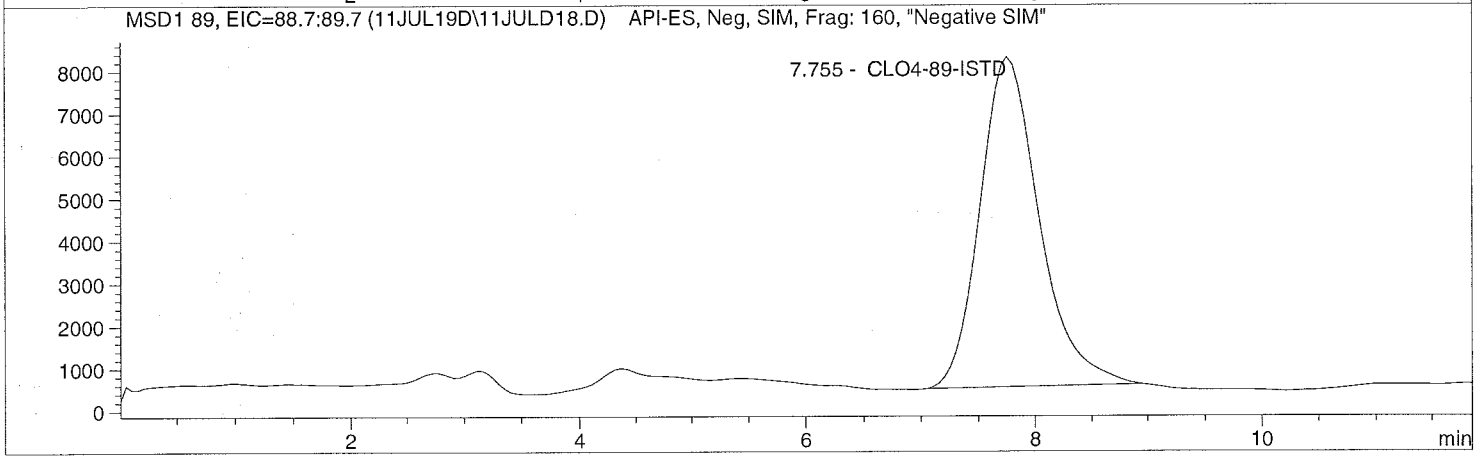
Injection Date:	7/11/2019 15:06:56	Seq Line:	18
Sample Name:	1918705003 MSD	Location:	Vial 56
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD18.D Sample Name: 1918705003 MSD

Injection Date:	7/11/2019 15:06:56	Seq Line:	18
Sample Name:	1918705003 MSD	Location:	Vial 56
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.740	PBA	350061.6	4.0921	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.755	PBA	110963.2	4.2197	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.755	PBA	281563.4	5.0000	CLO4-89-ISTD

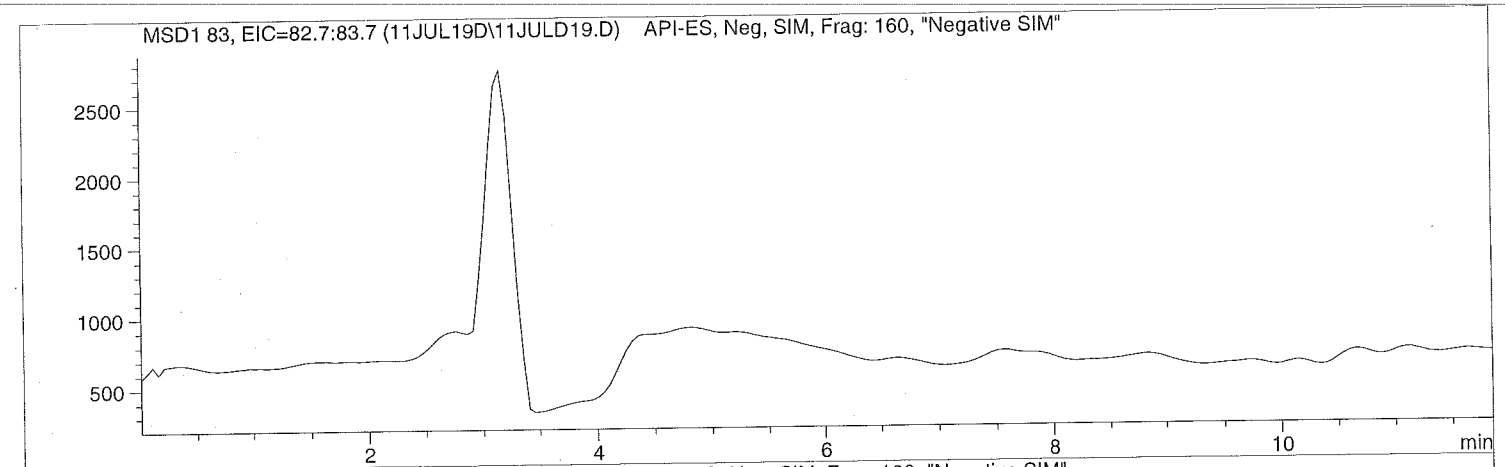
*** End of Report ***

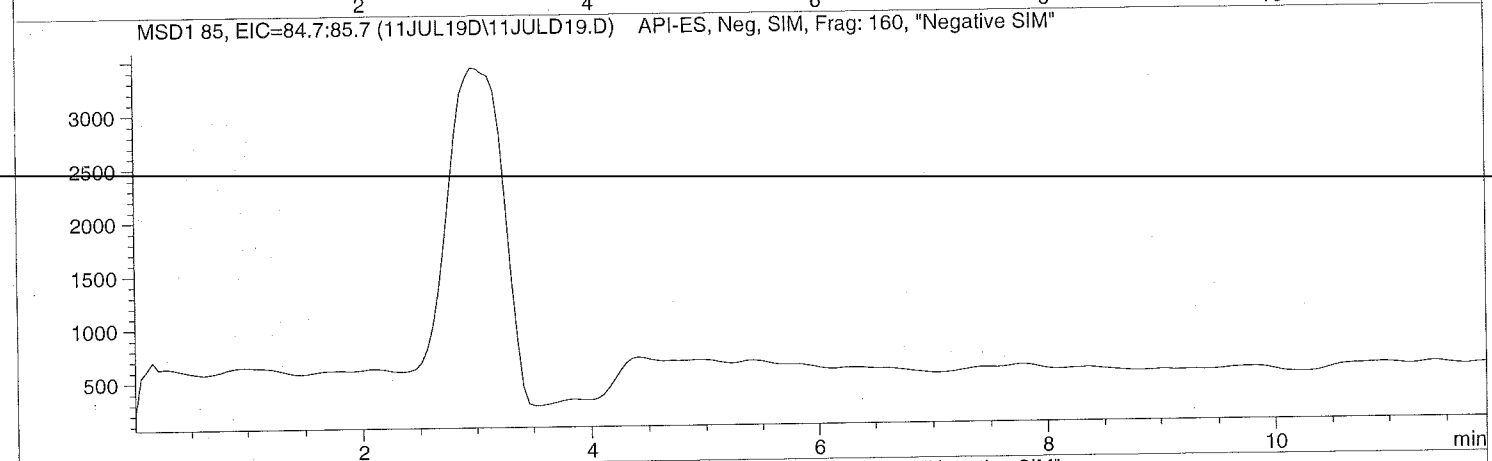
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD19.D Sample Name: 1918705004

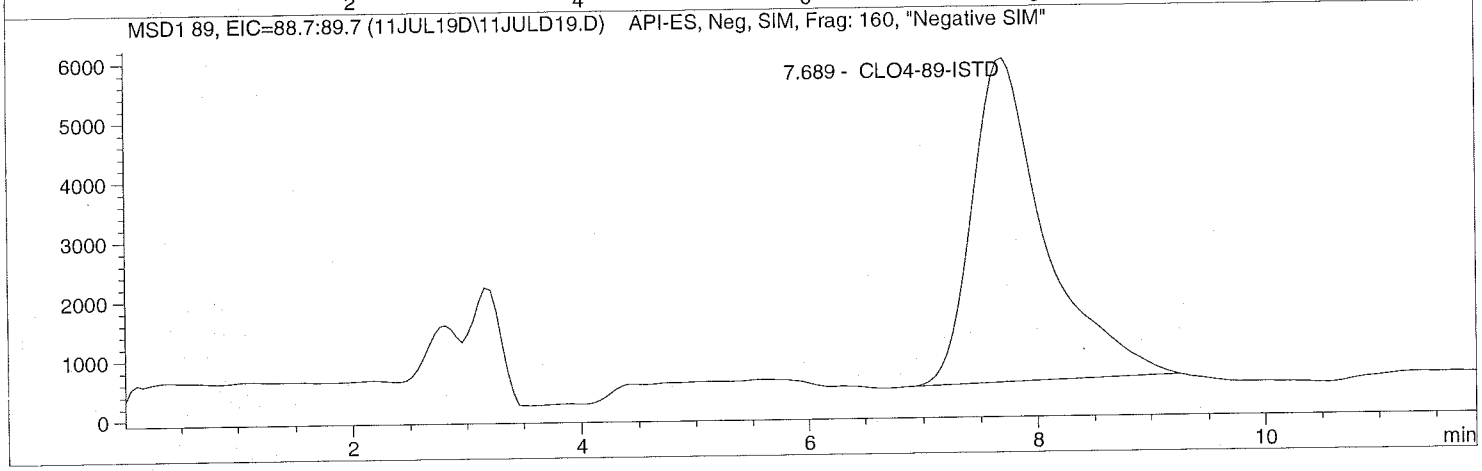
Injection Date:	7/11/2019 15:21:50	Seq Line:	19
Sample Name:	1918705004	Location:	Vial 57
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD19.D Sample Name: 1918705004

Injection Date:	7/11/2019 15:21:50	Seq Line:	19
Sample Name:	1918705004	Location:	Vial 57
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.689	PBA	240534.6	5.0000	CLO4-89-ISTD

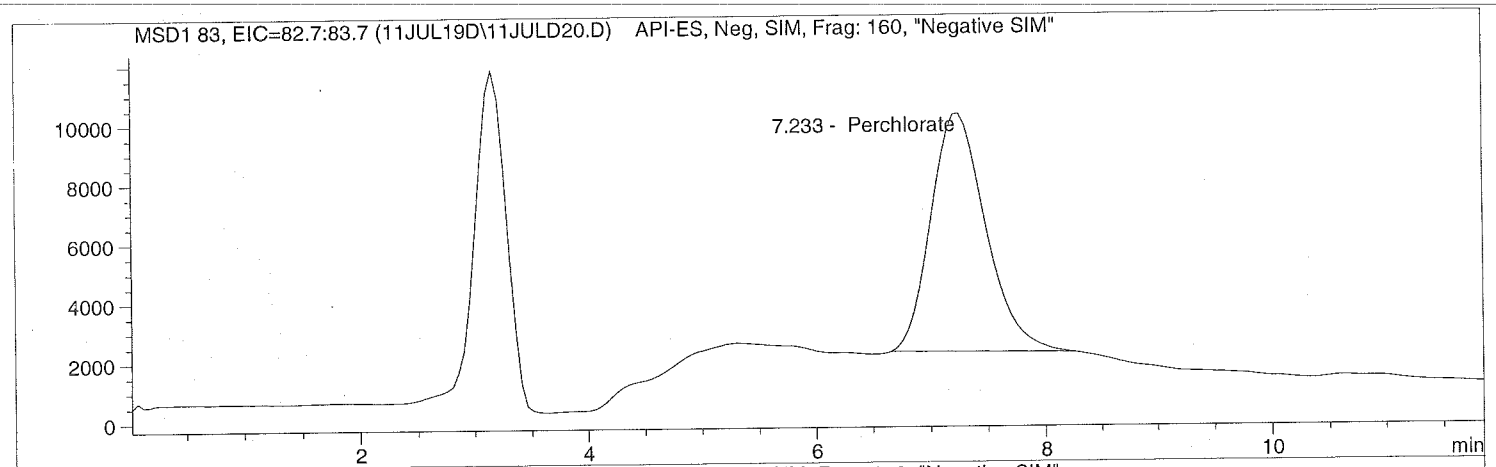
*** End of Report ***

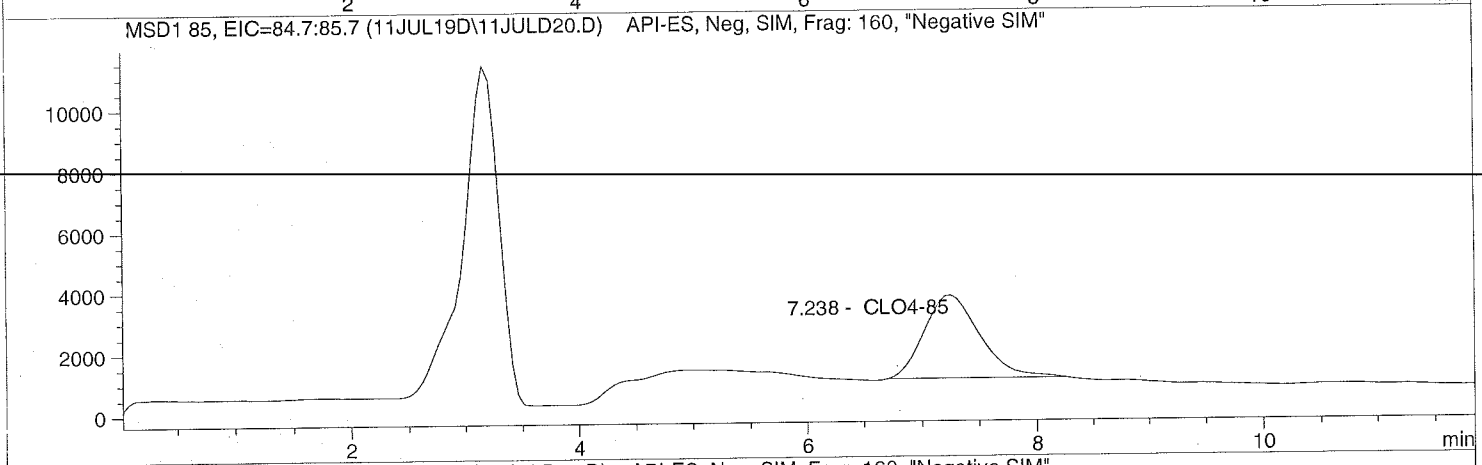
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD20.D Sample Name: 1918705005

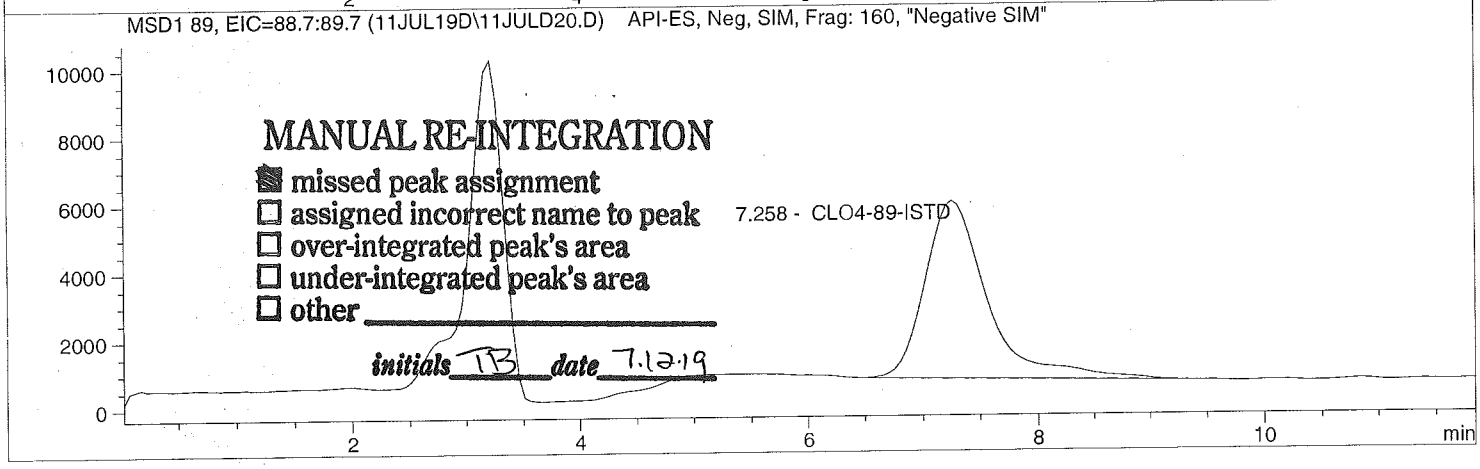
Injection Date:	7/11/2019 15:35:52	Seq Line:	20
Sample Name:	1918705005	Location:	Vial 58
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD20.D Sample Name: 1918705005

Injection Date:	7/11/2019 15:35:52	Seq Line:	20
Sample Name:	1918705005	Location:	Vial 58
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.233	PBA	264721.6	4.4092	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.238	BBA	91183.5	4.9513	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.258	MM	196904.8	5.0000	CLO4-89-ISTD

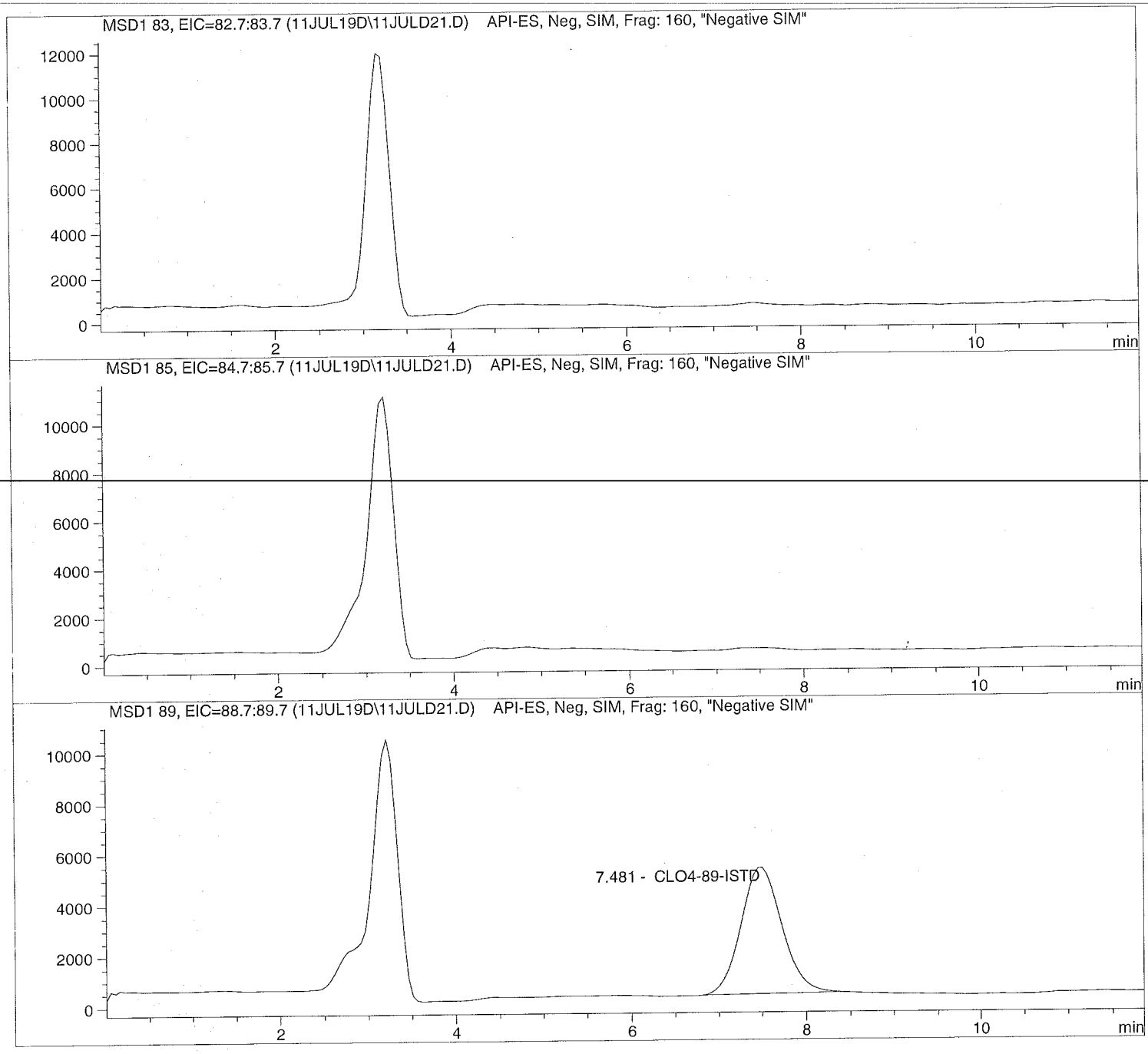
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD21.D Sample Name: 1918705006

Injection Date:	7/11/2019 15:49:37	Seq Line:	21
Sample Name:	1918705006	Location:	Vial 59
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD21.D Sample Name: 1918705006

Injection Date:	7/11/2019 15:49:37	Seq Line:	21
Sample Name:	1918705006	Location:	Vial 59
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.481	PBA	163865.3	5.0000	CLO4-89-ISTD

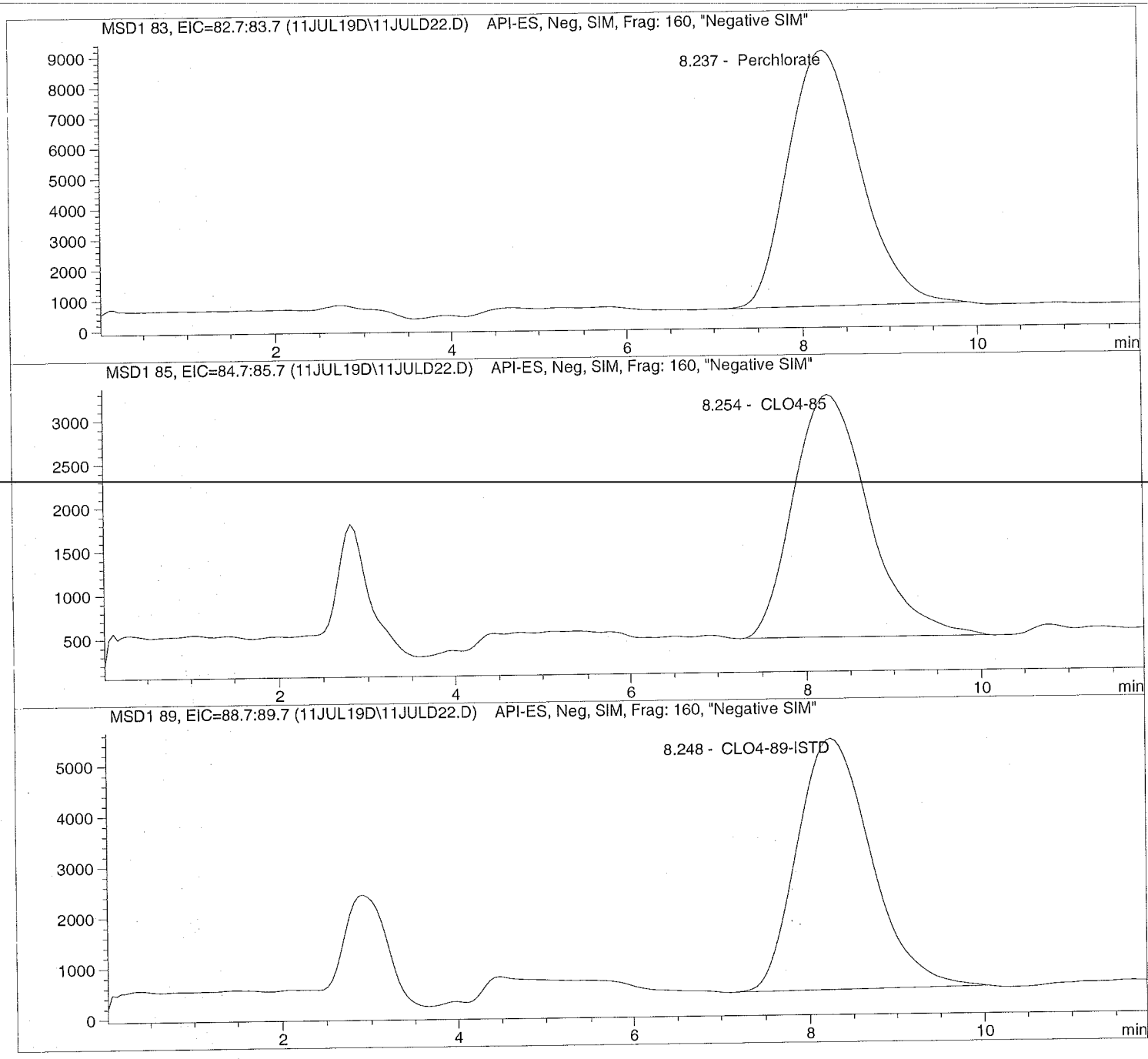
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD22.D Sample Name: 1918705007 10X

Injection Date:	7/11/2019 16:03:27	Seq Line:	22
Sample Name:	1918705007 10X	Location:	Vial 60
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD22.D Sample Name: 1918705007 10X

Injection Date:	7/11/2019 16:03:27	Seq Line:	22
Sample Name:	1918705007 10X	Location:	Vial 60
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 10.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.237	PBA	480293.1	53.7355	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.254	PBA	165862.6	60.8905	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.248	PBA	290575.8	50.0000	CLO4-89-ISTD

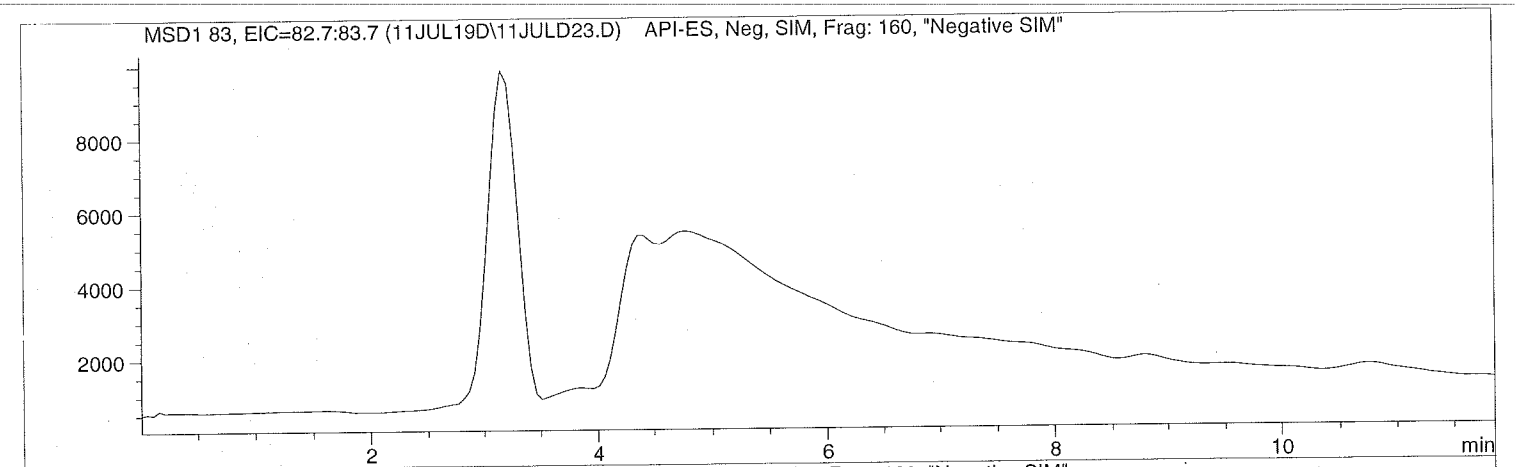
*** End of Report ***

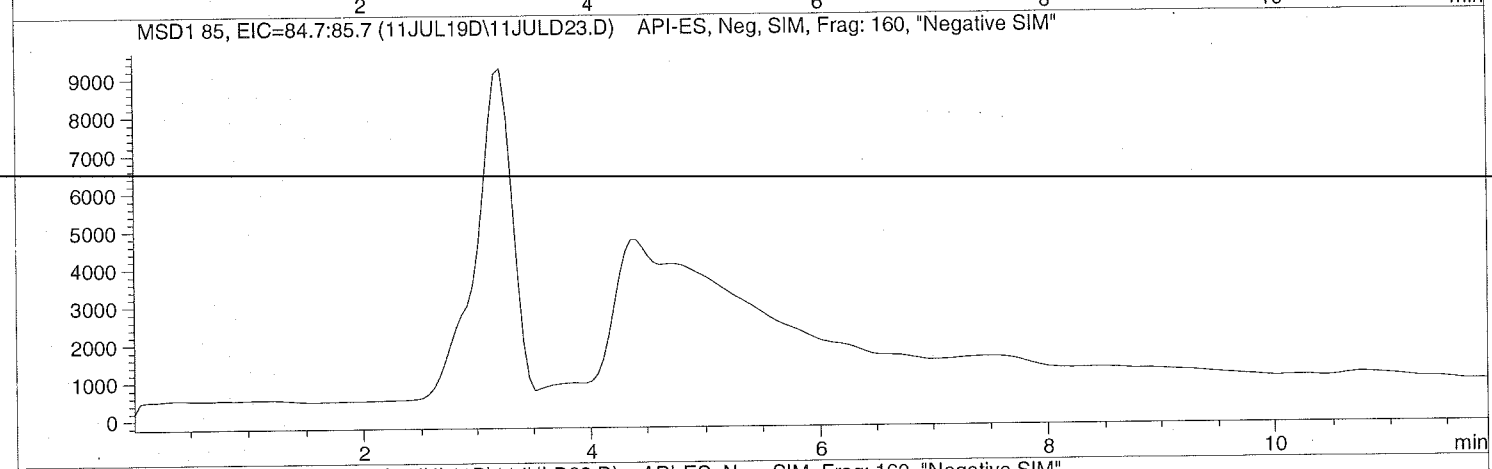
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD23.D Sample Name: 1918705008

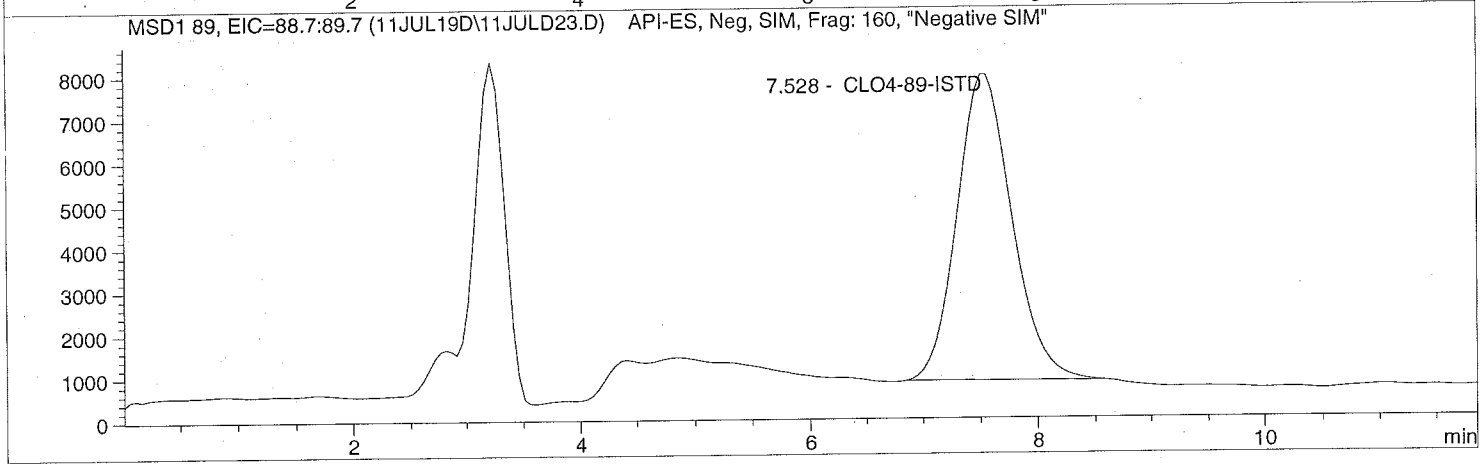
Injection Date:	7/11/2019 16:17:15	Seq Line:	23
Sample Name:	1918705008	Location:	Vial 61
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD23.D Sample Name: 1918705008

Injection Date:	7/11/2019 16:17:15	Seq Line:	23
Sample Name:	1918705008	Location:	Vial 61
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.528	PBA	237165.4	5.0000	CLO4-89-ISTD

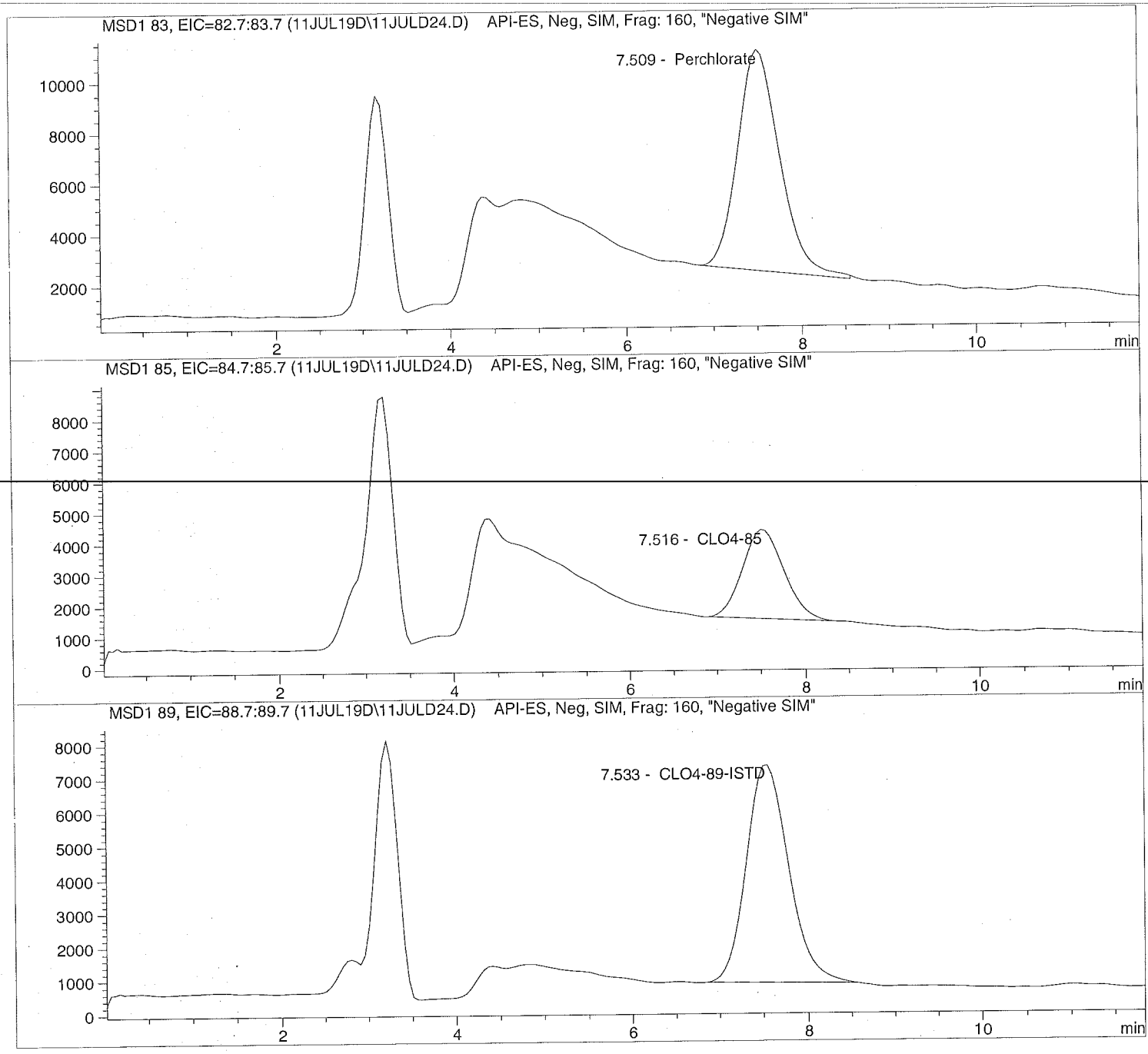
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD24.D Sample Name: 1918705009 MS

Injection Date:	7/11/2019 16:31:15	Seq Line:	24
Sample Name:	1918705009 MS	Location:	Vial 62
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD24.D Sample Name: 1918705009 MS

Injection Date:	7/11/2019 16:31:15	Seq Line:	24
Sample Name:	1918705009 MS	Location:	Vial 62
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.509	PBA	288361.0	4.3992	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.516	PBA	93975.4	4.6759	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.533	PBA	214999.5	5.0000	CLO4-89-ISTD

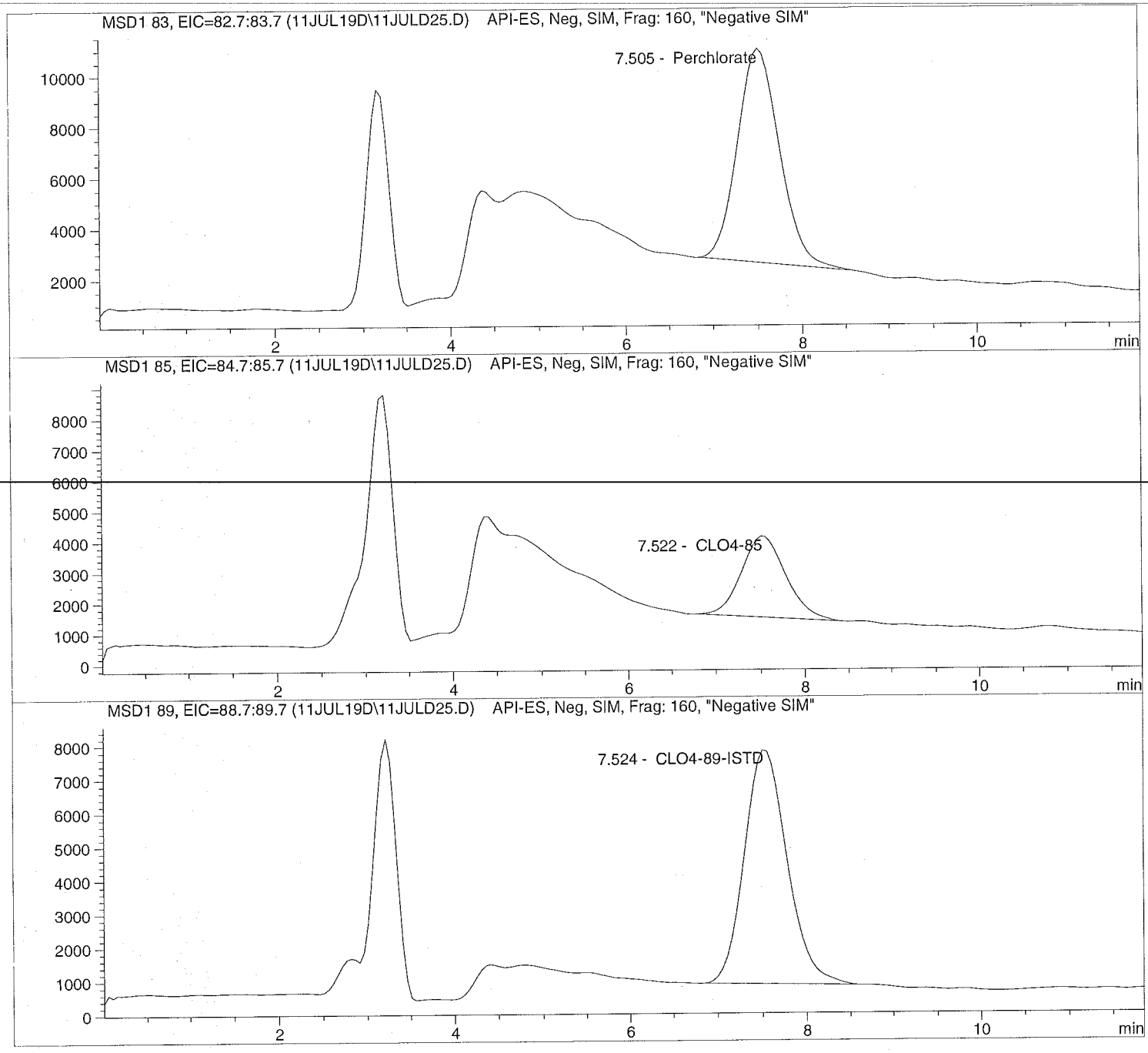
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD25.D Sample Name: 1918705010 MSD 00942108

Injection Date:	7/11/2019 16:45:02	Seq Line:	25
Sample Name:	1918705010 MSD	Location:	Vial 63
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD25.D Sample Name: 1918705010 MSD

Injection Date:	7/11/2019 16:45:02	Seq Line:	25
Sample Name:	1918705010 MSD	Location:	Vial 63
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.505	PBA	277079.4	3.9208	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.522	PBA	91663.1	4.2105	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.524	PBA	233099.0	5.0000	CLO4-89-ISTD

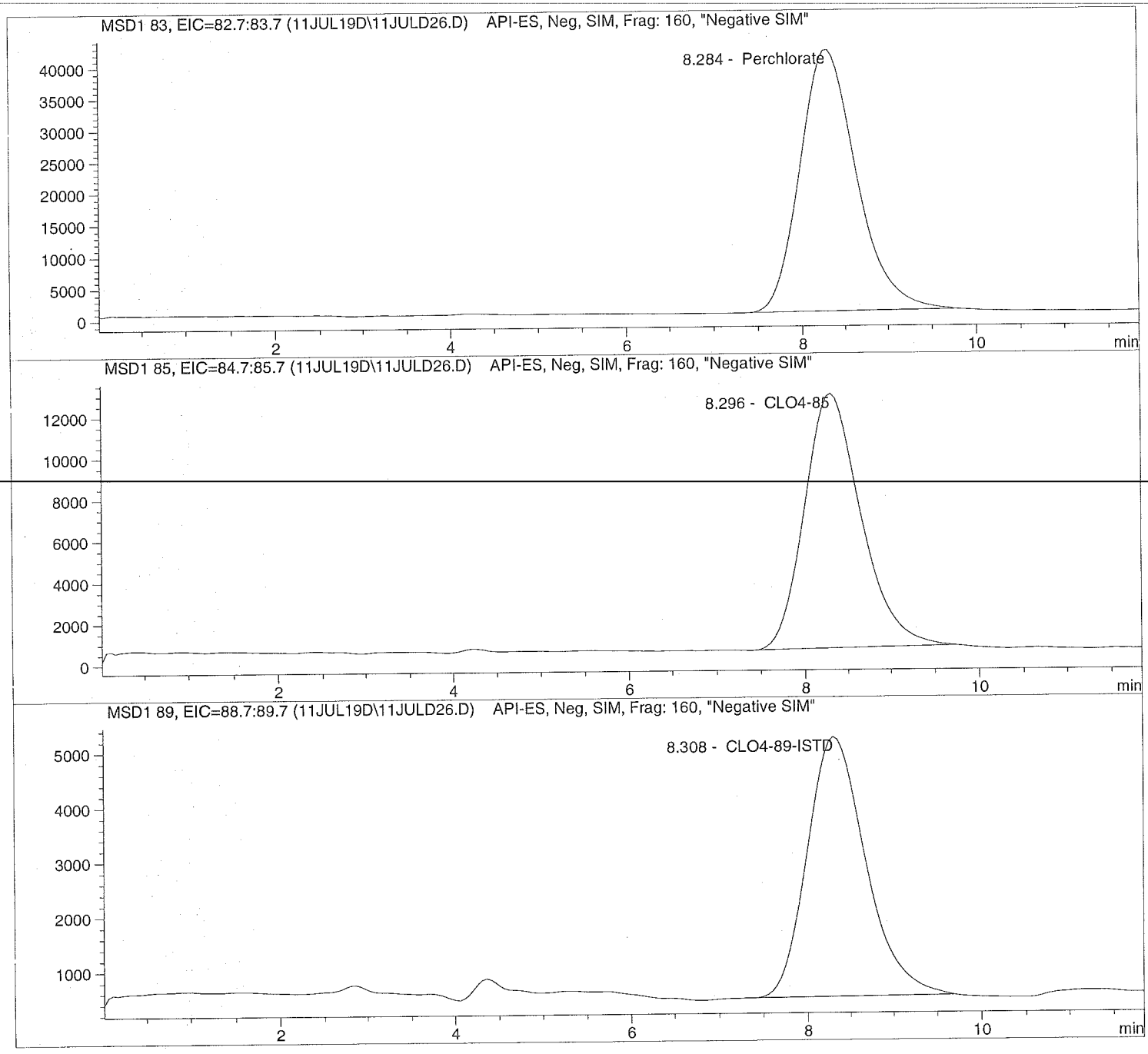
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD26.D Sample Name: 663036 CCV@25

Injection Date:	7/11/2019 16:58:48	Seq Line:	26
Sample Name:	663036 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD26.D Sample Name: 663036 CCV@25

Injection Date:	7/11/2019 16:58:48	Seq Line:	26
Sample Name:	663036 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.284	PBA	1877862.1	25.5677	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.296	PBA	559339.1	25.6558	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.308	BBA	223151.0	5.0000	CLO4-89-ISTD

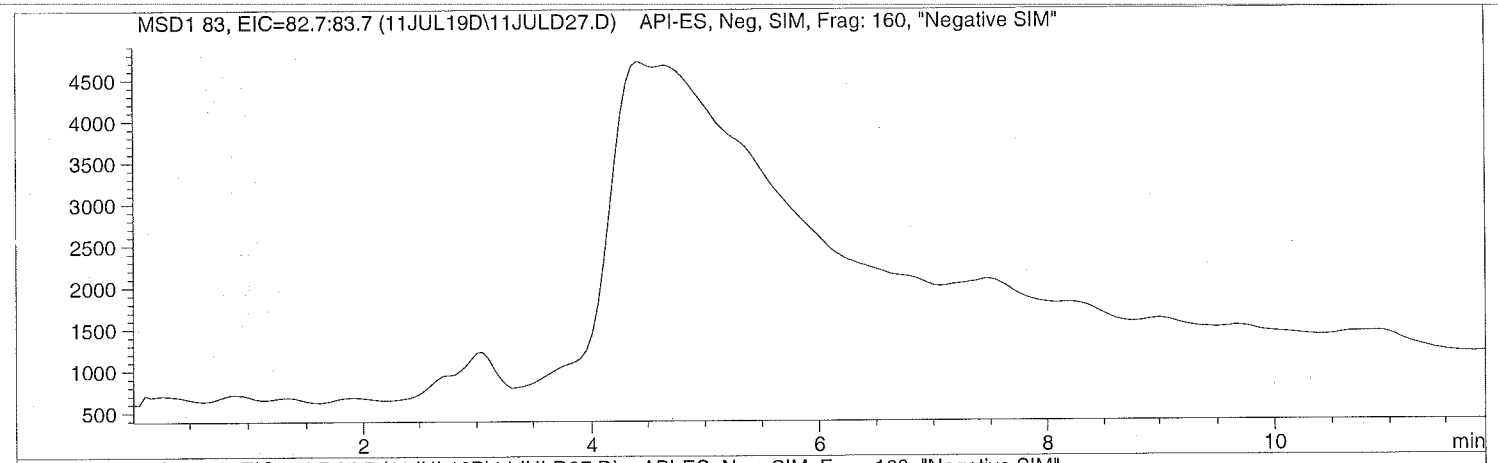
*** End of Report ***

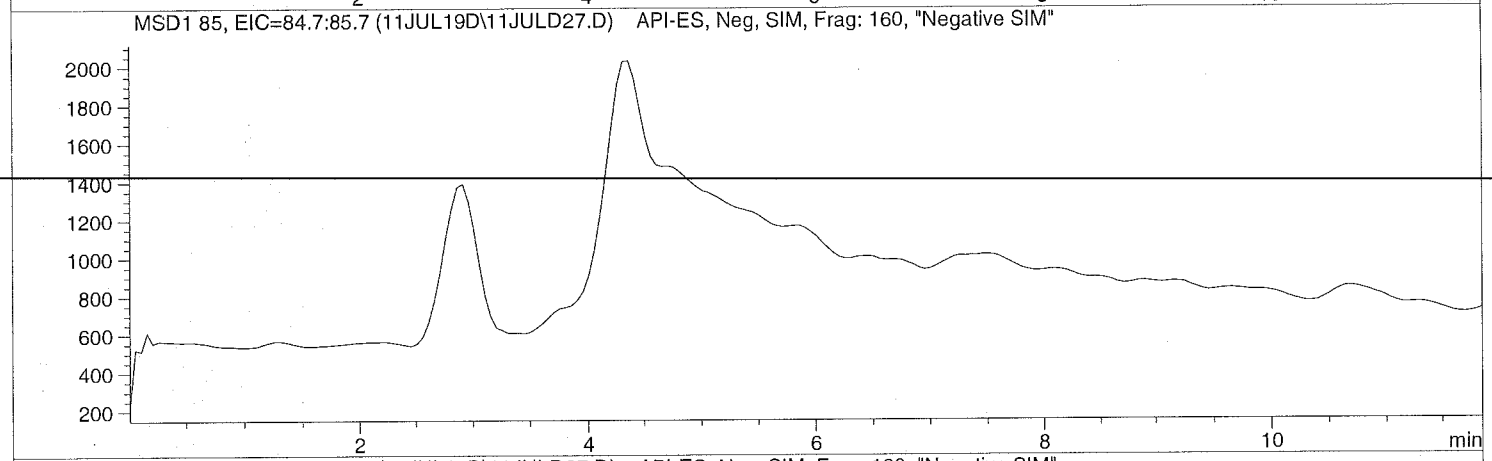
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD27.D Sample Name: 1918871001 00942112

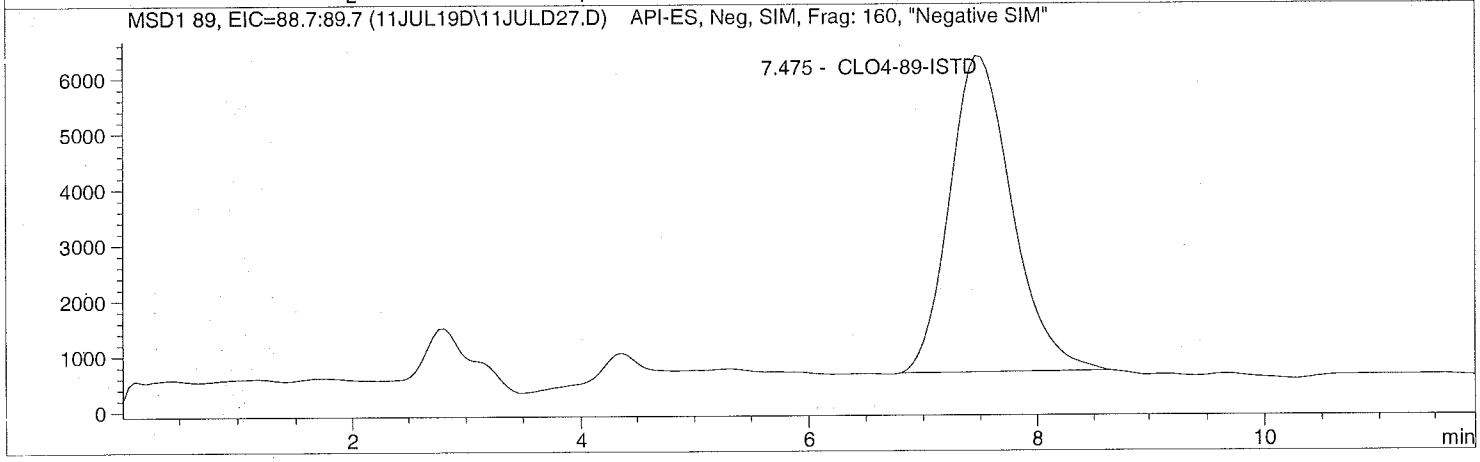
Injection Date:	7/11/2019 17:12:38	Seq Line:	27
Sample Name:	1918871001	Location:	Vial 64
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD27.D Sample Name: 1918871001

Injection Date:	7/11/2019 17:12:38	Seq Line:	27
Sample Name:	1918871001	Location:	Vial 64
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.475	PBA	217461.8	5.0000	CLO4-89-ISTD

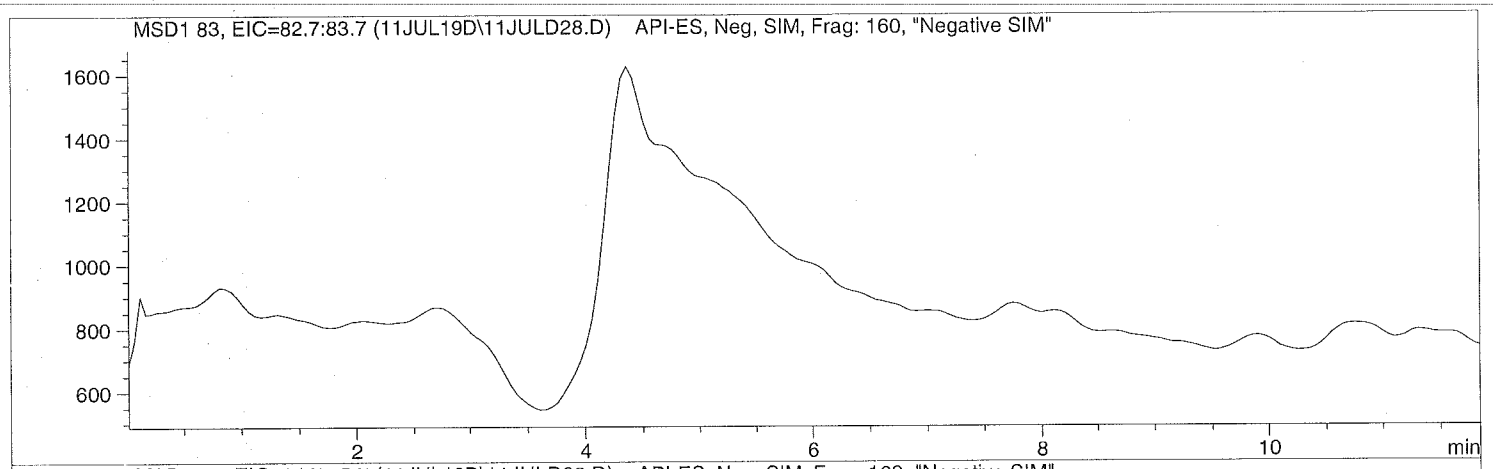
*** End of Report ***

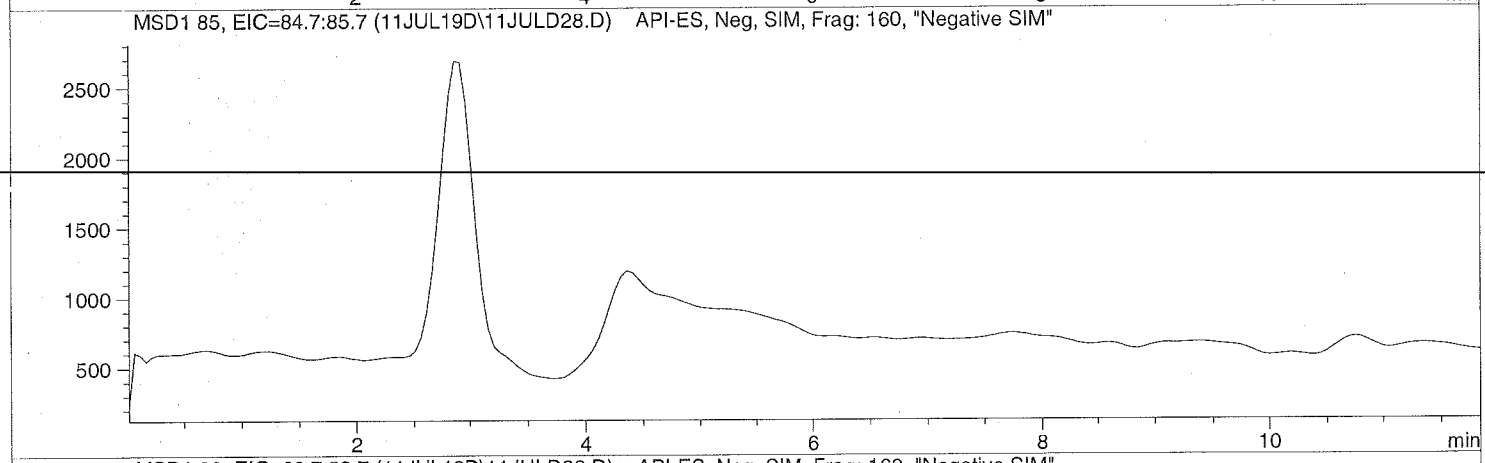
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD28.D Sample Name: 1918871002

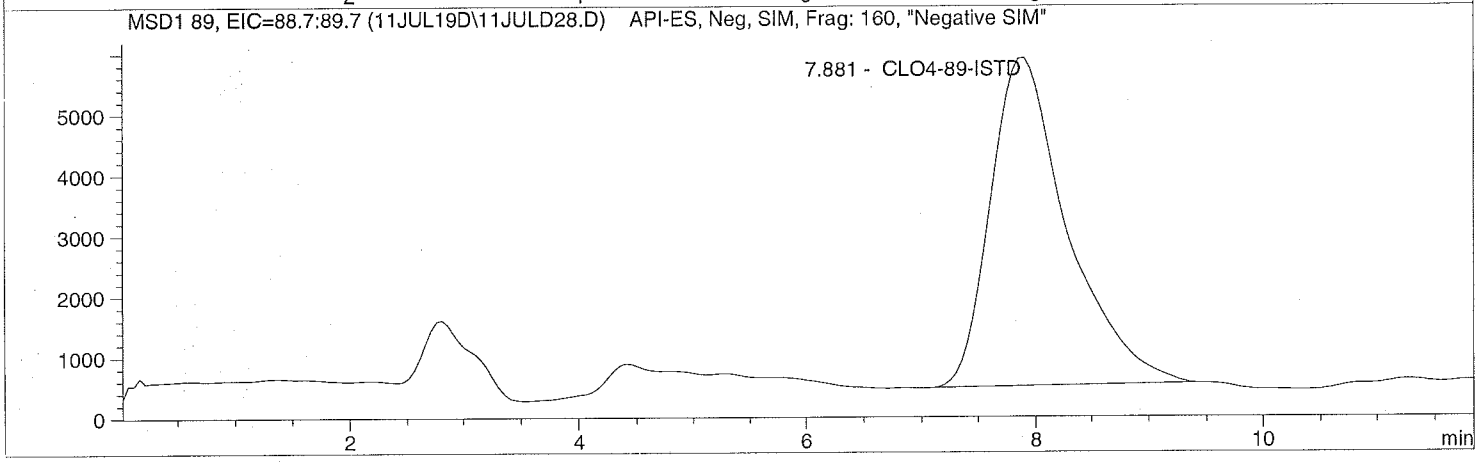
Injection Date:	7/11/2019 17:26:27	Seq Line:	28
Sample Name:	1918871002	Location:	Vial 65
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD28.D Sample Name: 1918871002

Injection Date:	7/11/2019 17:26:27	Seq Line:	28
Sample Name:	1918871002	Location:	Vial 65
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.881	PBA	252228.0	5.0000	CLO4-89-ISTD

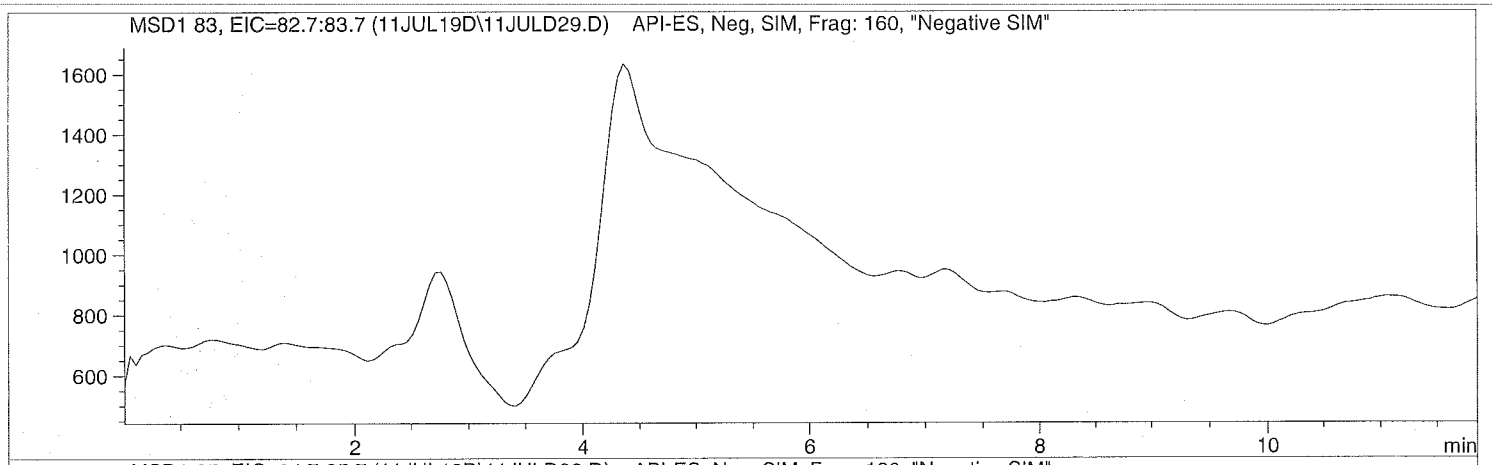
*** End of Report ***

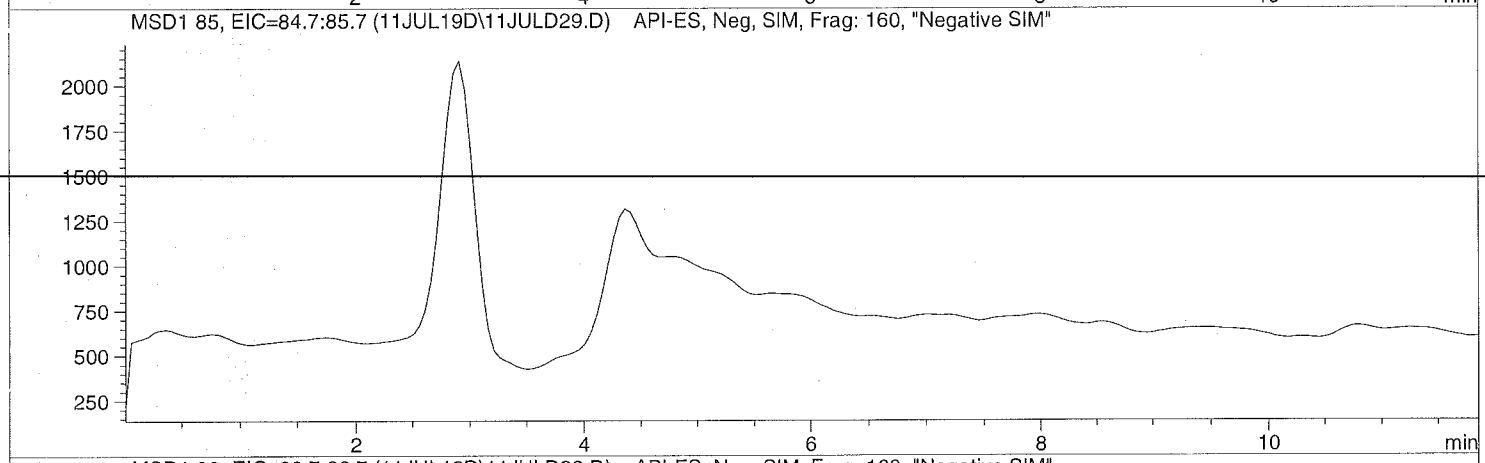
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD29.D Sample Name: 1918871003

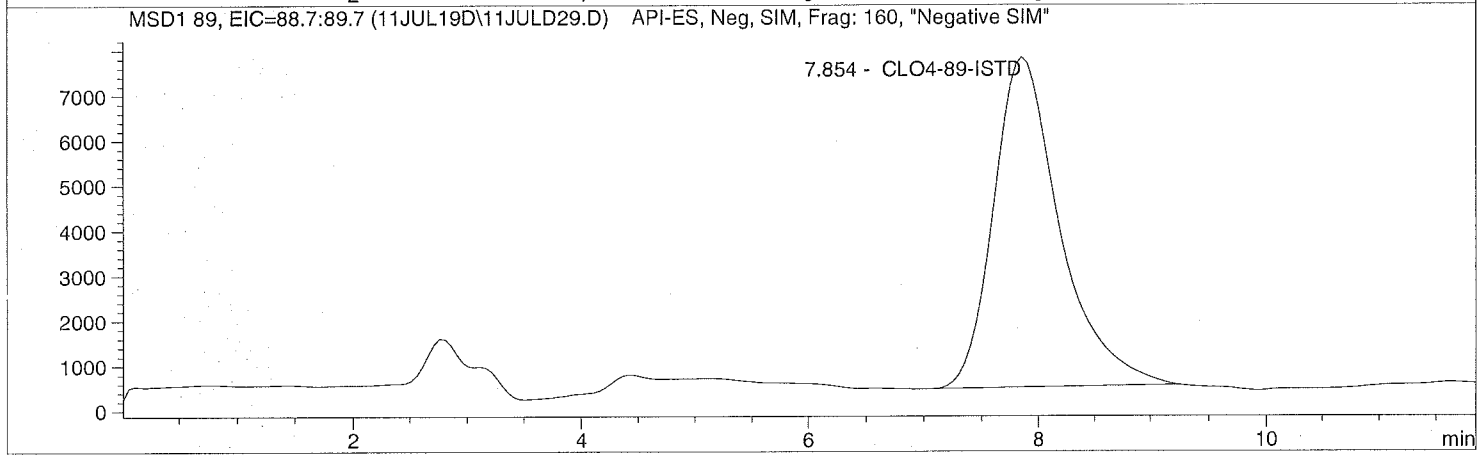
Injection Date:	7/11/2019 17:40:12	Seq Line:	29
Sample Name:	1918871003	Location:	Vial 66
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD29.D Sample Name: 1918871003

Injection Date:	7/11/2019 17:40:12	Seq Line:	29
Sample Name:	1918871003	Location:	Vial 66
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.854	PBA	297108.1	5.0000	CLO4-89-ISTD

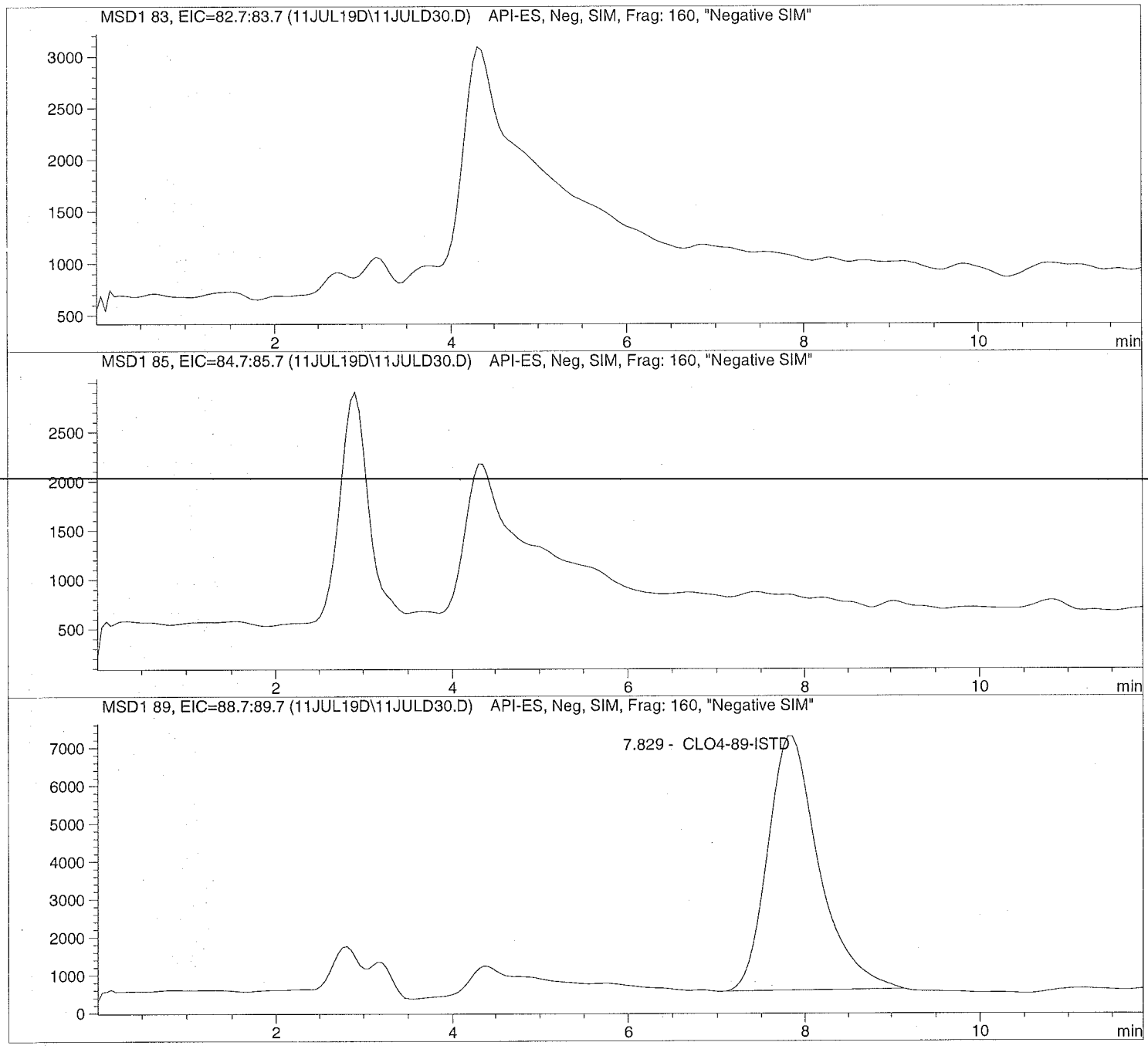
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD30.D Sample Name: 1918871004

Injection Date:	7/11/2019 17:54:08	Seq Line:	30
Sample Name:	1918871004	Location:	Vial 67
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD30.D Sample Name: 1918871004

Injection Date:	7/11/2019 17:54:08	Seq Line:	30
Sample Name:	1918871004	Location:	Vial 67
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.829	PBA	273038.9	5.0000	CLO4-89-ISTD

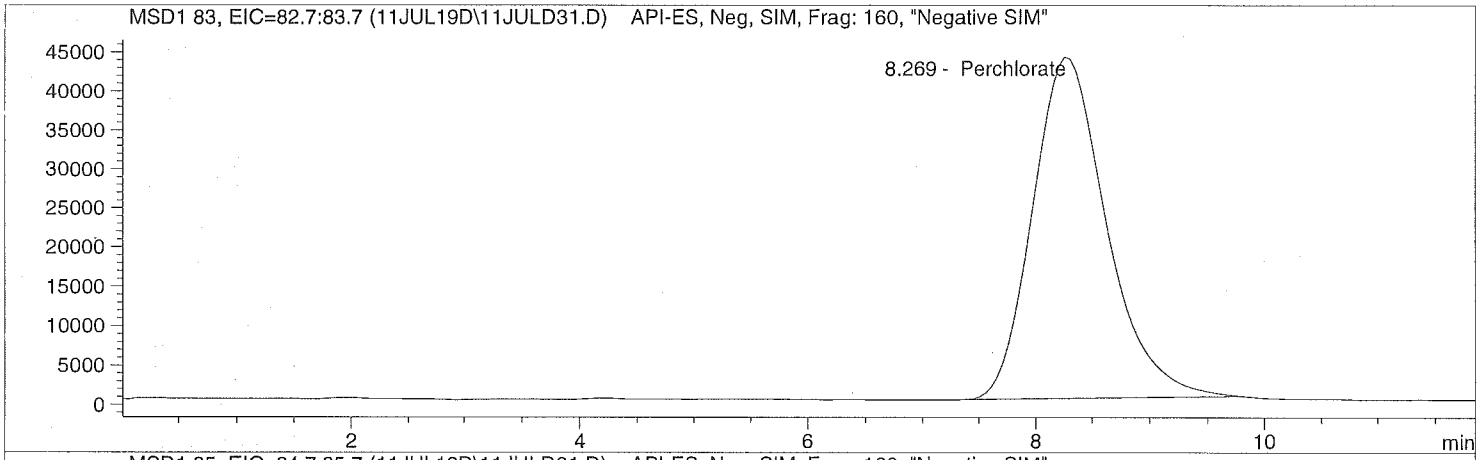
*** End of Report ***

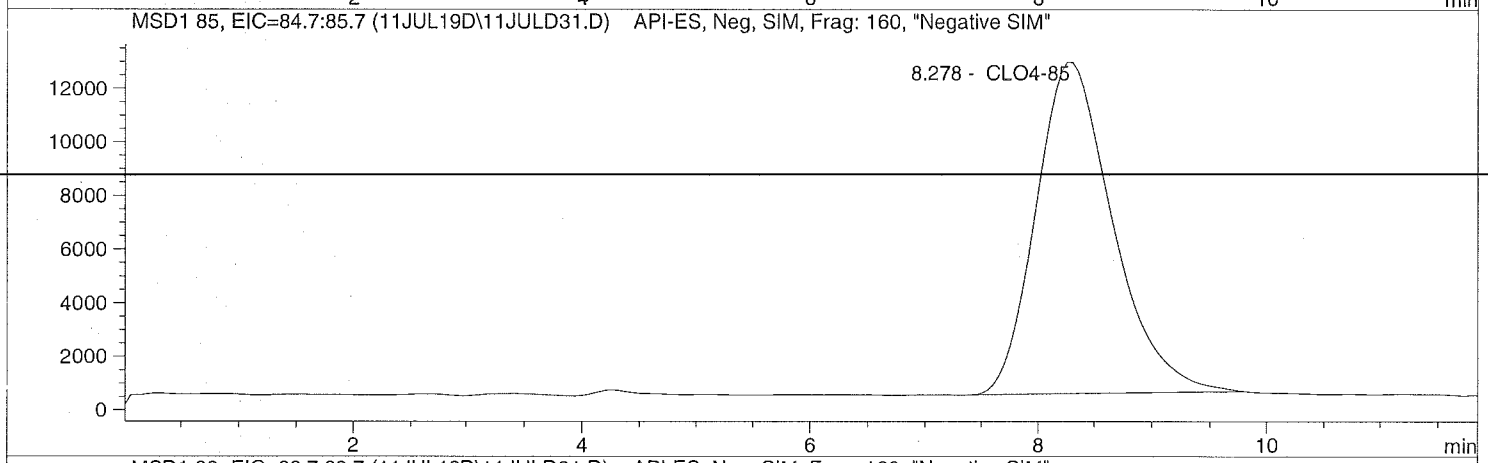
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD31.D Sample Name: 663037 CCV@25

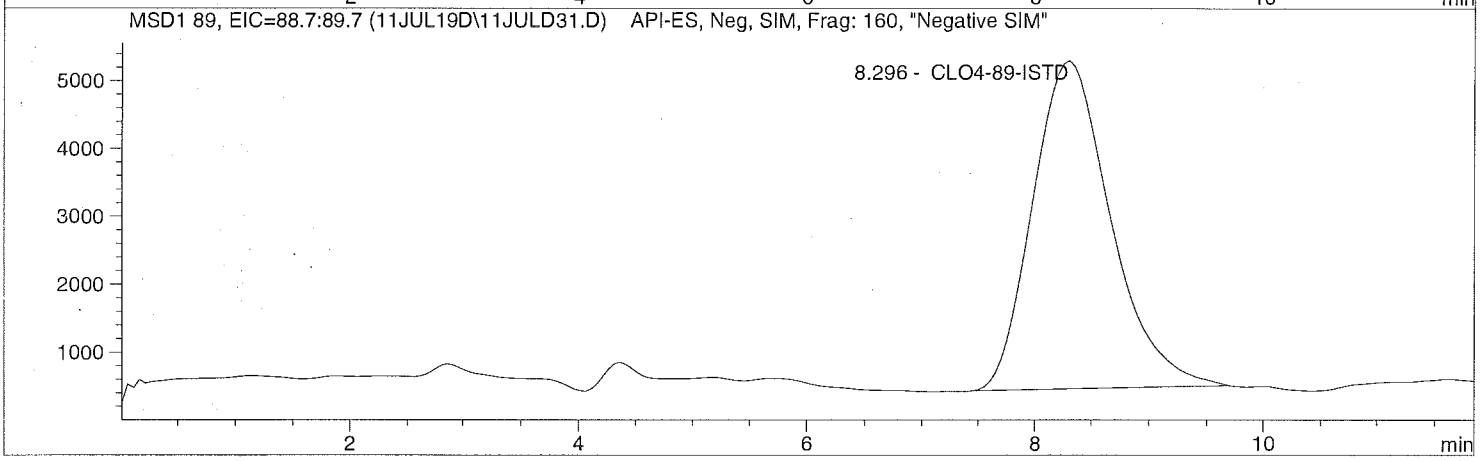
Injection Date:	7/11/2019 18:07:55	Seq Line:	31
Sample Name:	663037 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD31.D Sample Name: 663037 CCV@25

Injection Date:	7/11/2019 18:07:55	Seq Line:	31
Sample Name:	663037 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.269	PBA	1970476.5	25.8725	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.278	PBA	583651.3	25.8263	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.296	PBA	231230.8	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

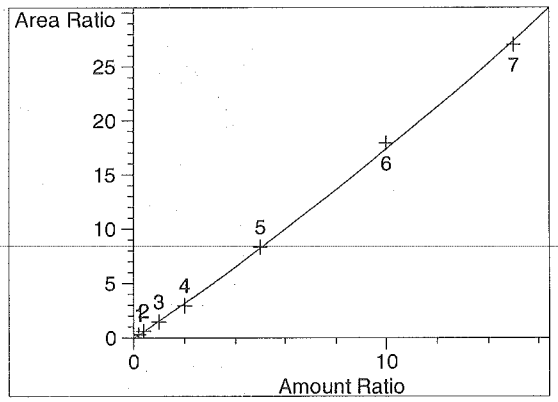
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

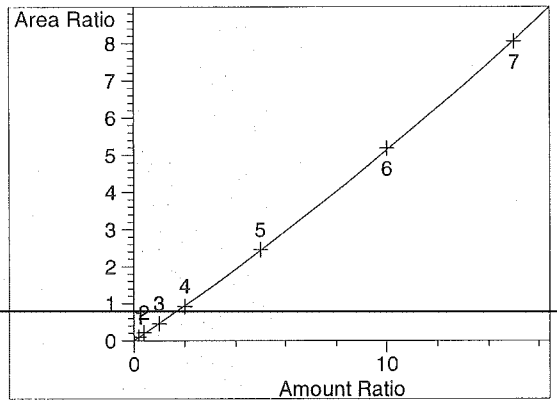
Peak Sum Table

No Entries in table

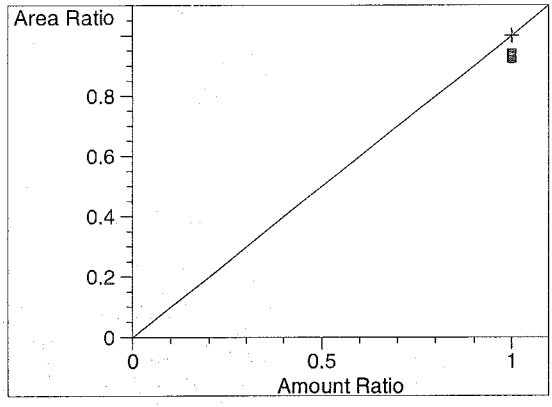
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Report: C:\HPCHEM\1\DATA\19MAR19I\19MAR19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

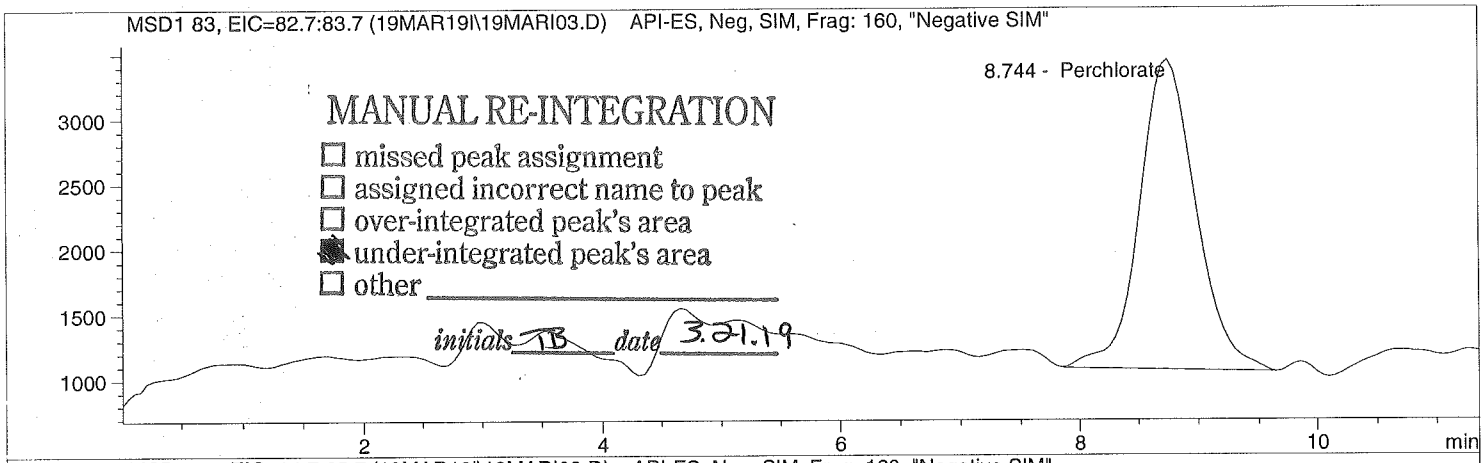
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

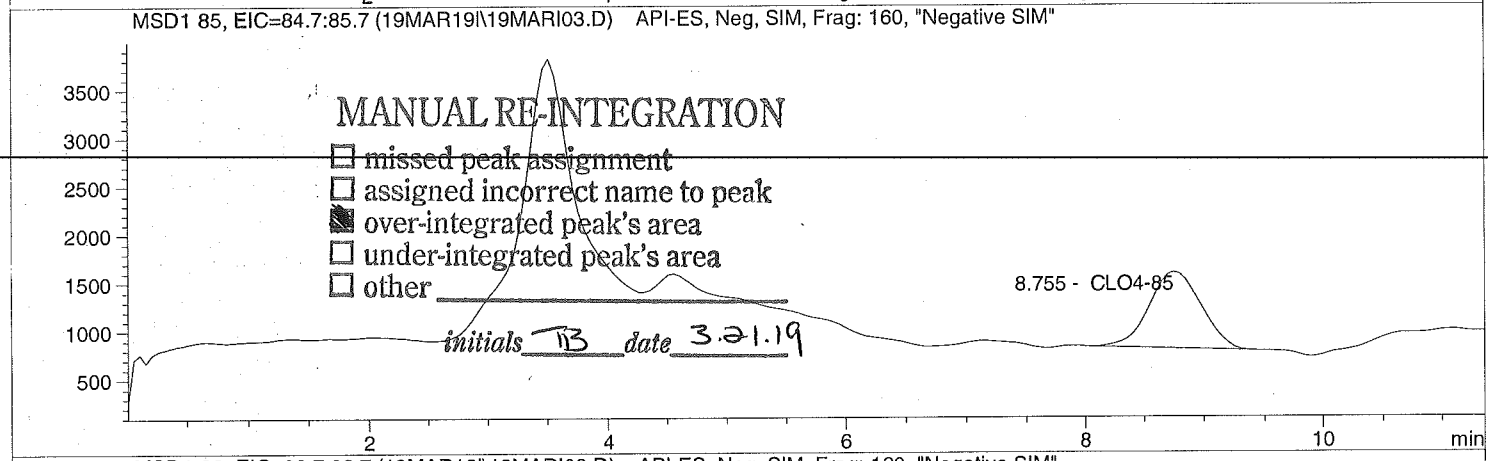
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

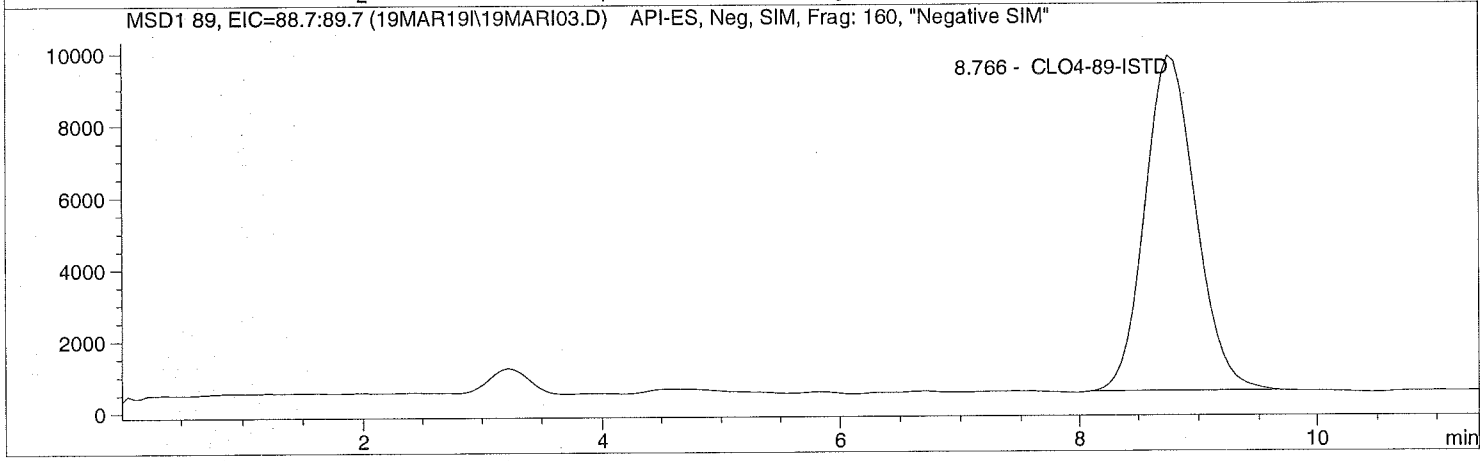
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

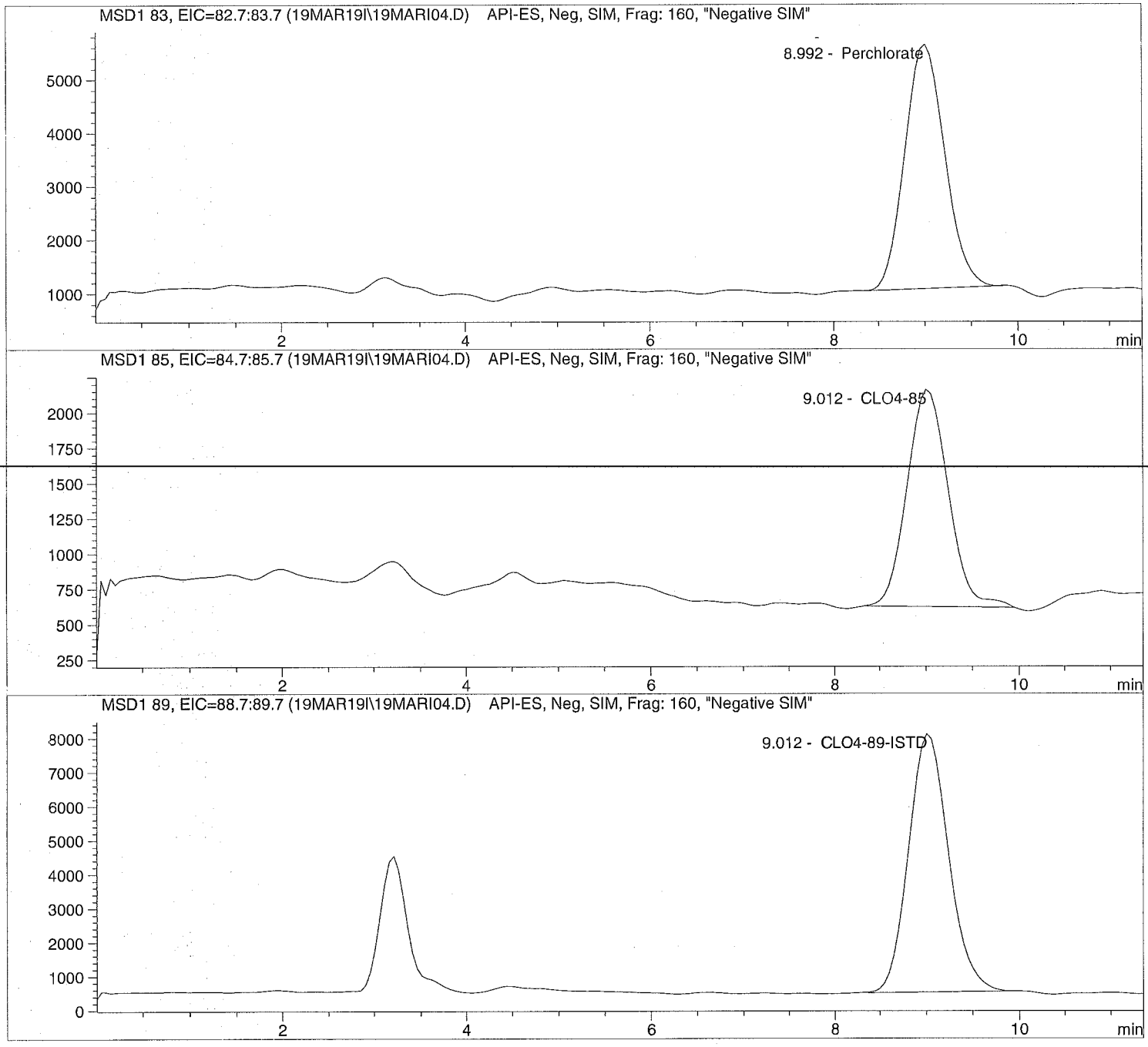
00942130

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

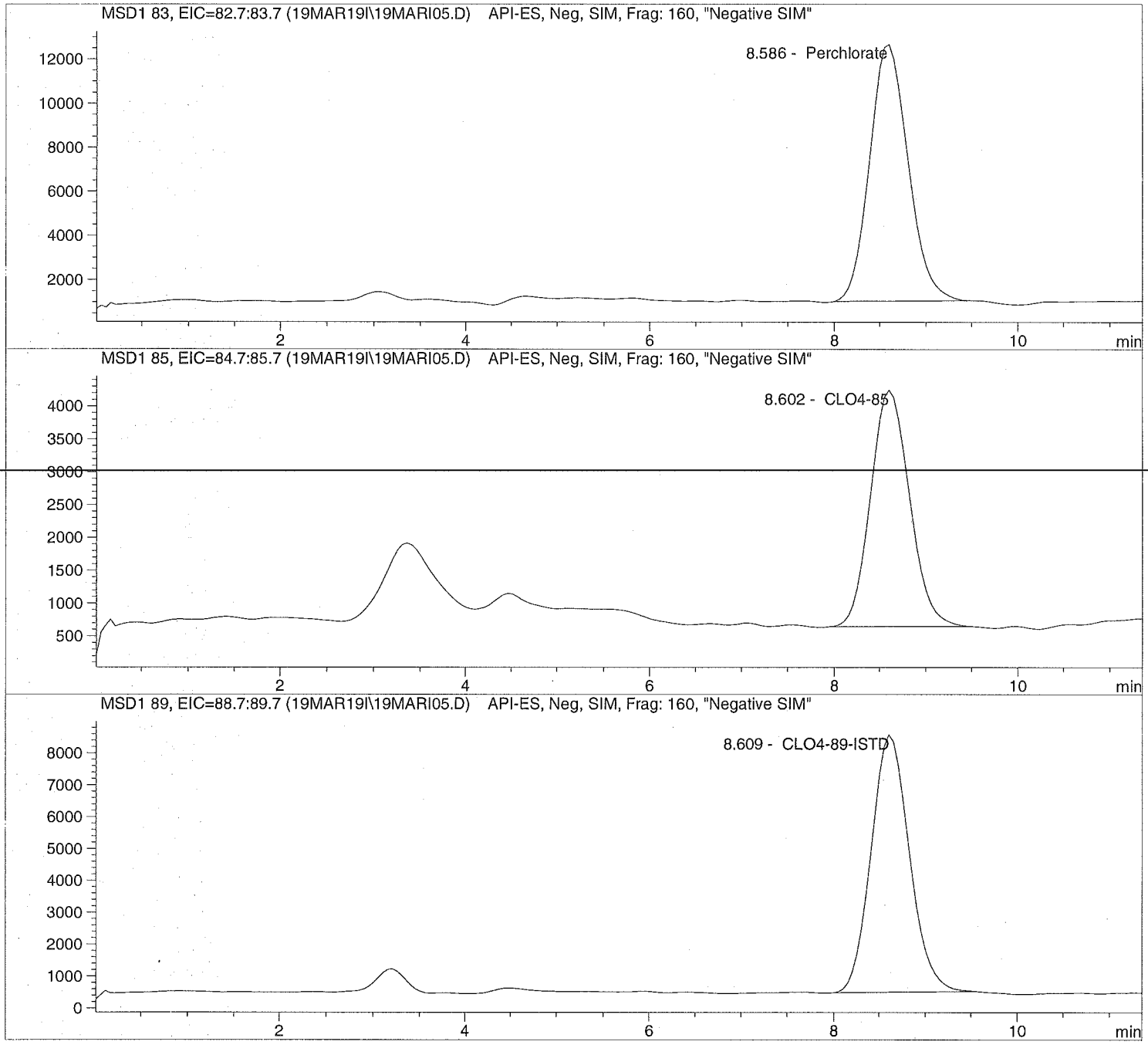
00942132

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

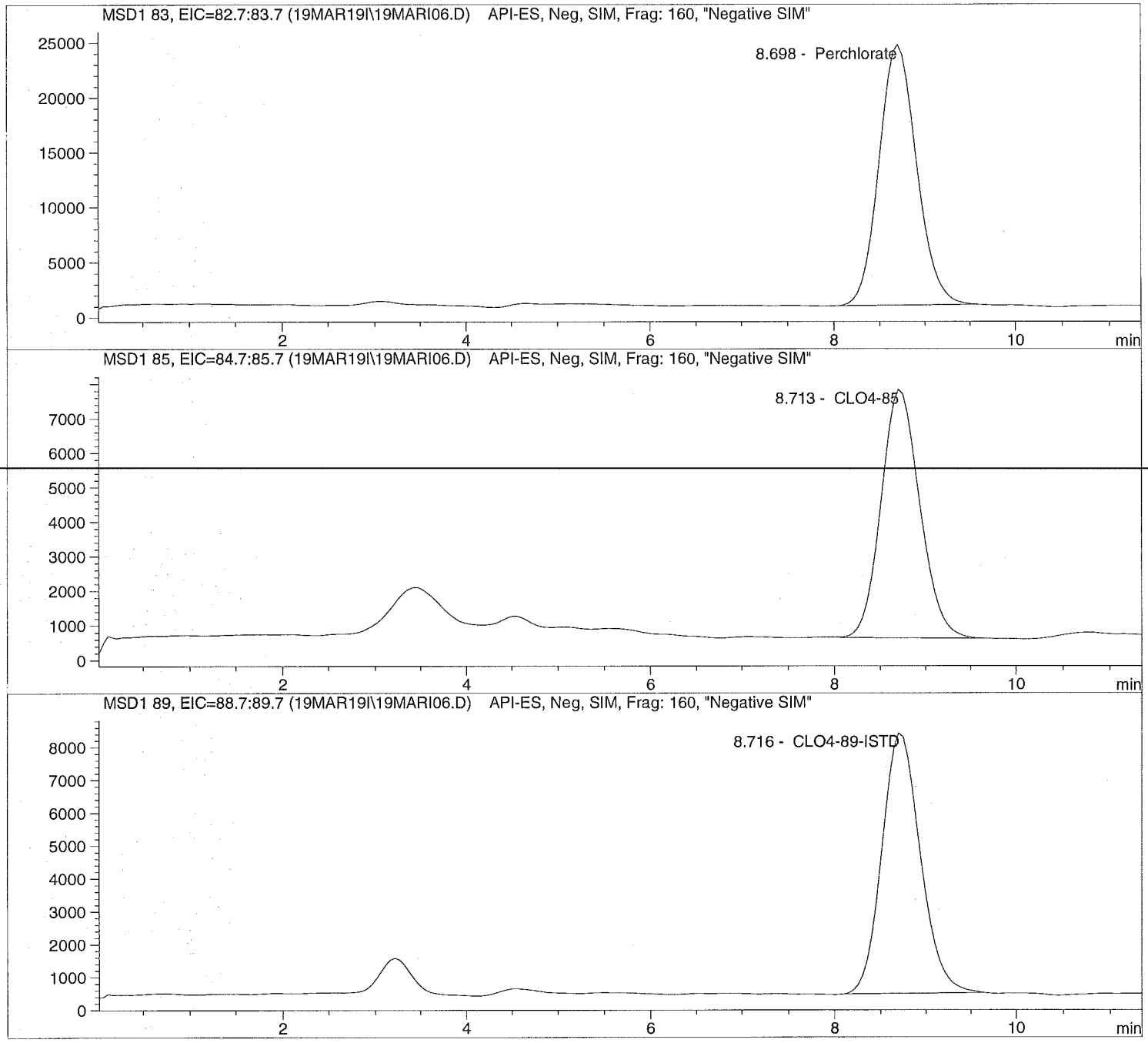
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

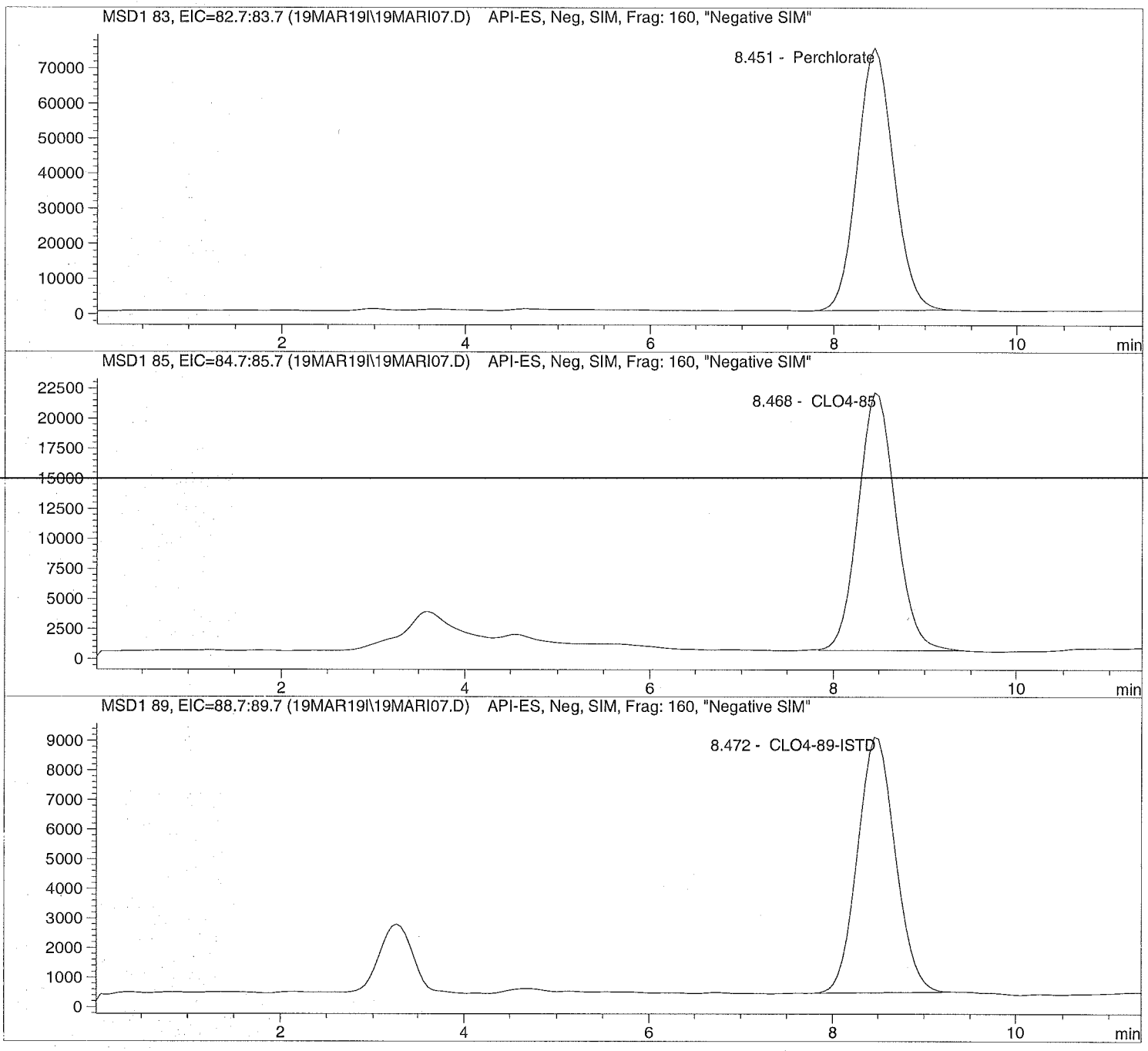
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

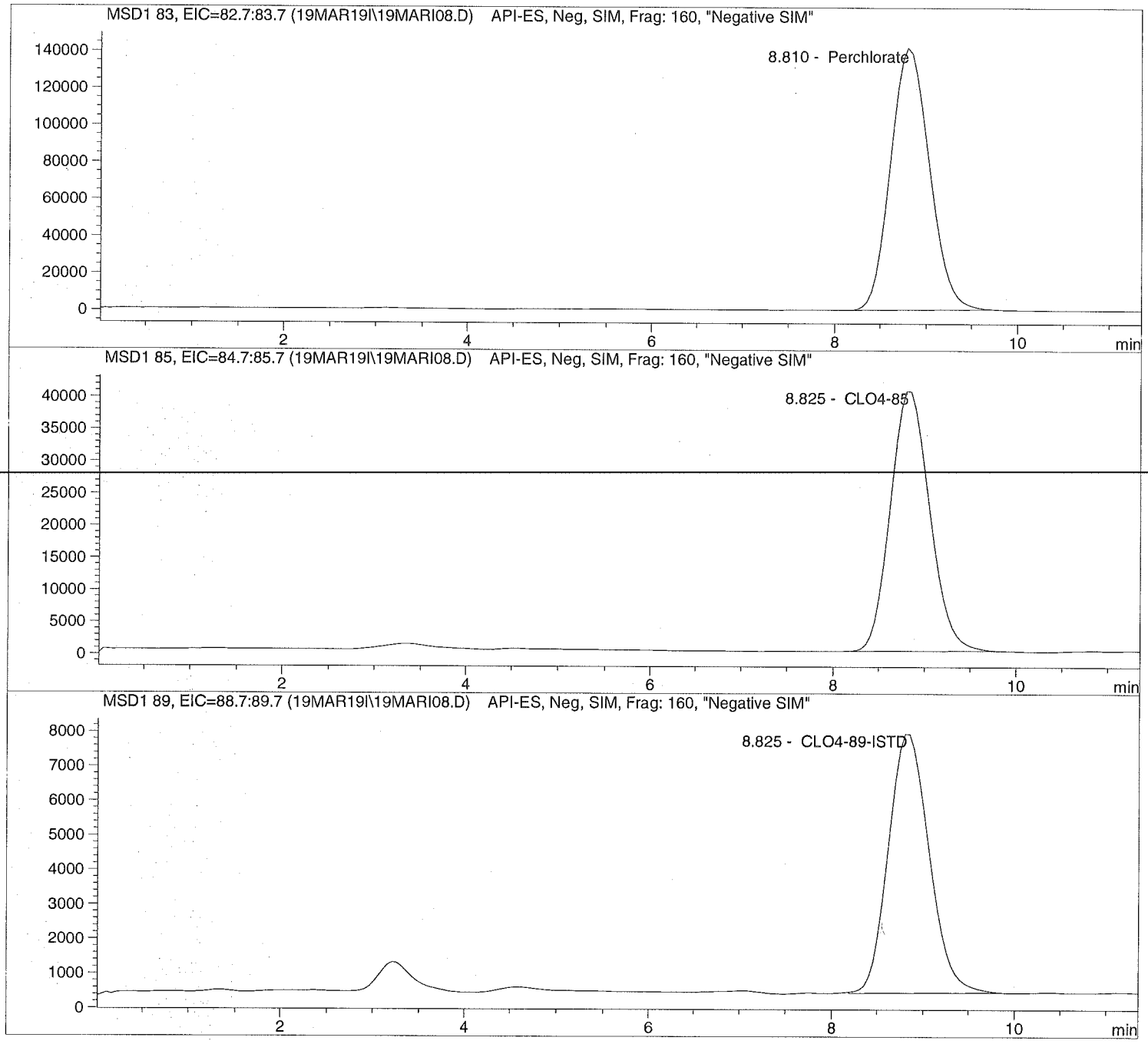
00942138

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

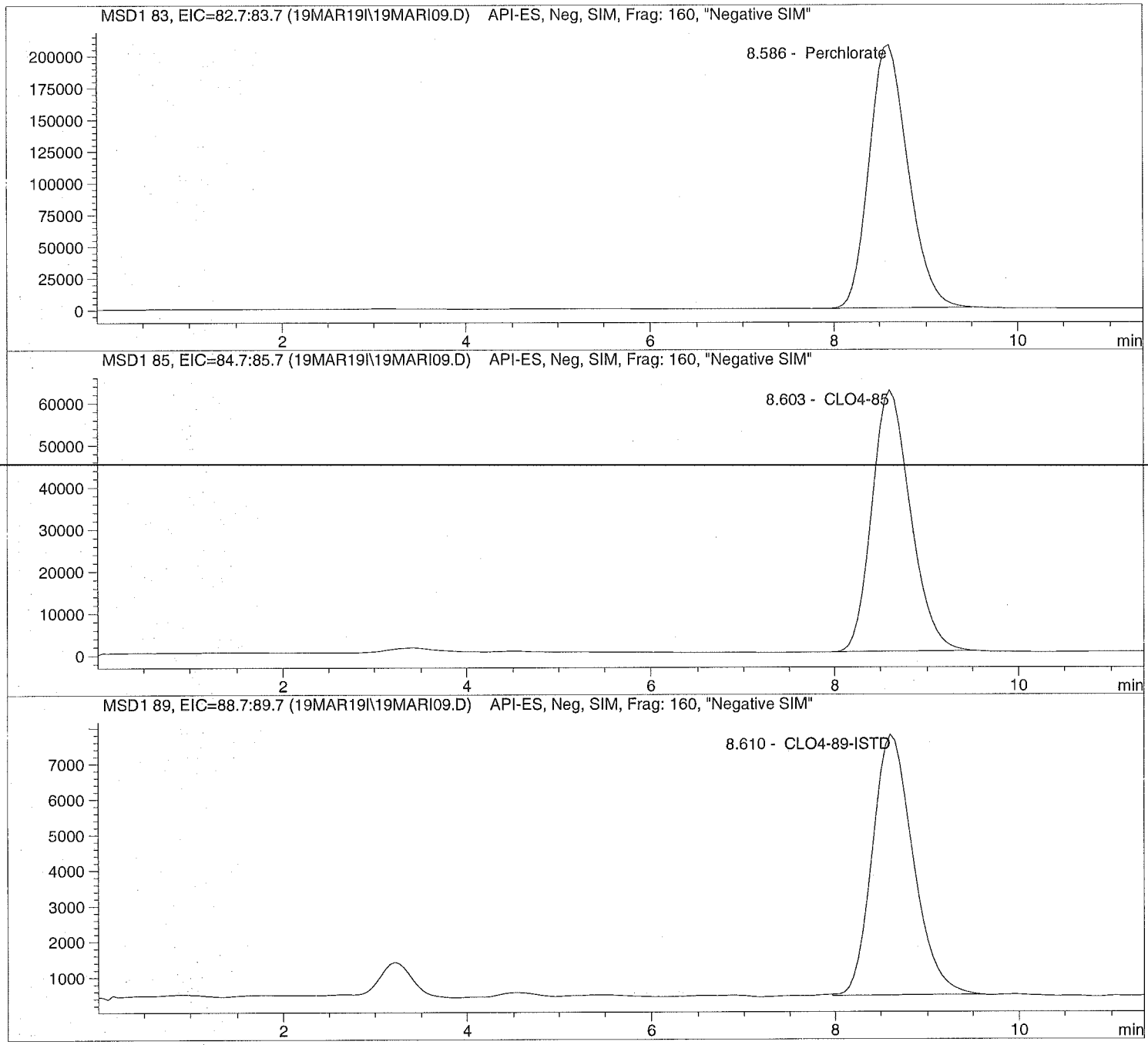
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

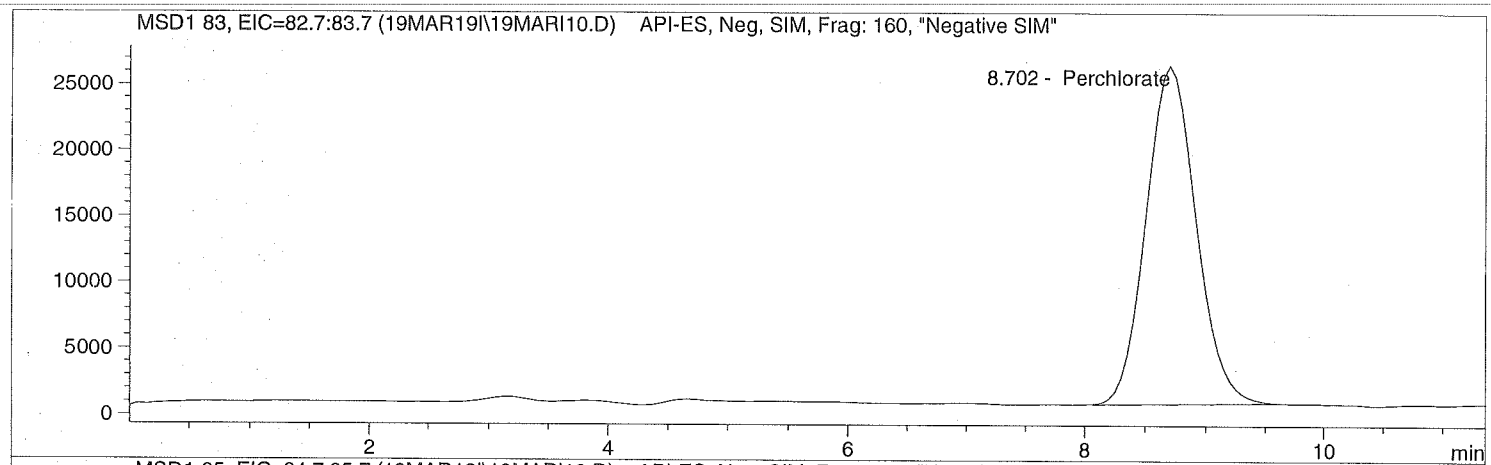
*** End of Report ***

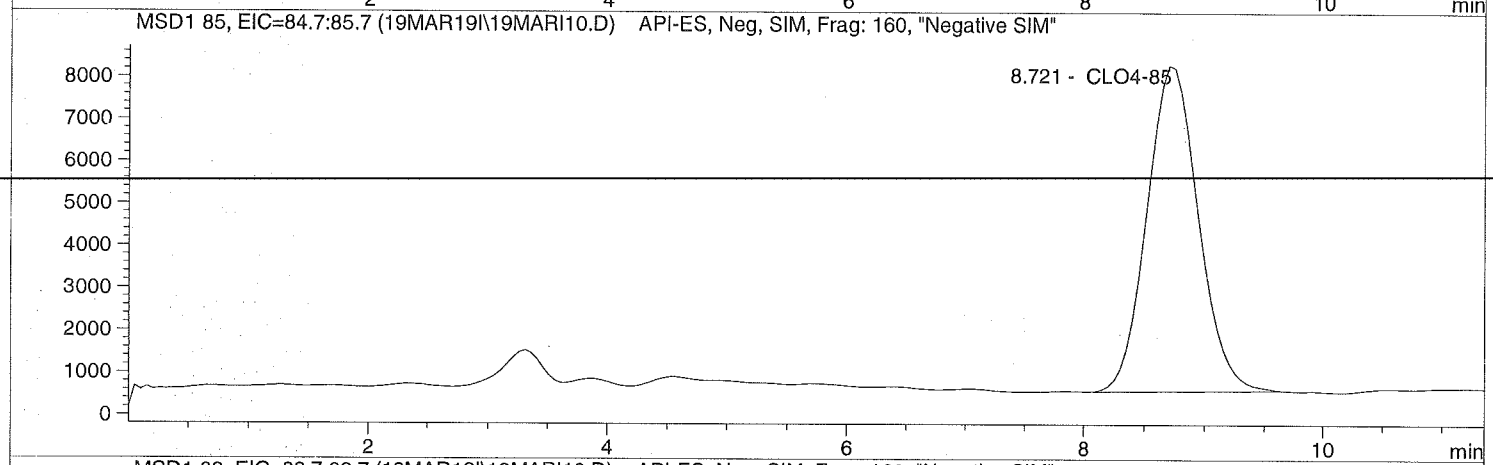
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

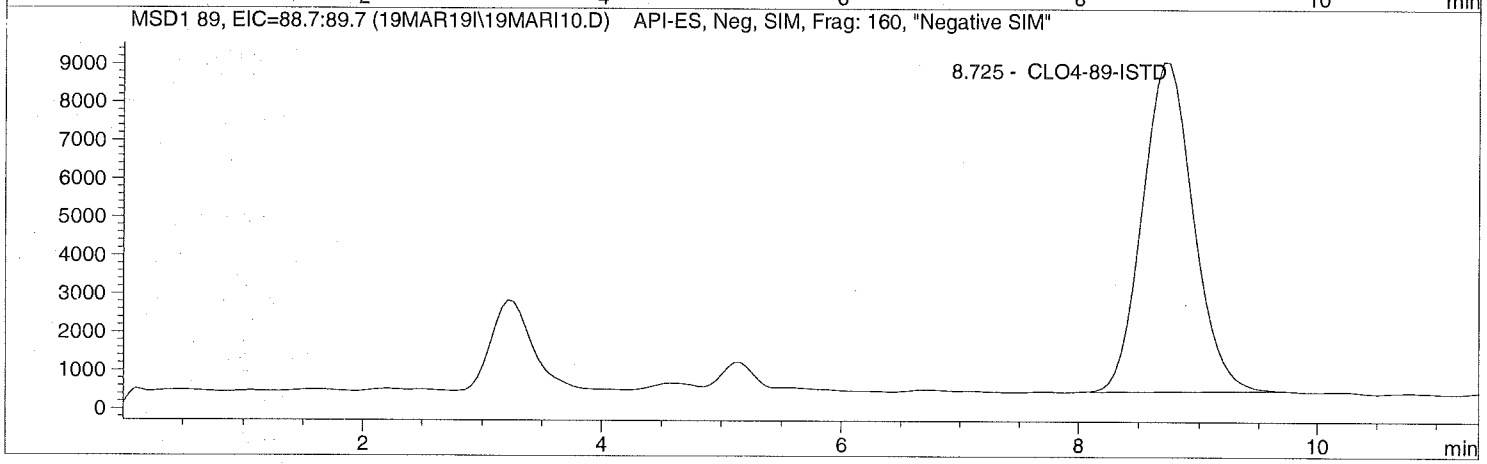
Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

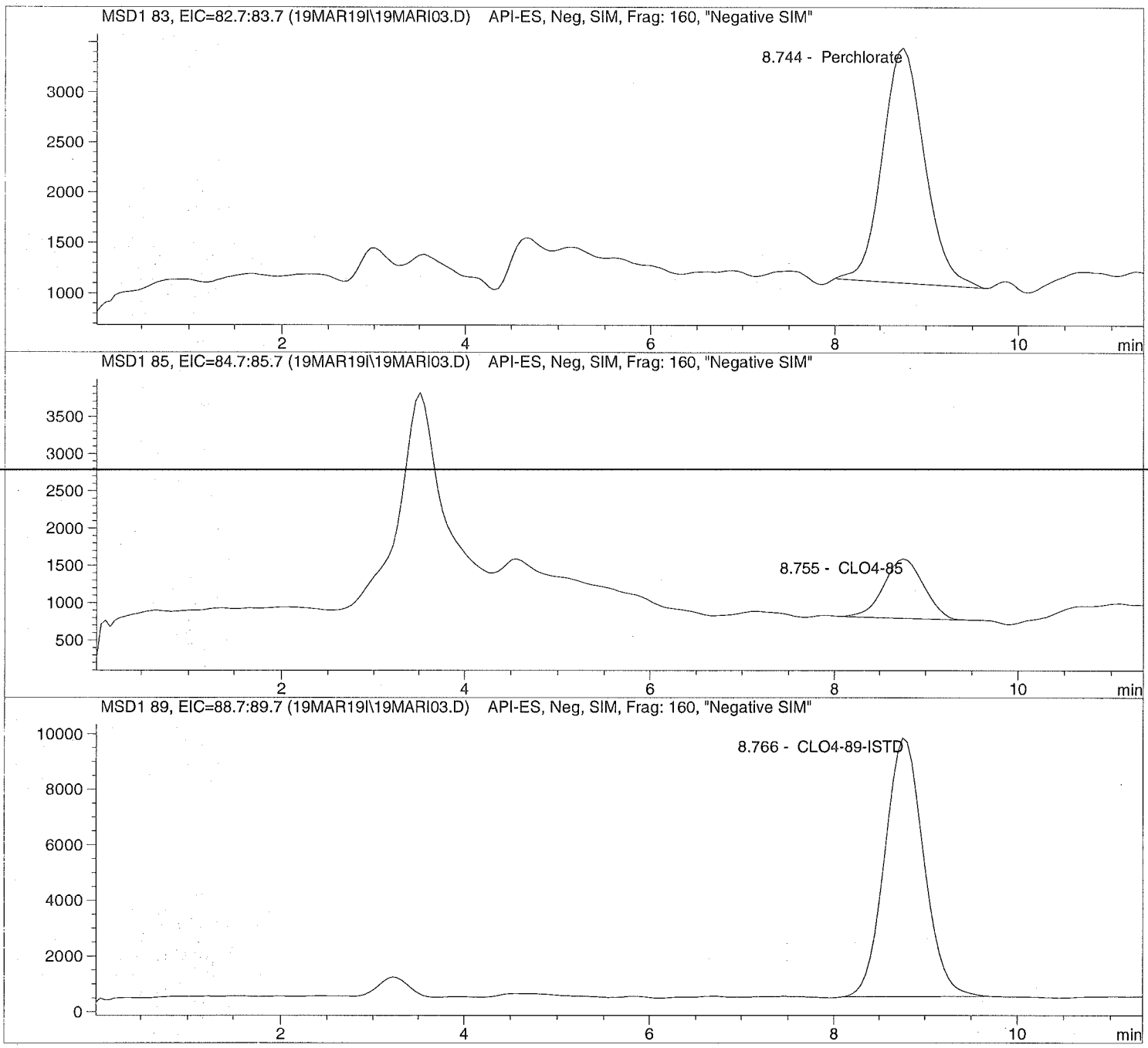
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

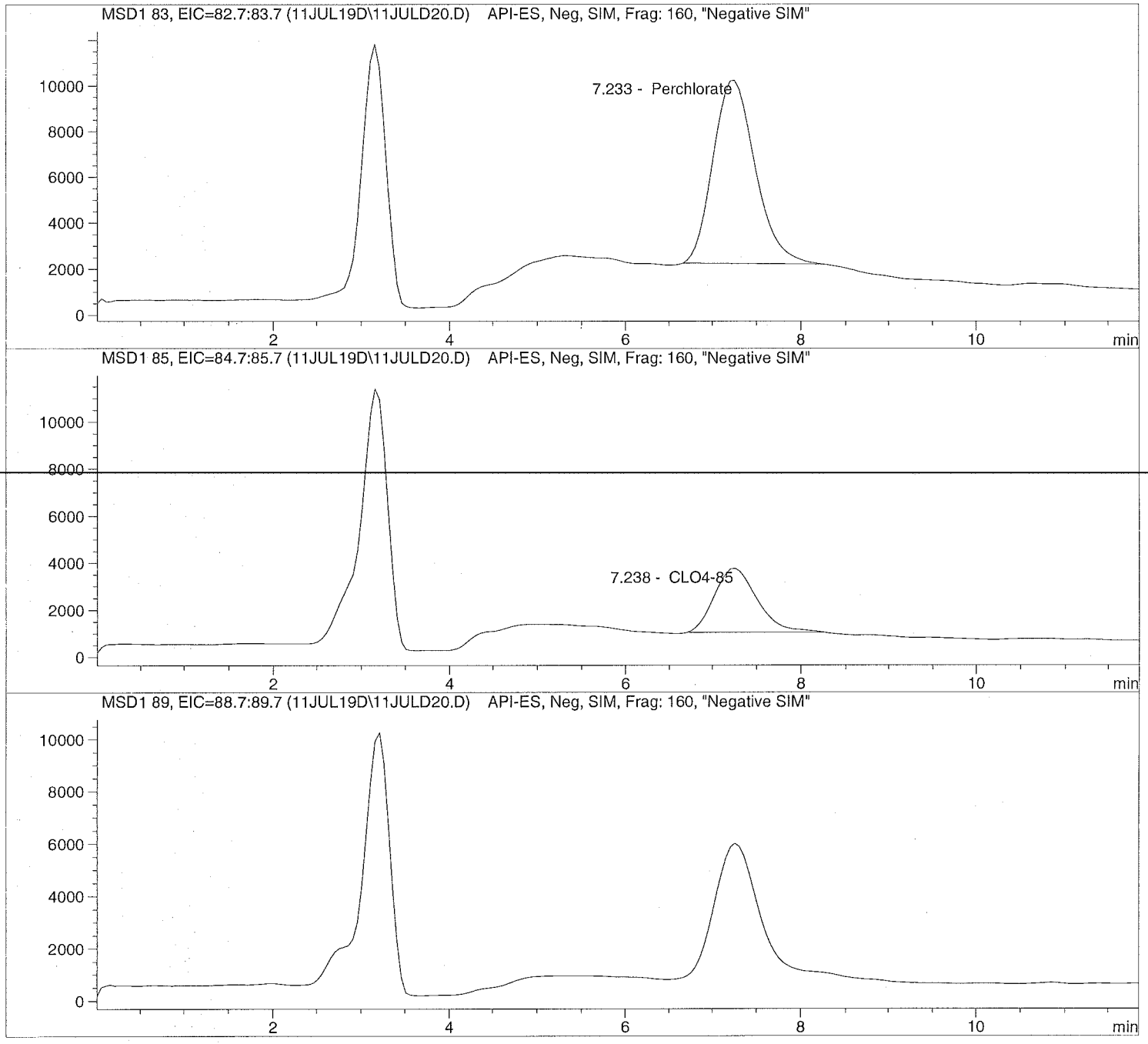
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD20.D Sample Name: 1918705005

Injection Date:	7/11/2019 15:35:52	Seq Line:	20
Sample Name:	1918705005	Location:	Vial 58
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD20.D Sample Name: 1918705005

Injection Date:	7/11/2019 15:35:52	Seq Line:	20
Sample Name:	1918705005	Location:	Vial 58
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.233	PBA	264721.6	0.1573	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.238	BBA	91183.5	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-89-ISTD

*** End of Report ***

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
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July 16, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19061547**

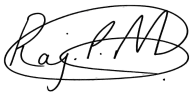
Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 5 sample(s) on Jun 28, 2019 for the analysis presented in the following report.

This is a REVISED REPORT. Please see the Case Narrative for discussion concerning this revision.

Regards,



Generated By: RJ.MODASHIA
RJ Modashia
Project Manager

ALS Houston, US Date: 16-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061547

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19061547-01	18WW08_062719	Groundwater		27-Jun-2019 09:45	28-Jun-2019 08:59	☐
HS19061547-02	18WW09_062719	Groundwater		27-Jun-2019 10:35	28-Jun-2019 08:59	☐
HS19061547-03	18CPTMW16_062719	Groundwater		27-Jun-2019 11:45	28-Jun-2019 08:59	☐
HS19061547-04	18WW25_062719	Groundwater		27-Jun-2019 10:00	28-Jun-2019 08:59	☐
HS19061547-05	Trip Blank	Water	C&G-050119-186	27-Jun-2019 00:00	28-Jun-2019 08:59	☐

Revision:1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19061547

CASE NARRATIVE

Work Order Comments

• Revised to correct the sample ID for 18WW25_062719

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 142659

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R342223

Sample ID: HS19070016-09MS

• MS and MSD are for an unrelated sample

Metals by Method SW7470

Batch ID: 142769

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 142750

Sample ID: HS19070016-05MS

• MS and MSD are for an unrelated sample

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW08_062719
Collection Date: 27-Jun-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19061547
Lab ID:HS19061547-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:29
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 12:29
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Jul-2019 12:29
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:29
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Jul-2019 12:29
Acetone	**2.1**		**0.40**	**1.0**	**2.0**	**UG/L**	1	10-Jul-2019 12:29
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Jul-2019 12:29
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW08_062719
Collection Date: 27-Jun-2019 09:45

ANALYTICAL REPORT
WorkOrder:HS19061547
Lab ID:HS19061547-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Jul-2019 12:29
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 12:29
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Jul-2019 12:29
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:29
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:29
Surr: 1,2-Dichloroethane-d4	*94.0*			**0**	*81-118*	*%REC*	*1*	*10-Jul-2019 12:29*
Surr: 4-Bromofluorobenzene	*99.0*			**0**	*85-114*	*%REC*	*1*	*10-Jul-2019 12:29*
Surr: Dibromofluoromethane	*95.4*			**0**	*80-119*	*%REC*	*1*	*10-Jul-2019 12:29*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*10-Jul-2019 12:29*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 02-Jul-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	09-Jul-2019 15:44
Surr: 2-Fluorobiphenyl	*77.3*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 15:44*
Surr: 4-Terphenyl-d14	*101*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 15:44*
Surr: Nitrobenzene-d5	*93.2*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 15:44*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW09_062719
Collection Date: 27-Jun-2019 10:35

ANALYTICAL REPORT
WorkOrder:HS19061547
Lab ID:HS19061547-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 02-Jul-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	09-Jul-2019 16:05
Surr: 2-Fluorobiphenyl	*75.1*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 16:05*
Surr: 4-Terphenyl-d14	*85.5*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 16:05*
Surr: Nitrobenzene-d5	*104*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 16:05*
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.0863**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 18:42
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 01:13
Arsenic	**0.00754**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:13
Barium	**0.239**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 01:13
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:13
Cadmium	**0.000214**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 01:13
Calcium	**17.9**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 01:13
Chromium	**0.0175**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:13
Cobalt	**0.00123**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:13
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	09-Jul-2019 01:13
Iron	**39.4**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:13
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 01:13
Magnesium	**9.91**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:13
Manganese	**0.792**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:13
Nickel	**0.0111**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:13
Potassium	**2.58**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:13
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 01:13
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 18:42
Sodium	**42.5**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:13
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:13
Vanadium	**0.00236**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:13
Zinc	**0.0131**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 01:13
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	05-Jul-2019 15:22
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18CPTMW16_062719
Collection Date: 27-Jun-2019 11:45

ANALYTICAL REPORT
WorkOrder:HS19061547
Lab ID:HS19061547-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 02-Jul-2019		Analyst: LG
1,4-Dioxane	**0.048**		**0.010**	**0.010**	**0.010**	**ug/L**	1	09-Jul-2019 16:26
Surr: 2-Fluorobiphenyl	*90.9*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 16:26*
Surr: 4-Terphenyl-d14	*81.1*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 16:26*
Surr: Nitrobenzene-d5	*90.7*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 16:26*
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW25_062719
Collection Date: 27-Jun-2019 10:00

ANALYTICAL REPORT
WorkOrder:HS19061547
Lab ID:HS19061547-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:53
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 12:53
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Jul-2019 12:53
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:53
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Jul-2019 12:53
Acetone	**2.3**		**0.40**	**1.0**	**2.0**	**UG/L**	1	10-Jul-2019 12:53
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Jul-2019 12:53
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc. **ANALYTICAL REPORT**
Project: LHAAP 18 24 WorkOrder:HS19061547
Sample ID: 18WW25_062719 Lab ID:HS19061547-04
Collection Date: 27-Jun-2019 10:00 Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Jul-2019 12:53
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 12:53
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Jul-2019 12:53
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:53
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:53
Surr: 1,2-Dichloroethane-d4	*95.1*			**0**	*81-118*	*%REC*	*1*	*10-Jul-2019 12:53*
Surr: 4-Bromofluorobenzene	*96.6*			**0**	*85-114*	*%REC*	*1*	*10-Jul-2019 12:53*
Surr: Dibromofluoromethane	*95.5*			**0**	*80-119*	*%REC*	*1*	*10-Jul-2019 12:53*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*10-Jul-2019 12:53*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 02-Jul-2019		Analyst: LG
1,4-Dioxane	0.010	U	0.010	0.010	0.010	ug/L	1	09-Jul-2019 16:47
Surr: 2-Fluorobiphenyl	*77.2*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 16:47*
Surr: 4-Terphenyl-d14	*95.4*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 16:47*
Surr: Nitrobenzene-d5	*90.1*			**0**	*40-140*	*%REC*	*1*	*09-Jul-2019 16:47*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW25_062719
Collection Date: 27-Jun-2019 10:00

ANALYTICAL REPORT
WorkOrder:HS19061547
Lab ID:HS19061547-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.255**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 18:44
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 01:15
Arsenic	**0.00770**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:15
Barium	**0.316**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 01:15
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:15
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:15
Calcium	**20.6**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 01:15
Chromium	**0.000744**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:15
Cobalt	**0.00410**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 01:15
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	09-Jul-2019 01:15
Iron	**27.0**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:15
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 01:15
Magnesium	**12.5**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:15
Manganese	**2.92**		**0.00700**	**0.0100**	**0.0500**	**mg/L**	10	09-Jul-2019 18:48
Nickel	**0.00273**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:15
Potassium	**1.51**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:15
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 01:15
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 18:44
Sodium	**35.7**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 01:15
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 01:15
Vanadium	**0.000983**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 01:15
Zinc	**0.0183**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 01:15
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	05-Jul-2019 15:23
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	12-Jul-2019 18:48

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 27-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061547
Lab ID:HS19061547-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:05
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
2-Butanone	**1.2**	J	**0.50**	**1.0**	**2.0**	**UG/L**	1	10-Jul-2019 12:05
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Jul-2019 12:05
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:05
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Jul-2019 12:05
Acetone	**15**		**0.40**	**1.0**	**2.0**	**UG/L**	1	10-Jul-2019 12:05
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Jul-2019 12:05
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 27-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19061547
Lab ID:HS19061547-05
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Jul-2019 12:05
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 12:05
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Jul-2019 12:05
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 12:05
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 12:05
Surr: 1,2-Dichloroethane-d4	*95.9*			**0**	*81-118*	*%REC*	*1*	*10-Jul-2019 12:05*
Surr: 4-Bromofluorobenzene	*99.4*			**0**	*85-114*	*%REC*	*1*	*10-Jul-2019 12:05*
Surr: Dibromofluoromethane	*97.1*			**0**	*80-119*	*%REC*	*1*	*10-Jul-2019 12:05*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*10-Jul-2019 12:05*

Note: See Qualifiers Page for a list of qualifiers and their explanation. **Revision:** 1

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WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

Batch ID: 142659 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061547-01	1	1000	1 (mL)	0.001
HS19061547-02	1	1000	1 (mL)	0.001
HS19061547-03	1	1000	1 (mL)	0.001
HS19061547-04	1	1000	1 (mL)	0.001

Batch ID: 142750 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061547-02	1	10	10 (mL)	1
HS19061547-04	1	10	10 (mL)	1

Batch ID: 142769 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19061547-02	1	10 (mL)	10 (mL)	1
HS19061547-04	1	10 (mL)	10 (mL)	1

ALS Houston, US Date: 16-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142659 (0)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Groundwater	
HS19061547-01	18WW08_062719	27 Jun 2019 09:45		02 Jul 2019 12:18	09 Jul 2019 15:44	1
HS19061547-02	18WW09_062719	27 Jun 2019 10:35		02 Jul 2019 12:18	09 Jul 2019 16:05	1
HS19061547-03	18CPTMW16_062719	27 Jun 2019 11:45		02 Jul 2019 12:18	09 Jul 2019 16:26	1
HS19061547-04	18WW25_062719	27 Jun 2019 10:00		02 Jul 2019 12:18	09 Jul 2019 16:47	1
Batch ID: 142750 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19061547-02	18WW09_062719	27 Jun 2019 10:35		05 Jul 2019 10:03	09 Jul 2019 18:42	1
HS19061547-02	18WW09_062719	27 Jun 2019 10:35		05 Jul 2019 10:03	09 Jul 2019 01:13	1
HS19061547-04	18WW25_062719	27 Jun 2019 10:00		05 Jul 2019 10:03	09 Jul 2019 18:48	10
HS19061547-04	18WW25_062719	27 Jun 2019 10:00		05 Jul 2019 10:03	09 Jul 2019 18:44	1
HS19061547-04	18WW25_062719	27 Jun 2019 10:00		05 Jul 2019 10:03	09 Jul 2019 01:15	1
Batch ID: 142769 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19061547-02	18WW09_062719	27 Jun 2019 10:35		05 Jul 2019 10:30	05 Jul 2019 15:22	1
HS19061547-04	18WW25_062719	27 Jun 2019 10:00		05 Jul 2019 10:30	05 Jul 2019 15:23	1
Batch ID: R342223 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19061547-05	Trip Blank	27 Jun 2019 00:00			10 Jul 2019 12:05	1
Batch ID: R342223 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19061547-01	18WW08_062719	27 Jun 2019 09:45			10 Jul 2019 12:29	1
HS19061547-04	18WW25_062719	27 Jun 2019 10:00			10 Jul 2019 12:53	1
Batch ID: R342378 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19061547-01	18WW08_062719	27 Jun 2019 09:45			12 Jul 2019 18:48	1
HS19061547-02	18WW09_062719	27 Jun 2019 10:35			12 Jul 2019 18:48	1
HS19061547-03	18CPTMW16_062719	27 Jun 2019 11:45			12 Jul 2019 18:48	1
HS19061547-04	18WW25_062719	27 Jun 2019 10:00			12 Jul 2019 18:48	1

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 14:46**
Client ID: Run ID: **ICPMS05_342082** SeqNo: **5159142** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.00500	0.0100								U
Antimony	0.00078	0.00500								J
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00100	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.000871	0.00500								J
Zinc	0.00250	0.00500								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 00:09**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157973** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.01569	0.0100								
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00100	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0188	0.200								J
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.01316	0.00500								

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 00:11**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157974** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.105	0.0100	0.1	0	105	84 - 117				
Antimony	0.05026	0.00500	0.05	0	101	85 - 117				
Arsenic	0.05045	0.00500	0.05	0	101	84 - 116				
Barium	0.04898	0.00500	0.05	0	98.0	86 - 114				
Beryllium	0.0522	0.00200	0.05	0	104	83 - 121				
Cadmium	0.05062	0.00200	0.05	0	101	87 - 115				
Calcium	5.044	0.500	5	0	101	87 - 118				
Chromium	0.05022	0.00500	0.05	0	100	85 - 116				
Cobalt	0.05178	0.00500	0.05	0	104	86 - 115				
Copper	0.05054	0.00500	0.05	0	101	85 - 118				
Iron	5.157	0.200	5	0	103	87 - 118				
Lead	0.04892	0.00500	0.05	0	97.8	88 - 115				
Magnesium	5.207	0.200	5	0	104	83 - 118				
Manganese	0.05151	0.00500	0.05	0	103	87 - 115				
Nickel	0.05192	0.00500	0.05	0	104	85 - 117				
Potassium	5.01	0.200	5	0	100	87 - 115				
Selenium	0.05098	0.00500	0.05	0	102	80 - 120				
Sodium	5.131	0.200	5	0	103	85 - 117				
Thallium	0.04741	0.00200	0.05	0	94.8	82 - 116				
Vanadium	0.04942	0.00500	0.05	0	98.8	86 - 115				
Zinc	0.05405	0.00500	0.05	0	108	83 - 119				

LCS Sample ID: **LCS-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 16:22**
Client ID: Run ID: **ICPMS05_342082** SeqNo: **5159203** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Silver	0.05104	0.00500	0.05	0	102	85 - 116				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19070016-05MS** Units: **mg/L** Analysis Date: **09-Jul-2019 00:18**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157977** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09637	0.0100	0.1	0.008457	87.9	84 - 117				
Antimony	0.04754	0.00500	0.05	0.000233	94.6	85 - 117				
Arsenic	0.04735	0.00500	0.05	0.000332	94.0	84 - 116				
Barium	0.5018	0.00500	0.05	0.443	118	86 - 114				SO
Beryllium	0.05054	0.00200	0.05	0.000285	101	83 - 121				
Cadmium	0.04557	0.00200	0.05	0.000354	90.4	87 - 115				
Calcium	15.22	0.500	5	10.34	97.6	87 - 118				
Chromium	0.1883	0.00500	0.05	0.1422	92.1	85 - 116				
Cobalt	0.05284	0.00500	0.05	0.004809	96.1	86 - 115				
Copper	0.05149	0.00500	0.05	0.004724	93.5	85 - 118				
Iron	5.767	0.200	5	1.003	95.3	87 - 118				
Lead	0.04574	0.00500	0.05	0.000066	91.3	88 - 115				
Magnesium	11.72	0.200	5	7.041	93.6	83 - 118				
Manganese	0.255	0.00500	0.05	0.2048	100	87 - 115				O
Nickel	0.6207	0.00500	0.05	0.5635	114	85 - 117				O
Potassium	5.81	0.200	5	0.934	97.5	87 - 115				
Selenium	0.05067	0.00500	0.05	0.000254	101	80 - 120				
Silver	0.05394	0.00500	0.05	0.000034	108	85 - 116				
Sodium	70.47	0.200	5	64.83	113	85 - 117				O
Thallium	0.04418	0.00200	0.05	0.000618	87.1	82 - 116				
Vanadium	0.0472	0.00500	0.05	0.001088	92.2	86 - 115				
Zinc	0.1359	0.00500	0.05	0.09015	91.5	83 - 119				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19070016-05MSD** Units: **mg/L** Analysis Date: **09-Jul-2019 00:21**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157978** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.0988	0.0100	0.1	0.008457	90.3	84 - 117	0.09637	2.49	20	
Antimony	0.04561	0.00500	0.05	0.000233	90.8	85 - 117	0.04754	4.15	20	
Arsenic	0.0475	0.00500	0.05	0.000332	94.3	84 - 116	0.04735	0.314	20	
Barium	0.5084	0.00500	0.05	0.443	131	86 - 114	0.5018	1.3	20	SO
Beryllium	0.05016	0.00200	0.05	0.000285	99.8	83 - 121	0.05054	0.751	20	
Cadmium	0.04804	0.00200	0.05	0.000354	95.4	87 - 115	0.04557	5.28	20	
Calcium	14.79	0.500	5	10.34	89.1	87 - 118	15.22	2.83	20	
Chromium	0.1943	0.00500	0.05	0.1422	104	85 - 116	0.1883	3.17	20	
Cobalt	0.05273	0.00500	0.05	0.004809	95.8	86 - 115	0.05284	0.201	20	
Copper	0.05346	0.00500	0.05	0.004724	97.5	85 - 118	0.05149	3.75	20	
Iron	5.694	0.200	5	1.003	93.8	87 - 118	5.767	1.28	20	
Lead	0.04407	0.00500	0.05	0.000066	88.0	88 - 115	0.04574	3.72	20	
Magnesium	11.29	0.200	5	7.041	85.1	83 - 118	11.72	3.73	20	
Manganese	0.2539	0.00500	0.05	0.2048	98.1	87 - 115	0.255	0.456	20	O
Nickel	0.6206	0.00500	0.05	0.5635	114	85 - 117	0.6207	0.00725	20	O
Potassium	5.591	0.200	5	0.934	93.1	87 - 115	5.81	3.84	20	
Selenium	0.0495	0.00500	0.05	0.000254	98.5	80 - 120	0.05067	2.33	20	
Silver	0.05636	0.00500	0.05	0.000034	113	85 - 116	0.05394	4.39	20	
Sodium	68.43	0.200	5	64.83	71.9	85 - 117	70.47	2.94	20	SO
Thallium	0.04256	0.00200	0.05	0.000618	83.9	82 - 116	0.04418	3.74	20	
Vanadium	0.04785	0.00500	0.05	0.001088	93.5	86 - 115	0.0472	1.37	20	
Zinc	0.1384	0.00500	0.05	0.09015	96.5	83 - 119	0.1359	1.82	20	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19070016-05PDS** Units: **mg/L** Analysis Date: **09-Jul-2019 00:23**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157979** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1004	0.0100	0.1	0.008457	92.0	80 - 120				
Antimony	0.08827	0.00500	0.1	0.000233	88.0	80 - 120				
Arsenic	0.1014	0.00500	0.1	0.000332	101	80 - 120				
Barium	0.5467	0.00500	0.1	0.443	104	80 - 120				O
Beryllium	0.09789	0.00200	0.1	0.000285	97.6	80 - 120				
Cadmium	0.09739	0.00200	0.1	0.000354	97.0	80 - 120				
Calcium	19.93	0.500	10	10.34	96.0	80 - 120				
Chromium	0.2417	0.00500	0.1	0.1422	99.5	80 - 120				
Cobalt	0.1061	0.00500	0.1	0.004809	101	80 - 120				
Copper	0.1034	0.00500	0.1	0.004724	98.7	80 - 120				
Iron	11.04	0.200	10	1.003	100	80 - 120				
Lead	0.09432	0.00500	0.1	0.000066	94.2	80 - 120				
Magnesium	16.83	0.200	10	7.041	97.9	80 - 120				
Manganese	0.3036	0.00500	0.1	0.2048	98.8	80 - 120				
Nickel	0.652	0.00500	0.1	0.5635	88.5	80 - 120				O
Potassium	10.66	0.200	10	0.934	97.2	80 - 120				
Selenium	0.1067	0.00500	0.1	0.000254	106	80 - 120				
Silver	0.1124	0.00500	0.1	0.000034	112	80 - 120				
Sodium	73.52	0.200	10	64.83	86.9	80 - 120				O
Thallium	0.09198	0.00200	0.1	0.000618	91.4	80 - 120				
Vanadium	0.101	0.00500	0.1	0.001088	99.9	80 - 120				
Zinc	0.1865	0.00500	0.1	0.09015	96.3	80 - 120				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19070016-05SD** Units: **mg/L** Analysis Date: **09-Jul-2019 00:16**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157976** PrepDate: **05-Jul-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.0250	0.0500					0.008457	0	10	U
Antimony	0.00250	0.0250					0.000233	0	10	U
Arsenic	0.00250	0.0250					0.000332	0	10	U
Barium	0.4183	0.0250					0.443	5.57	10	
Beryllium	0.00250	0.0100					0.000285	0	10	U
Cadmium	0.00250	0.0100					0.000354	0	10	U
Calcium	10.41	2.50					10.34	0.714	10	
Chromium	0.1432	0.0250					0.1422	0.69	10	
Cobalt	0.005021	0.0250					0.004809	0	10	J
Copper	0.00500	0.0250					0.004724	0	10	U
Iron	1.017	1.00					1.003	1.35	10	
Lead	0.00500	0.0250					0.000066	0	10	U
Magnesium	6.942	1.00					7.041	1.41	10	
Manganese	0.2079	0.0250					0.2048	1.52	10	
Nickel	0.5877	0.0250					0.5635	4.3	10	
Potassium	0.9174	1.00					0.934	0	10	J
Selenium	0.0125	0.0250					0.000254	0	10	U
Silver	0.00250	0.0250					0.000034	0	10	U
Sodium	66.24	1.00					64.83	2.17	10	
Thallium	0.00250	0.0100					0.000618	0	10	U
Vanadium	0.00500	0.0250					0.001088	0	10	U
Zinc	0.08743	0.0250					0.09015	3.02	10	

The following samples were analyzed in this batch: HS19061547-02 HS19061547-04

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: 142769 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142769** Units: **mg/L** Analysis Date: **05-Jul-2019 15:01**
Client ID: Run ID: **HG03_341922** SeqNo: **5154872** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142769** Units: **mg/L** Analysis Date: **05-Jul-2019 15:03**
Client ID: Run ID: **HG03_341922** SeqNo: **5154873** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00505	0.000200	0.005	0	101	82 - 119				

MS Sample ID: **HS19070016-09MS** Units: **mg/L** Analysis Date: **05-Jul-2019 15:06**
Client ID: Run ID: **HG03_341922** SeqNo: **5154875** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00527	0.000200	0.005	-0.00001500	106	82 - 119				

MSD Sample ID: **HS19070016-09MSD** Units: **mg/L** Analysis Date: **05-Jul-2019 15:08**
Client ID: Run ID: **HG03_341922** SeqNo: **5154876** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00517	0.000200	0.005	-0.00001500	104	82 - 119	0.005270	1.92	20	

The following samples were analyzed in this batch: HS19061547-02 HS19061547-04

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: 142659 (0) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-142659** Units: **ug/L** Analysis Date: **09-Jul-2019 12:38**
Client ID: Run ID: **SV-5_342071** SeqNo: **5159697** PrepDate: **02-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.05997*	*0*	*0.08*	*0*	*75.0*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.05244*	*0*	*0.08*	*0*	*65.5*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.0849*	*0*	*0.08*	*0*	*106*	*40 - 140*				

LCS Sample ID: **LCS-142659** Units: **ug/L** Analysis Date: **09-Jul-2019 12:59**
Client ID: Run ID: **SV-5_342071** SeqNo: **5159698** PrepDate: **02-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.07981	0.010	0.08	0	99.8	40 - 140				
Surr: 2-Fluorobiphenyl	*0.06497*	*0*	*0.08*	*0*	*81.2*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.05228*	*0*	*0.08*	*0*	*65.3*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.07798*	*0*	*0.08*	*0*	*97.5*	*40 - 140*				

LCSD Sample ID: **LCSD-142659** Units: **ug/L** Analysis Date: **09-Jul-2019 13:19**
Client ID: Run ID: **SV-5_342071** SeqNo: **5159699** PrepDate: **02-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.08031	0.010	0.08	0	100	40 - 140	0.07981	0.627	20	
Surr: 2-Fluorobiphenyl	*0.07017*	*0*	*0.08*	*0*	*87.7*	*40 - 140*	*0.06497*	*7.7*	*20*	
Surr: 4-Terphenyl-d14	*0.05934*	*0*	*0.08*	*0*	*74.2*	*40 - 140*	*0.05228*	*12.7*	*20*	
Surr: Nitrobenzene-d5	*0.08488*	*0*	*0.08*	*0*	*106*	*40 - 140*	*0.07798*	*8.47*	*20*	

The following samples were analyzed in this batch: HS19061547-01 HS19061547-02 HS19061547-03 HS19061547-04

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190710** Units: **UG/L** Analysis Date: **10-Jul-2019 11:42**
Client ID: Run ID: **VOA6_342223** SeqNo: **5162121** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190710** Units: **UG/L** Analysis Date: **10-Jul-2019 11:42**
Client ID: Run ID: **VOA6_342223** SeqNo: **5162121** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.85*	*1.0*	*50*	*0*	*93.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.68*	*1.0*	*50*	*0*	*97.4*	*85 - 114*				
Surr: Dibromofluoromethane	*47.48*	*1.0*	*50*	*0*	*95.0*	*80 - 119*				
Surr: Toluene-d8	*51.24*	*1.0*	*50*	*0*	*102*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-190710** Units: **UG/L** Analysis Date: **10-Jul-2019 10:54**
Client ID: Run ID: **VOA6_342223** SeqNo: **5162120** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.81	1.0	20	0	104	78 - 124				
1,1,1-Trichloroethane	18.54	1.0	20	0	92.7	74 - 131				
1,1,2,2-Tetrachloroethane	19.9	1.0	20	0	99.5	71 - 121				
1,1,2-Trichloroethane	19.84	1.0	20	0	99.2	80 - 119				
1,1-Dichloroethane	18.35	1.0	20	0	91.8	77 - 125				
1,1-Dichloroethene	17.92	1.0	20	0	89.6	71 - 131				
1,1-Dichloropropene	18.67	1.0	20	0	93.3	78 - 125				
1,2,3-Trichlorobenzene	21.76	1.0	20	0	109	69 - 129				
1,2,3-Trichloropropane	21.19	1.0	20	0	106	73 - 122				
1,2,4-Trichlorobenzene	20.51	1.0	20	0	103	69 - 130				
1,2,4-Trimethylbenzene	19.3	1.0	20	0	96.5	76 - 124				
1,2-Dibromo-3-chloropropane	20.98	1.0	20	0	105	62 - 128				
1,2-Dibromoethane	20.25	1.0	20	0	101	77 - 121				
1,2-Dichlorobenzene	19.71	1.0	20	0	98.6	80 - 119				
1,2-Dichloroethane	19.2	1.0	20	0	96.0	73 - 128				
1,2-Dichloropropane	19.95	1.0	20	0	99.7	78 - 122				
1,3,5-Trimethylbenzene	19.12	1.0	20	0	95.6	75 - 124				
1,3-Dichlorobenzene	20.24	1.0	20	0	101	80 - 119				
1,3-Dichloropropane	19.62	1.0	20	0	98.1	80 - 119				
1,4-Dichlorobenzene	19.22	1.0	20	0	96.1	79 - 118				
2,2-Dichloropropane	18.87	1.0	20	0	94.4	60 - 139				
2-Butanone	38.33	2.0	40	0	95.8	56 - 143				
2-Chlorotoluene	18.83	1.0	20	0	94.2	79 - 122				
2-Hexanone	40.21	2.0	40	0	101	57 - 139				
4-Chlorotoluene	18.81	1.0	20	0	94.1	78 - 122				
4-Isopropyltoluene	19.29	1.0	20	0	96.4	77 - 127				
4-Methyl-2-pentanone	39.48	2.0	40	0	98.7	67 - 130				
Acetone	42.6	2.0	40	0	106	39 - 160				
Benzene	19.58	1.0	20	0	97.9	79 - 120				
Bromobenzene	20.57	1.0	20	0	103	80 - 120				
Bromochloromethane	18.33	1.0	20	0	91.7	78 - 123				
Bromodichloromethane	19.84	1.0	20	0	99.2	79 - 125				
Bromoform	21.68	1.0	20	0	108	66 - 130				
Bromomethane	20.98	1.0	20	0	105	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

LCS Sample ID: **VLCSW-190710** Units: **UG/L** Analysis Date: **10-Jul-2019 10:54**
Client ID: Run ID: **VOA6_342223** SeqNo: **5162120** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	36.43	2.0	40	0	91.1	64 - 133				
Carbon tetrachloride	19.06	1.0	20	0	95.3	72 - 136				
Chlorobenzene	19.87	1.0	20	0	99.3	82 - 118				
Chloroethane	17.25	1.0	20	0	86.3	60 - 138				
Chloroform	20.32	1.0	20	0	102	79 - 124				
Chloromethane	18.07	1.0	20	0	90.3	50 - 139				
cis-1,2-Dichloroethene	18.34	1.0	20	0	91.7	78 - 123				
cis-1,3-Dichloropropene	20.29	1.0	20	0	101	75 - 124				
Dibromochloromethane	20.71	1.0	20	0	104	74 - 126				
Dibromomethane	19.81	1.0	20	0	99.0	79 - 123				
Dichlorodifluoromethane	19.07	1.0	20	0	95.4	32 - 152				
Ethylbenzene	20.2	1.0	20	0	101	79 - 121				
Hexachlorobutadiene	21.34	1.0	20	0	107	66 - 134				
Isopropylbenzene	19.76	1.0	20	0	98.8	72 - 131				
m,p-Xylene	40.44	2.0	40	0	101	80 - 121				
Methylene chloride	17.94	2.0	20	0	89.7	74 - 124				
Naphthalene	20.18	1.0	20	0	101	61 - 128				
n-Butylbenzene	20.34	1.0	20	0	102	75 - 128				
n-Propylbenzene	18.95	1.0	20	0	94.7	76 - 126				
o-Xylene	19.77	1.0	20	0	98.9	78 - 122				
sec-Butylbenzene	18.77	1.0	20	0	93.8	77 - 126				
Styrene	20.26	1.0	20	0	101	78 - 123				
tert-Butylbenzene	19.11	1.0	20	0	95.6	78 - 124				
Tetrachloroethene	21.08	1.0	20	0	105	74 - 129				
Toluene	20.27	1.0	20	0	101	80 - 121				
trans-1,2-Dichloroethene	18.43	1.0	20	0	92.2	75 - 124				
trans-1,3-Dichloropropene	20.13	1.0	20	0	101	73 - 127				
Trichloroethene	20.02	1.0	20	0	100	79 - 123				
Trichlorofluoromethane	17.77	1.0	20	0	88.8	65 - 141				
Vinyl chloride	17.77	1.0	20	0	88.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.33*	*1.0*	*50*	*0*	*96.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.26*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*48.5*	*1.0*	*50*	*0*	*97.0*	*80 - 119*				
Surr: Toluene-d8	*50.1*	*1.0*	*50*	*0*	*100*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19070016-09MS** Units: **UG/L** Analysis Date: **10-Jul-2019 16:29**
Client ID: Run ID: **VOA6_342223** SeqNo: **5162133** PrepDate: DF: **250**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	4891	250	5000	0	97.8	78 - 124				
1,1,1-Trichloroethane	4523	250	5000	0	90.5	74 - 131				
1,1,2,2-Tetrachloroethane	4842	250	5000	0	96.8	71 - 121				
1,1,2-Trichloroethane	4780	250	5000	0	95.6	80 - 119				
1,1-Dichloroethane	4517	250	5000	0	90.3	77 - 125				
1,1-Dichloroethene	4557	250	5000	0	91.1	71 - 131				
1,1-Dichloropropene	4336	250	5000	0	86.7	78 - 125				
1,2,3-Trichlorobenzene	4758	250	5000	0	95.2	69 - 129				
1,2,3-Trichloropropane	4449	250	5000	0	89.0	73 - 122				
1,2,4-Trichlorobenzene	4765	250	5000	0	95.3	69 - 130				
1,2,4-Trimethylbenzene	4514	250	5000	0	90.3	76 - 124				
1,2-Dibromo-3-chloropropane	4917	250	5000	0	98.3	62 - 128				
1,2-Dibromoethane	4838	250	5000	0	96.8	77 - 121				
1,2-Dichlorobenzene	4663	250	5000	0	93.3	80 - 119				
1,2-Dichloroethane	4677	250	5000	0	93.5	73 - 128				
1,2-Dichloropropane	4687	250	5000	0	93.7	78 - 122				
1,3,5-Trimethylbenzene	4400	250	5000	0	88.0	75 - 124				
1,3-Dichlorobenzene	4680	250	5000	0	93.6	80 - 119				
1,3-Dichloropropane	4732	250	5000	0	94.6	80 - 119				
1,4-Dichlorobenzene	4506	250	5000	0	90.1	79 - 118				
2,2-Dichloropropane	4521	250	5000	0	90.4	60 - 139				
2-Butanone	9558	500	10000	0	95.6	56 - 143				
2-Chlorotoluene	4383	250	5000	0	87.7	79 - 122				
2-Hexanone	9453	500	10000	0	94.5	57 - 139				
4-Chlorotoluene	4362	250	5000	0	87.2	78 - 122				
4-Isopropyltoluene	4307	250	5000	0	86.1	77 - 127				
4-Methyl-2-pentanone	9526	500	10000	0	95.3	67 - 130				
Acetone	9253	500	10000	0	92.5	39 - 160				
Benzene	4636	250	5000	0	92.7	79 - 120				
Bromobenzene	4722	250	5000	0	94.4	80 - 120				
Bromochloromethane	4625	250	5000	0	92.5	78 - 123				
Bromodichloromethane	4749	250	5000	0	95.0	79 - 125				
Bromoform	5120	250	5000	0	102	66 - 130				
Bromomethane	4501	250	5000	0	90.0	53 - 141				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19070016-09MS** Units: **UG/L** Analysis Date: **10-Jul-2019 16:29**
Client ID: Run ID: **VOA6_342223** SeqNo: **5162133** PrepDate: DF: **250**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	8878	500	10000	0	88.8	64 - 133				
Carbon tetrachloride	4324	250	5000	0	86.5	72 - 136				
Chlorobenzene	4649	250	5000	0	93.0	82 - 118				
Chloroethane	4096	250	5000	0	81.9	60 - 138				
Chloroform	4954	250	5000	0	99.1	79 - 124				
Chloromethane	5011	250	5000	0	100	50 - 139				
cis-1,2-Dichloroethene	23100	250	5000	21140	39.2	78 - 123				SO
cis-1,3-Dichloropropene	4827	250	5000	0	96.5	75 - 124				
Dibromochloromethane	4878	250	5000	0	97.6	74 - 126				
Dibromomethane	4737	250	5000	0	94.7	79 - 123				
Dichlorodifluoromethane	3399	250	5000	0	68.0	32 - 152				
Ethylbenzene	4688	250	5000	0	93.8	79 - 121				
Hexachlorobutadiene	4446	250	5000	0	88.9	66 - 134				
Isopropylbenzene	4543	250	5000	0	90.9	72 - 131				
m,p-Xylene	9423	500	10000	0	94.2	80 - 121				
Methylene chloride	14100	500	5000	11040	61.2	74 - 124				S
Naphthalene	4749	250	5000	0	95.0	61 - 128				
n-Butylbenzene	4582	250	5000	0	91.6	75 - 128				
n-Propylbenzene	4342	250	5000	0	86.8	76 - 126				
o-Xylene	4615	250	5000	0	92.3	78 - 122				
sec-Butylbenzene	4264	250	5000	0	85.3	77 - 126				
Styrene	4772	250	5000	0	95.4	78 - 123				
tert-Butylbenzene	4332	250	5000	0	86.6	78 - 124				
Tetrachloroethene	4667	250	5000	0	93.3	74 - 129				
Toluene	4725	250	5000	0	94.5	80 - 121				
trans-1,2-Dichloroethene	4619	250	5000	0	92.4	75 - 124				
trans-1,3-Dichloropropene	4683	250	5000	0	93.7	73 - 127				
Trichloroethene	5077	250	5000	582.4	89.9	79 - 123				
Trichlorofluoromethane	4135	250	5000	0	82.7	65 - 141				
Vinyl chloride	5623	250	5000	2069	71.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*12590*	*250*	*12500*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*12440*	*250*	*12500*	*0*	*99.5*	*85 - 114*				
Surr: Dibromofluoromethane	*12510*	*250*	*12500*	*0*	*100*	*80 - 119*				
Surr: Toluene-d8	*12360*	*250*	*12500*	*0*	*98.9*	*89 - 112*				

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19070016-09MSD** Units: **UG/L** Analysis Date: **10-Jul-2019 16:53**
Client ID: Run ID: **VOA6_342223** SeqNo: **5162134** PrepDate: DF: **250**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	4855	250	5000	0	97.1	78 - 124	4891	0.747	20	
1,1,1-Trichloroethane	4432	250	5000	0	88.6	74 - 131	4523	2.04	20	
1,1,2,2-Tetrachloroethane	4980	250	5000	0	99.6	71 - 121	4842	2.8	20	
1,1,2-Trichloroethane	4841	250	5000	0	96.8	80 - 119	4780	1.26	20	
1,1-Dichloroethane	4528	250	5000	0	90.6	77 - 125	4517	0.237	20	
1,1-Dichloroethene	4504	250	5000	0	90.1	71 - 131	4557	1.17	20	
1,1-Dichloropropene	4353	250	5000	0	87.1	78 - 125	4336	0.396	20	
1,2,3-Trichlorobenzene	4700	250	5000	0	94.0	69 - 129	4758	1.24	20	
1,2,3-Trichloropropane	4506	250	5000	0	90.1	73 - 122	4449	1.28	20	
1,2,4-Trichlorobenzene	4693	250	5000	0	93.9	69 - 130	4765	1.52	20	
1,2,4-Trimethylbenzene	4459	250	5000	0	89.2	76 - 124	4514	1.22	20	
1,2-Dibromo-3-chloropropane	4998	250	5000	0	100.0	62 - 128	4917	1.64	20	
1,2-Dibromoethane	4945	250	5000	0	98.9	77 - 121	4838	2.19	20	
1,2-Dichlorobenzene	4696	250	5000	0	93.9	80 - 119	4663	0.715	20	
1,2-Dichloroethane	4766	250	5000	0	95.3	73 - 128	4677	1.88	20	
1,2-Dichloropropane	4752	250	5000	0	95.0	78 - 122	4687	1.39	20	
1,3,5-Trimethylbenzene	4391	250	5000	0	87.8	75 - 124	4400	0.197	20	
1,3-Dichlorobenzene	4674	250	5000	0	93.5	80 - 119	4680	0.133	20	
1,3-Dichloropropane	4779	250	5000	0	95.6	80 - 119	4732	0.993	20	
1,4-Dichlorobenzene	4450	250	5000	0	89.0	79 - 118	4506	1.26	20	
2,2-Dichloropropane	4516	250	5000	0	90.3	60 - 139	4521	0.102	20	
2-Butanone	10040	500	10000	0	100	56 - 143	9558	4.88	20	
2-Chlorotoluene	4368	250	5000	0	87.4	79 - 122	4383	0.326	20	
2-Hexanone	9919	500	10000	0	99.2	57 - 139	9453	4.8	20	
4-Chlorotoluene	4331	250	5000	0	86.6	78 - 122	4362	0.724	20	
4-Isopropyltoluene	4310	250	5000	0	86.2	77 - 127	4307	0.0714	20	
4-Methyl-2-pentanone	9761	500	10000	0	97.6	67 - 130	9526	2.44	20	
Acetone	9893	500	10000	0	98.9	39 - 160	9253	6.69	20	
Benzene	4674	250	5000	0	93.5	79 - 120	4636	0.809	20	
Bromobenzene	4840	250	5000	0	96.8	80 - 120	4722	2.48	20	
Bromochloromethane	4665	250	5000	0	93.3	78 - 123	4625	0.855	20	
Bromodichloromethane	4817	250	5000	0	96.3	79 - 125	4749	1.42	20	
Bromoform	5133	250	5000	0	103	66 - 130	5120	0.254	20	
Bromomethane	4543	250	5000	0	90.9	53 - 141	4501	0.923	20	

Revision: 1

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ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19070016-09MSD** Units: **UG/L** Analysis Date: **10-Jul-2019 16:53**
Client ID: Run ID: **VOA6_342223** SeqNo: **5162134** PrepDate: DF: **250**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	8808	500	10000	0	88.1	64 - 133	8878	0.796	20	
Carbon tetrachloride	4290	250	5000	0	85.8	72 - 136	4324	0.786	20	
Chlorobenzene	4660	250	5000	0	93.2	82 - 118	4649	0.236	20	
Chloroethane	4042	250	5000	0	80.8	60 - 138	4096	1.32	20	
Chloroform	4982	250	5000	0	99.6	79 - 124	4954	0.556	20	
Chloromethane	4668	250	5000	0	93.4	50 - 139	5011	7.09	20	
cis-1,2-Dichloroethene	23230	250	5000	21140	41.9	78 - 123	23100	0.574	20	SO
cis-1,3-Dichloropropene	4904	250	5000	0	98.1	75 - 124	4827	1.58	20	
Dibromochloromethane	4973	250	5000	0	99.5	74 - 126	4878	1.93	20	
Dibromomethane	4883	250	5000	0	97.7	79 - 123	4737	3.03	20	
Dichlorodifluoromethane	3338	250	5000	0	66.8	32 - 152	3399	1.8	20	
Ethylbenzene	4601	250	5000	0	92.0	79 - 121	4688	1.87	20	
Hexachlorobutadiene	4448	250	5000	0	89.0	66 - 134	4446	0.0369	20	
Isopropylbenzene	4460	250	5000	0	89.2	72 - 131	4543	1.85	20	
m,p-Xylene	9235	500	10000	0	92.3	80 - 121	9423	2.02	20	
Methylene chloride	14020	500	5000	11040	59.5	74 - 124	14100	0.608	20	S
Naphthalene	4658	250	5000	0	93.2	61 - 128	4749	1.93	20	
n-Butylbenzene	4615	250	5000	0	92.3	75 - 128	4582	0.715	20	
n-Propylbenzene	4231	250	5000	0	84.6	76 - 126	4342	2.59	20	
o-Xylene	4566	250	5000	0	91.3	78 - 122	4615	1.05	20	
sec-Butylbenzene	4265	250	5000	0	85.3	77 - 126	4264	0.0244	20	
Styrene	4815	250	5000	0	96.3	78 - 123	4772	0.89	20	
tert-Butylbenzene	4257	250	5000	0	85.1	78 - 124	4332	1.75	20	
Tetrachloroethene	4607	250	5000	0	92.1	74 - 129	4667	1.31	20	
Toluene	4683	250	5000	0	93.7	80 - 121	4725	0.908	20	
trans-1,2-Dichloroethene	4547	250	5000	0	90.9	75 - 124	4619	1.57	20	
trans-1,3-Dichloropropene	4835	250	5000	0	96.7	73 - 127	4683	3.2	20	
Trichloroethene	5061	250	5000	582.4	89.6	79 - 123	5077	0.303	20	
Trichlorofluoromethane	4088	250	5000	0	81.8	65 - 141	4135	1.14	20	
Vinyl chloride	5457	250	5000	2069	67.8	58 - 137	5623	3	20	
Surr: 1,2-Dichloroethane-d4	*12730*	*250*	*12500*	*0*	*102*	*81 - 118*	*12590*	*1.1*	*20*	
Surr: 4-Bromofluorobenzene	*12460*	*250*	*12500*	*0*	*99.7*	*85 - 114*	*12440*	*0.117*	*20*	
Surr: Dibromofluoromethane	*12790*	*250*	*12500*	*0*	*102*	*80 - 119*	*12510*	*2.19*	*20*	
Surr: Toluene-d8	*12220*	*250*	*12500*	*0*	*97.8*	*89 - 112*	*12360*	*1.11*	*20*	

Revision: 1

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19061547

QC BATCH REPORT

Batch ID: R342223 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch: HS19061547-01 HS19061547-04 HS19061547-05

ALS Houston, US Date: 16-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19061547**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

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CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

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ALS Houston, US Date: 16-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19061547
Date/Time Received: **28-Jun-2019 08:59**
Received by: **NDR**

Checklist completed by: *Paresh M. Giga* eSignature 28-Jun-2019 Date
Reviewed by: *RJ Modashia* eSignature 28-Jun-2019 Date

Matrices: **Groundwater/Water**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	2.3c U/C	IR11
Cooler(s)/Kit(s):	44880	
Date/Time sample(s) sent to storage:	6/28/19 13:25	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

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bhate
ENVIRONMENTAL CONSTRUCTION ENERGY

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beesinger

Sample Analysis Requested (5) | Quality Assurance Samples (6)

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (1)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS	1, 4 - DIOXANE								Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
18mw08_062719		27-Jun-2019	0945	-	N		WG	5	X	X		X											
18mw09_062719		27-Jun-2019	1035	-	N		WG	3		X	X	X											
18PTMW16_062719		27-Jun-2019	1145	-	N		WG	2		X		X											
18mw25_062719		27-Jun-2019	1000	-	N		WG	6	X	X	X	X											
TRIP BLANK		27-Jun-2019			TB		W	2	X														
				-																			
				-																			
				-																			
				-																			
				-																			
				-																			

HS19061547
Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS: _____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	6/27/19	1430	1. NA	6.28.19	08:59
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped No.:

Method of Shipment: _____

_____ Fed Ex _____ Airbill Number:

Analytical Lab: ALS 10450 Stanc[illegible] Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

Temp 4°C 2.3

46880. IR # 4F0

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00942184

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44880

CUSTODY SEAL

Date: 6/27/19 Time: 1430
Name: Scott Beesinger
Company: BHATE

Seal Broken By:
Date: 06/28/19

44880

Must Deliver Next Business Day
Time and Tempature Sensitive!

44880

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202

MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 24MAY19
ACTWGT: 1.00 LB MAN
CAD: 3001307CAFE3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP/18/24 & SURFACE WATER-RJ

RMA:

FedEx Express

FedEx
TRK# 0221 4809 7834 3284

FRI - 28 JUN 10:30A
PRIORITY OVERNIGHT

77099
TX-US
IAH

AB SGRA

ITD 162765 27JUN19 SGRA 553C1/D210/0CBA

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Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1918528, 1918705, 1918871

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2270 (243267)

General Set Information: There were twenty-four field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1918705007 was analyzed and reported from a 1:10 dilution. Field sample 1918528010 was analyzed and reported from a 1:100 dilution. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 663033) was less than 1/2 the CRDL. The recovery for the LCS (663034) was within acceptable parameters.

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MS/MSD Analysis: MS/MSD was performed on samples 1918705002/03 and 1918705009/10 (Client ID's: CO9_062619 and MW18_062619). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The MS/MSD percent recoveries and relative percent difference were within the performance limits. The MS (1918705002MS) failed QC acceptance criteria for percent recovery. MS/MSD 1918705002/03 also failed the relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 663031) is reported from the analysis of the Laboratory Control Sample (LCS – 663034) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafile 11JULD20.

Thomas Bosch July 12, 2019
Analyst Date

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ANALYTICAL REPORT

Report Date: July 12, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1918871**
Project ID: HS19061547
Purchase Order: HS19061547
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
18WW08_062719	1918871001	06/27/19	06/29/19	
18WW09_062719	1918871002	06/27/19	06/29/19	
18CPTMW16_062719	1918871003	06/27/19	06/29/19	
18WW25_062719	1918871004	06/27/19	06/29/19	

ANALYTICAL REPORT

Workorder: 34-1918871
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18WW08_062719** | Sampling Site: NA | Collected: 06/27/2019
Lab ID: 1918871001 | Media: 125 mL Nalgene | Received: 06/29/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 17:12 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18WW09_062719** | Sampling Site: NA | Collected: 06/27/2019
Lab ID: 1918871002 | Media: 125 mL Nalgene | Received: 06/29/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 17:26 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18CPTMW16_062719** | Sampling Site: NA | Collected: 06/27/2019
Lab ID: 1918871003 | Media: 125 mL Nalgene | Received: 06/29/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 17:40 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18WW25_062719** | Sampling Site: NA | Collected: 06/27/2019
Lab ID: 1918871004 | Media: 125 mL Nalgene | Received: 06/29/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2270 (HBN: 243267) | **Percent Solid:** NA
Analyzed: 07/11/2019 17:54 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

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ANALYTICAL REPORT

Workorder: 34-1918871
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/12/2019 10:14	/S/ Stephen Brose 07/12/2019 11:30

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

ANALYTICAL REPORT

Workorder: 34-1918871
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1918871

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2270 (HBN: 243267)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 663033
Analyzed: 07/11/2019 11:53
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 663034
Analyzed: 07/11/2019 11:26
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.41	4.00	110	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

	Sample: 1918705001	MS: 1918705002	MSD: 1918705003
	Analyzed: 07/11/2019 14:39	Analyzed: 07/11/2019 14:52	Analyzed: 07/11/2019 15:06
	Dilution: 1	Dilution: 1	Dilution: 1
	Units: ug/L	Units: ug/L	Units: ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	5.21	4	# 130	78.8	123.8	4.09	102	# 24	0.0	20.0

	Sample: 1918705008	MS: 1918705009	MSD: 1918705010
	Analyzed: 07/11/2019 16:17	Analyzed: 07/11/2019 16:31	Analyzed: 07/11/2019 16:45
	Dilution: 1	Dilution: 1	Dilution: 1
	Units: ug/L	Units: ug/L	Units: ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.4	4	110	78.8	123.8	3.92	98.0	11.5	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/12/2019 10:17	07/12/2019 11:30

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
\# - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

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ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19061547	***Split:***	**Workorder ID:** 1918871	**Level:** ENV_LVL4	**Requested Analysis**	
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly		
Comments:			**Preservatives**		
			COOL		
			Containers		

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count	EPA 6850, DoD GSM
1	06/27/2019 09:45	18WW08_062719	1918871001		Water	A	1	A
2	06/27/2019 10:35	18WW09_062719	1918871002		Water	A	1	A
3	06/27/2019 11:45	18CPTMW16_062719	1918871003		Water	A	1	A
4	06/27/2019 10:00	18WW2516_062719	1918871004		Water	A	1	A
5								
6								
7								
8								
9								
10								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	06/29/2019 08:58	ALS Sample Receiving	Sample Login
[signature]	7.1.19 1400	GB	Storage
R.33.1	7.10.19/10:25	T. Bush	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

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00942193

W 1918871

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

18698/#2

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

COC ID: **11698**

1918871

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19061547
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19061547-01**	**18WW08_062719**	**Groundwater**	**27 Jun 2019 09:45**
	SUB_Perch-6850			09 Jul 2019
2.	**HS19061547-02**	**18WW09_062719**	**Groundwater**	**27 Jun 2019 10:35**
	SUB_Perch-6850			09 Jul 2019
3.	**HS19061547-03**	**18CPTMW16_062719**	**Groundwater**	**27 Jun 2019 11:45**
	SUB_Perch-6850			09 Jul 2019
4.	**HS19061547-04**	**18WW2516_062719**	**Groundwater**	**27 Jun 2019 10:00**
	SUB_Perch-6850			09 Jul 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 6/28/19 1800.

Received By: _____ Date/Time: 6/29/19 858

Cooler ID(s): 9738 Temperature(s): 2°

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston Project/Task/Site: 1918871

Date/Time of Receipt: 6/19/19 858 Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Cntnr/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:					
Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Meredith Ellis (Signature) Meredith Ellis (Printed Name) 6/20/19 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

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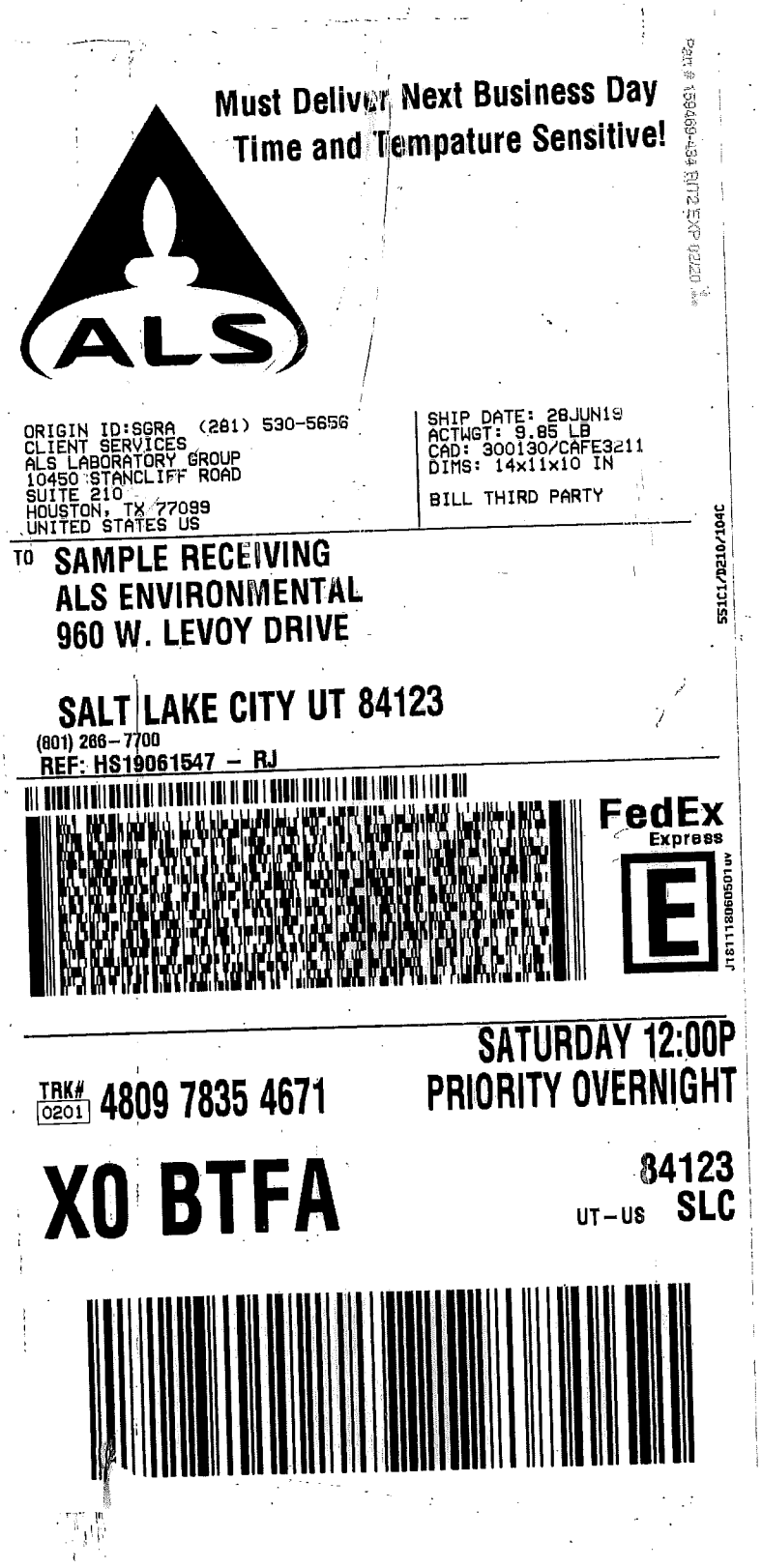

Must Deliver Next Business Day
Time and Tempature Sensitive!

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 28JUN19
ACTWGT: 9.85 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19061547 - RJ

FedEx Express

SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 0201 4809 7835 4671

XO BTFA

84123
UT-US SLC

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Batch Worklist

Batch: ELMS/ 2270 Created: 7/10/2019 13:34 Instrument: HBN: 243267

Rule: EPA 6850, DoD QSM Water Analyst: T. Bosch Status: WP

Workorder: 1918528 [ENV_LVL4]
Workorder: 1918705 [ENV_LVL4]
Workorder: 1918871 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	663030	CCV for HBN 243267 [ELMS/2270]				CCV	3		E685041C3Q	5311		7/11/2019	
2	663031	RLVS for HBN 243267 [ELMS/2270				RLVS	3		E685041C3Q	5311		7/11/2019	
3	663032	ICS for HBN 243267 [ELMS/2270]				ICS	3		E6850..D3Q	5311		7/11/2019	
4	663033	LMB for HBN 243267 [ELMS/2270]				LMB	3		E6850Q413Q	5311		7/11/2019	
5	663034	LCS for HBN 243267 [ELMS/2270]				LCS	3		E6850Q413Q	5311		7/11/2019	
6	1918528001	17WW08_062519				SAMPLE	3	1918528001-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
7	1918528002	130_062519				SAMPLE	3	1918528002-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
8	1918528003	130_062519_a				SAMPLE	3	1918528003-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
9	1918528004	MW10_062519				SAMPLE	3	1918528004-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
10	1918528005	MW13_062519				SAMPLE	3	1918528005-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
11	1918528006	CO2_062519				SAMPLE	3	1918528006-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
12	1918528007	MW17_062519				SAMPLE	3	1918528007-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
13	1918528008	18WW10_062519				SAMPLE	3	1918528008-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
14	1918528009	18WW10_062519_a				SAMPLE	3	1918528009-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
15	1918528010	MW9_062519				SAMPLE	3	1918528010-A	E6850Q41.3	5480	7/23/2019	7/11/2019	
16	663035	CCV for HBN 243267 [ELMS/2270]				CCV	3		E685041C3Q	5311		7/11/2019	
17	1918705001	CO9_062619				SAMPLE	3	1918705001-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
18	1918705002	CO9_062619 MS				MS	3	1918705002-A	E6850Q413Q	5480		7/11/2019	
19	1918705003	CO9_062619 MSD				MSD	3	1918705003-A	E6850Q413Q	5480		7/11/2019	
20	1918705004	C06_062619				SAMPLE	3	1918705004-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
21	1918705005	18WW16_062619				SAMPLE	3	1918705005-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
22	1918705006	18CPTMW18_062619				SAMPLE	3	1918705006-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
23	1918705007	CO3_062619				SAMPLE	3	1918705007-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
24	1918705008	MW18_062619				SAMPLE	3	1918705008-A	E6850Q41.3	5480	7/24/2019	7/12/2019	
25	1918705009	MW18_062619 MS				MS	3	1918705009-A	E6850Q413Q	5480		7/11/2019	
26	1918705010	MW18_062619 MSD				MSD	3	1918705010-A	E6850Q413Q	5480		7/11/2019	
27	663036	CCV for HBN 243267 [ELMS/2270]				CCV	3		E685041C3Q	5311		7/11/2019	

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00942197

Batch Worklist

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
28	1918871001	18WW08_062719				SAMPLE	3	1918871001-A	E6850Q41.3	5480	7/25/2019	7/12/2019	
29	1918871002	18WW09_062719				SAMPLE	3	1918871002-A	E6850Q41.3	5480	7/25/2019	7/12/2019	
30	1918871003	18CPTMW16_062719				SAMPLE	3	1918871003-A	E6850Q41.3	5480	7/25/2019	7/12/2019	
31	1918871004	18WW2516_062719				SAMPLE	3	1918871004-A	E6850Q41.3	5480	7/25/2019	7/12/2019	
32	663037	CCV for HBN 243267 [ELMS/2270]				CCV	3		E685041C3Q	5311		7/11/2019	

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00942198

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

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ALS Work Order #'s & Sample #( )'s: 1918528 (001-10), 1918705 (001-10); 1918871 (001-04)
ELMS Batch/HBN ID: 2270 (243267)
Prep Date: 07/10/2019 Analysis Date: 07/11/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\11JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 30µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 663034; Target = 4.0µg/L. ASTM type II water was used for LMB 663033.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on samples 1918705002/03 and 1918705009/10 (Client ID's: CO9_062619 and MW18_062619). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field sample 1918705007 was analyzed and reported from a 1:10 dilution. Field sample 1918528010 was analyzed and reported from a 1:100 dilution. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS (1918705002MS) failed QC acceptance criteria for percent recovery. MS/MSD 1918705002/03 also failed the relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\243267-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 663031) is reported from the analysis of the Laboratory Control Sample (LCS – 663034) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 11JULD20.

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5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2270 HBN: 243267 Sample Set IDs if Applicable: 1918528/1918705/1918871	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SD
Standards traceability checked and meets criteria	TB	SD
Standard curve coefficients evaluated and meet criteria	TB	SD
ICVs analyzed and meet acceptance criteria	TB	SD
CCVs analyzed and meet acceptance criteria	TB	SD
Method Blanks analyzed and meet acceptance criteria	TB	SD
Retention Time Windows checked	TB	SD
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SD
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SD
RLVS analyzed	TB	SD
Preparation and analysis hold times met	TB	SD
Preparation deviations and re-preparations noted when performed	TB	SD
Analysis deviations and re-analyses noted when performed	TB	SD
Sample dilution factors noted on reports	TB	SD
Electronic records in HBN transcription accuracy and completeness checked	TB	SD
Preparation and analysis calculations checked	TB	SD
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SD
Manual integrations checked	TB	SD

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STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

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STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

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STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description - 6850 QC WKG STD 100ug/L

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

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STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O — **Description - ASTM Type II Water**

Standard: 109
MFG: DCL In House
MFG Lot: Not Provided
Part ID: Not Provided

Created By: ALS Support (Lims)
Create Date: 10/06/2005 09:10AM

Amount: 1000 L
Expires: 11/07/2025
Usable: Yes
Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

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STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

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STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

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STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

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ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

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125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

QR-ORG/INO-001
Rev. 5/18

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Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

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ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

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Batch Report: C:\HPCHEM\1\DATA\11JUL19D\11JUL19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	663030 CCV@25	Vial 71	1	Control	1	2.11871e6	8.255	26.67636
*	663034 QC@4.0	Vial 41	1	Control	2	3.99419e5	7.994	4.40774
*	663032 ICS@4.0	Vial 42	1	Control	3	3.13185e5	7.844	3.89337
*	663033 LMB	Vial 43	1	Control	4	0.00000	0.000	0.00000
*	1918528001	Vial 44	1	Sample	5	0.00000	0.000	0.00000
*	1918528002	Vial 45	1	Sample	6	0.00000	0.000	0.00000
*	1918528003	Vial 46	1	Sample	7	0.00000	0.000	0.00000
*	1918528004	Vial 47	1	Sample	8	0.00000	0.000	0.00000
*	1918528005	Vial 48	1	Sample	9	0.00000	0.000	0.00000
*	1918528006	Vial 49	1	Sample	10	0.00000	0.000	0.00000
*	1918528007	Vial 50	1	Sample	11	0.00000	0.000	0.00000
*	1918528008	Vial 51	1	Sample	12	0.00000	0.000	0.00000
*	1918528009	Vial 52	1	Sample	13	0.00000	0.000	0.00000
*	1918528010 100	Vial 53	1	Sample	14	4.15809e5	8.321	518.23230
*	663035 CCV@25	Vial 71	1	Control	15	2.05306e6	8.245	25.67471
*	1918705001	Vial 54	1	Sample	16	0.00000	0.000	0.00000
*	1918705002 MS	Vial 55	1	Sample	17	3.65014e5	7.751	5.20905
*	1918705003 MSD	Vial 56	1	Sample	18	3.50062e5	7.740	4.09212
*	1918705004	Vial 57	1	Sample	19	0.00000	0.000	0.00000
*	1918705005	Vial 58	1	Sample	20	2.64722e5	7.233	4.40918
*	1918705006	Vial 59	1	Sample	21	0.00000	0.000	0.00000
*	1918705007 10X	Vial 60	1	Sample	22	4.80293e5	8.237	53.73554
*	1918705008	Vial 61	1	Sample	23	0.00000	0.000	0.00000
*	1918705009 MS	Vial 62	1	Sample	24	2.88361e5	7.509	4.39917
*	1918705010 MSD	Vial 63	1	Sample	25	2.77079e5	7.505	3.92076
*	663036 CCV@25	Vial 71	1	Control	26	1.87786e6	8.284	25.56775
*	1918871001	Vial 64	1	Sample	27	0.00000	0.000	0.00000
*	1918871002	Vial 65	1	Sample	28	0.00000	0.000	0.00000
*	1918871003	Vial 66	1	Sample	29	0.00000	0.000	0.00000
*	1918871004	Vial 67	1	Sample	30	0.00000	0.000	0.00000
*	663037 CCV@25	Vial 71	1	Control	31	1.97048e6	8.269	25.87251

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	663030 CCV@25	Vial 71	1	Control	1	6.24075e5	8.272	26.49423
*	663034 QC@4.0	Vial 41	1	Control	2	1.31480e5	7.999	4.73215
*	663032 ICS@4.0	Vial 42	1	Control	3	1.02079e5	7.839	4.11867
*	663033 LMB	Vial 43	1	Control	4	0.00000	0.000	0.00000
*	1918528001	Vial 44	1	Sample	5	0.00000	0.000	0.00000
*	1918528002	Vial 45	1	Sample	6	0.00000	0.000	0.00000
*	1918528003	Vial 46	1	Sample	7	0.00000	0.000	0.00000
*	1918528004	Vial 47	1	Sample	8	0.00000	0.000	0.00000
*	1918528005	Vial 48	1	Sample	9	0.00000	0.000	0.00000
*	1918528006	Vial 49	1	Sample	10	0.00000	0.000	0.00000
*	1918528007	Vial 50	1	Sample	11	0.00000	0.000	0.00000
*	1918528008	Vial 51	1	Sample	12	0.00000	0.000	0.00000
*	1918528009	Vial 52	1	Sample	13	0.00000	0.000	0.00000
*	1918528010 100	Vial 53	1	Sample	14	1.37449e5	8.342	561.78024
*	663035 CCV@25	Vial 71	1	Control	15	6.14214e5	8.269	25.87142
*	1918705001	Vial 54	1	Sample	16	0.00000	0.000	0.00000
*	1918705002 MS	Vial 55	1	Sample	17	1.12801e5	7.762	5.28376
*	1918705003 MSD	Vial 56	1	Sample	18	1.10963e5	7.755	4.21966
*	1918705004	Vial 57	1	Sample	19	0.00000	0.000	0.00000
*	1918705005	Vial 58	1	Sample	20	9.11835e4	7.238	4.95128
*	1918705006	Vial 59	1	Sample	21	0.00000	0.000	0.00000
*	1918705007 10X	Vial 60	1	Sample	22	1.65863e5	8.254	60.89054
*	1918705008	Vial 61	1	Sample	23	0.00000	0.000	0.00000
*	1918705009 MS	Vial 62	1	Sample	24	9.39754e4	7.516	4.67594
*	1918705010 MSD	Vial 63	1	Sample	25	9.16631e4	7.522	4.21052
*	663036 CCV@25	Vial 71	1	Control	26	5.59339e5	8.296	25.65584

RIGHT SOLUTIONS | RIGHT PARTNER

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	1918871001	Vial 64	1	Sample	27	0.00000	0.000	0.00000
*	1918871002	Vial 65	1	Sample	28	0.00000	0.000	0.00000
*	1918871003	Vial 66	1	Sample	29	0.00000	0.000	0.00000
*	1918871004	Vial 67	1	Sample	30	0.00000	0.000	0.00000
*	663037 CCV@25	Vial 71	1	Control	31	5.83651e5	8.278	25.82631

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	663030 CCV@25	Vial 71	1	Control	1	2.40676e5	8.290	5.00000
*	663034 QC@4.0	Vial 41	1	Control	2	2.97198e5	8.012	5.00000
*	663032 ICS@4.0	Vial 42	1	Control	3	2.65421e5	7.859	5.00000
*	663033 LMB	Vial 43	1	Control	4	3.18343e5	8.270	5.00000
*	1918528001	Vial 44	1	Sample	5	2.09428e5	7.499	5.00000
*	1918528002	Vial 45	1	Sample	6	2.27592e5	7.803	5.00000
*	1918528003	Vial 46	1	Sample	7	2.83805e5	7.792	5.00000
*	1918528004	Vial 47	1	Sample	8	2.31744e5	7.766	5.00000
*	1918528005	Vial 48	1	Sample	9	2.65465e5	7.949	5.00000
*	1918528006	Vial 49	1	Sample	10	3.02483e5	7.805	5.00000
*	1918528007	Vial 50	1	Sample	11	2.39370e5	7.809	5.00000
*	1918528008	Vial 51	1	Sample	12	2.57536e5	7.582	5.00000
*	1918528009	Vial 52	1	Sample	13	3.47245e5	7.601	5.00000
*	1918528010 100	Vial 53	1	Sample	14	2.61248e5	8.355	500.00000
*	663035 CCV@25	Vial 71	1	Control	15	2.42892e5	8.260	5.00000
*	1918705001	Vial 54	1	Sample	16	3.40152e5	7.747	5.00000
*	1918705002 MS	Vial 55	1	Sample	17	2.28107e5	7.767	5.00000
*	1918705003 MSD	Vial 56	1	Sample	18	2.81563e5	7.755	5.00000
*	1918705004	Vial 57	1	Sample	19	2.40535e5	7.689	5.00000
*	1918705005	Vial 58	1	Sample	20	1.96905e5	7.258	5.00000
*	1918705006	Vial 59	1	Sample	21	1.63865e5	7.481	5.00000
*	1918705007 10X	Vial 60	1	Sample	22	2.90576e5	8.248	50.00000
*	1918705008	Vial 61	1	Sample	23	2.37165e5	7.528	5.00000
*	1918705009 MS	Vial 62	1	Sample	24	2.14999e5	7.533	5.00000
*	1918705010 MSD	Vial 63	1	Sample	25	2.33099e5	7.524	5.00000
*	663036 CCV@25	Vial 71	1	Control	26	2.23151e5	8.308	5.00000
*	1918871001	Vial 64	1	Sample	27	2.17462e5	7.475	5.00000
*	1918871002	Vial 65	1	Sample	28	2.52228e5	7.881	5.00000
*	1918871003	Vial 66	1	Sample	29	2.97108e5	7.854	5.00000
*	1918871004	Vial 67	1	Sample	30	2.73039e5	7.829	5.00000
*	663037 CCV@25	Vial 71	1	Control	31	2.31231e5	8.296	5.00000

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\11JUL19D.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	663030	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 41	663034	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 42	663032	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 43	663033	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 44	1918528001		CLO4-AQN	1	Sample		
6	Vial 45	1918528002		CLO4-AQN	1	Sample		
7	Vial 46	1918528003		CLO4-AQN	1	Sample		
8	Vial 47	1918528004		CLO4-AQN	1	Sample		
9	Vial 48	1918528005		CLO4-AQN	1	Sample		
10	Vial 49	1918528006		CLO4-AQN	1	Sample		
11	Vial 50	1918528007		CLO4-AQN	1	Sample		
12	Vial 51	1918528008		CLO4-AQN	1	Sample		
13	Vial 52	1918528009		CLO4-AQN	1	Sample		
14	Vial 53	1918528010	100	CLO4-AQN	1	Sample		
15	Vial 71	663035	CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 54	1918705001		CLO4-AQN	1	Sample		
17	Vial 55	1918705002	MS	CLO4-AQN	1	Sample		
18	Vial 56	1918705003	MSD	CLO4-AQN	1	Sample		
19	Vial 57	1918705004		CLO4-AQN	1	Sample		
20	Vial 58	1918705005		CLO4-AQN	1	Sample		
21	Vial 59	1918705006		CLO4-AQN	1	Sample		
22	Vial 60	1918705007	10X	CLO4-AQN	1	Sample		
23	Vial 61	1918705008		CLO4-AQN	1	Sample		
24	Vial 62	1918705009	MS	CLO4-AQN	1	Sample		
25	Vial 63	1918705010	MSD	CLO4-AQN	1	Sample		
26	Vial 71	663036	CCV@25	CLO4-AQN	1	Ctrl Samp		
27	Vial 64	1918871001		CLO4-AQN	1	Sample		
28	Vial 65	1918871002		CLO4-AQN	1	Sample		
29	Vial 66	1918871003		CLO4-AQN	1	Sample		
30	Vial 67	1918871004		CLO4-AQN	1	Sample		
31	Vial 71	663037	CCV@25	CLO4-AQN	1	Ctrl Samp		

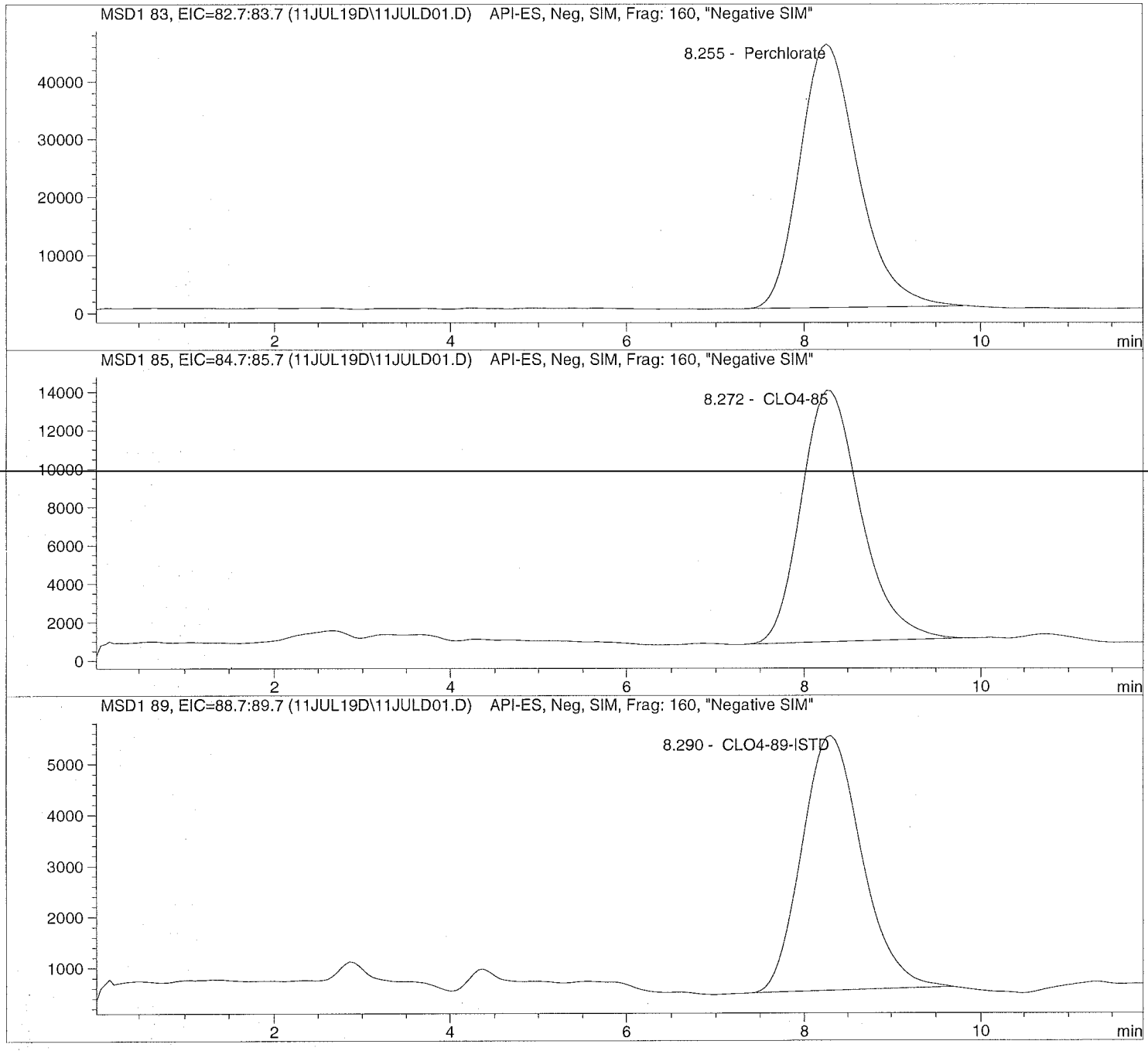
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD01.D Sample Name: 663030 CCV@25

Injection Date:	7/11/2019 11:12:20	Seq Line:	1
Sample Name:	663030 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD01.D Sample Name: 663030 CCV@25

Injection Date:	7/11/2019 11:12:20	Seq Line:	1
Sample Name:	663030 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.255	PBA	2118713.0	26.6764	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.272	PBA	624075.3	26.4942	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.290	PBA	240676.4	5.0000	CLO4-89-ISTD

*** End of Report ***

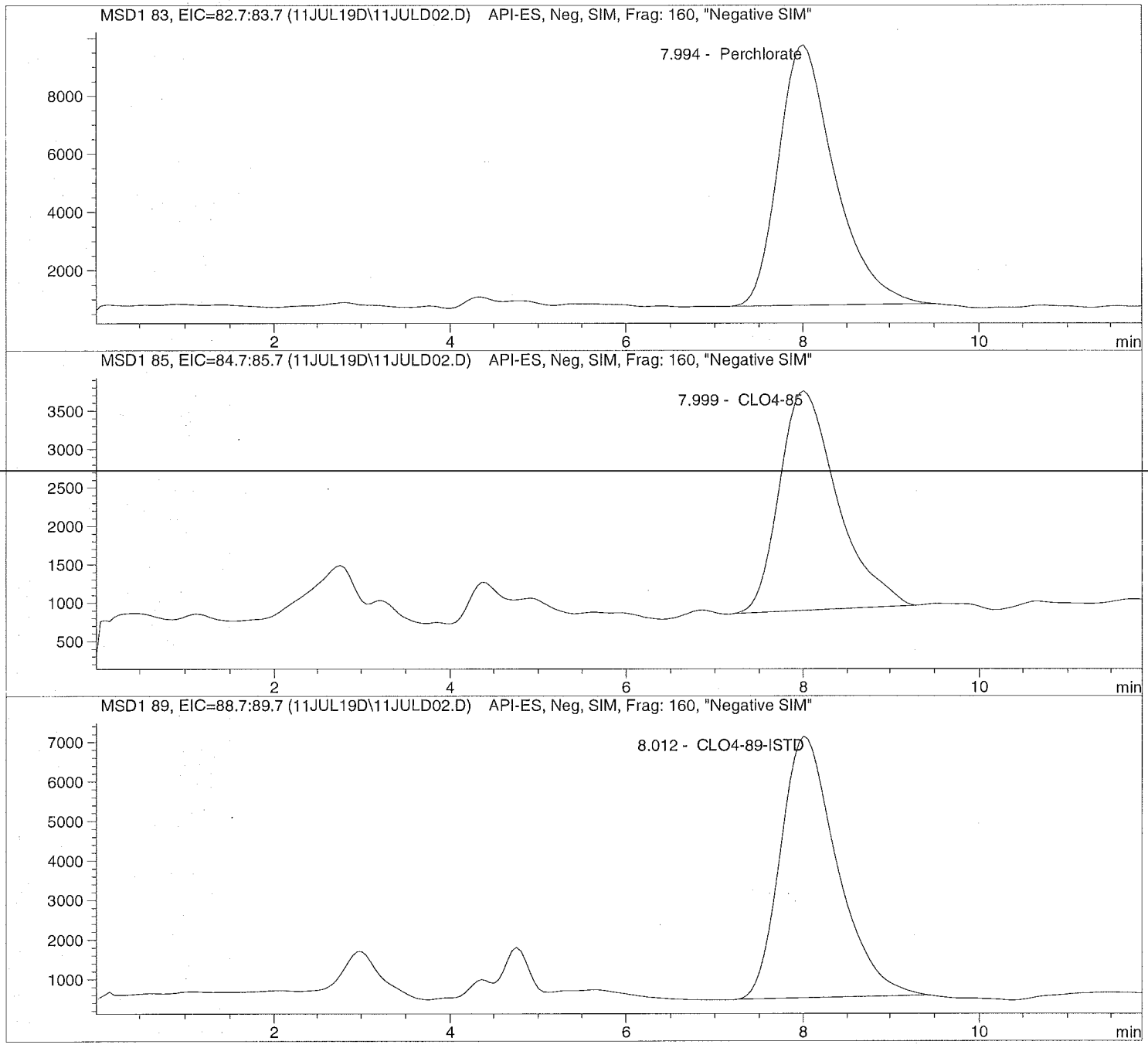
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD02.D Sample Name: 663034 QC@4.0

Injection Date:	7/11/2019 11:26:05	Seq Line:	2
Sample Name:	663034 QC@4.0	Location:	Vial 41
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD02.D Sample Name: 663034 QC@4.0

Injection Date:	7/11/2019 11:26:05	Seq Line:	2
Sample Name:	663034 QC@4.0	Location:	Vial 41
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.994	PBA	399419.3	4.4077	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.999	PBA	131479.8	4.7322	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.012	PBA	297197.6	5.0000	CLO4-89-ISTD

*** End of Report ***

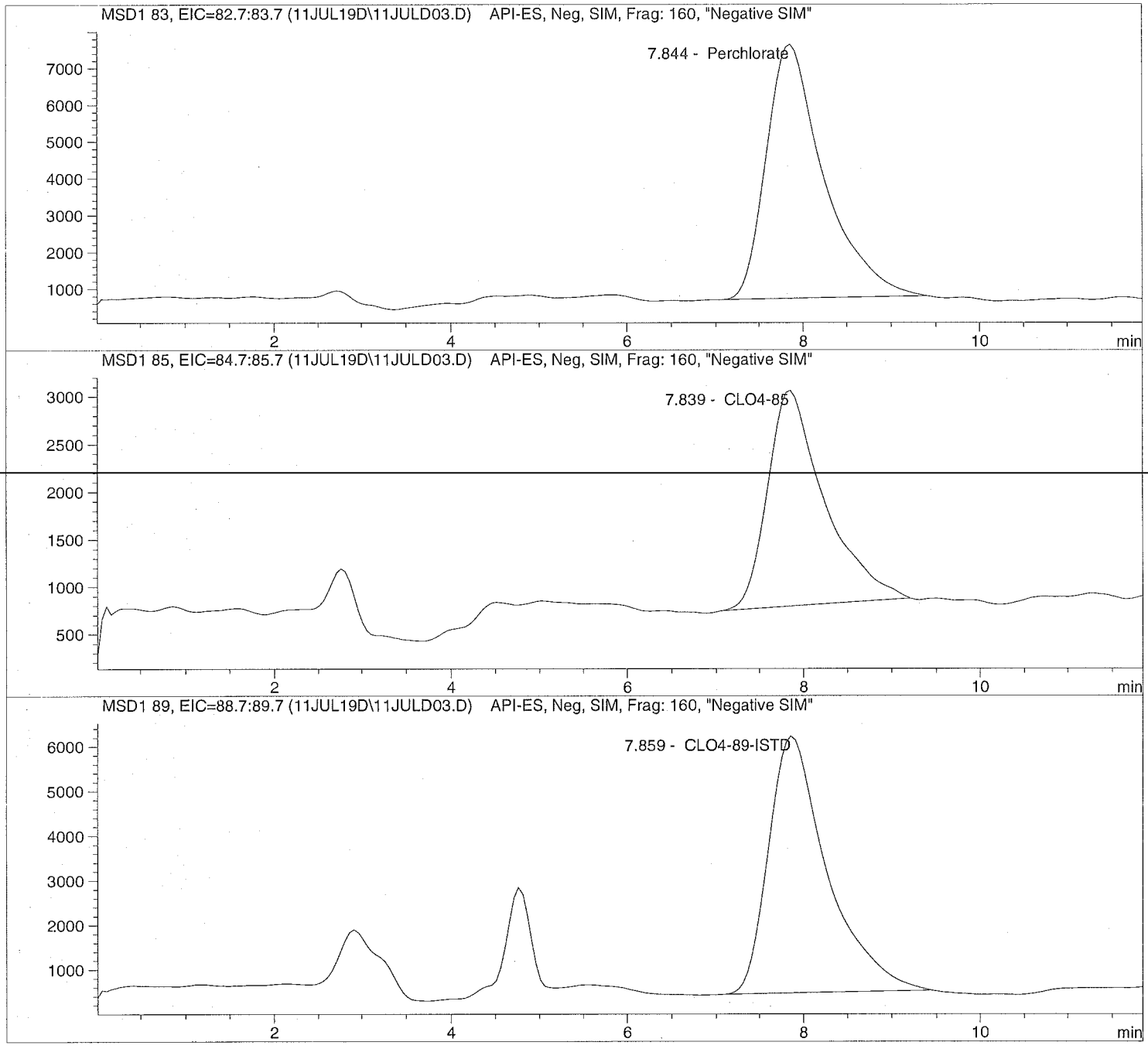
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD03.D Sample Name: 663032 ICS@4.0

Injection Date:	7/11/2019 11:39:52	Seq Line:	3
Sample Name:	663032 ICS@4.0	Location:	Vial 42
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD03.D Sample Name: 663032 ICS@4.0

Injection Date:	7/11/2019 11:39:52	Seq Line:	3
Sample Name:	663032 ICS@4.0	Location:	Vial 42
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.844	PBA	313184.6	3.8934	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.839	PBA	102078.9	4.1187	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.859	PBA	265421.4	5.0000	CLO4-89-ISTD

*** End of Report ***

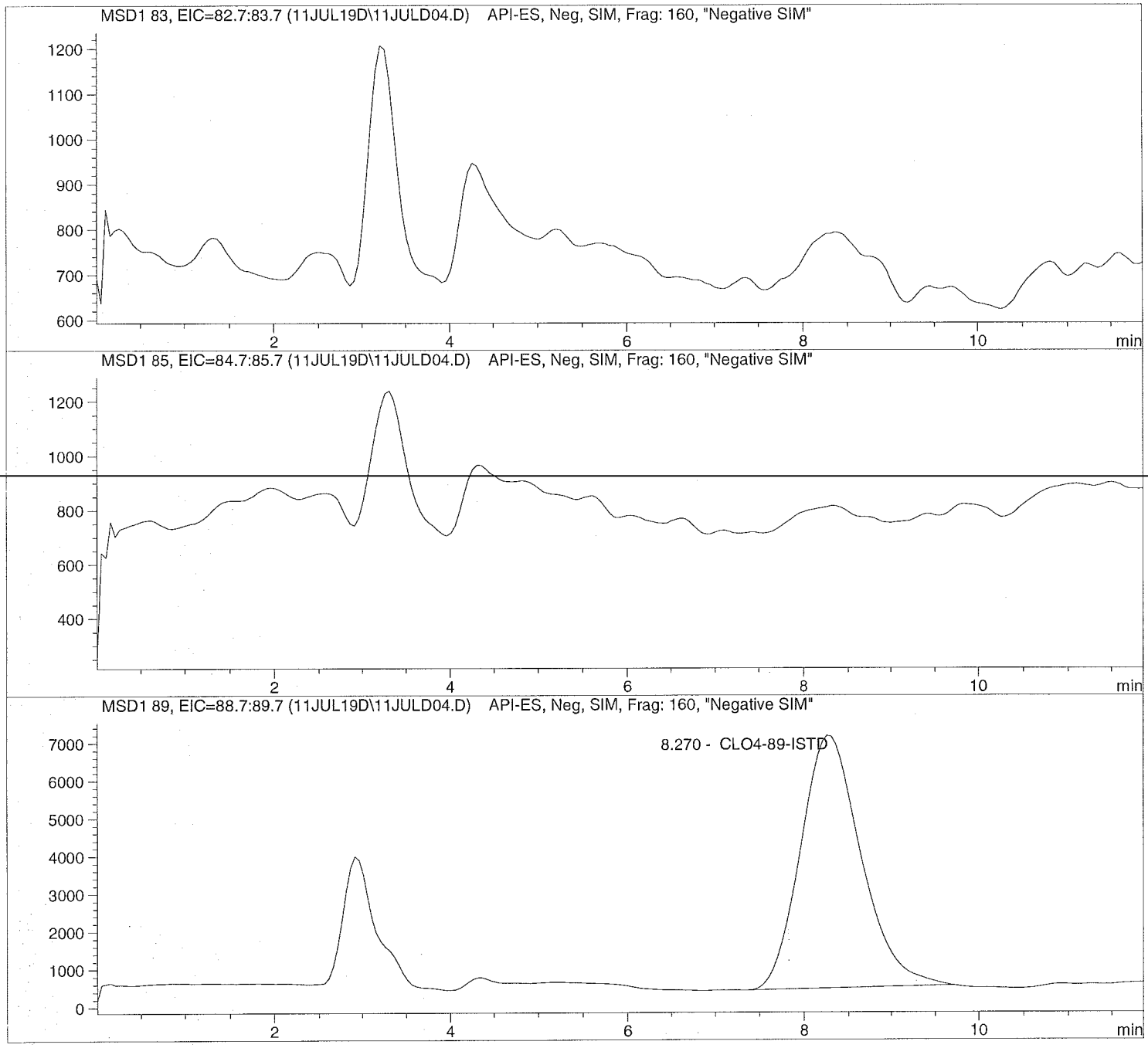
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD04.D Sample Name: 663033 LMB

Injection Date:	7/11/2019 11:53:41	Seq Line:	4
Sample Name:	663033 LMB	Location:	Vial 43
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD04.D Sample Name: 663033 LMB

Injection Date:	7/11/2019 11:53:41	Seq Line:	4
Sample Name:	663033 LMB	Location:	Vial 43
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.270	PBA	318342.8	5.0000	CLO4-89-ISTD

*** End of Report ***

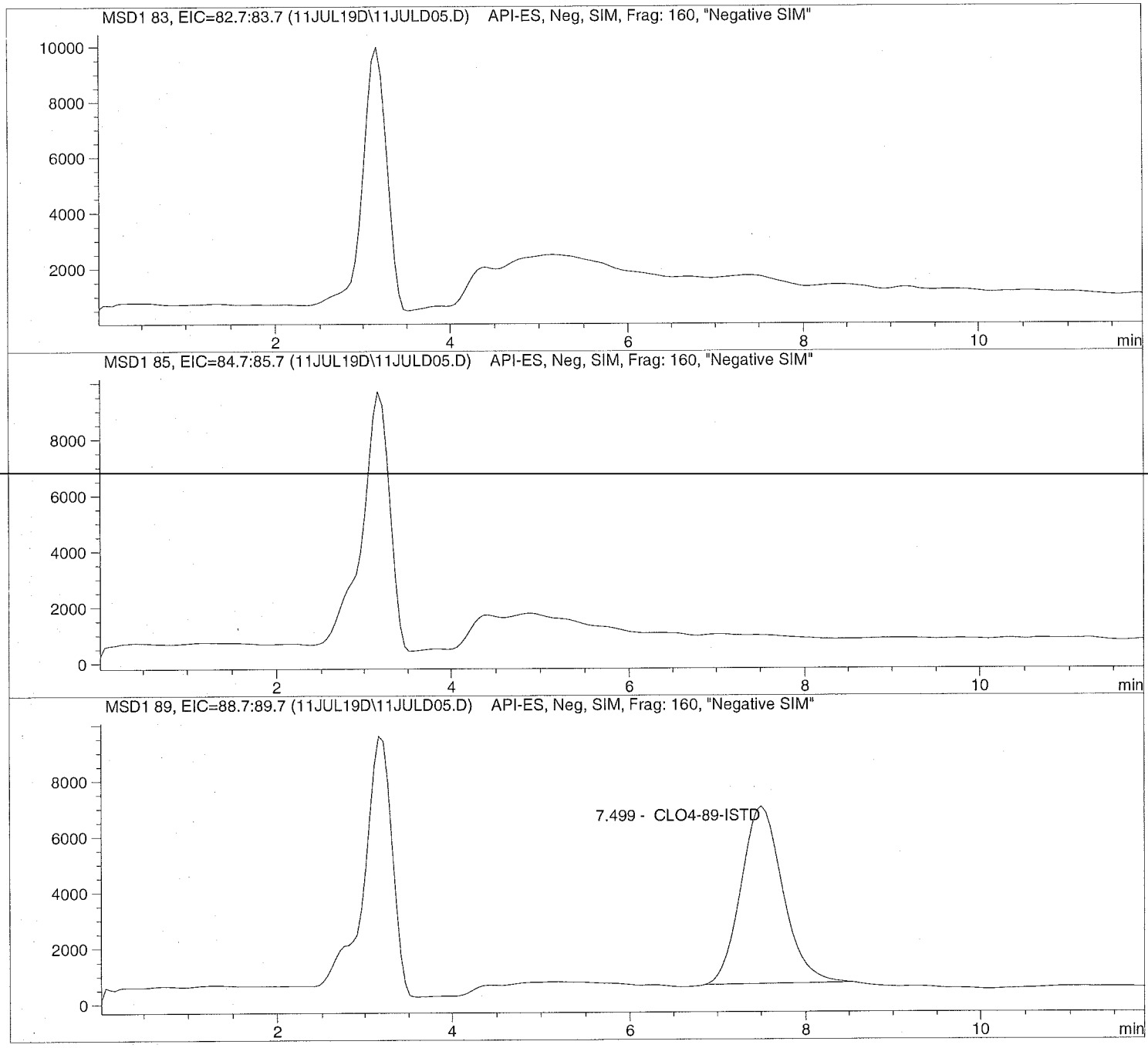
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD05.D Sample Name: 1918528001

Injection Date:	7/11/2019 12:07:26	Seq Line:	5
Sample Name:	1918528001	Location:	Vial 44
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD05.D Sample Name: 1918528001

Injection Date:	7/11/2019 12:07:26	Seq Line:	5
Sample Name:	1918528001	Location:	Vial 44
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.499	PBA	209428.4	5.0000	CLO4-89-ISTD

*** End of Report ***

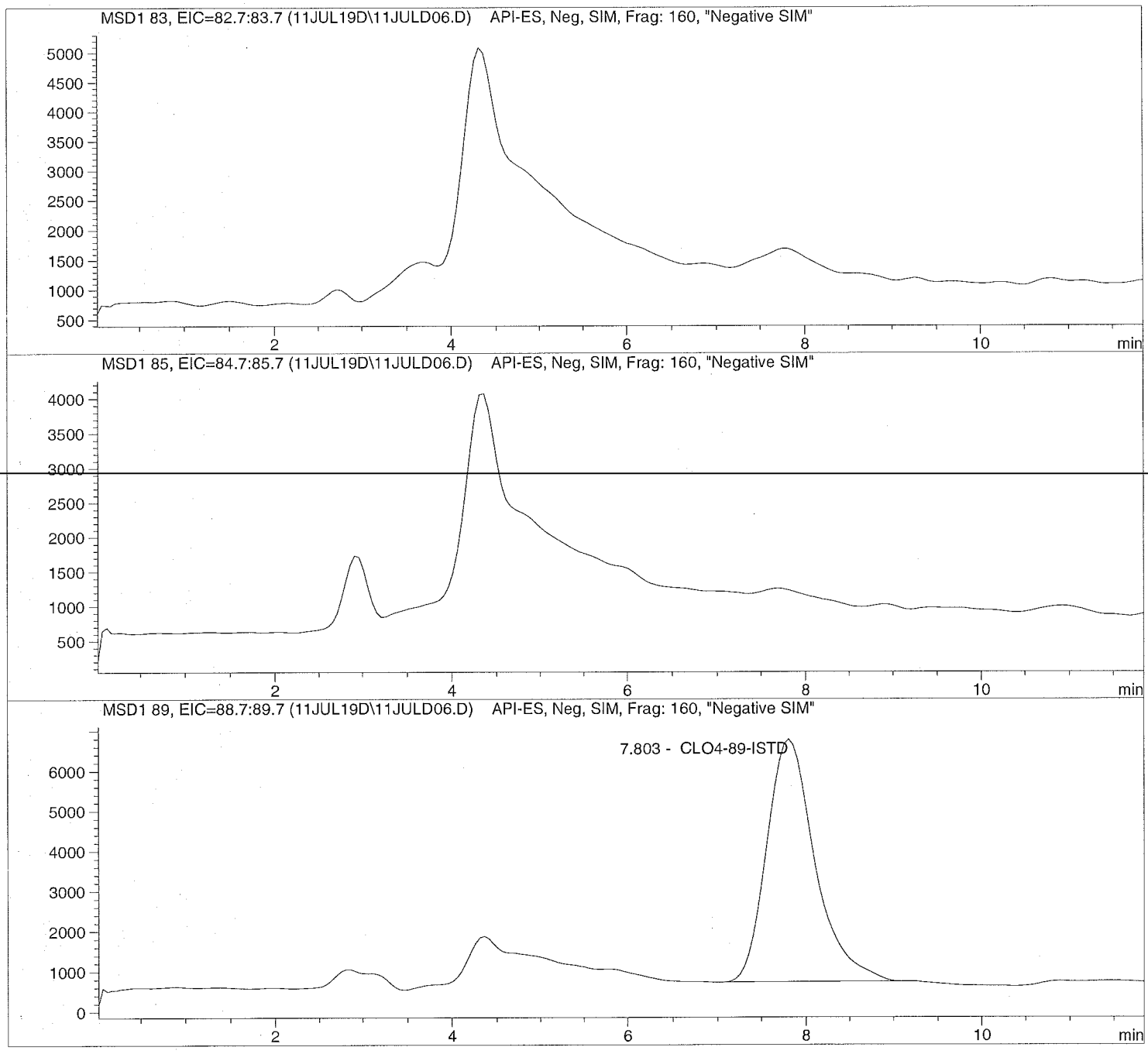
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD06.D Sample Name: 1918528002

Injection Date:	7/11/2019 12:21:11	Seq Line:	6
Sample Name:	1918528002	Location:	Vial 45
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD06.D Sample Name: 1918528002

Injection Date:	7/11/2019 12:21:11	Seq Line:	6
Sample Name:	1918528002	Location:	Vial 45
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.803	PBA	227591.6	5.0000	CLO4-89-ISTD

*** End of Report ***

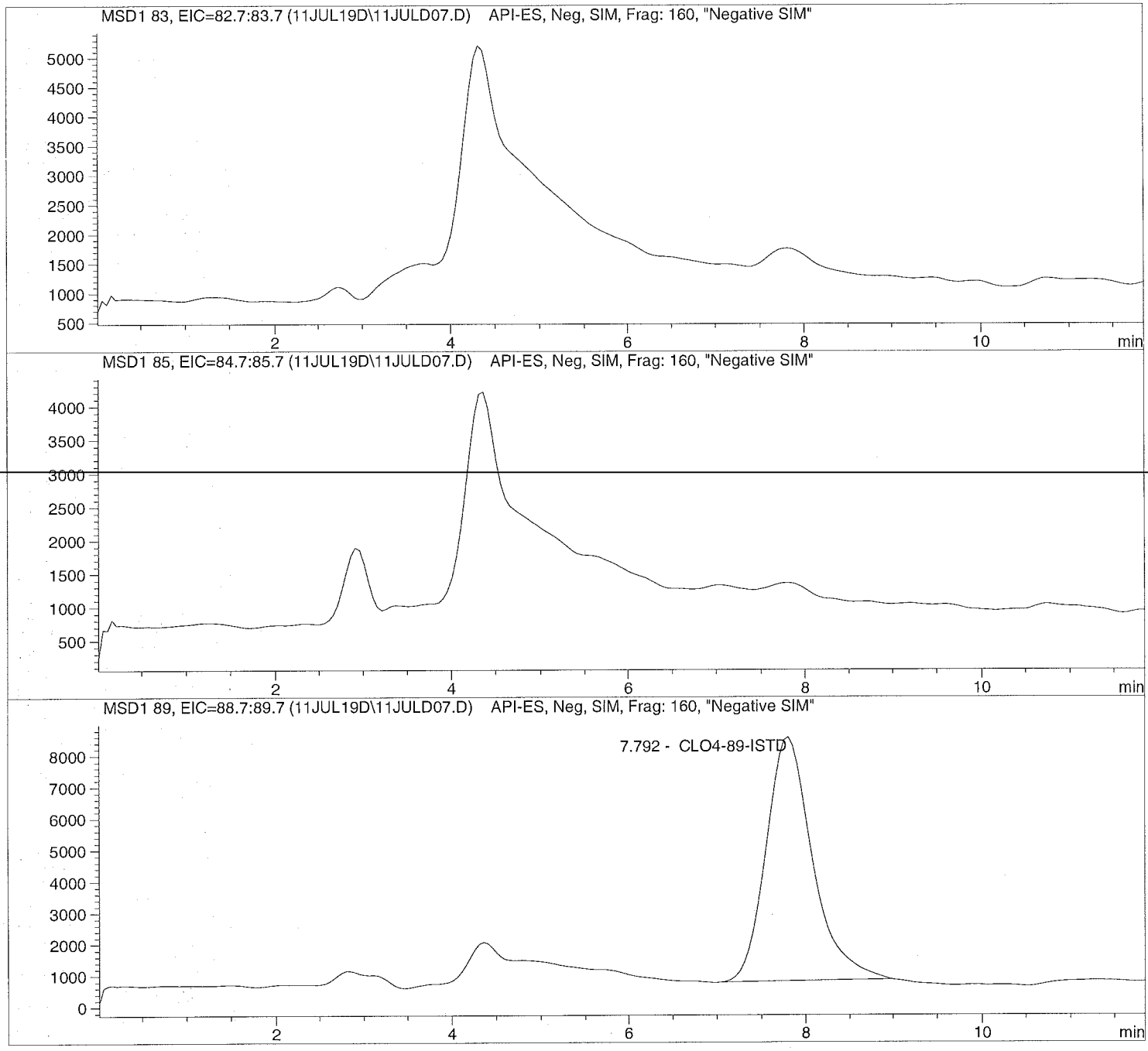
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD07.D Sample Name: 1918528003

Injection Date:	7/11/2019 12:34:58	Seq Line:	7
Sample Name:	1918528003	Location:	Vial 46
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD07.D Sample Name: 1918528003

Injection Date:	7/11/2019 12:34:58	Seq Line:	7
Sample Name:	1918528003	Location:	Vial 46
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.792	PBA	283804.7	5.0000	CLO4-89-ISTD

*** End of Report ***

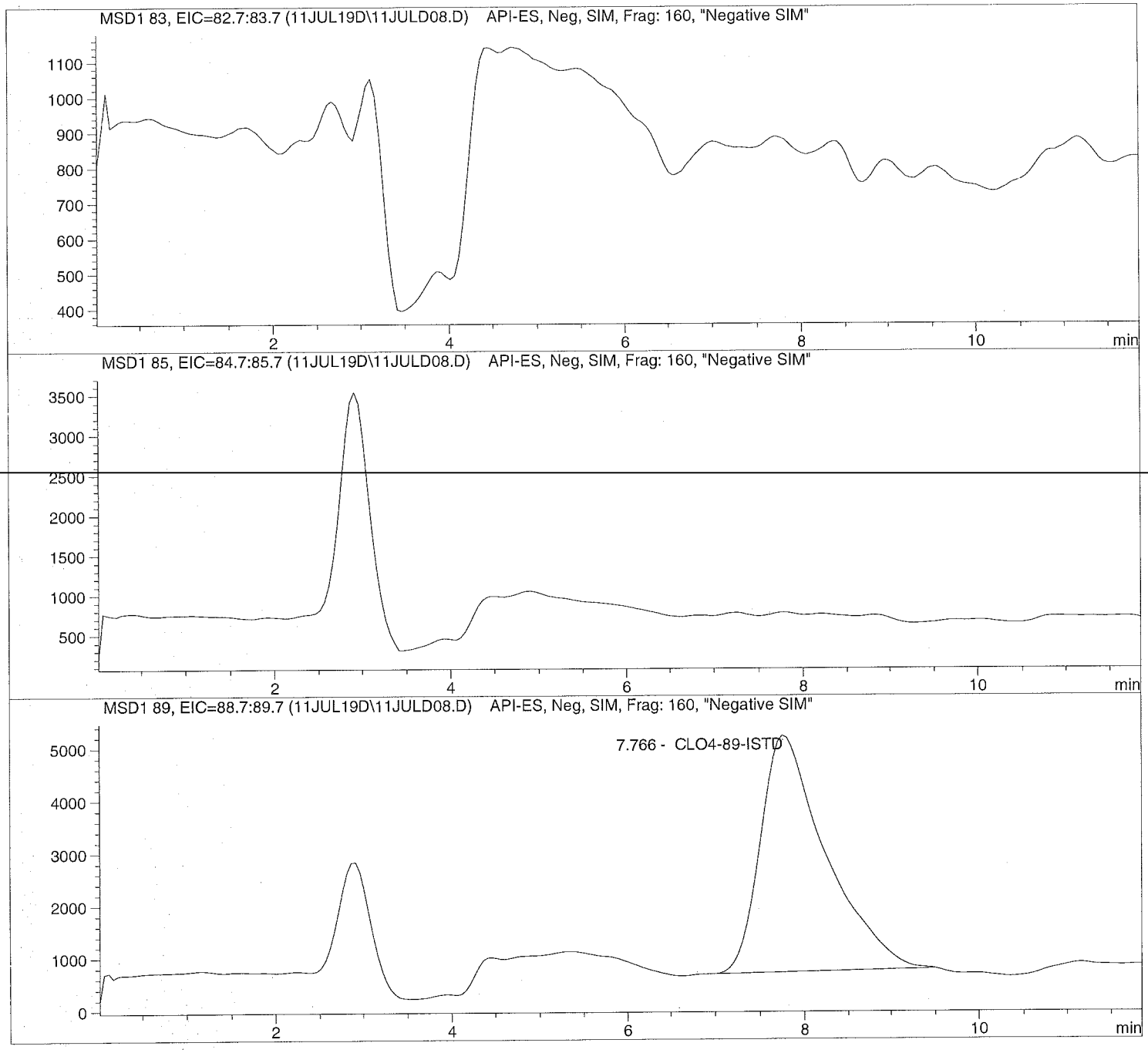
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD08.D Sample Name: 1918528004

Injection Date:	7/11/2019 12:48:44	Seq Line:	8
Sample Name:	1918528004	Location:	Vial 47
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD08.D Sample Name: 1918528004

Injection Date:	7/11/2019 12:48:44	Seq Line:	8
Sample Name:	1918528004	Location:	Vial 47
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.766	PBA	231743.6	5.0000	CLO4-89-ISTD

*** End of Report ***

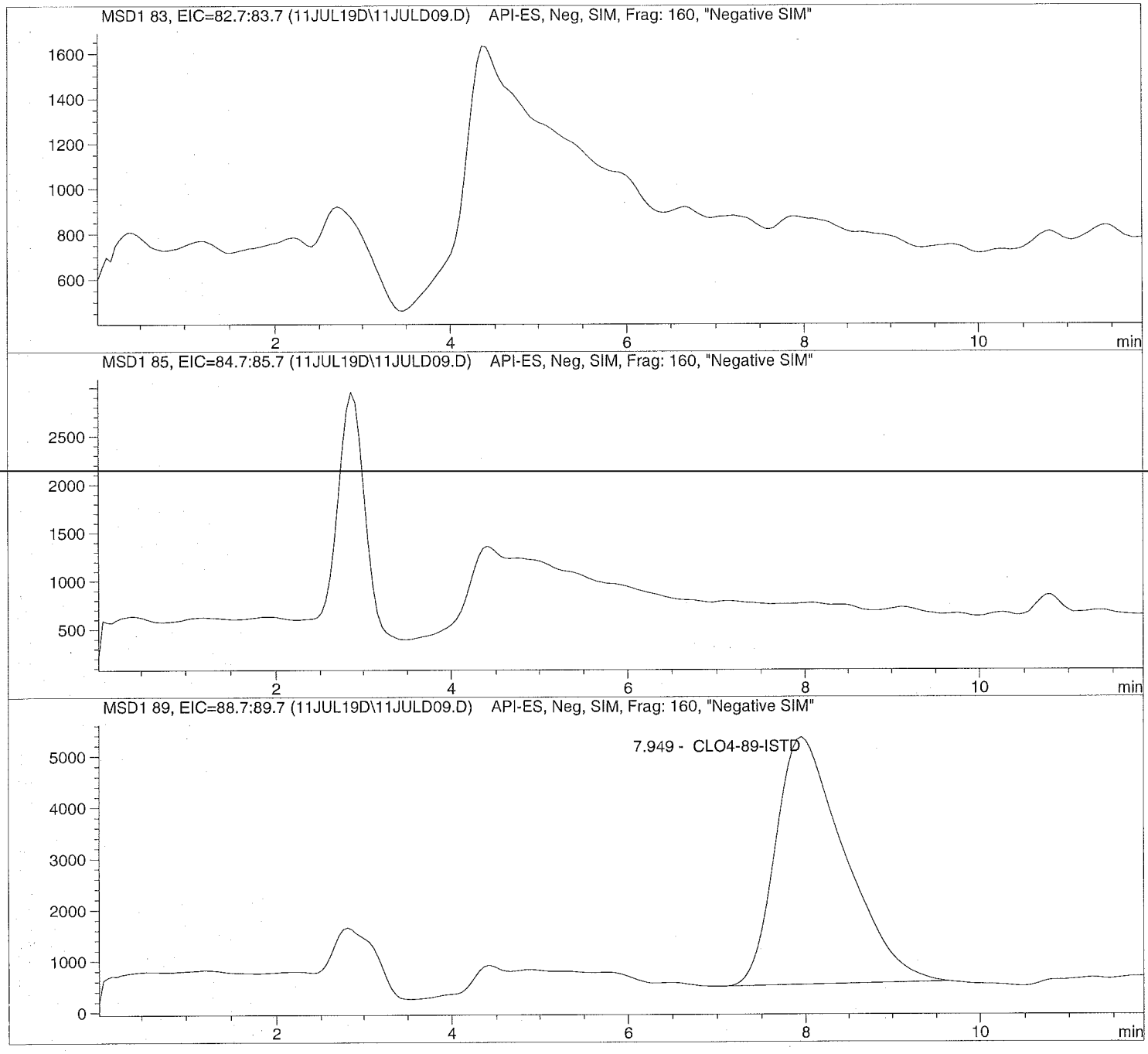
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD09.D Sample Name: 1918528005

Injection Date:	7/11/2019 13:02:32	Seq Line:	9
Sample Name:	1918528005	Location:	Vial 48
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD09.D Sample Name: 1918528005

Injection Date:	7/11/2019 13:02:32	Seq Line:	9
Sample Name:	1918528005	Location:	Vial 48
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.949	PBA	265464.7	5.0000	CLO4-89-ISTD

*** End of Report ***

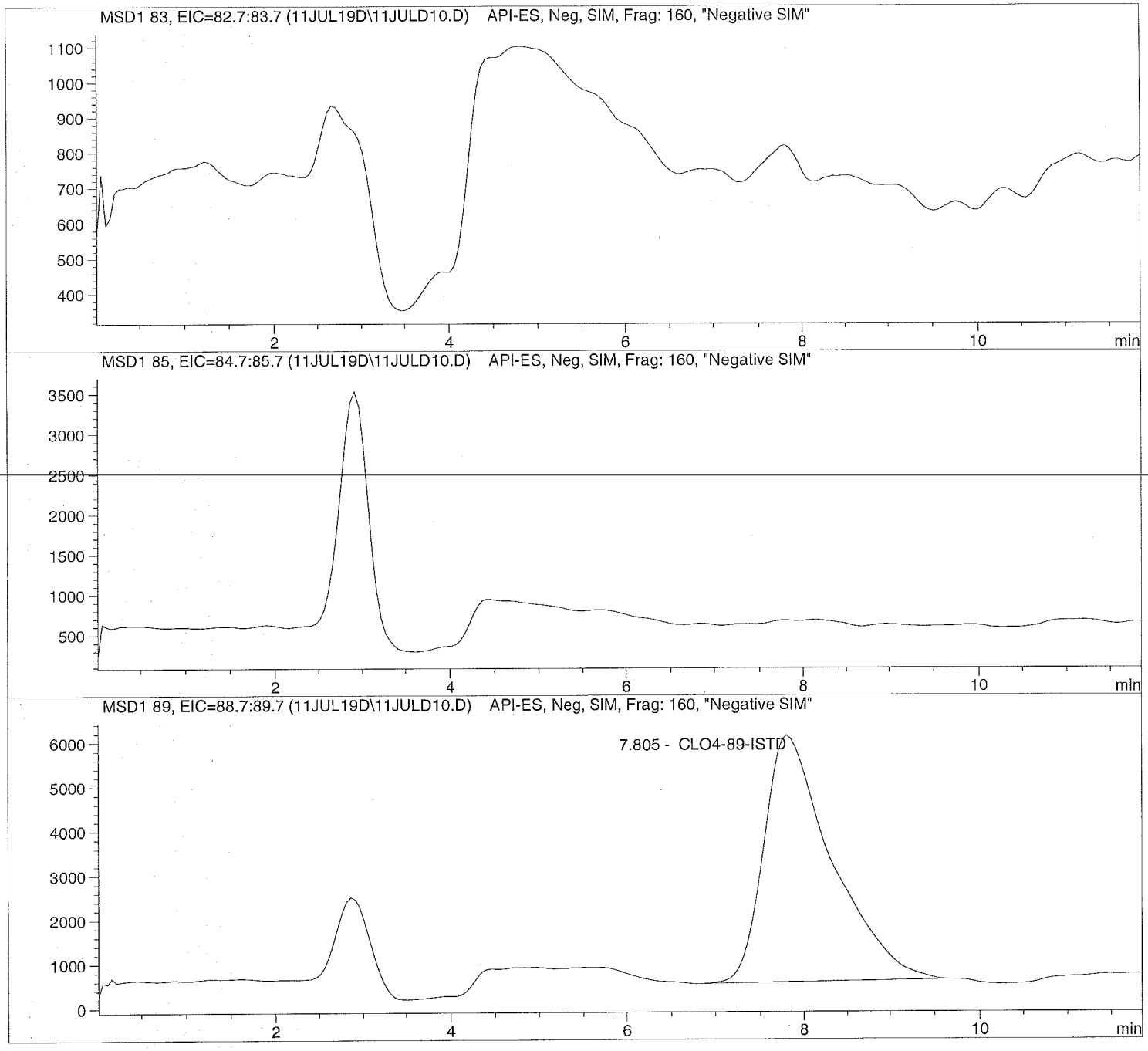
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD10.D Sample Name: 1918528006

Injection Date:	7/11/2019 13:16:18	Seq Line:	10
Sample Name:	1918528006	Location:	Vial 49
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD10.D Sample Name: 1918528006

Injection Date:	7/11/2019 13:16:18	Seq Line:	10
Sample Name:	1918528006	Location:	Vial 49
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	302483.2	5.0000	CLO4-89-ISTD

*** End of Report ***

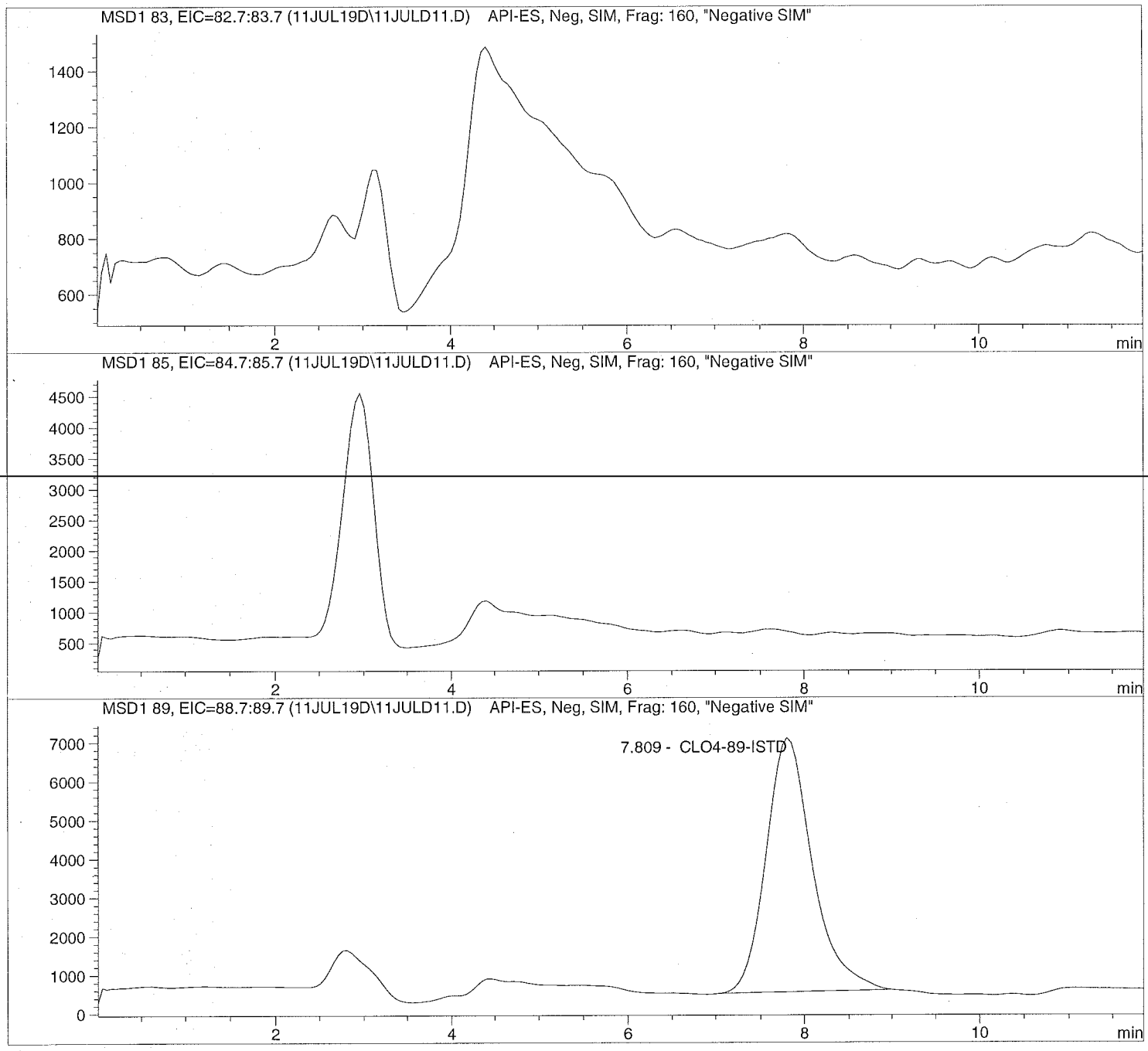
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD11.D Sample Name: 1918528007

Injection Date:	7/11/2019 13:30:12	Seq Line:	11
Sample Name:	1918528007	Location:	Vial 50
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD11.D Sample Name: 1918528007

Injection Date:	7/11/2019 13:30:12	Seq Line:	11
Sample Name:	1918528007	Location:	Vial 50
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.809	PBA	239369.6	5.0000	CLO4-89-ISTD

*** End of Report ***

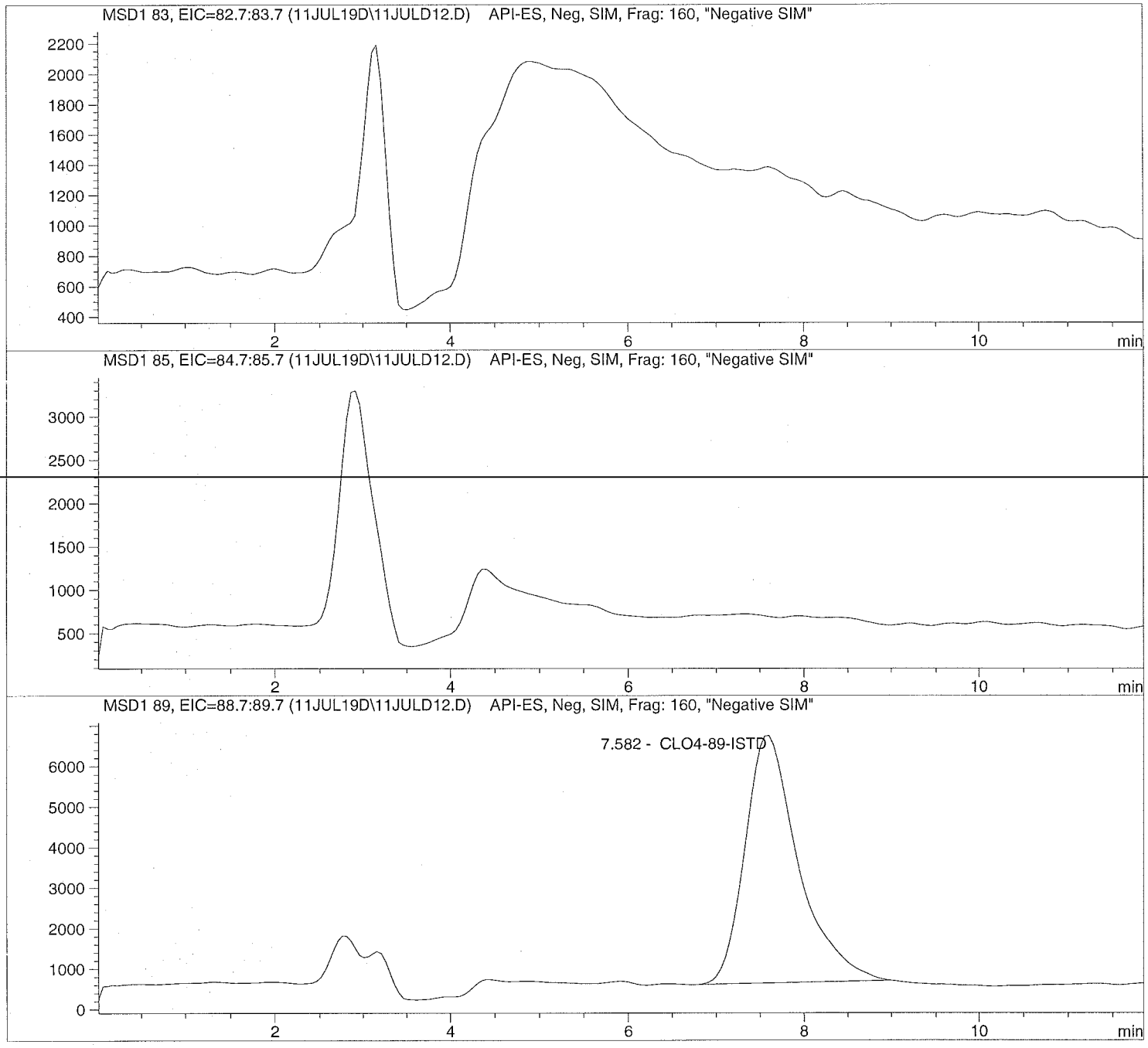
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD12.D Sample Name: 1918528008

Injection Date:	7/11/2019 13:43:59	Seq Line:	12
Sample Name:	1918528008	Location:	Vial 51
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD12.D Sample Name: 1918528008

Injection Date:	7/11/2019 13:43:59	Seq Line:	12
Sample Name:	1918528008	Location:	Vial 51
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.582	PBA	257536.2	5.0000	CLO4-89-ISTD

*** End of Report ***

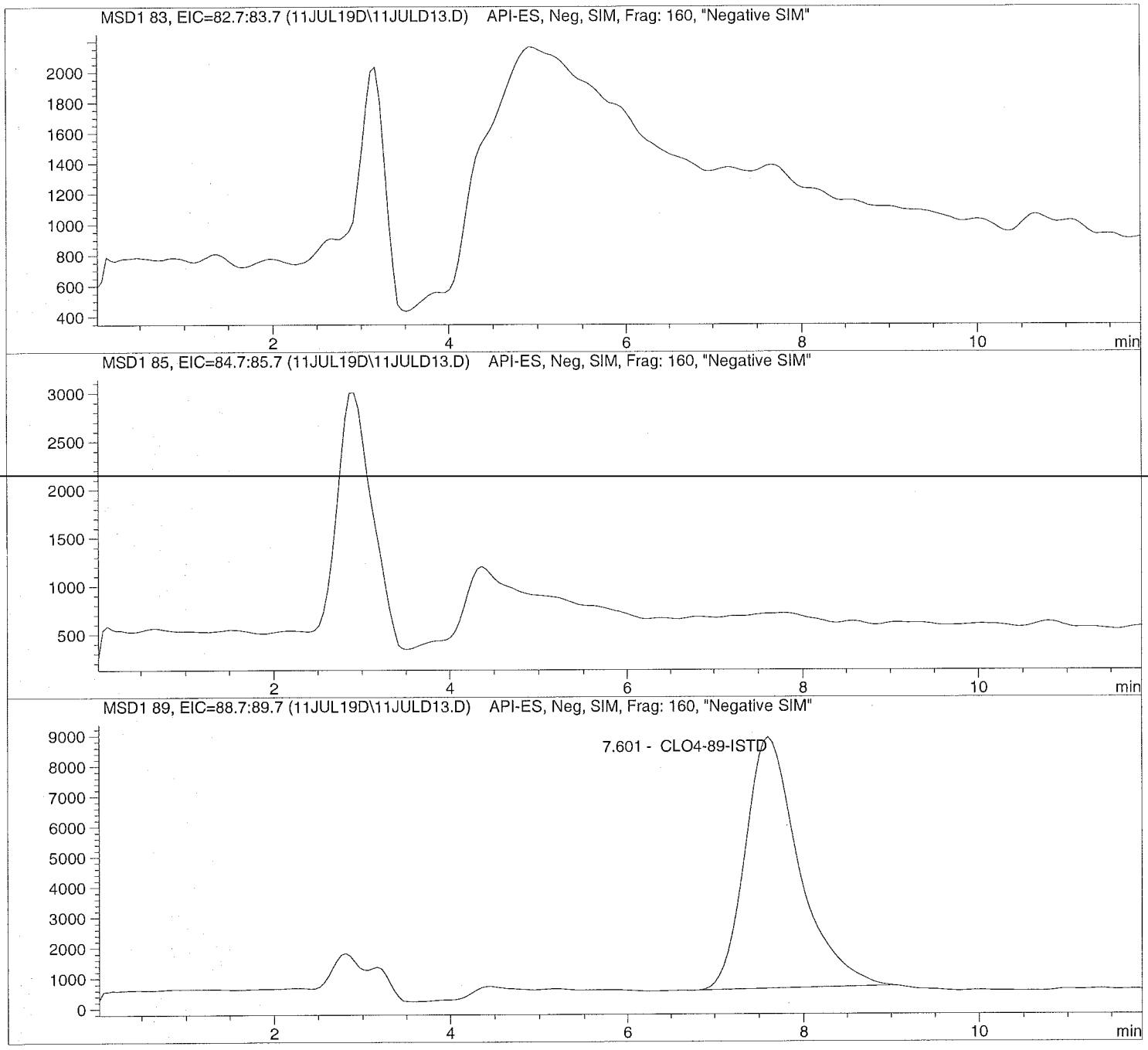
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD13.D Sample Name: 1918528009

Injection Date:	7/11/2019 13:57:45	Seq Line:	13
Sample Name:	1918528009	Location:	Vial 52
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD13.D Sample Name: 1918528009

Injection Date:	7/11/2019 13:57:45	Seq Line:	13
Sample Name:	1918528009	Location:	Vial 52
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.601	PBA	347244.5	5.0000	CLO4-89-ISTD

*** End of Report ***

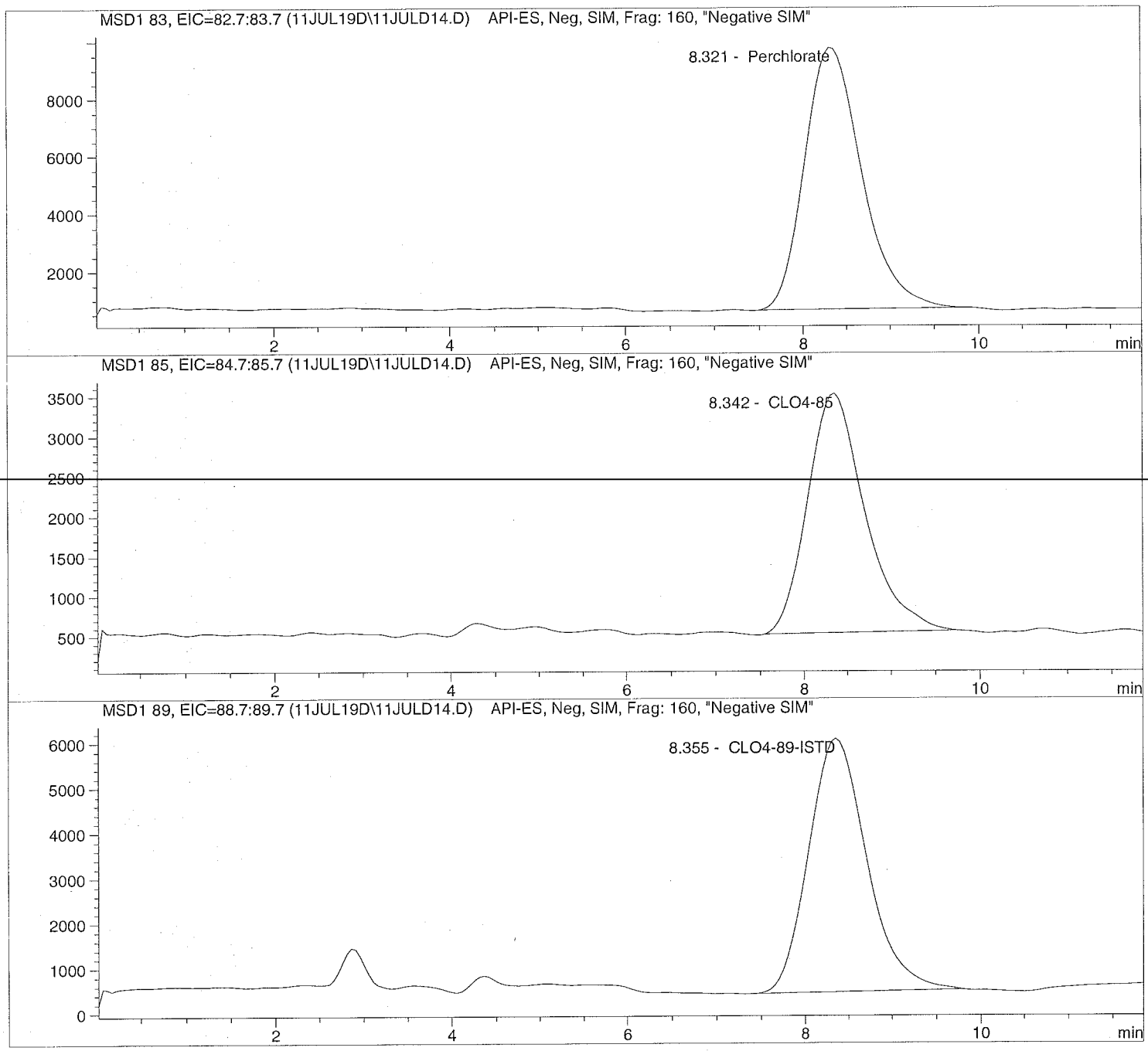
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD14.D Sample Name: 1918528010 100

Injection Date:	7/11/2019 14:11:32	Seq Line:	14
Sample Name:	1918528010 100	Location:	Vial 53
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD14.D Sample Name: 1918528010 100

Injection Date:	7/11/2019 14:11:32	Seq Line:	14
Sample Name:	1918528010 100	Location:	Vial 53
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.321	BBA	415809.4	518.2323	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.342	PBA	137449.3	561.7802	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.355	PBA	261248.4	500.0000	CLO4-89-ISTD

*** End of Report ***

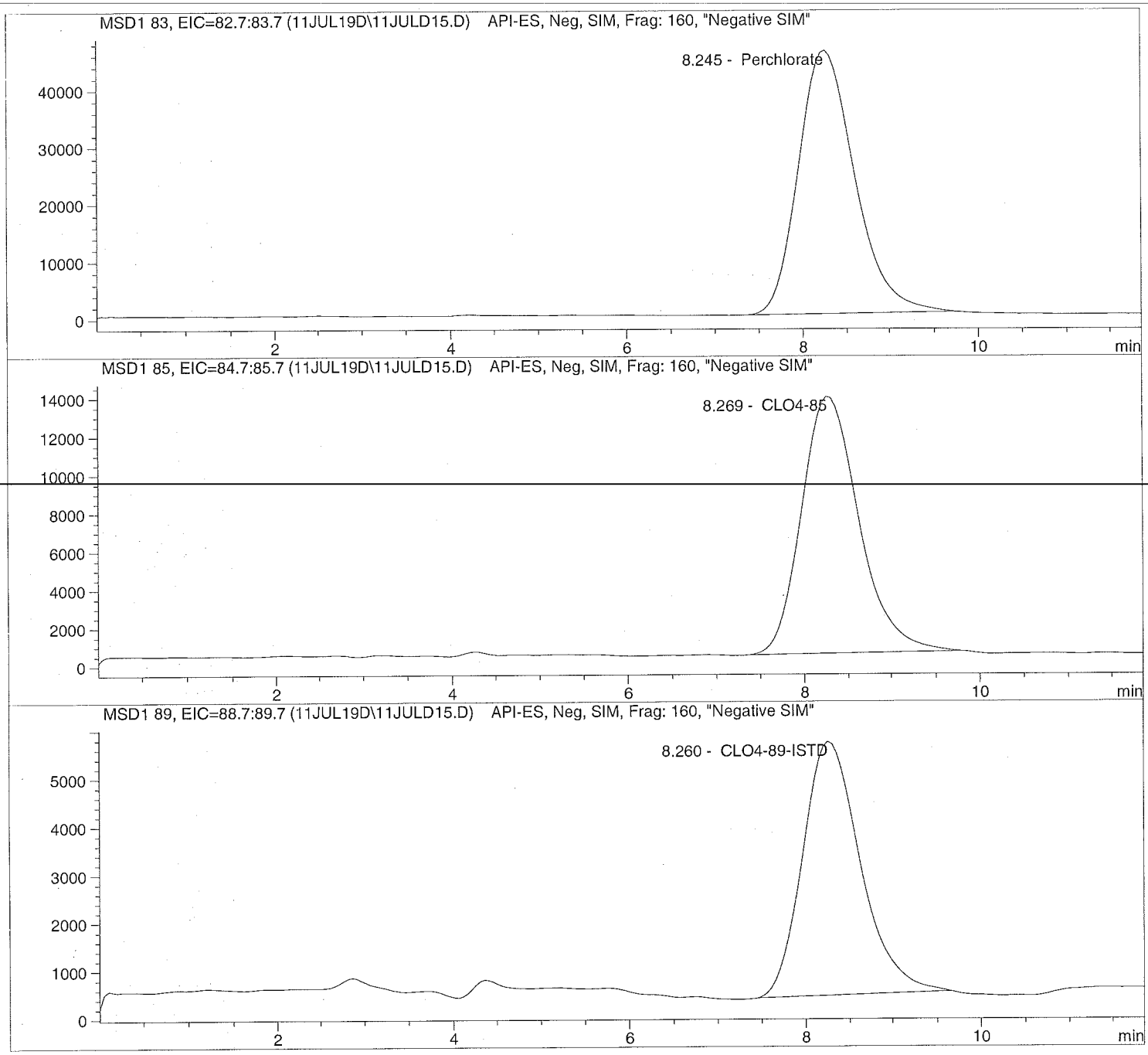
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD15.D Sample Name: 663035 CCV@25

Injection Date:	7/11/2019 14:25:24	Seq Line:	15
Sample Name:	663035 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD15.D Sample Name: 663035 CCV@25

Injection Date:	7/11/2019 14:25:24	Seq Line:	15
Sample Name:	663035 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.245	PBA	2053058.0	25.6747	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.269	PBA	614213.5	25.8714	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.260	PBA	242891.8	5.0000	CLO4-89-ISTD

*** End of Report ***

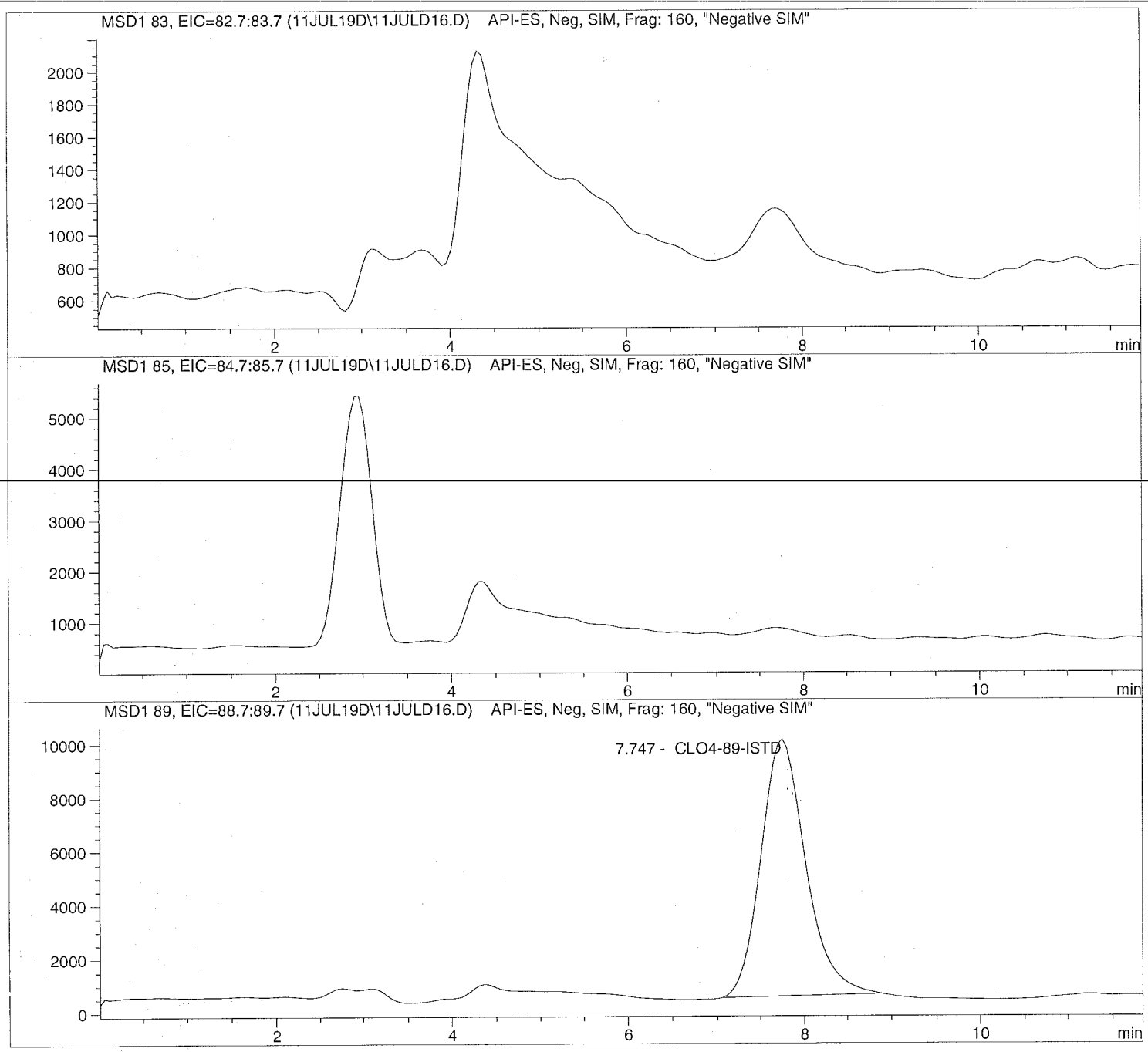
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD16.D Sample Name: 1918705001

Injection Date:	7/11/2019 14:39:13	Seq Line:	16
Sample Name:	1918705001	Location:	Vial 54
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD16.D Sample Name: 1918705001

Injection Date:	7/11/2019 14:39:13	Seq Line:	16
Sample Name:	1918705001	Location:	Vial 54
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.747	PBA	340152.4	5.0000	CLO4-89-ISTD

*** End of Report ***

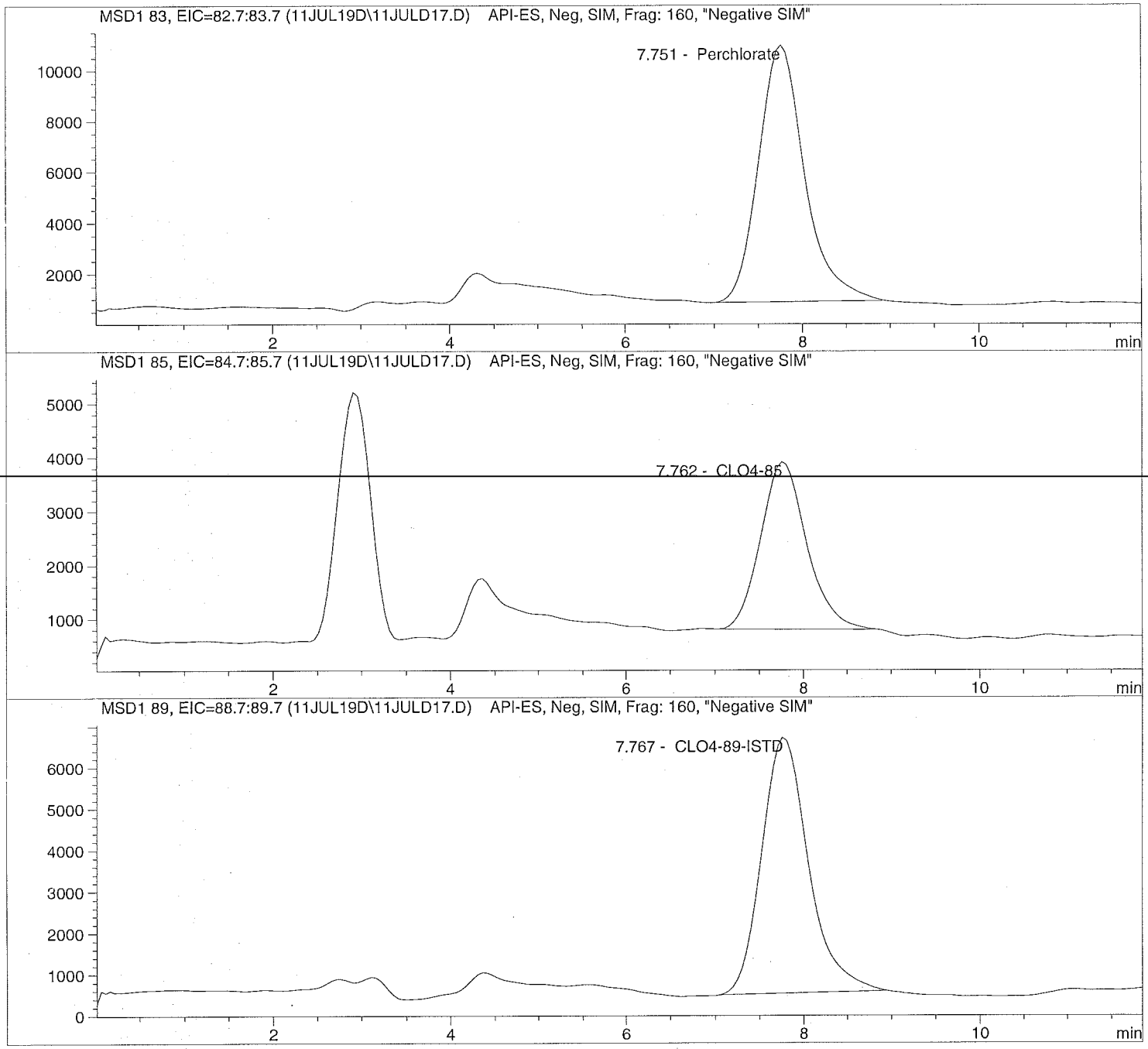
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD17.D Sample Name: 1918705002 MS

Injection Date:	7/11/2019 14:52:59	Seq Line:	17
Sample Name:	1918705002 MS	Location:	Vial 55
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD17.D Sample Name: 1918705002 MS

Injection Date:	7/11/2019 14:52:59	Seq Line:	17
Sample Name:	1918705002 MS	Location:	Vial 55
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.751	PBA	365013.6	5.2090	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.762	BBA	112800.8	5.2838	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.767	PBA	228107.2	5.0000	CLO4-89-ISTD

*** End of Report ***

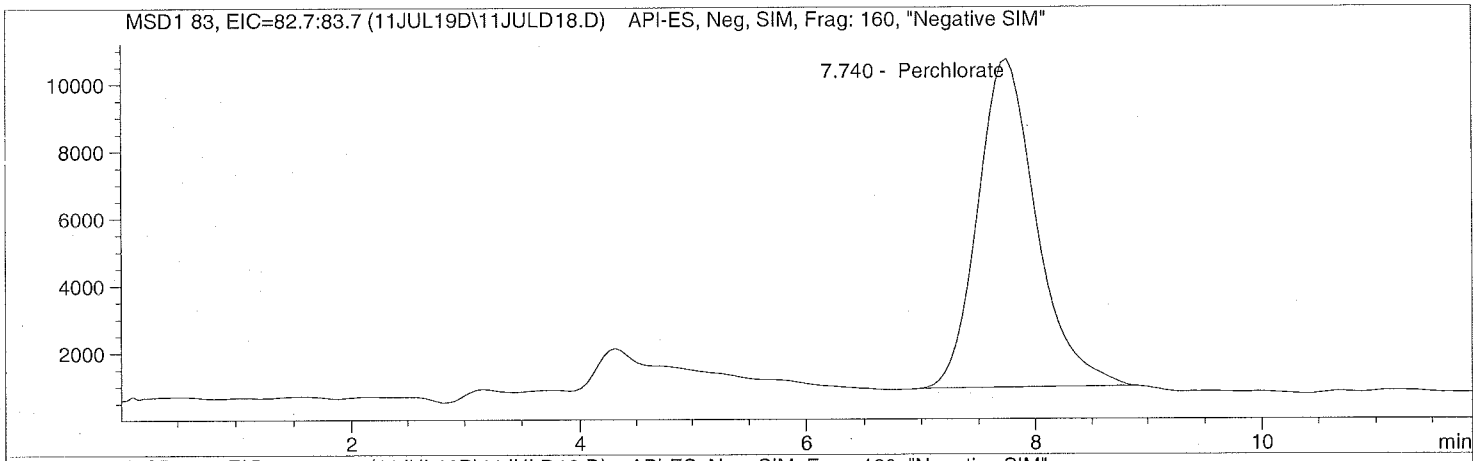
RIGHT SOLUTIONS | RIGHT PARTNER

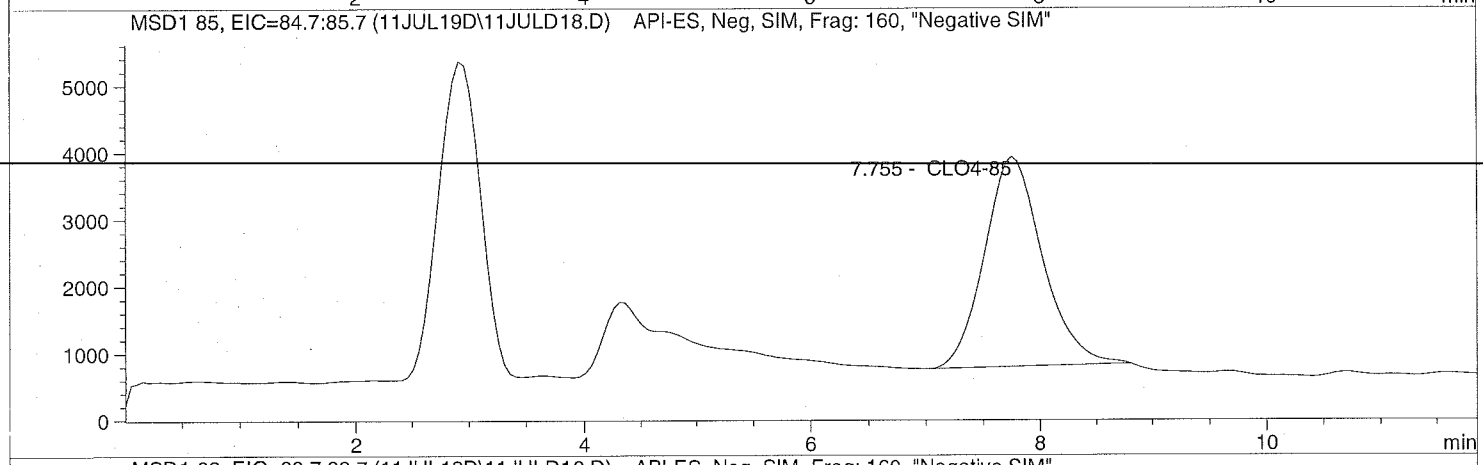
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD18.D Sample Name: 1918705003 MSD

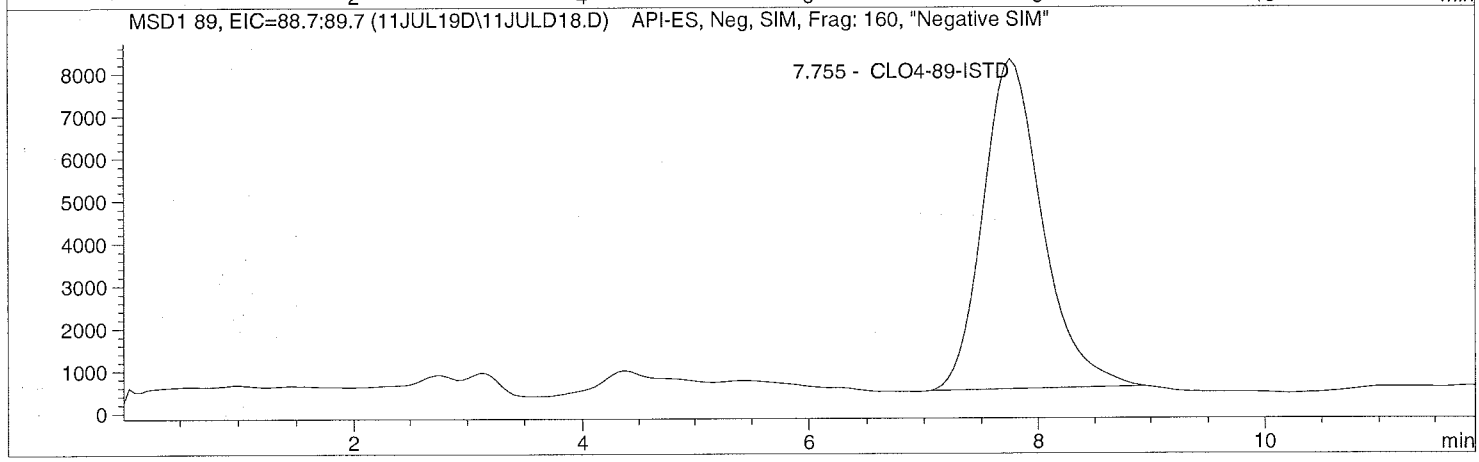
Injection Date:	7/11/2019 15:06:56	Seq Line:	18
Sample Name:	1918705003 MSD	Location:	Vial 56
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD18.D Sample Name: 1918705003 MSD

Injection Date:	7/11/2019 15:06:56	Seq Line:	18
Sample Name:	1918705003 MSD	Location:	Vial 56
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.740	PBA	350061.6	4.0921	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.755	PBA	110963.2	4.2197	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.755	PBA	281563.4	5.0000	CLO4-89-ISTD

*** End of Report ***

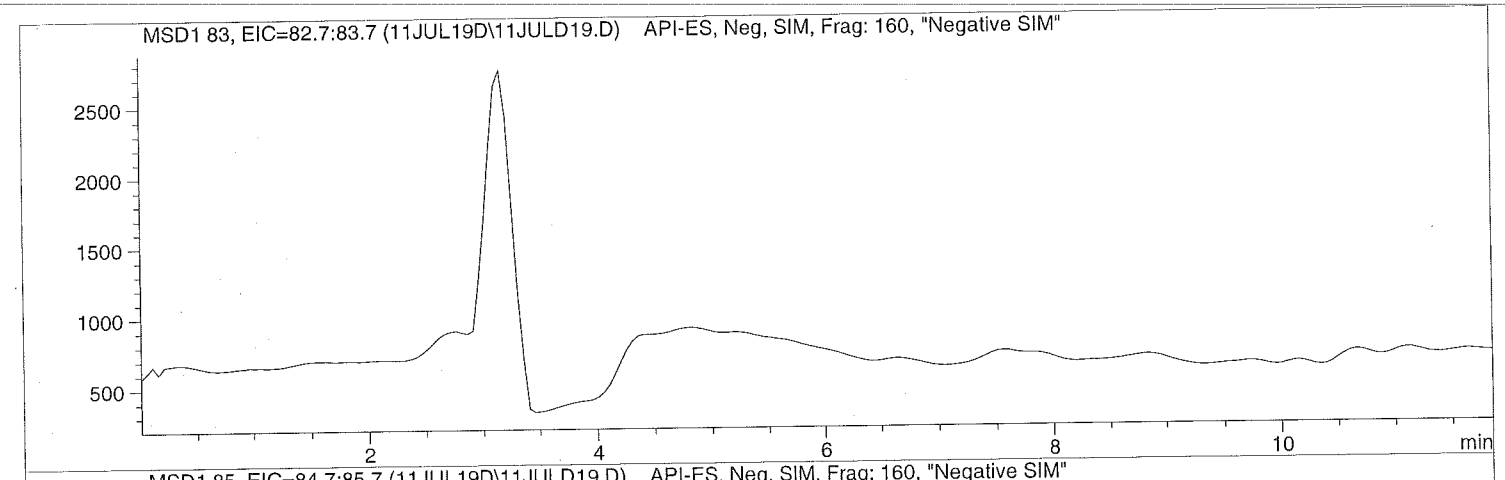
RIGHT SOLUTIONS | RIGHT PARTNER

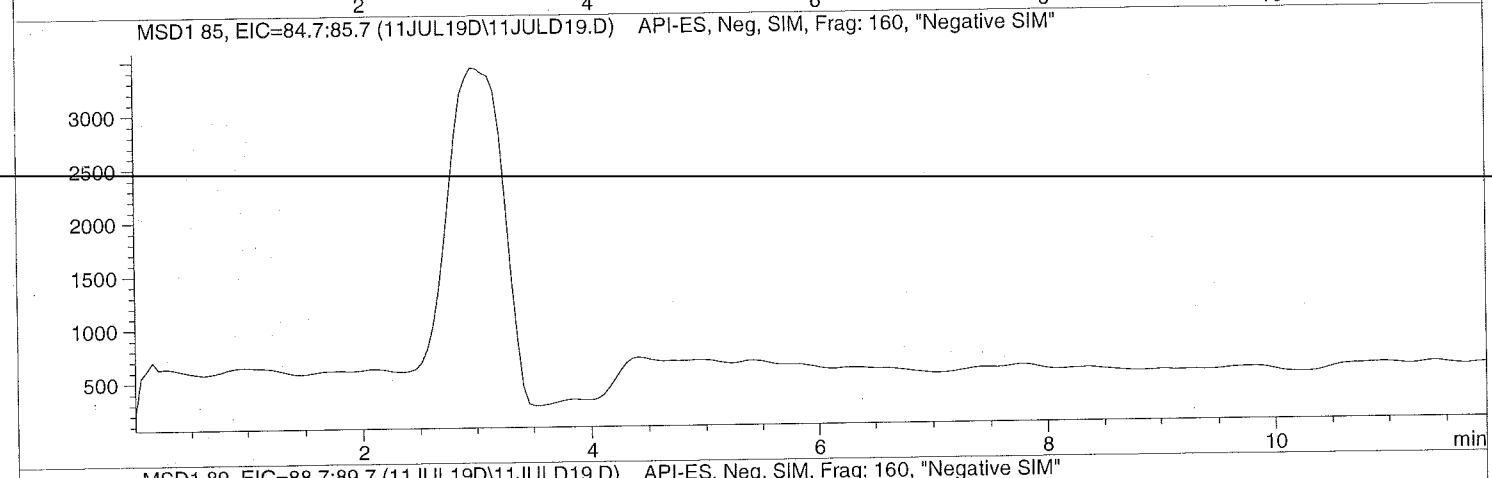
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD19.D Sample Name: 1918705004

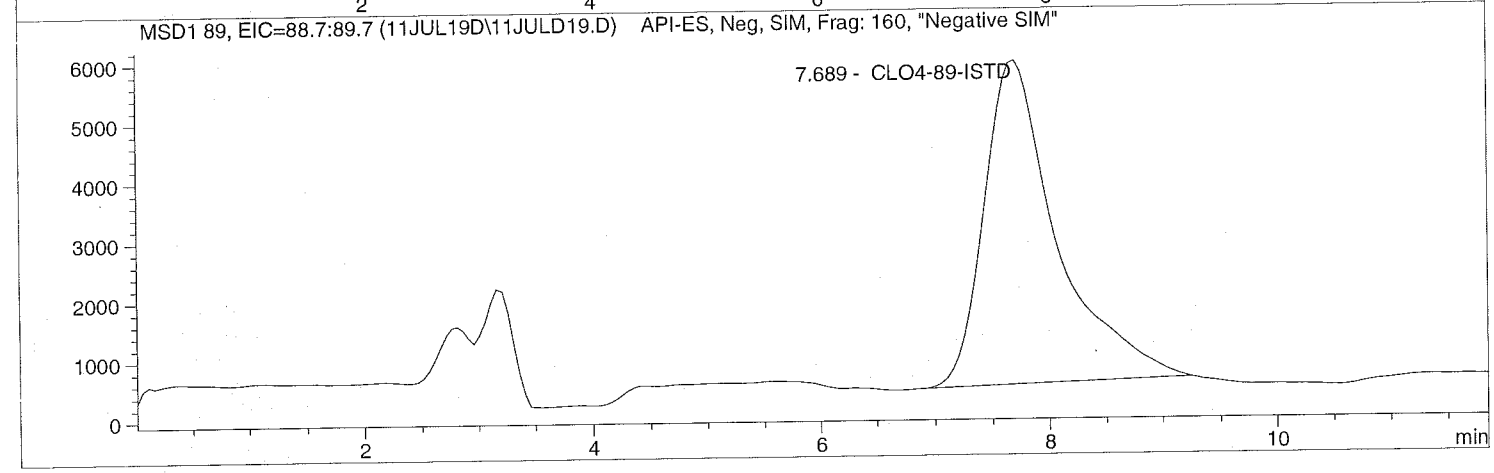
Injection Date:	7/11/2019 15:21:50	Seq Line:	19
Sample Name:	1918705004	Location:	Vial 57
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD19.D Sample Name: 1918705004

Injection Date:	7/11/2019 15:21:50	Seq Line:	19
Sample Name:	1918705004	Location:	Vial 57
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.689	PBA	240534.6	5.0000	CLO4-89-ISTD

*** End of Report ***

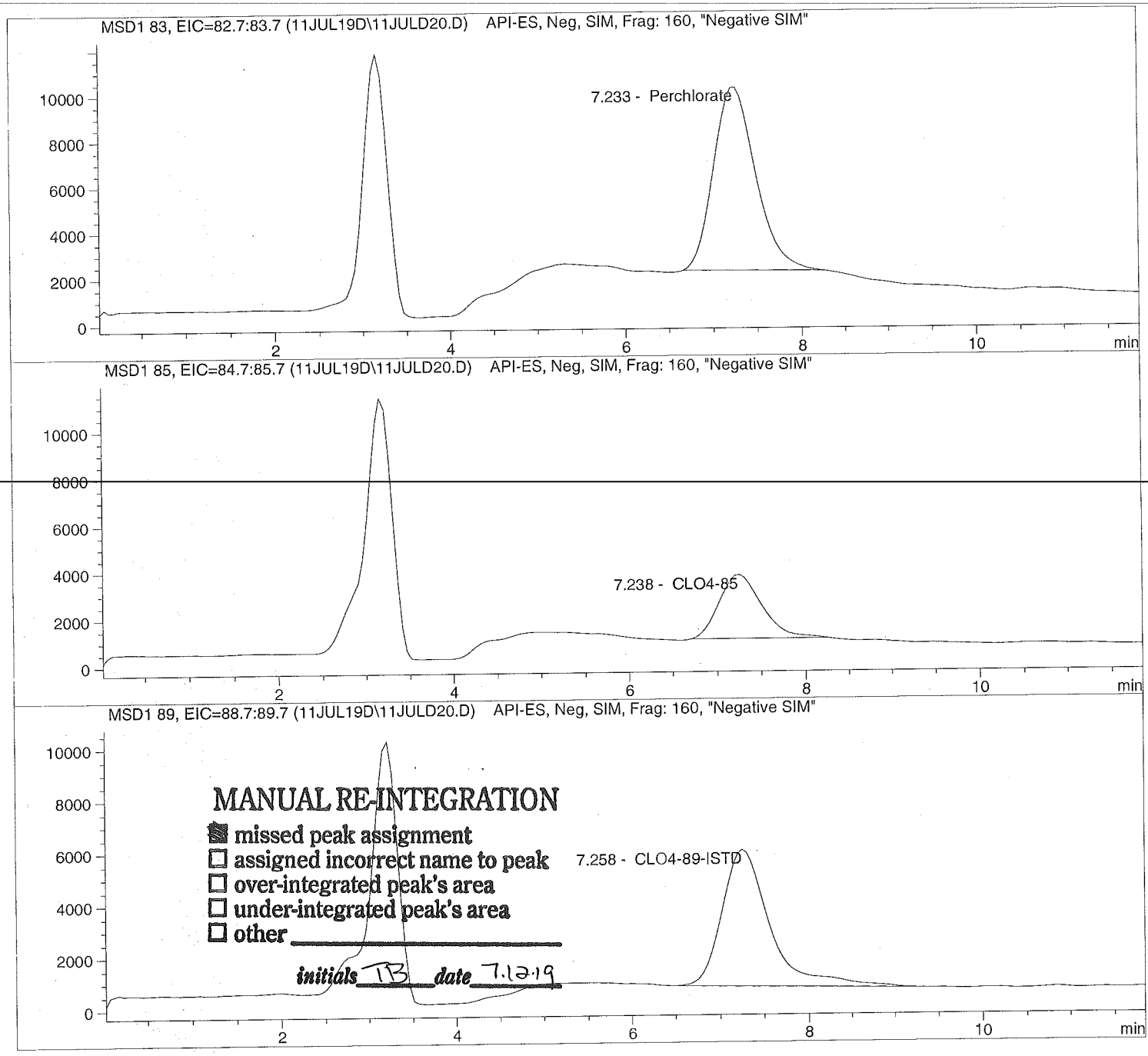
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD20.D Sample Name: 1918705005

Injection Date:	7/11/2019 15:35:52	Seq Line:	20
Sample Name:	1918705005	Location:	Vial 58
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD20.D Sample Name: 1918705005

Injection Date:	7/11/2019 15:35:52	Seq Line:	20
Sample Name:	1918705005	Location:	Vial 58
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.233	PBA	264721.6	4.4092	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.238	BBA	91183.5	4.9513	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.258	MM	196904.8	5.0000	CLO4-89-ISTD

*** End of Report ***

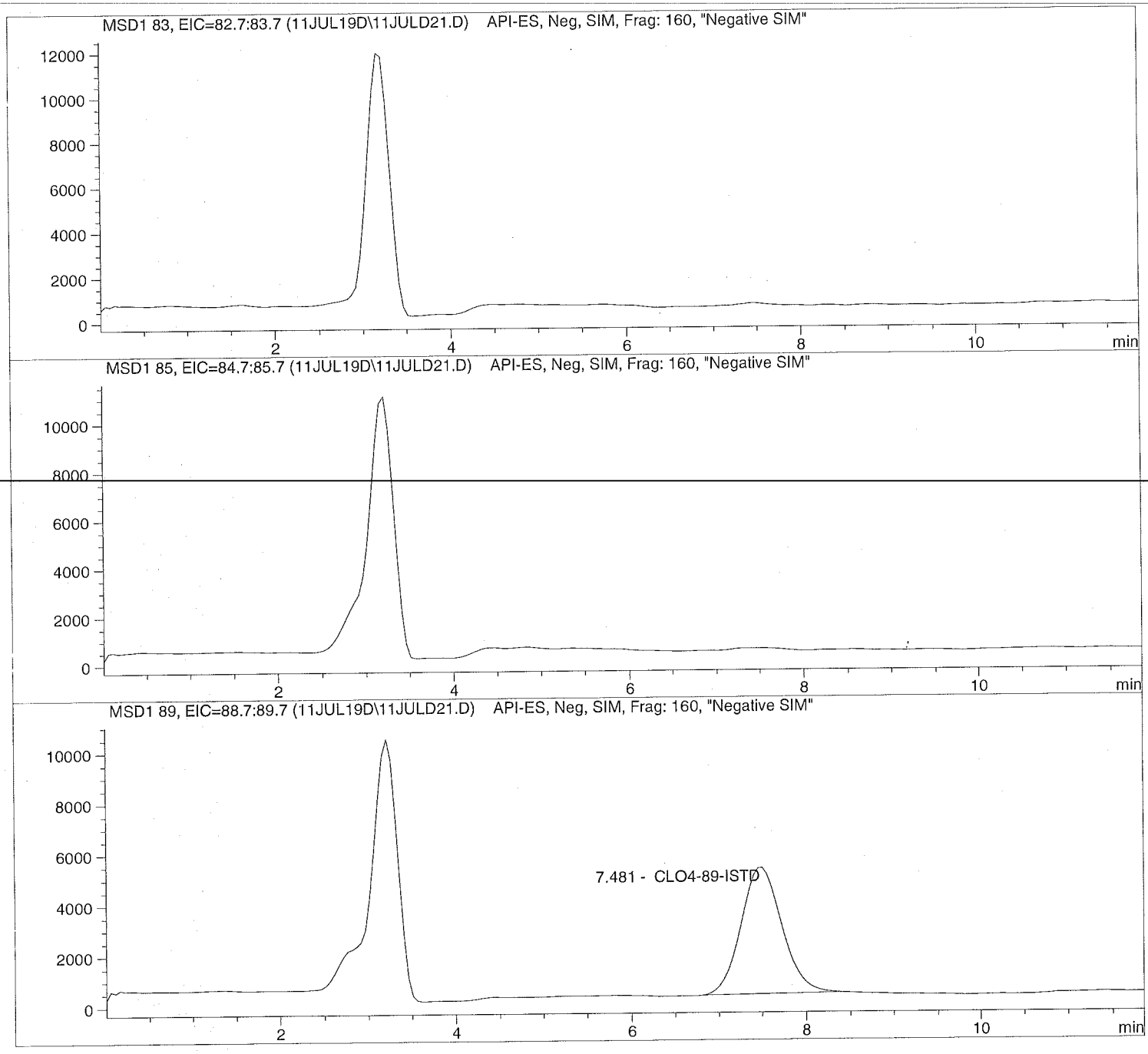
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD21.D Sample Name: 1918705006

Injection Date:	7/11/2019 15:49:37	Seq Line:	21
Sample Name:	1918705006	Location:	Vial 59
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD21.D Sample Name: 1918705006

Injection Date:	7/11/2019 15:49:37	Seq Line:	21
Sample Name:	1918705006	Location:	Vial 59
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.481	PBA	163865.3	5.0000	CLO4-89-ISTD

*** End of Report ***

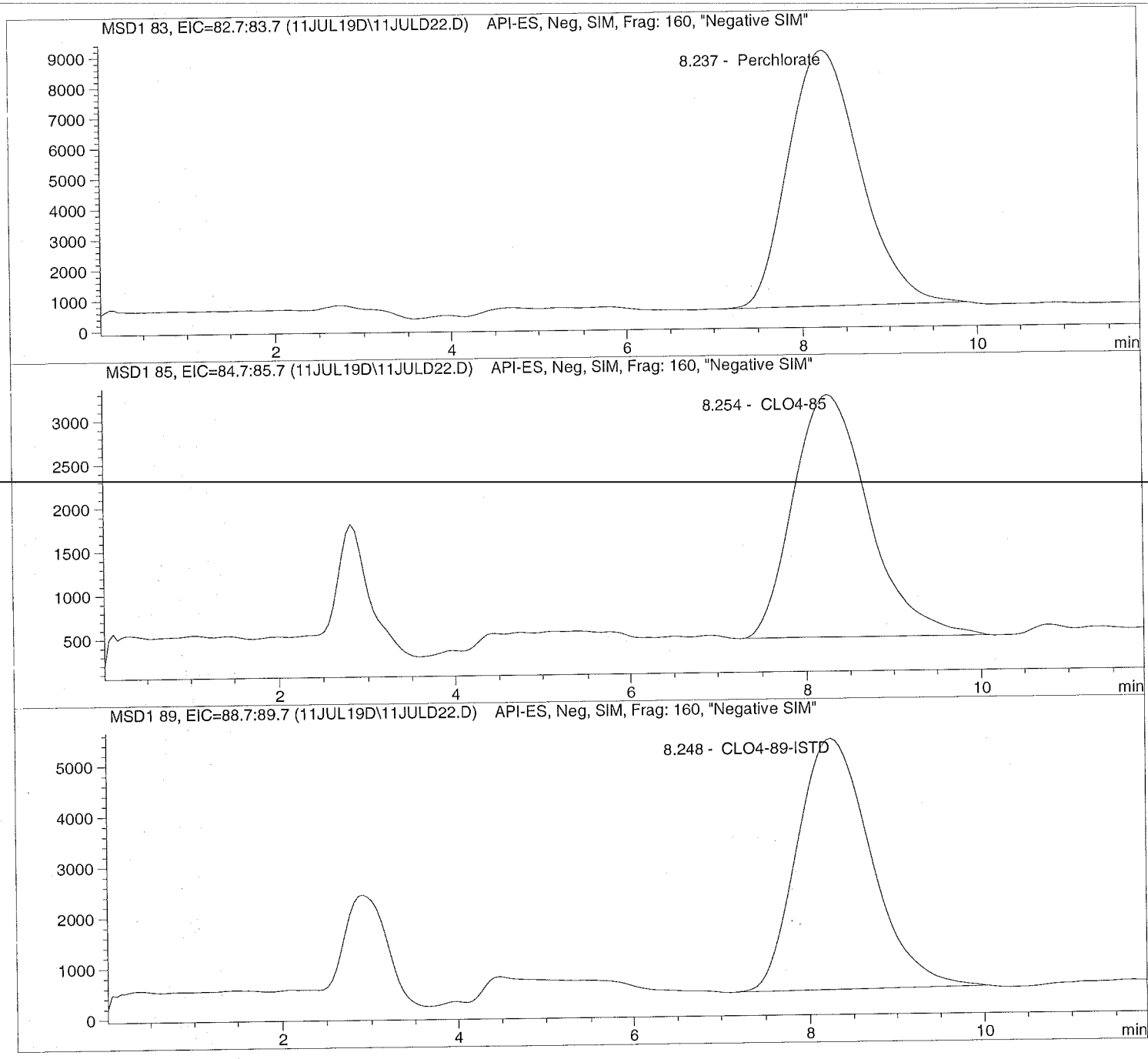
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD22.D Sample Name: 1918705007 10X

Injection Date:	7/11/2019 16:03:27	Seq Line:	22
Sample Name:	1918705007 10X	Location:	Vial 60
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD22.D Sample Name: 1918705007 10X

Injection Date:	7/11/2019 16:03:27	Seq Line:	22
Sample Name:	1918705007 10X	Location:	Vial 60
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.237	PBA	480293.1	53.7355	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.254	PBA	165862.6	60.8905	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.248	PBA	290575.8	50.0000	CLO4-89-ISTD

*** End of Report ***

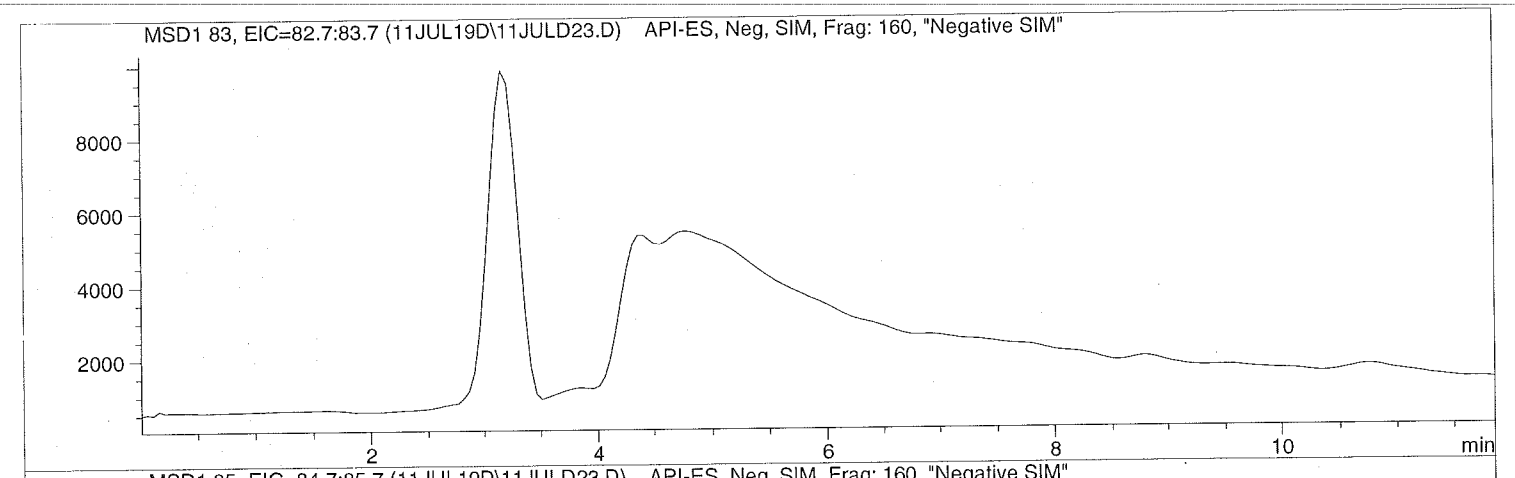
RIGHT SOLUTIONS | RIGHT PARTNER

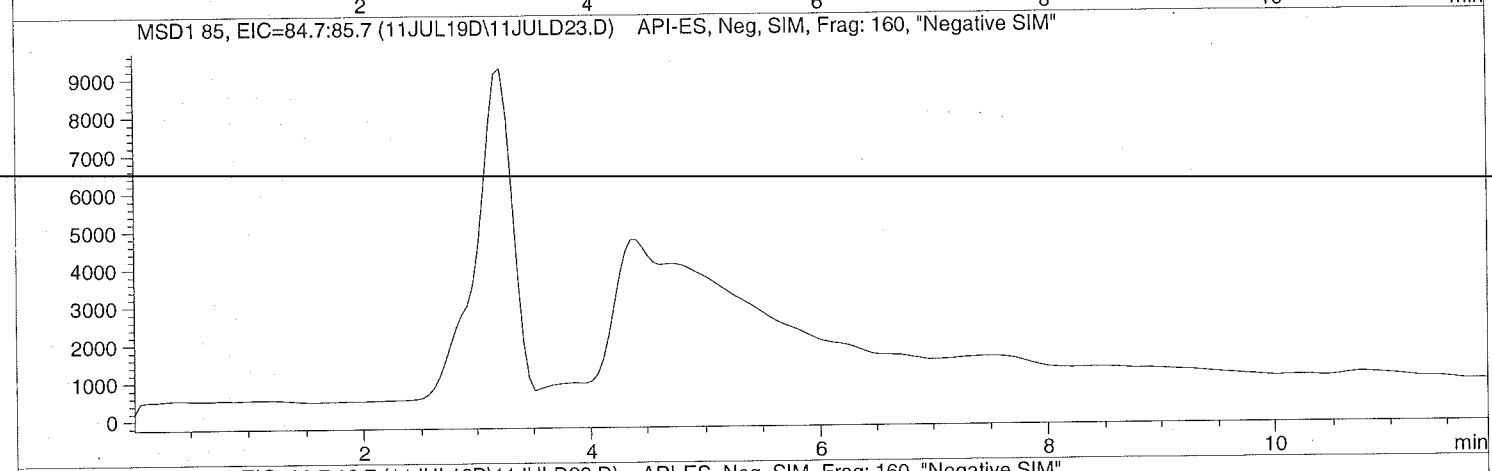
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD23.D Sample Name: 1918705008

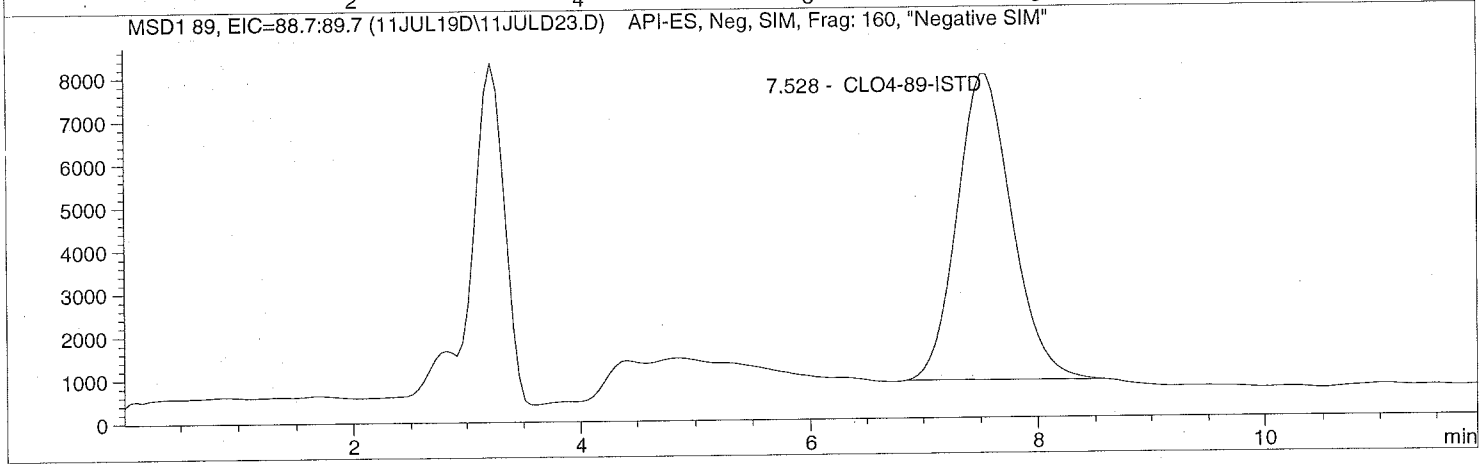
Injection Date:	7/11/2019 16:17:15	Seq Line:	23
Sample Name:	1918705008	Location:	Vial 61
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD23.D Sample Name: 1918705008

Injection Date:	7/11/2019 16:17:15	Seq Line:	23
Sample Name:	1918705008	Location:	Vial 61
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.528	PBA	237165.4	5.0000	CLO4-89-ISTD

*** End of Report ***

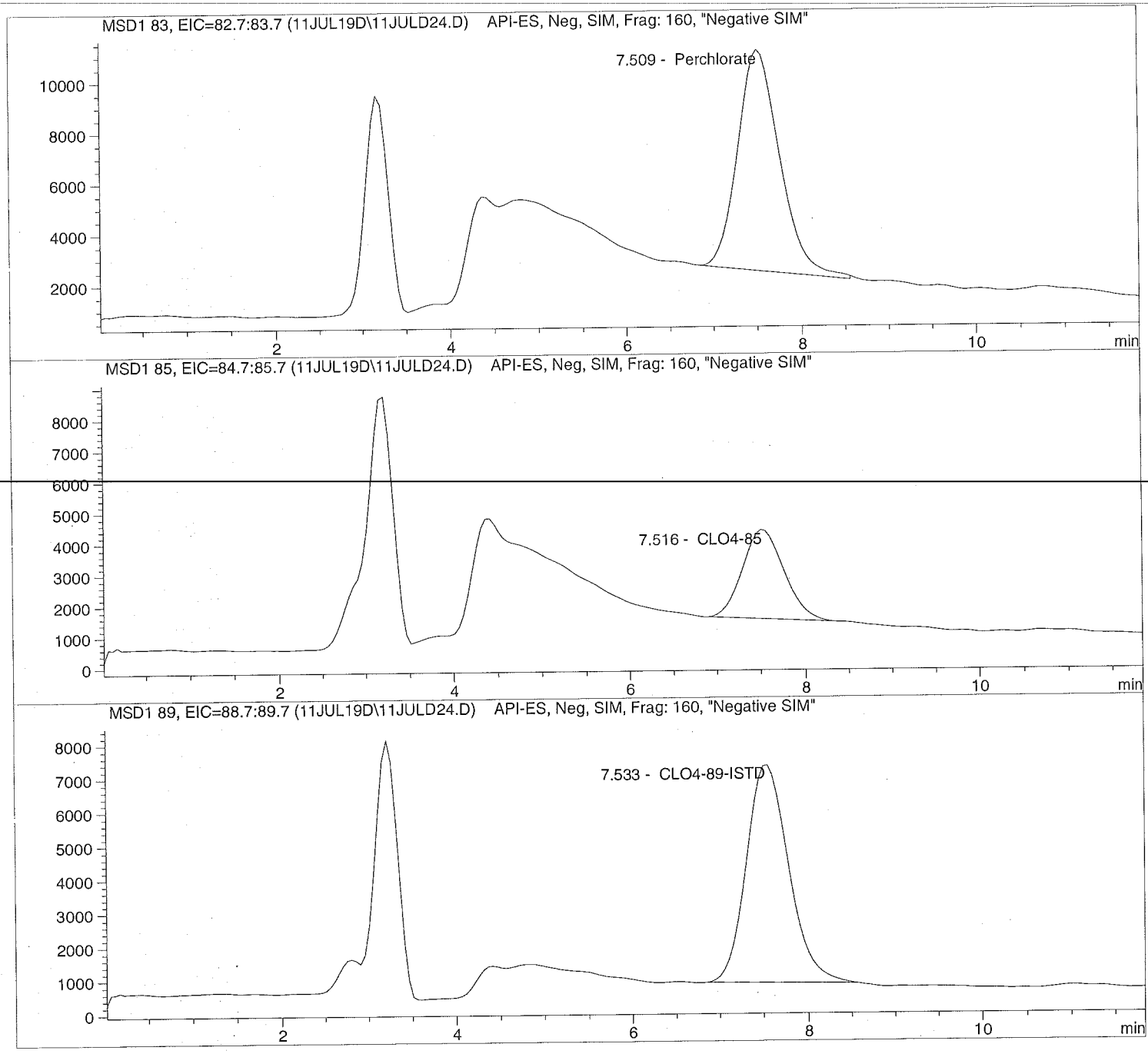
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD24.D Sample Name: 1918705009 MS

Injection Date:	7/11/2019 16:31:15	Seq Line:	24
Sample Name:	1918705009 MS	Location:	Vial 62
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD24.D Sample Name: 1918705009 MS

Injection Date:	7/11/2019 16:31:15	Seq Line:	24
Sample Name:	1918705009 MS	Location:	Vial 62
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.509	PBA	288361.0	4.3992	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.516	PBA	93975.4	4.6759	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.533	PBA	214999.5	5.0000	CLO4-89-ISTD

*** End of Report ***

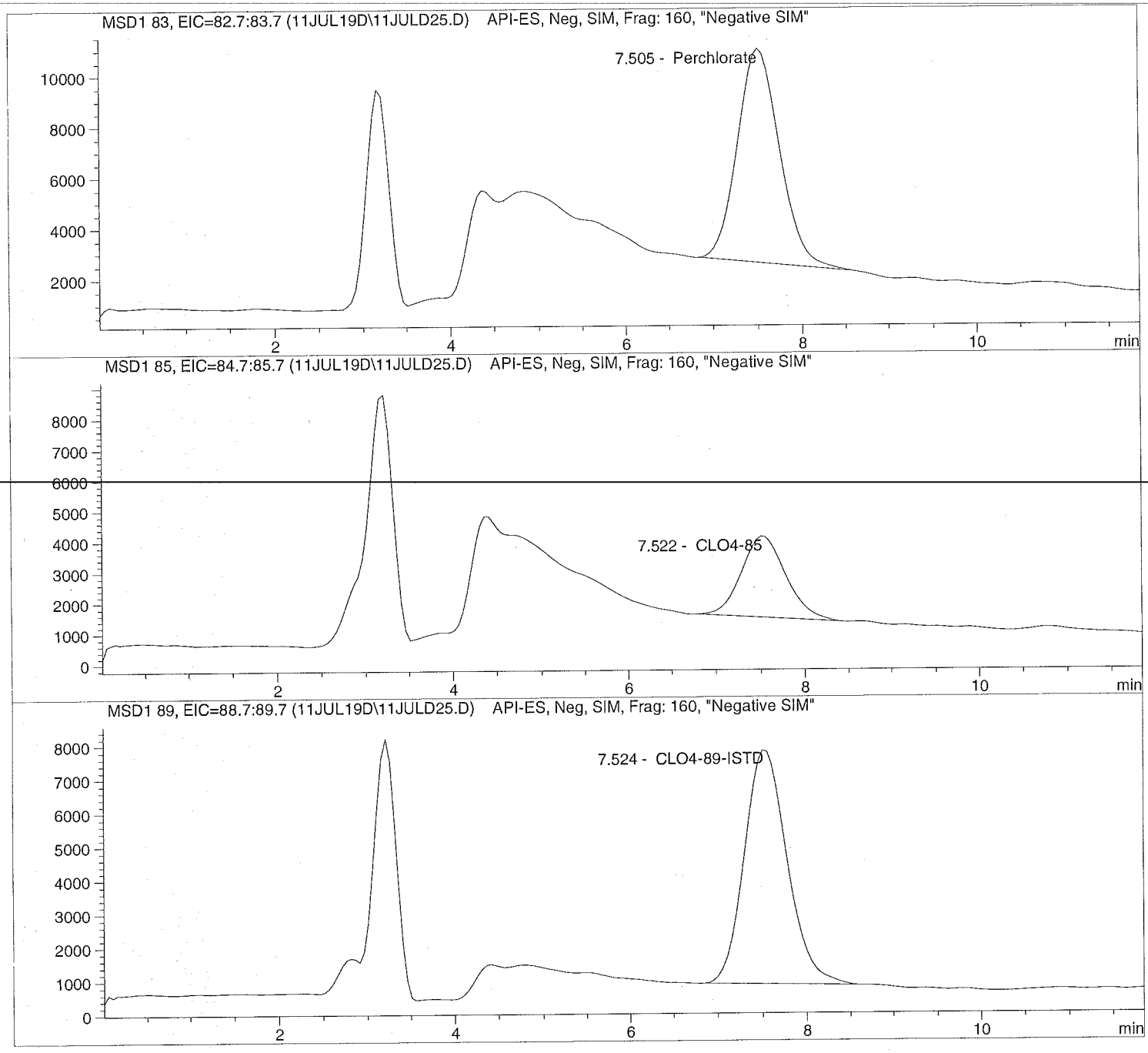
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD25.D Sample Name: 1918705010 MSD

Injection Date:	7/11/2019 16:45:02	Seq Line:	25
Sample Name:	1918705010 MSD	Location:	Vial 63
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD25.D Sample Name: 1918705010 MSD

Injection Date:	7/11/2019 16:45:02	Seq Line:	25
Sample Name:	1918705010 MSD	Location:	Vial 63
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.505	PBA	277079.4	3.9208	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.522	PBA	91663.1	4.2105	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.524	PBA	233099.0	5.0000	CLO4-89-ISTD

*** End of Report ***

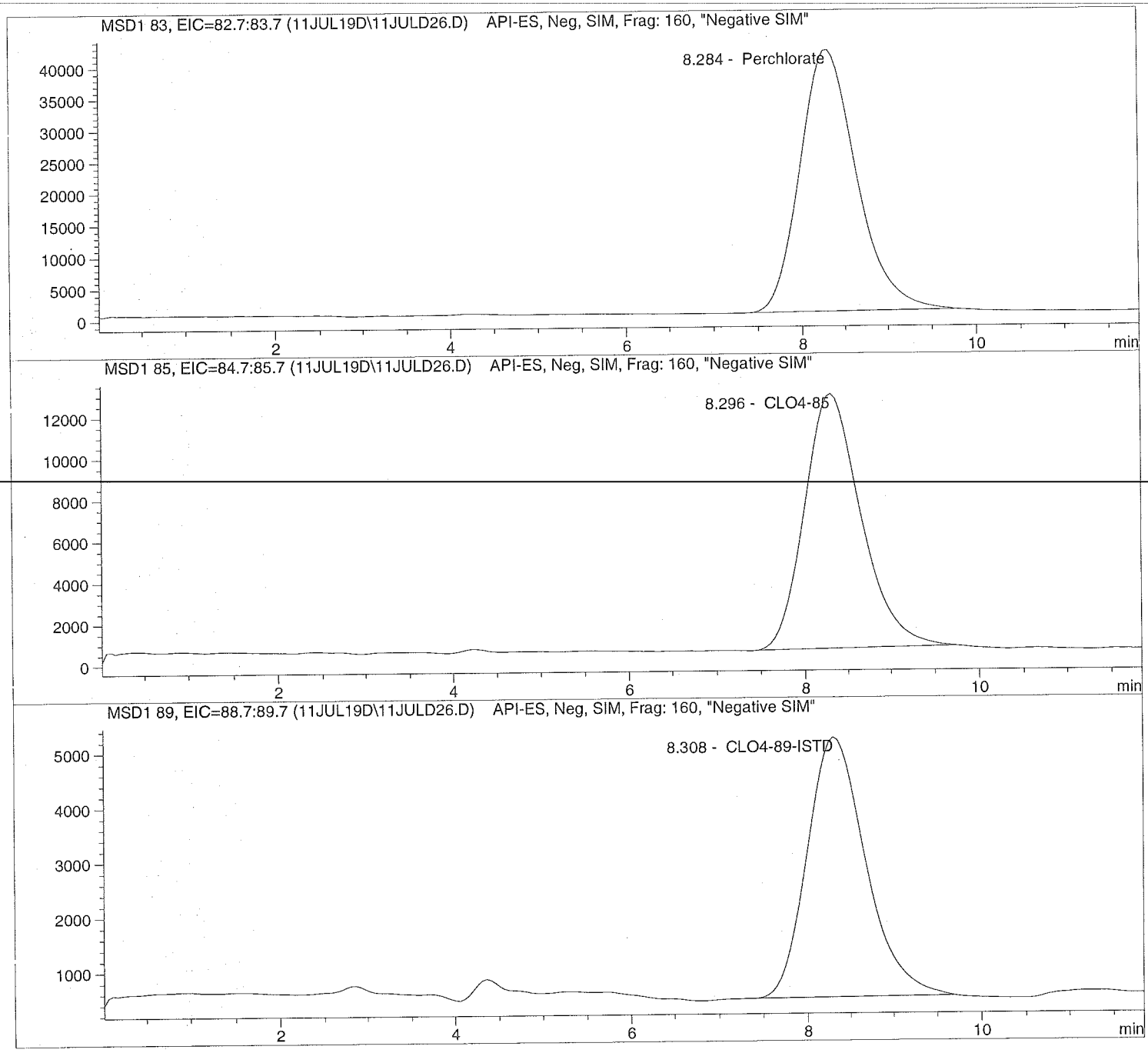
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD26.D Sample Name: 663036 CCV@25

Injection Date:	7/11/2019 16:58:48	Seq Line:	26
Sample Name:	663036 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD26.D Sample Name: 663036 CCV@25

Injection Date:	7/11/2019 16:58:48	Seq Line:	26
Sample Name:	663036 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.284	PBA	1877862.1	25.5677	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.296	PBA	559339.1	25.6558	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.308	BBA	223151.0	5.0000	CLO4-89-ISTD

*** End of Report ***

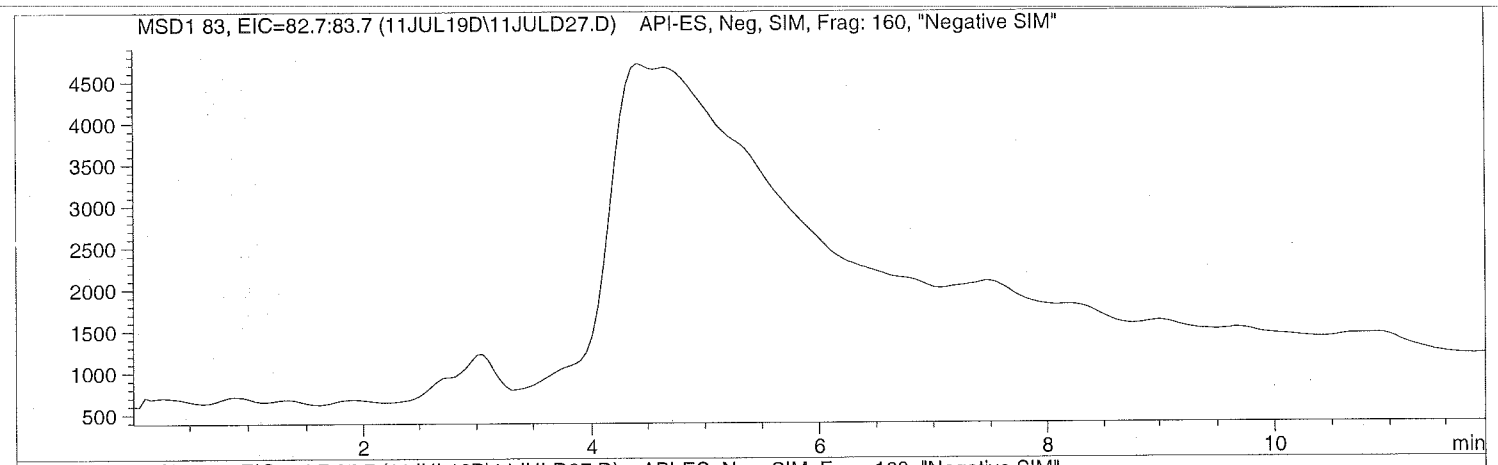
RIGHT SOLUTIONS | RIGHT PARTNER

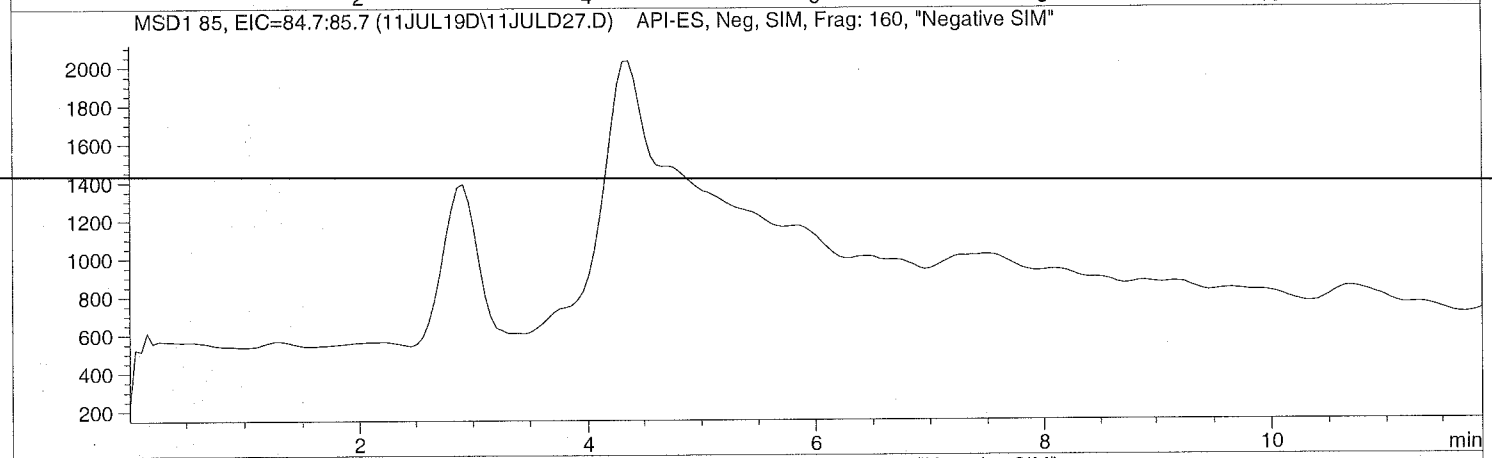
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD27.D Sample Name: 1918871001

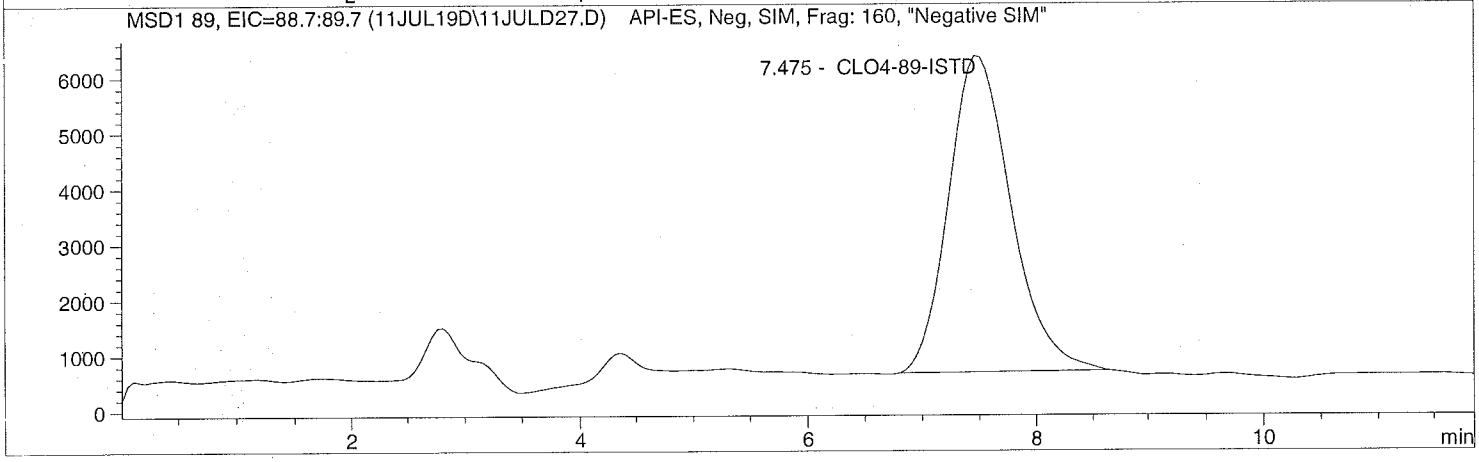
Injection Date:	7/11/2019 17:12:38	Seq Line:	27
Sample Name:	1918871001	Location:	Vial 64
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD27.D Sample Name: 1918871001

Injection Date:	7/11/2019 17:12:38	Seq Line:	27
Sample Name:	1918871001	Location:	Vial 64
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.475	PBA	217461.8	5.0000	CLO4-89-ISTD

*** End of Report ***

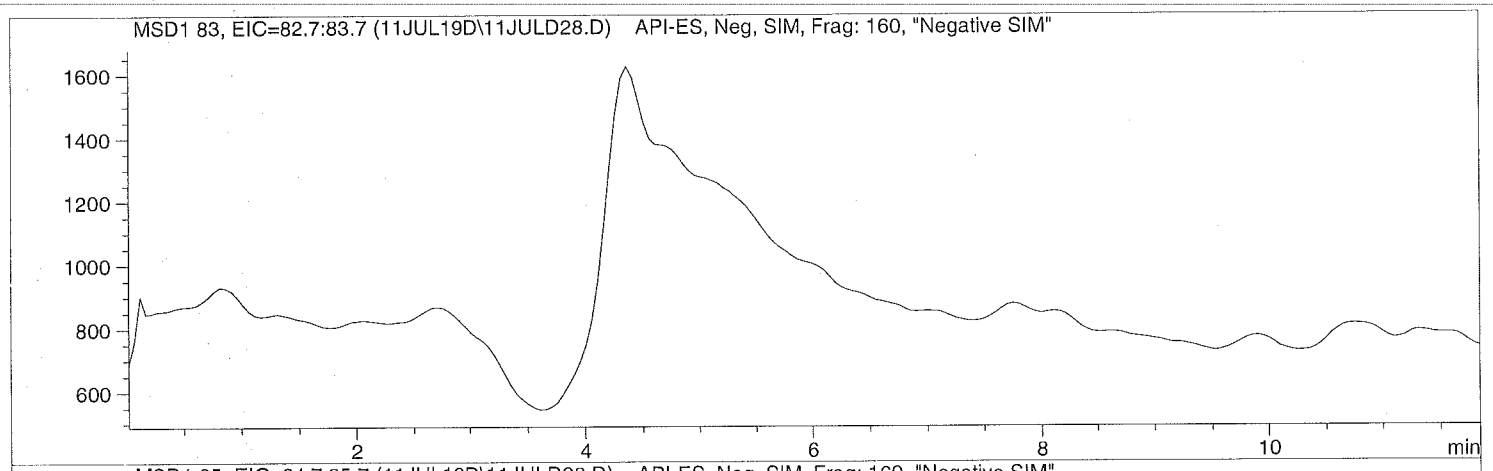
RIGHT SOLUTIONS | RIGHT PARTNER

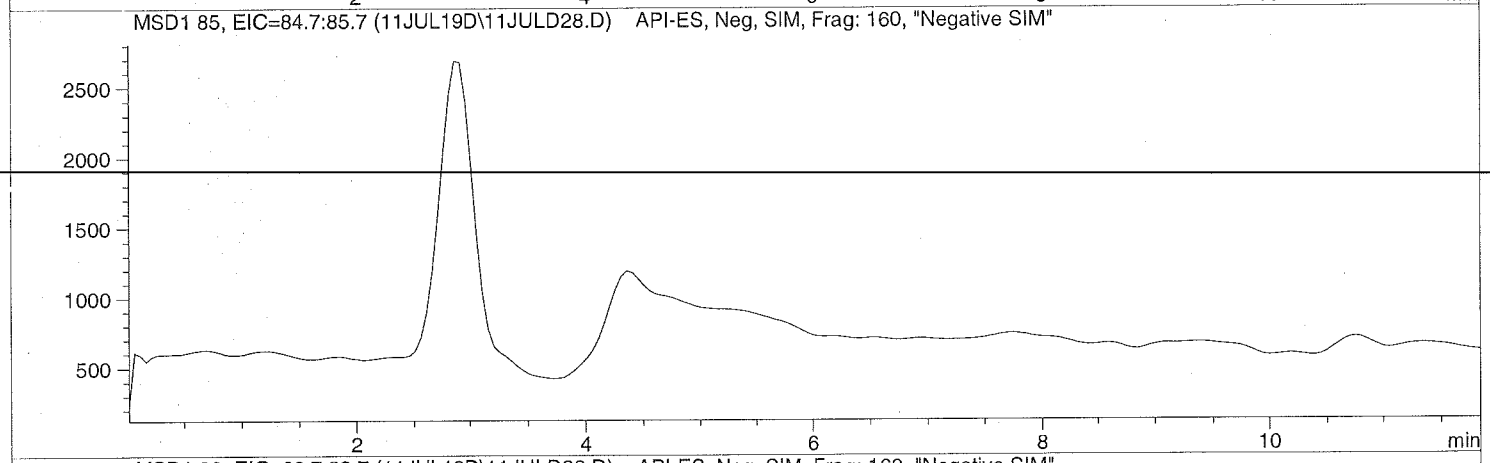
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD28.D Sample Name: 1918871002

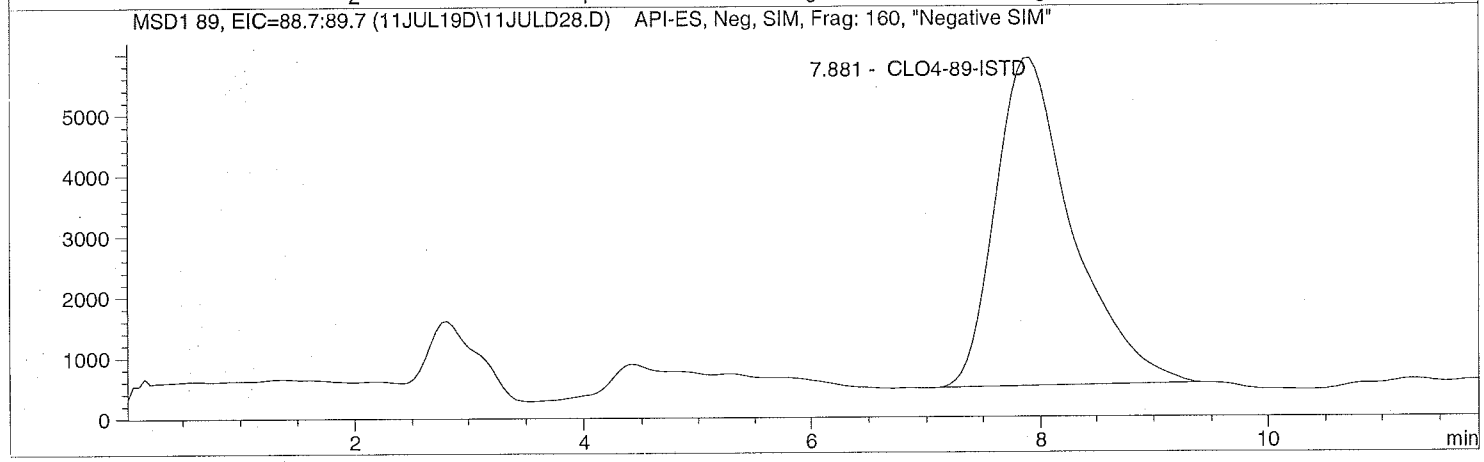
Injection Date:	7/11/2019 17:26:27	Seq Line:	28
Sample Name:	1918871002	Location:	Vial 65
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD28.D Sample Name: 1918871002

Injection Date:	7/11/2019 17:26:27	Seq Line:	28
Sample Name:	1918871002	Location:	Vial 65
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.881	PBA	252228.0	5.0000	CLO4-89-ISTD

*** End of Report ***

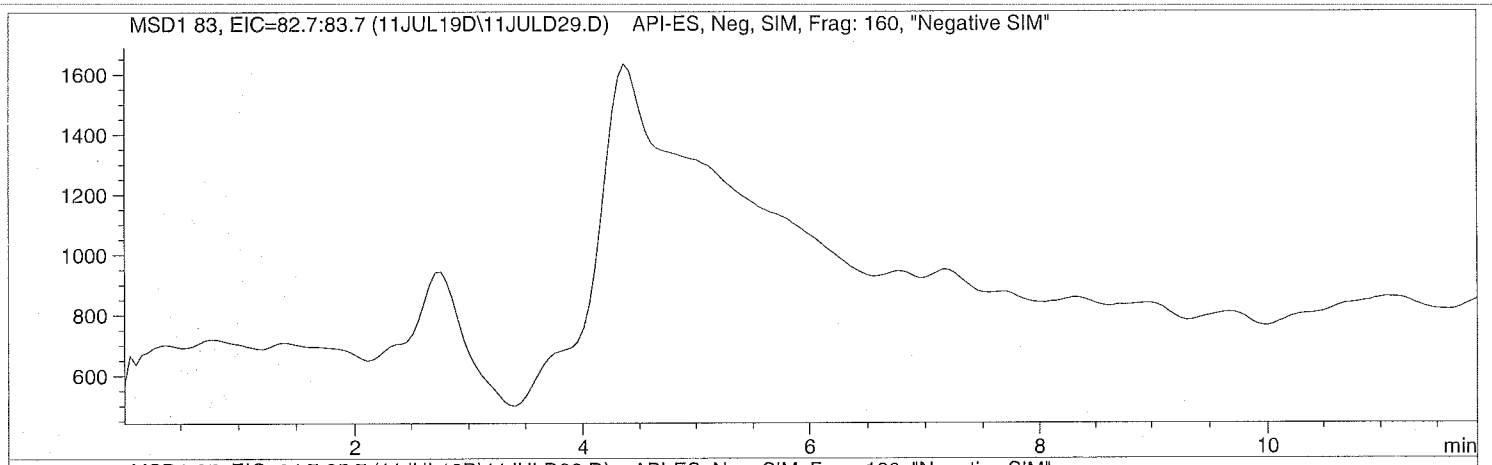
RIGHT SOLUTIONS | RIGHT PARTNER

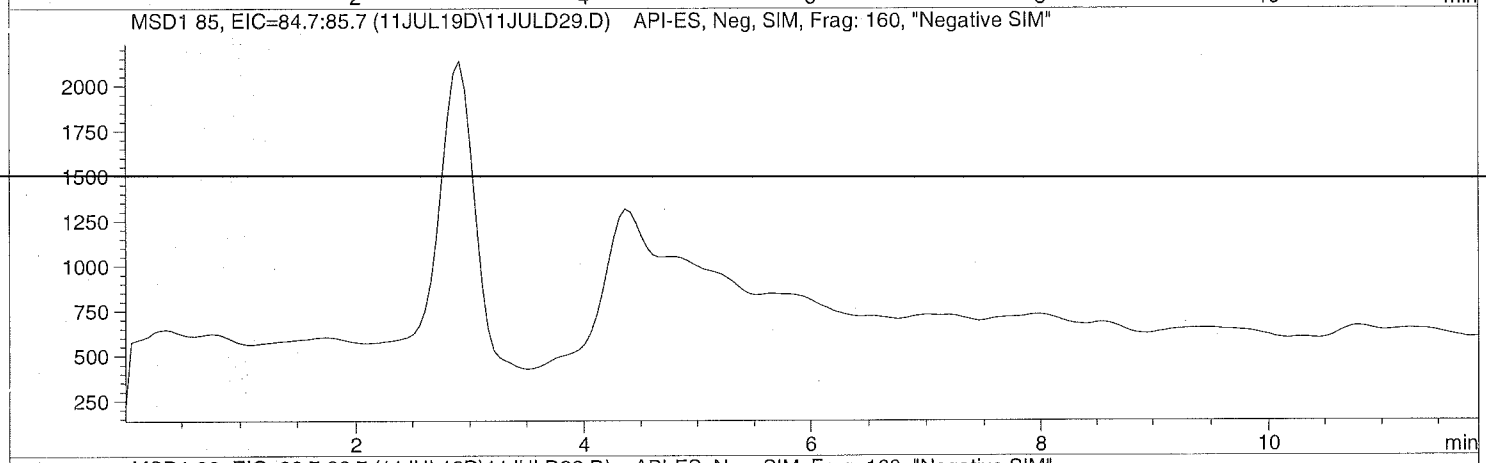
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD29.D Sample Name: 1918871003

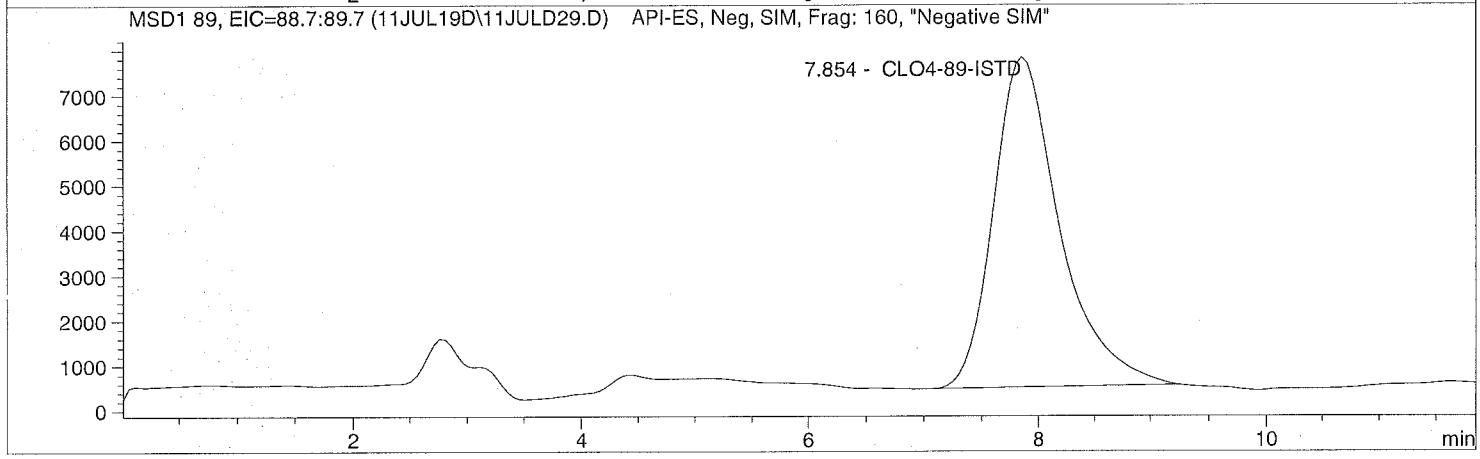
Injection Date:	7/11/2019 17:40:12	Seq Line:	29
Sample Name:	1918871003	Location:	Vial 66
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD29.D Sample Name: 1918871003

Injection Date:	7/11/2019 17:40:12	Seq Line:	29
Sample Name:	1918871003	Location:	Vial 66
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.854	PBA	297108.1	5.0000	CLO4-89-ISTD

*** End of Report ***

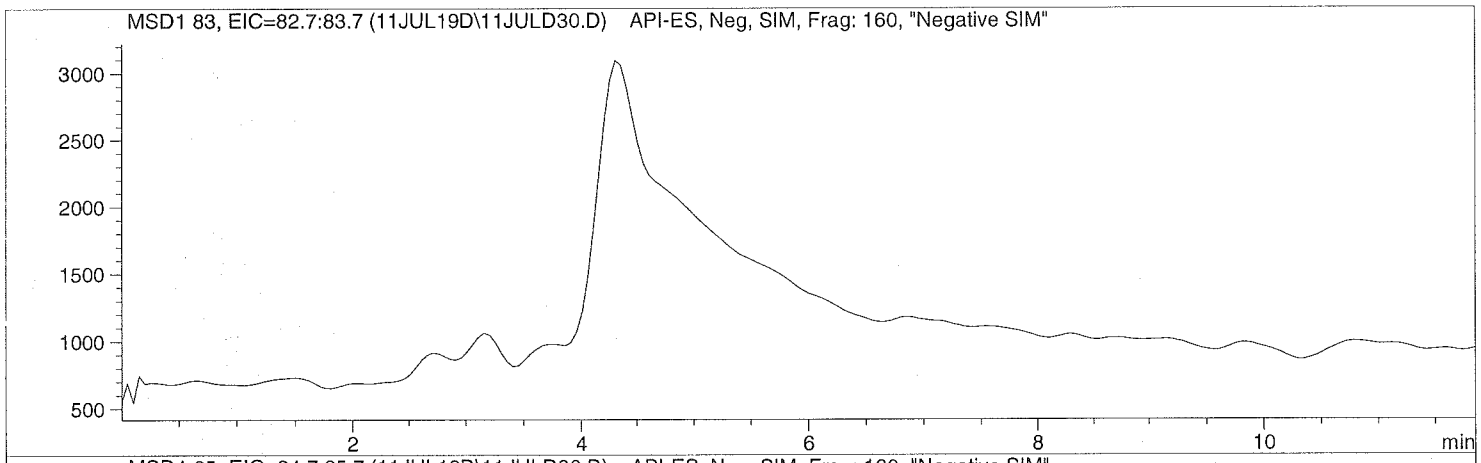
RIGHT SOLUTIONS | RIGHT PARTNER

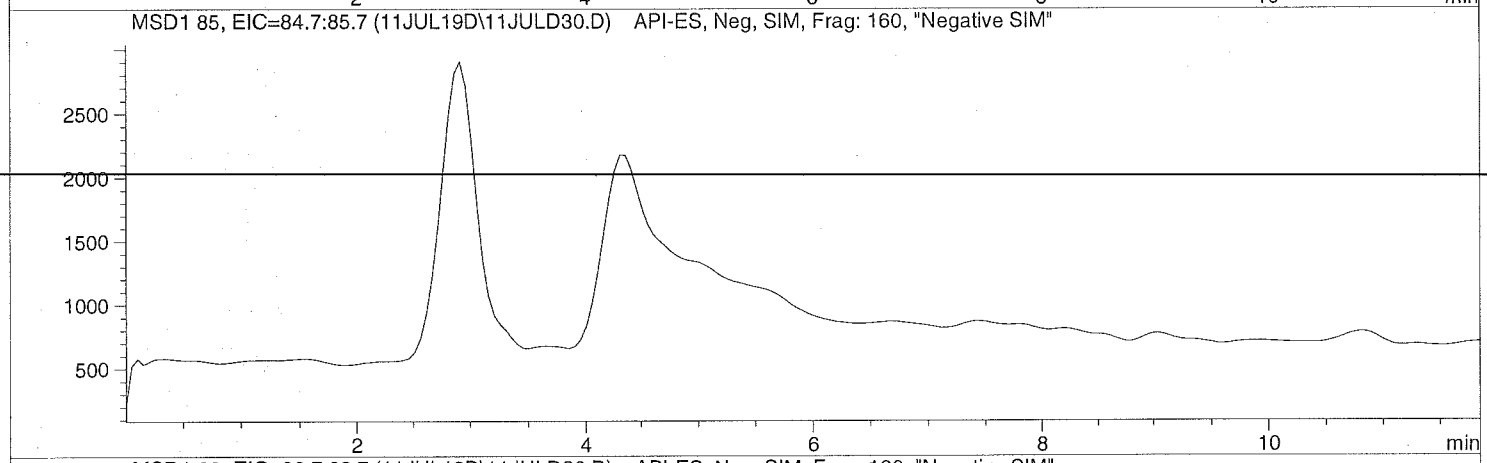
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD30.D Sample Name: 1918871004

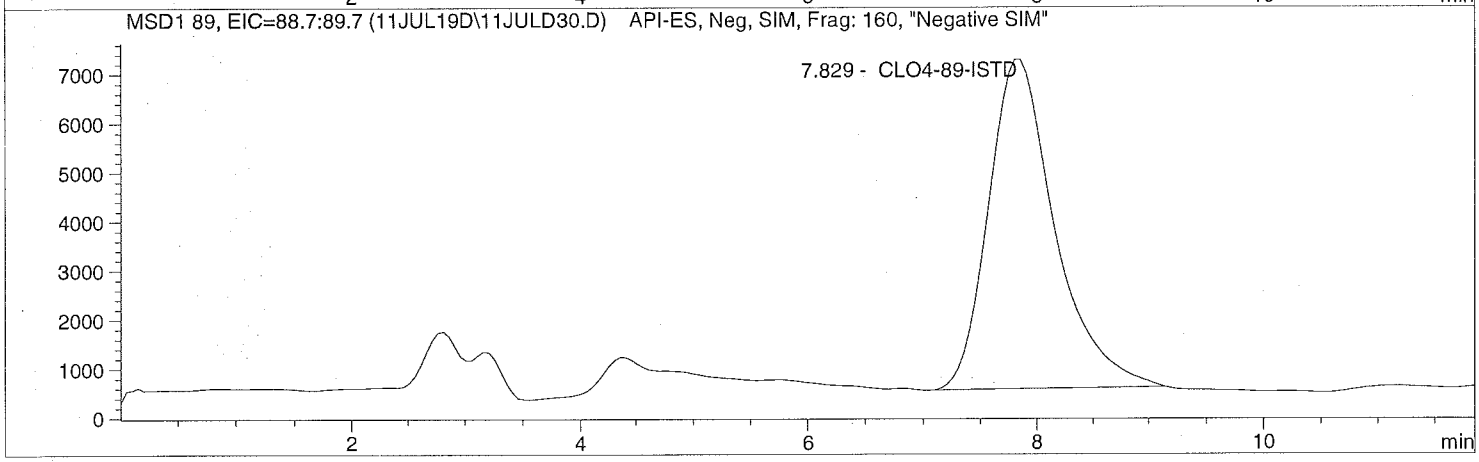
Injection Date:	7/11/2019 17:54:08	Seq Line:	30
Sample Name:	1918871004	Location:	Vial 67
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD30.D Sample Name: 1918871004

Injection Date:	7/11/2019 17:54:08	Seq Line:	30
Sample Name:	1918871004	Location:	Vial 67
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.829	PBA	273038.9	5.0000	CLO4-89-ISTD

*** End of Report ***

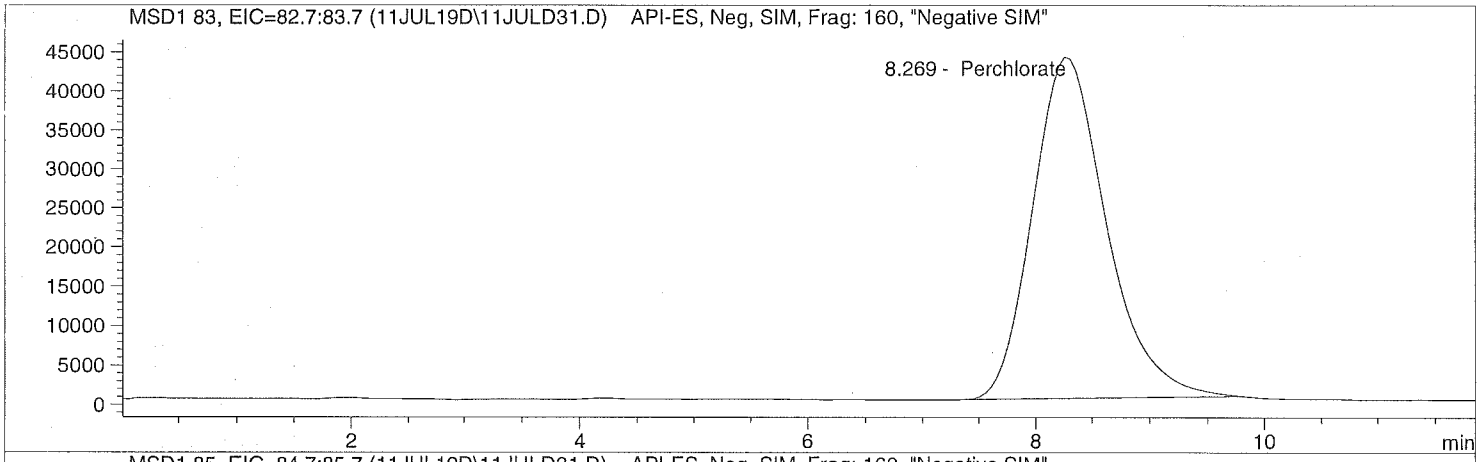
RIGHT SOLUTIONS | RIGHT PARTNER

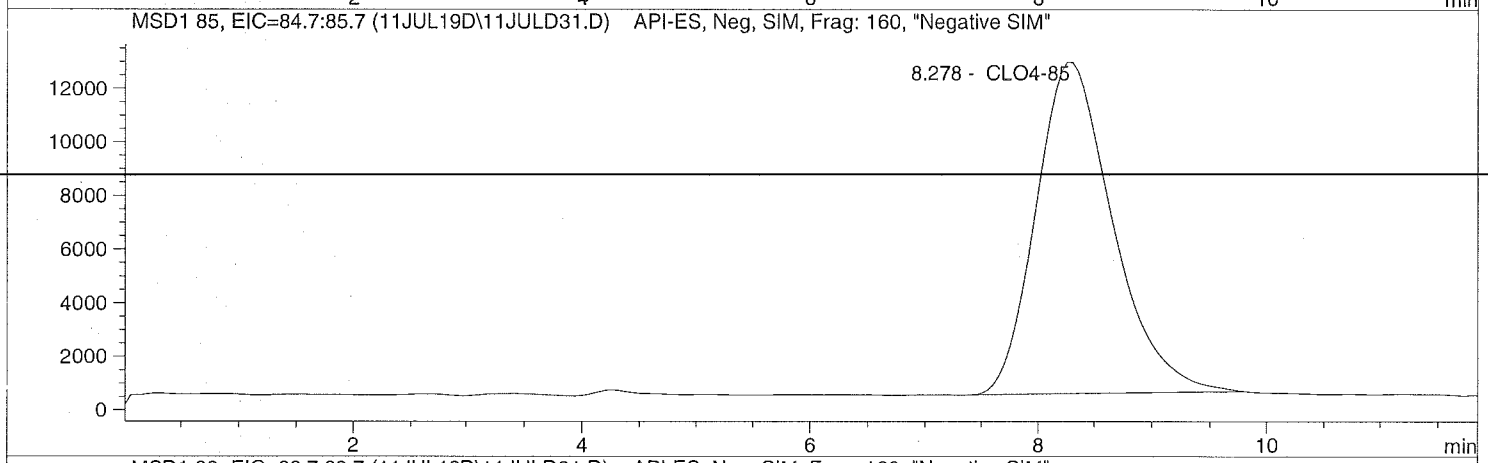
Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD31.D Sample Name: 663037 CCV@25

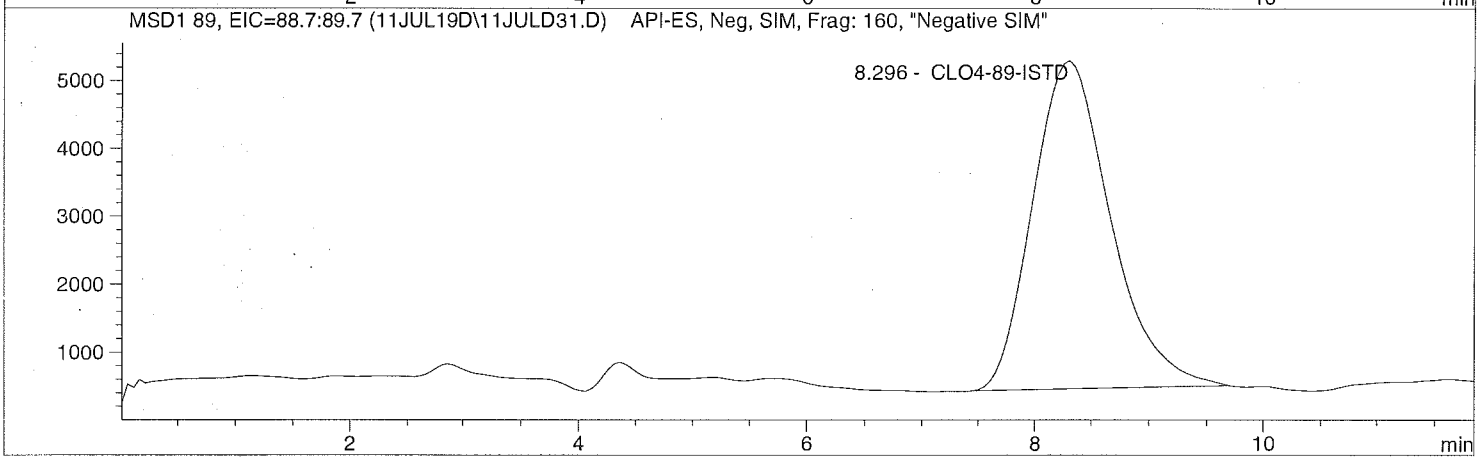
Injection Date:	7/11/2019 18:07:55	Seq Line:	31
Sample Name:	663037 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Injection Date:	7/11/2019 18:07:55	Seq Line:	31
Sample Name:	663037 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.269	PBA	1970476.5	25.8725	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.278	PBA	583651.3	25.8263	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.296	PBA	231230.8	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

RIGHT SOLUTIONS | RIGHT PARTNER

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RIGHT SOLUTIONS | RIGHT PARTNER

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

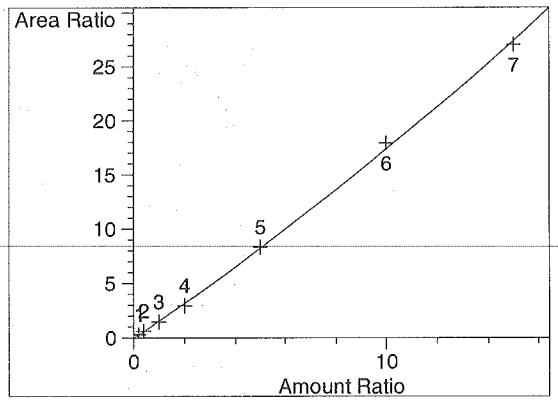
Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

Peak Sum Table

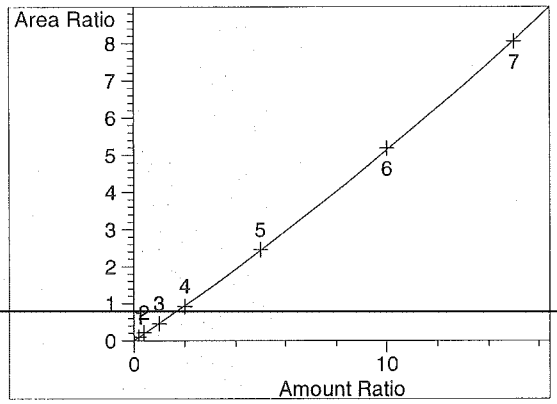
No Entries in table

RIGHT SOLUTIONS | RIGHT PARTNER

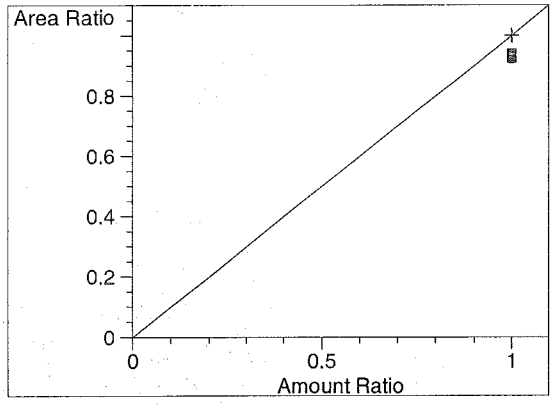
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

RIGHT SOLUTIONS | RIGHT PARTNER

Batch Report: C:\HPCHEM\1\DATA\19MAR19I\19MAR19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

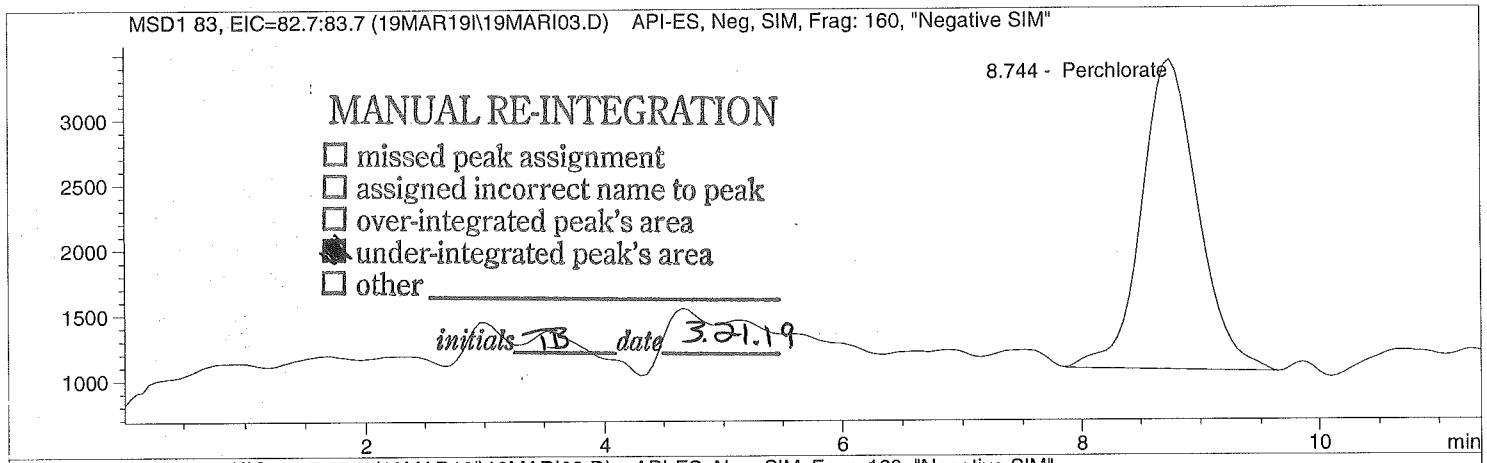
RIGHT SOLUTIONS | RIGHT PARTNER

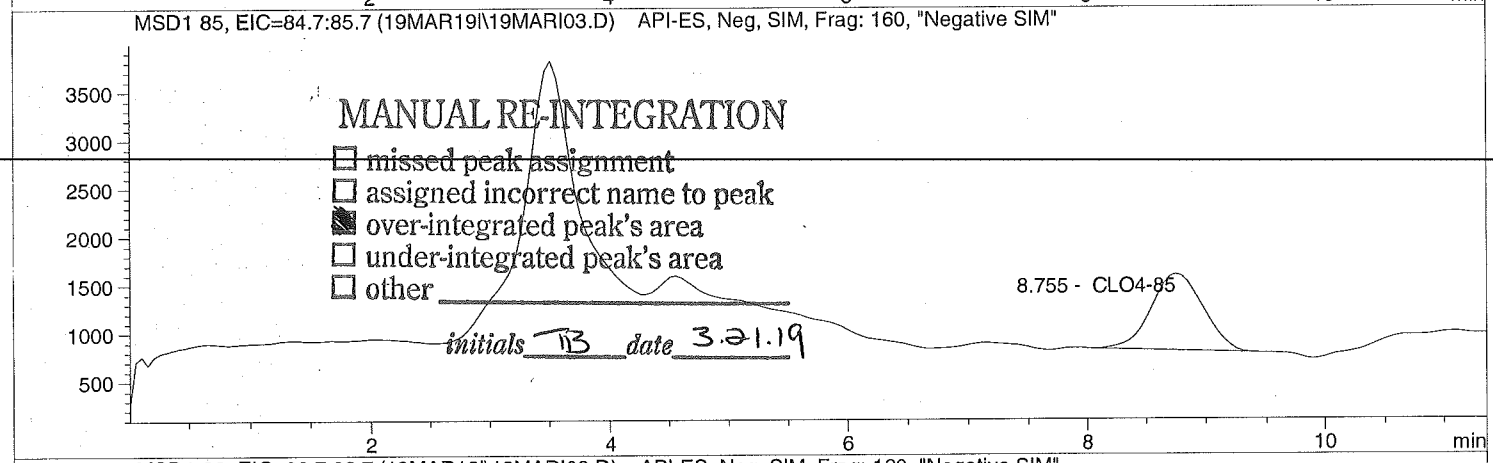
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

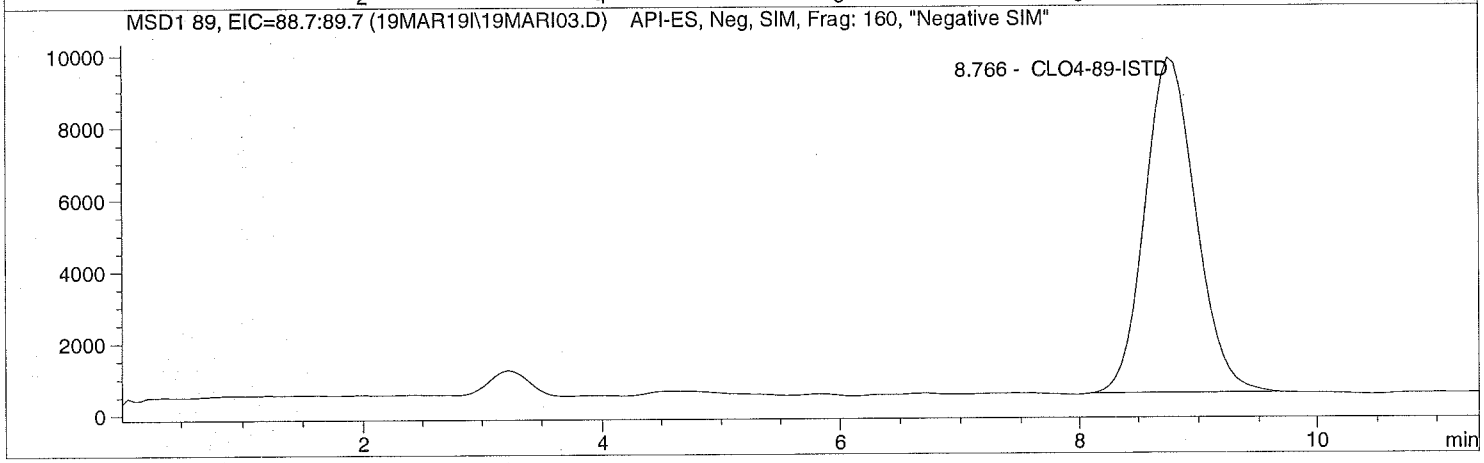
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

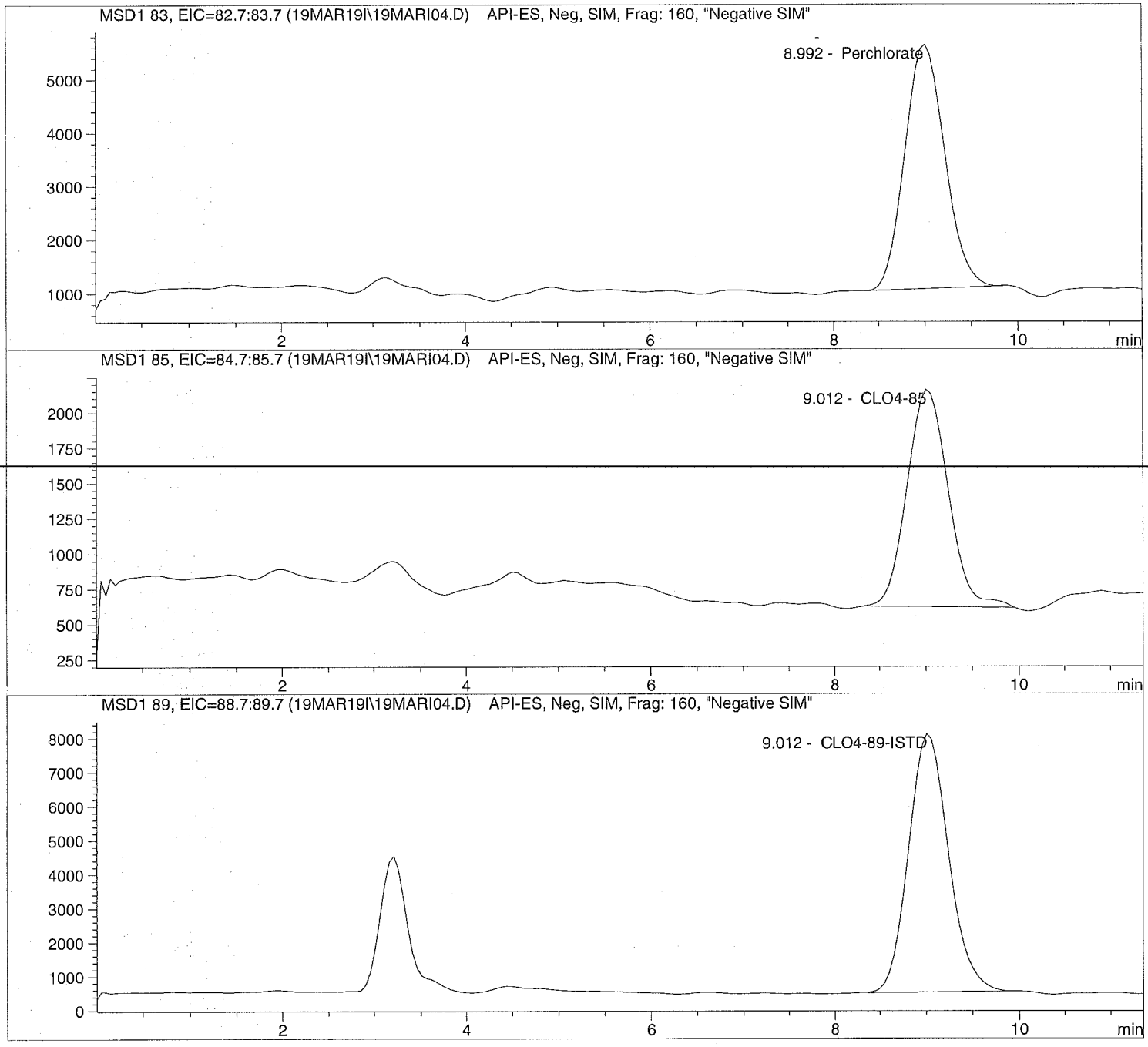
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

*** End of Report ***

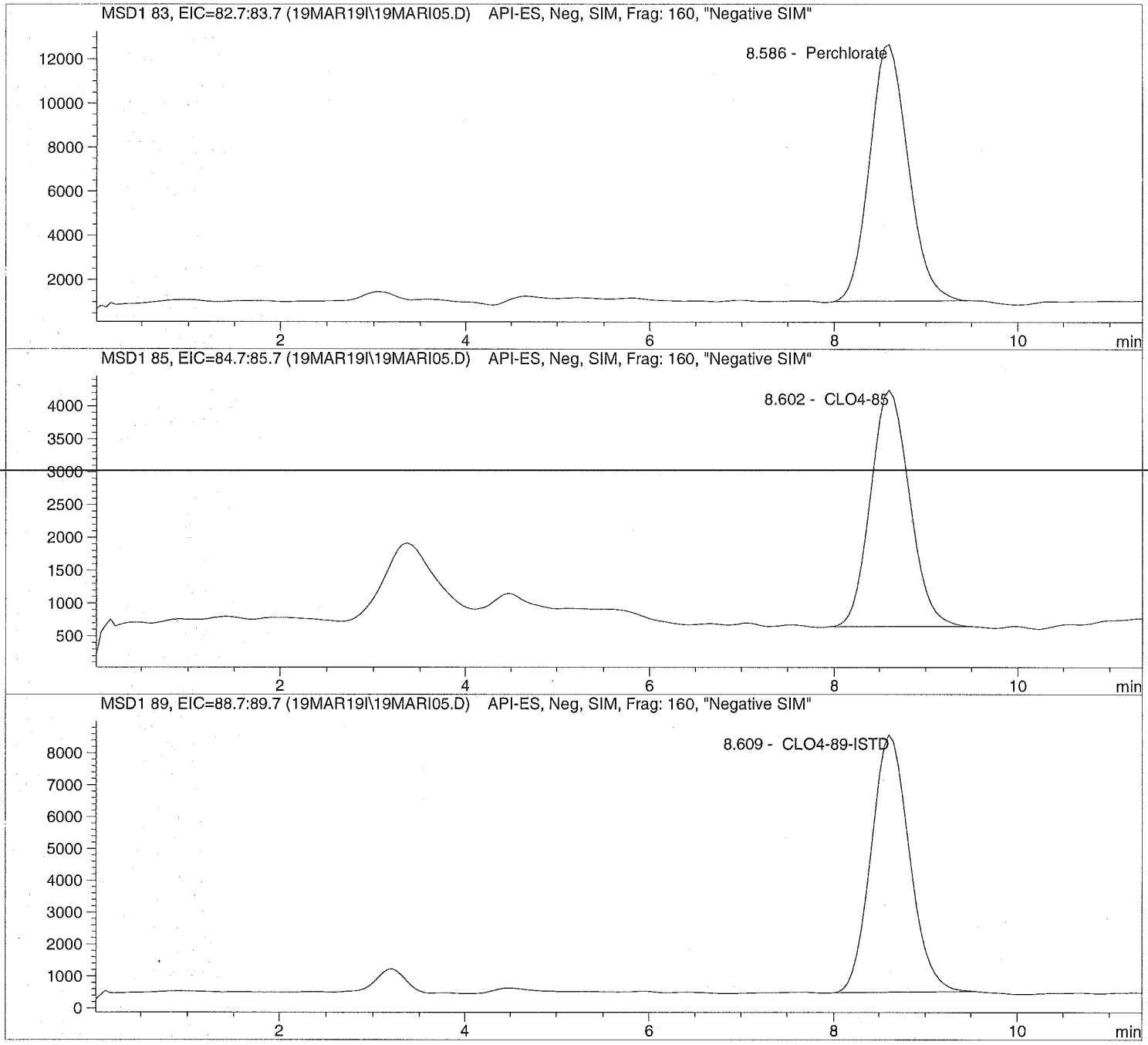
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

*** End of Report ***

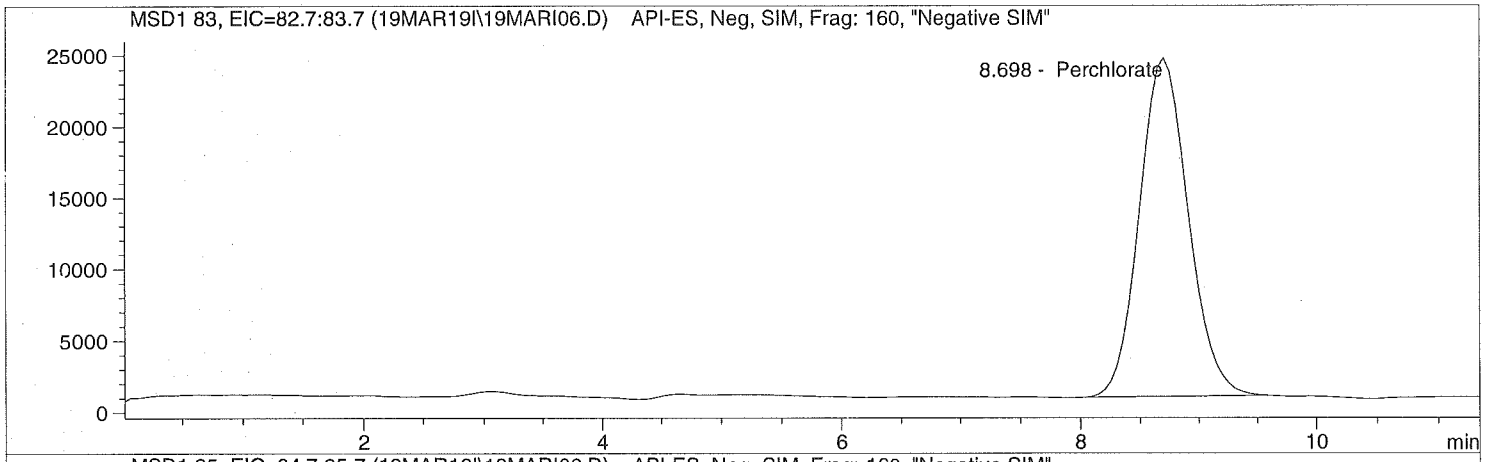
RIGHT SOLUTIONS | RIGHT PARTNER

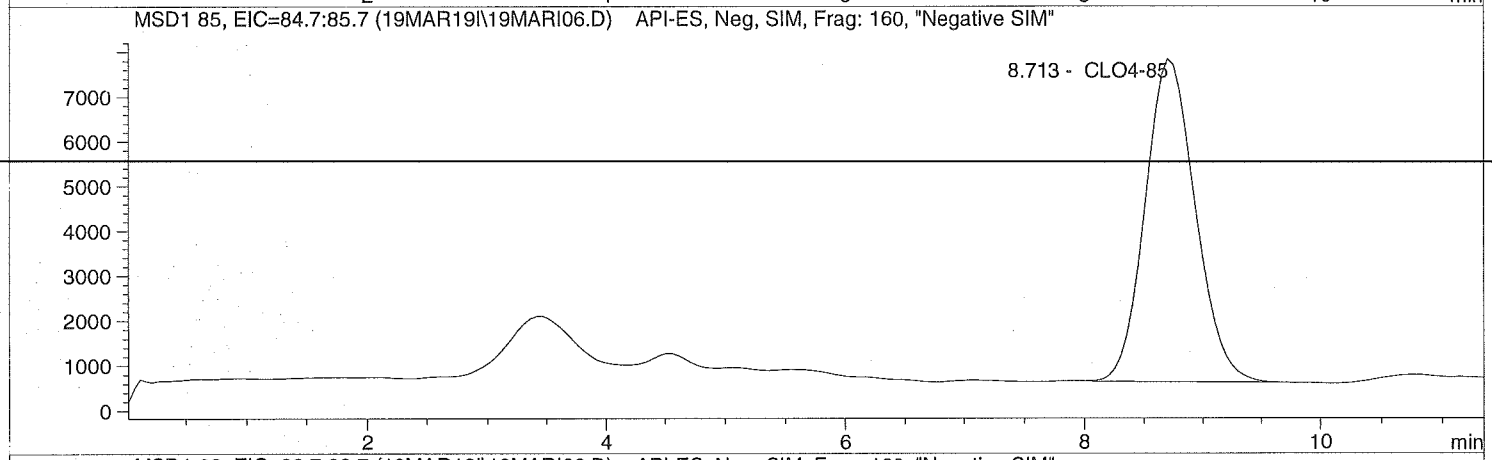
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

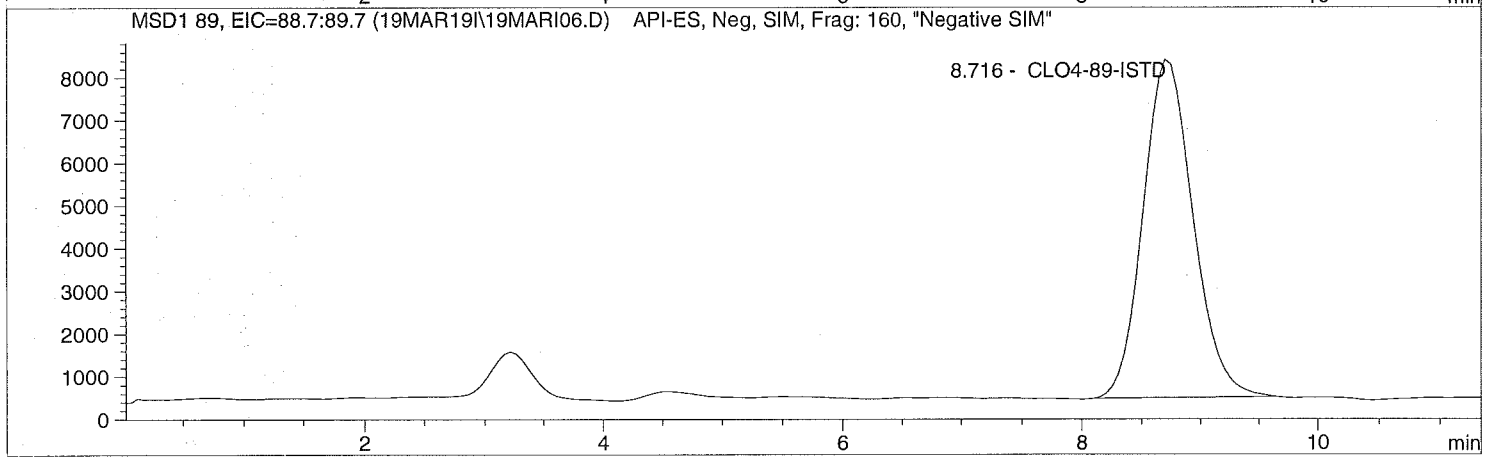
Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

*** End of Report ***

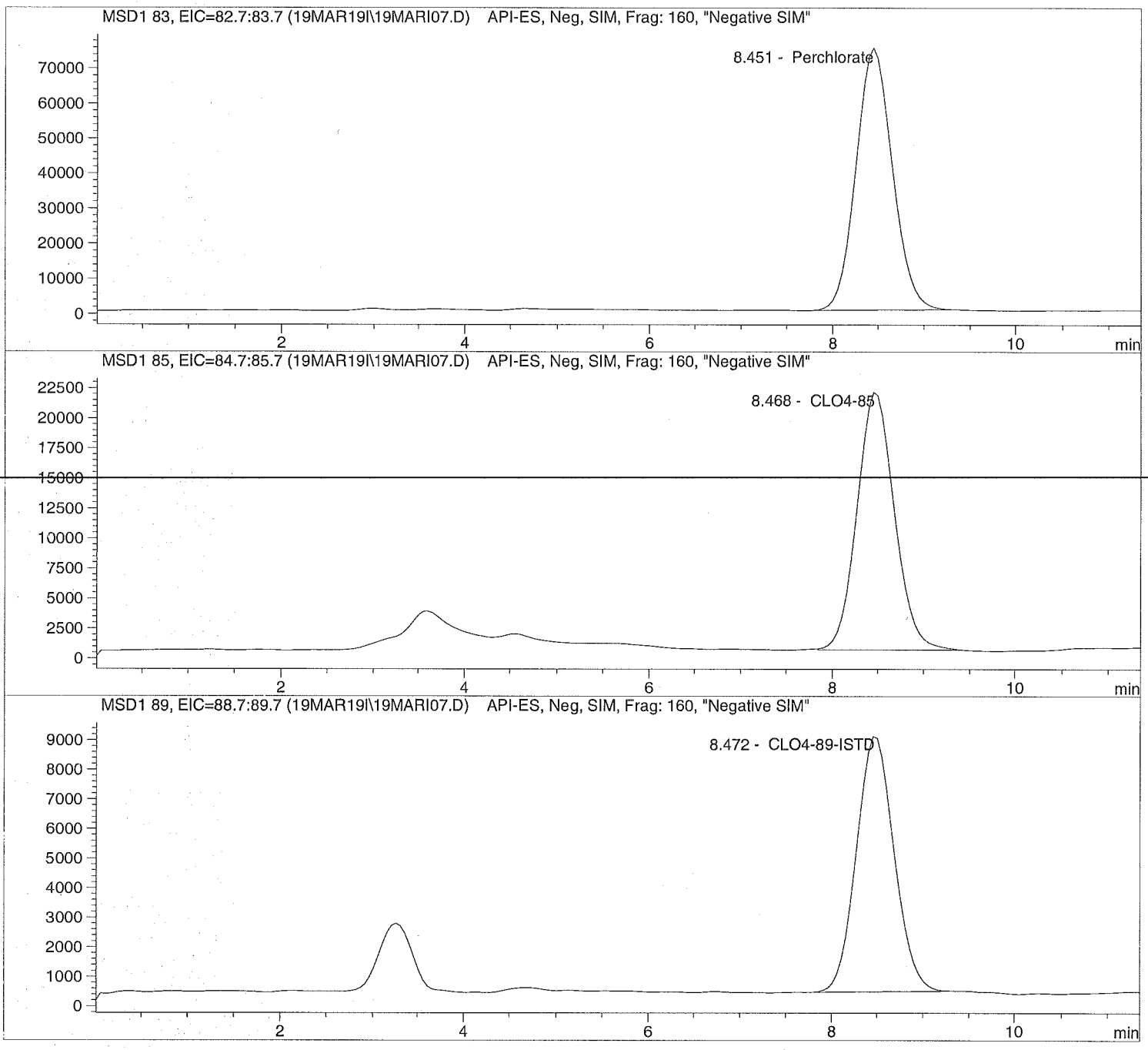
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

*** End of Report ***

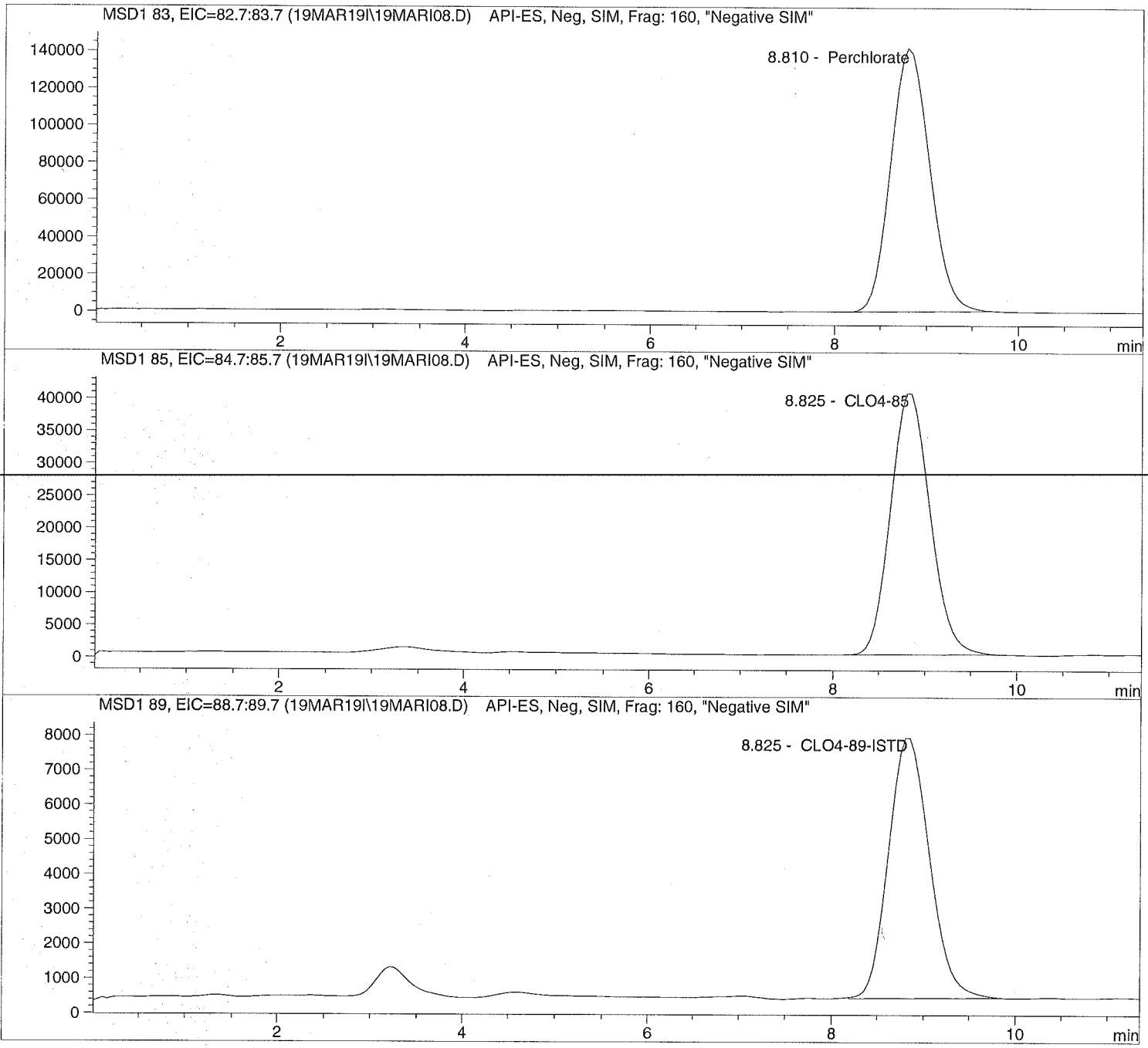
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

*** End of Report ***

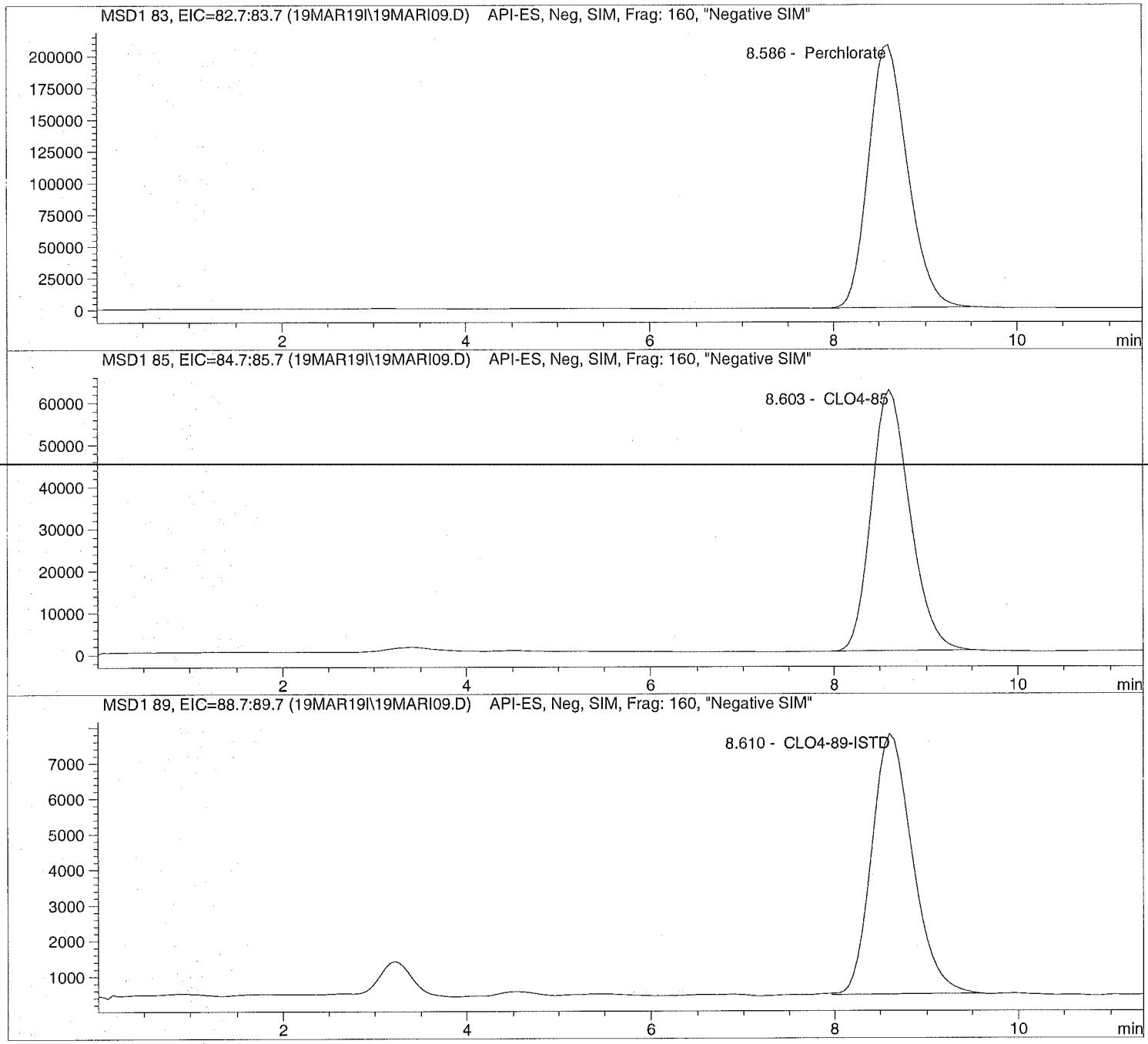
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

*** End of Report ***

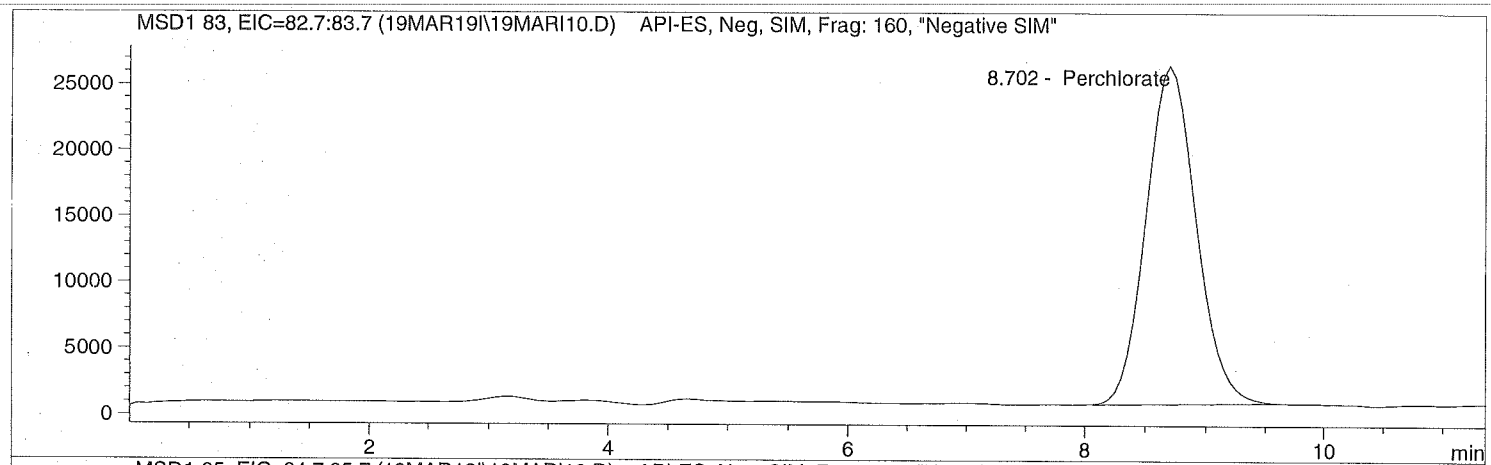
RIGHT SOLUTIONS | RIGHT PARTNER

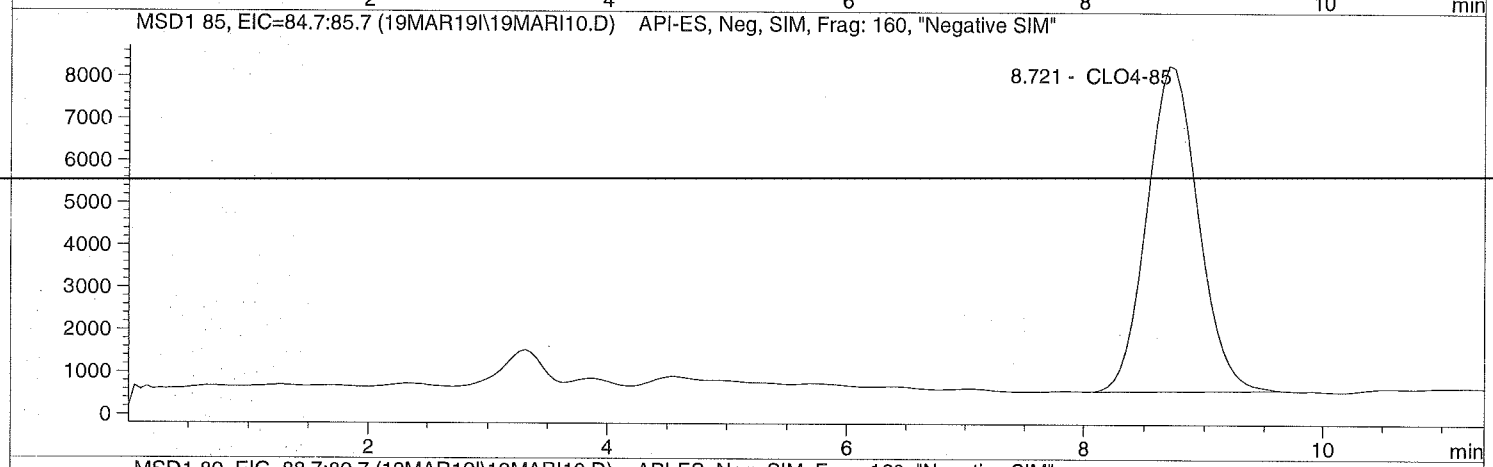
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

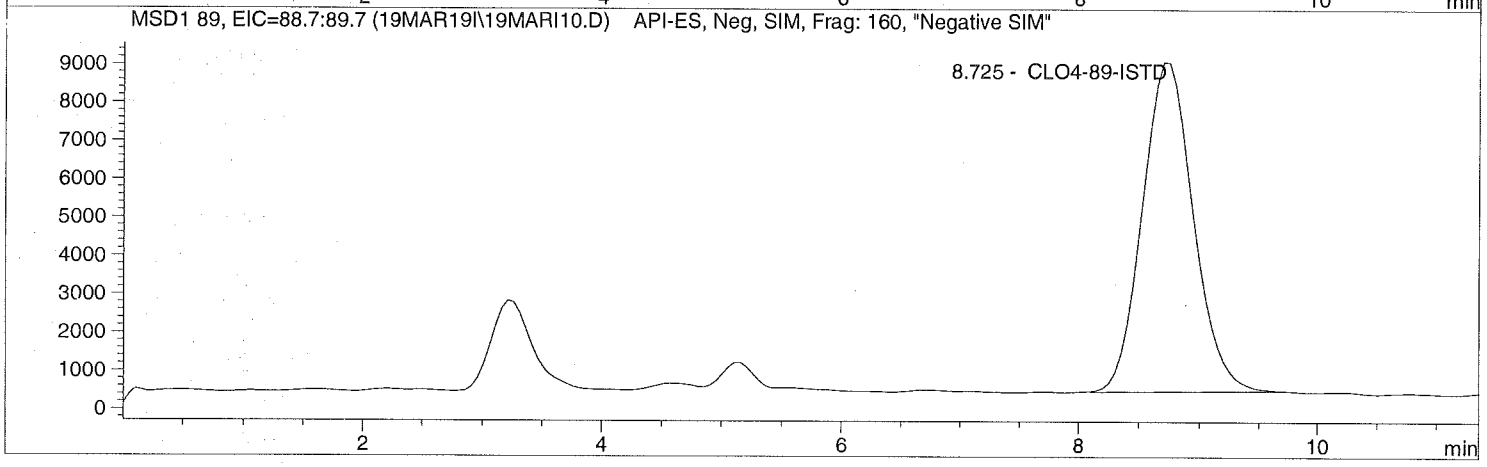
Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

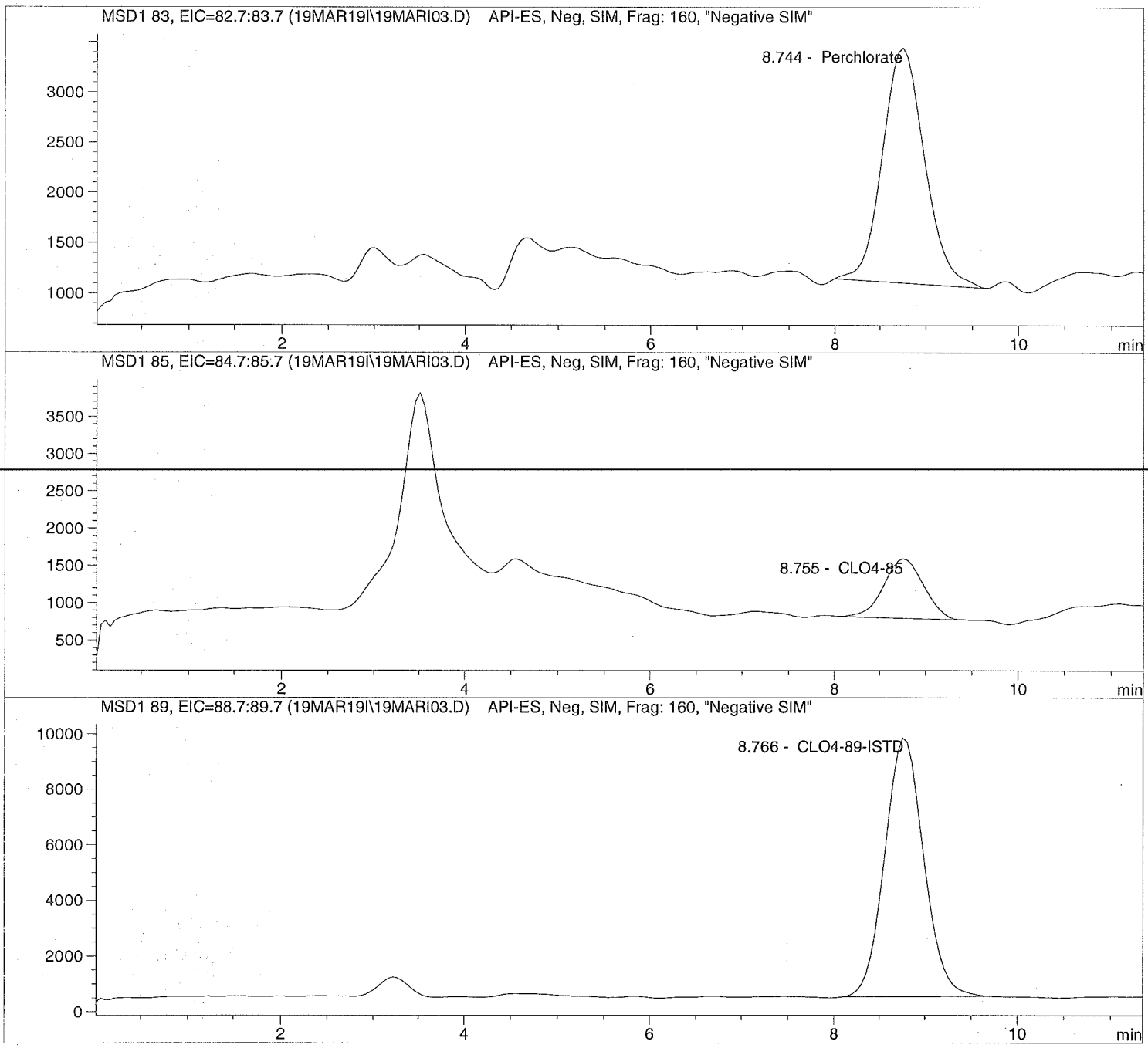
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

*** End of Report ***

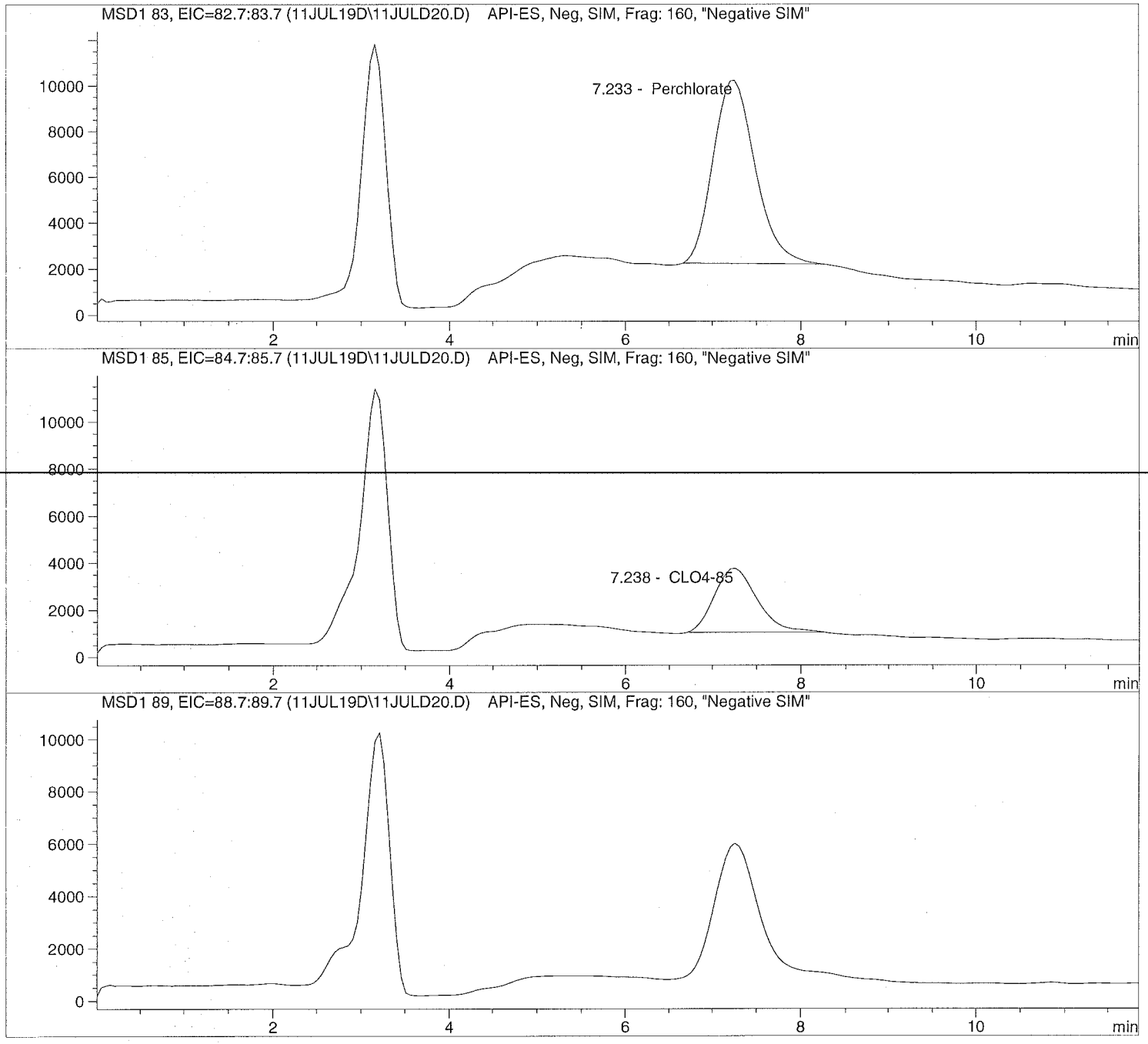
RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD20.D Sample Name: 1918705005

Injection Date:	7/11/2019 15:35:52	Seq Line:	20
Sample Name:	1918705005	Location:	Vial 58
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



RIGHT SOLUTIONS | RIGHT PARTNER

Data file: C:\HPCHEM\1\DATA\11JUL19D\11JULD20.D Sample Name: 1918705005

Injection Date:	7/11/2019 15:35:52	Seq Line:	20
Sample Name:	1918705005	Location:	Vial 58
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.233	PBA	264721.6	0.1573	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.238	BBA	91183.5	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-89-ISTD

*** End of Report ***

RIGHT SOLUTIONS | RIGHT PARTNER

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

July 17, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19070016**

Laboratory Results for: **LHAAP 18 24/ICT Wells**

Dear Marcia,

ALS Environmental received 19 sample(s) on Jun 29, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

July 29, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19070622**

Laboratory Results for: **LHAAP /ICT Wells**

Dear Marcia,

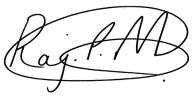
ALS Environmental received 2 sample(s) on Jul 12, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,



Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 29-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
Work Order: HS19070622

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19070622-01	ICT 13A_071119	Groundwater		11-Jul-2019 09:40	12-Jul-2019 09:00	☐
HS19070622-02	Trip Blank	Water	C&G-050119-171	11-Jul-2019 00:00	12-Jul-2019 09:00	☐

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
Work Order: HS19070622

CASE NARRATIVE

Work Order Comments

- The analysis for Perchlorate was subcontracted to ALS Environmental in Salt Lake City, UT. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R342424

Sample ID: CCV

- Bromoform exceeded %D limits for CCV. Samples are ND for this compound.

Sample ID: ICT 13A_071119 (HS19070622-01)

- Toluene -d8 (Surrogate) failure due to matrix. Confirmed by re-analysis at dilution.

Metals by Method SW7470

Batch ID: 143466

- The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 143326

Sample ID: ICT 13A_071119 (HS19070622-01MSD)

- Barium failed on MSD but passed for MS and PDS.
- The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Aluminum, Sodium and Zinc

Sample ID: ICT 13A_071119 (HS19070622-01PDS)

- The PDS recovery was outside method control limits, however the result in the parent sample is greater than 4x the spike amount. Aluminum

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
Sample ID: ICT 13A_071119
Collection Date: 11-Jul-2019 09:40

ANALYTICAL REPORT
WorkOrder:HS19070622
Lab ID:HS19070622-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,1-Dichloroethane	**1.3**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2019 14:22
1,1-Dichloroethene	**5.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2019 14:22
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,2-Dichloroethane	**18**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2019 14:22
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 14:22
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 14:22
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Jul-2019 14:22
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Jul-2019 14:22
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 14:22
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Jul-2019 14:22
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	15-Jul-2019 14:22
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Jul-2019 14:22
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 14:22

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
Sample ID: ICT 13A_071119
Collection Date: 11-Jul-2019 09:40

ANALYTICAL REPORT
WorkOrder:HS19070622
Lab ID:HS19070622-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 14:22
cis-1,2-Dichloroethene	**86**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2019 14:22
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Jul-2019 14:22
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Jul-2019 14:22
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Jul-2019 14:22
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 14:22
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Tetrachloroethene	**2.2**		**0.30**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2019 14:22
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 14:22
trans-1,2-Dichloroethene	**1.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2019 14:22
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Trichloroethene	**920**		**2.0**	**5.0**	**10**	**UG/L**	10	15-Jul-2019 16:46
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 14:22
Vinyl chloride	**6.4**		**0.20**	**0.50**	**1.0**	**UG/L**	1	15-Jul-2019 14:22
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*1*	*15-Jul-2019 14:22*
Surr: 1,2-Dichloroethane-d4	*98.2*			**0**	*81-118*	*%REC*	*10*	*15-Jul-2019 16:46*
Surr: 4-Bromofluorobenzene	*109*			**0**	*85-114*	*%REC*	*1*	*15-Jul-2019 14:22*
Surr: 4-Bromofluorobenzene	*96.4*			**0**	*85-114*	*%REC*	*10*	*15-Jul-2019 16:46*
Surr: Dibromofluoromethane	*96.6*			**0**	*80-119*	*%REC*	*10*	*15-Jul-2019 16:46*
Surr: Dibromofluoromethane	*102*			**0**	*80-119*	*%REC*	*1*	*15-Jul-2019 14:22*
Surr: Toluene-d8	*113*	*S*		**0**	*89-112*	*%REC*	*1*	*15-Jul-2019 14:22*
Surr: Toluene-d8	*99.1*			**0**	*89-112*	*%REC*	*10*	*15-Jul-2019 16:46*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
Sample ID: ICT 13A_071119
Collection Date: 11-Jul-2019 09:40

ANALYTICAL REPORT
WorkOrder:HS19070622
Lab ID:HS19070622-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 24-Jul-2019		Analyst: JHD
Aluminum	**0.677**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	25-Jul-2019 12:22
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	25-Jul-2019 12:22
Arsenic	**0.00149**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	25-Jul-2019 12:22
Barium	**0.0656**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	25-Jul-2019 12:22
Beryllium	**0.000221**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	25-Jul-2019 12:22
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	25-Jul-2019 12:22
Calcium	**3.93**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	25-Jul-2019 12:22
Chromium	**0.0155**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	25-Jul-2019 12:22
Cobalt	**0.00696**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	25-Jul-2019 12:22
Copper	**0.00803**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	25-Jul-2019 12:22
Iron	**5.49**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	25-Jul-2019 12:22
Lead	**0.000925**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	25-Jul-2019 12:22
Magnesium	**3.51**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	25-Jul-2019 12:22
Manganese	**0.132**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	25-Jul-2019 12:22
Nickel	**0.0145**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	25-Jul-2019 12:22
Potassium	**0.708**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	25-Jul-2019 12:22
Selenium	**0.00127**	J	**0.00110**	**0.00250**	**0.00500**	**mg/L**	1	25-Jul-2019 12:22
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	25-Jul-2019 12:22
Sodium	**70.0**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	25-Jul-2019 12:22
Thallium	**0.000243**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	25-Jul-2019 12:22
Vanadium	**0.00425**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	25-Jul-2019 12:22
Zinc	**0.288**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	25-Jul-2019 12:22
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 26-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	26-Jul-2019 15:35
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	26-Jul-2019 11:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
Sample ID: Trip Blank
Collection Date: 11-Jul-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19070622
Lab ID:HS19070622-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:34
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	15-Jul-2019 15:34
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	15-Jul-2019 15:34
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:34
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	15-Jul-2019 15:34
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	15-Jul-2019 15:34
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	15-Jul-2019 15:34
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
Sample ID: Trip Blank
Collection Date: 11-Jul-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19070622
Lab ID:HS19070622-02
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	15-Jul-2019 15:34
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	15-Jul-2019 15:34
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	15-Jul-2019 15:34
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	15-Jul-2019 15:34
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	15-Jul-2019 15:34
Surr: 1,2-Dichloroethane-d4	*84.6*			**0**	*81-118*	*%REC*	*1*	*15-Jul-2019 15:34*
Surr: 4-Bromofluorobenzene	*89.6*			**0**	*85-114*	*%REC*	*1*	*15-Jul-2019 15:34*
Surr: Dibromofluoromethane	*83.9*			**0**	*80-119*	*%REC*	*1*	*15-Jul-2019 15:34*
Surr: Toluene-d8	*92.7*			**0**	*89-112*	*%REC*	*1*	*15-Jul-2019 15:34*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

Batch ID: 143326 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19070622-01	1	10	10 (mL)	1

Batch ID: 143466 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19070622-01	1	10 (mL)	10 (mL)	1

ALS Houston, US Date: 29-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 143326 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19070622-01	ICT 13A_071119	11 Jul 2019 09:40		24 Jul 2019 09:30	25 Jul 2019 12:22	1
Batch ID: 143466 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19070622-01	ICT 13A_071119	11 Jul 2019 09:40		26 Jul 2019 10:30	26 Jul 2019 15:35	1
Batch ID: R342424 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19070622-02	Trip Blank	11 Jul 2019 00:00			15 Jul 2019 15:34	1
Batch ID: R342424 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19070622-01	ICT 13A_071119	11 Jul 2019 09:40			15 Jul 2019 16:46	10
HS19070622-01	ICT 13A_071119	11 Jul 2019 09:40			15 Jul 2019 14:22	1
Batch ID: R343090 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19070622-01	ICT 13A_071119	11 Jul 2019 09:40			26 Jul 2019 11:05	1

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

QC BATCH REPORT

Batch ID: 143326 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-143326** Units: **mg/L** Analysis Date: **25-Jul-2019 12:17**
Client ID: Run ID: **ICPMS05_343031** SeqNo: **5180874** PrepDate: **24-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.002013	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00100	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.000744	0.00500								J
Zinc	0.00250	0.00500								U

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

QC BATCH REPORT

Batch ID: 143326 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-143326** Units: **mg/L** Analysis Date: **25-Jul-2019 12:20**
Client ID: Run ID: **ICPMS05_343031** SeqNo: **5180875** PrepDate: **24-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09942	0.0100	0.1	0	99.4	84 - 117				
Antimony	0.04965	0.00500	0.05	0	99.3	85 - 117				
Arsenic	0.04934	0.00500	0.05	0	98.7	84 - 116				
Barium	0.04718	0.00500	0.05	0	94.4	86 - 114				
Beryllium	0.05002	0.00200	0.05	0	100	83 - 121				
Cadmium	0.04953	0.00200	0.05	0	99.1	87 - 115				
Calcium	4.947	0.500	5	0	98.9	87 - 118				
Chromium	0.05004	0.00500	0.05	0	100	85 - 116				
Cobalt	0.05182	0.00500	0.05	0	104	86 - 115				
Copper	0.05246	0.00500	0.05	0	105	85 - 118				
Iron	4.969	0.200	5	0	99.4	87 - 118				
Lead	0.04852	0.00500	0.05	0	97.0	88 - 115				
Magnesium	5.052	0.200	5	0	101	83 - 118				
Manganese	0.05112	0.00500	0.05	0	102	87 - 115				
Nickel	0.05087	0.00500	0.05	0	102	85 - 117				
Potassium	5.103	0.200	5	0	102	87 - 115				
Selenium	0.05187	0.00500	0.05	0	104	80 - 120				
Silver	0.0515	0.00500	0.05	0	103	85 - 116				
Sodium	4.935	0.200	5	0	98.7	85 - 117				
Thallium	0.04601	0.00200	0.05	0	92.0	82 - 116				
Vanadium	0.0502	0.00500	0.05	0	100	86 - 115				
Zinc	0.05265	0.00500	0.05	0	105	83 - 119				

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

QC BATCH REPORT

Batch ID: 143326 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19070622-01MS** Units: **mg/L** Analysis Date: **25-Jul-2019 12:27**
Client ID: **ICT 13A_071119** Run ID: **ICPMS05_343031** SeqNo: **5180878** PrepDate: **24-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.9046	0.0100	0.1	0.6768	228	84 - 117				SO
Antimony	0.04893	0.00500	0.05	0.00029	97.3	85 - 117				
Arsenic	0.05171	0.00500	0.05	0.00149	100	84 - 116				
Barium	0.1207	0.00500	0.05	0.06556	110	86 - 114				
Beryllium	0.05552	0.00200	0.05	0.000221	111	83 - 121				
Cadmium	0.05001	0.00200	0.05	0.000062	99.9	87 - 115				
Calcium	9.013	0.500	5	3.928	102	87 - 118				
Chromium	0.06289	0.00500	0.05	0.01546	94.9	85 - 116				
Cobalt	0.05755	0.00500	0.05	0.006955	101	86 - 115				
Copper	0.06013	0.00500	0.05	0.00803	104	85 - 118				
Iron	10.3	0.200	5	5.487	96.3	87 - 118				
Lead	0.04902	0.00500	0.05	0.000925	96.2	88 - 115				
Magnesium	8.466	0.200	5	3.51	99.1	83 - 118				
Manganese	0.1826	0.00500	0.05	0.1325	100	87 - 115				
Nickel	0.06418	0.00500	0.05	0.01449	99.4	85 - 117				
Potassium	5.731	0.200	5	0.7083	100	87 - 115				
Selenium	0.05084	0.00500	0.05	0.001273	99.1	80 - 120				
Silver	0.04792	0.00500	0.05	0.000012	95.8	85 - 116				
Sodium	75.31	0.200	5	70.04	105	85 - 117				O
Thallium	0.0455	0.00200	0.05	0.000243	90.5	82 - 116				
Vanadium	0.05497	0.00500	0.05	0.004252	101	86 - 115				
Zinc	0.3416	0.00500	0.05	0.2884	106	83 - 119				O

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

QC BATCH REPORT

Batch ID: 143326 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19070622-01MSD** Units: **mg/L** Analysis Date: **25-Jul-2019 15:43**
Client ID: **ICT 13A_071119** Run ID: **ICPMS05_343031** SeqNo: **5181045** PrepDate: **24-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.883	0.0100	0.1	0.6768	206	84 - 117	0.9046	2.42	20	SO
Antimony	0.04967	0.00500	0.05	0	99.3	85 - 117	0.04893	1.5	20	
Arsenic	0.05281	0.00500	0.05	0.00149	103	84 - 116	0.05171	2.1	20	
Barium	0.124	0.00500	0.05	0.06556	117	86 - 114	0.1207	2.62	20	S
Beryllium	0.05394	0.00200	0.05	0.000221	107	83 - 121	0.05552	2.88	20	
Cadmium	0.05302	0.00200	0.05	0	106	87 - 115	0.05001	5.84	20	
Calcium	8.921	0.500	5	3.928	99.8	87 - 118	9.013	1.03	20	
Chromium	0.06558	0.00500	0.05	0.01546	100	85 - 116	0.06289	4.19	20	
Cobalt	0.05904	0.00500	0.05	0.006955	104	86 - 115	0.05755	2.57	20	
Copper	0.06129	0.00500	0.05	0.00803	107	85 - 118	0.06013	1.91	20	
Iron	10.69	0.200	5	5.487	104	87 - 118	10.3	3.67	20	
Lead	0.04903	0.00500	0.05	0.000925	96.2	88 - 115	0.04902	0.0143	20	
Magnesium	8.83	0.200	5	3.51	106	83 - 118	8.466	4.21	20	
Manganese	0.1861	0.00500	0.05	0.1325	107	87 - 115	0.1826	1.88	20	
Nickel	0.06534	0.00500	0.05	0.01449	102	85 - 117	0.06418	1.79	20	
Potassium	5.882	0.200	5	0.7083	103	87 - 115	5.731	2.61	20	
Selenium	0.05239	0.00500	0.05	0.001273	102	80 - 120	0.05084	3	20	
Silver	0.05214	0.00500	0.05	0	104	85 - 116	0.04792	8.44	20	
Sodium	77.74	0.200	5	70.04	154	85 - 117	75.31	3.18	20	SO
Thallium	0.04647	0.00200	0.05	0.000243	92.4	82 - 116	0.0455	2.11	20	
Vanadium	0.05531	0.00500	0.05	0.004252	102	86 - 115	0.05497	0.624	20	
Zinc	0.3498	0.00500	0.05	0.2884	123	83 - 119	0.3416	2.36	20	SO

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

QC BATCH REPORT

Batch ID: 143326 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19070622-01PDS** Units: **mg/L** Analysis Date: **25-Jul-2019 12:31**
Client ID: **ICT 13A_071119** Run ID: **ICPMS05_343031** SeqNo: **5180880** PrepDate: **24-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.8011	0.0100	0.1	0.6768	124	80 - 120				SO
Antimony	0.08641	0.00500	0.1	0.00029	86.1	80 - 120				
Arsenic	0.09875	0.00500	0.1	0.00149	97.3	80 - 120				
Barium	0.1697	0.00500	0.1	0.06556	104	80 - 120				
Beryllium	0.09605	0.00200	0.1	0.000221	95.8	80 - 120				
Cadmium	0.09772	0.00200	0.1	0.000062	97.7	80 - 120				
Calcium	13.52	0.500	10	3.928	95.9	80 - 120				
Chromium	0.1157	0.00500	0.1	0.01546	100	80 - 120				
Cobalt	0.1042	0.00500	0.1	0.006955	97.2	80 - 120				
Copper	0.1104	0.00500	0.1	0.00803	102	80 - 120				
Iron	14.96	0.200	10	5.487	94.7	80 - 120				
Lead	0.09646	0.00500	0.1	0.000925	95.5	80 - 120				
Magnesium	13.05	0.200	10	3.51	95.4	80 - 120				
Manganese	0.227	0.00500	0.1	0.1325	94.6	80 - 120				
Nickel	0.1111	0.00500	0.1	0.01449	96.6	80 - 120				
Potassium	10.31	0.200	10	0.7083	96.0	80 - 120				
Selenium	0.09668	0.00500	0.1	0.001273	95.4	80 - 120				
Silver	0.09841	0.00500	0.1	0.000012	98.4	80 - 120				
Sodium	78.78	0.200	10	70.04	87.4	80 - 120				O
Thallium	0.09228	0.00200	0.1	0.000243	92.0	80 - 120				
Vanadium	0.1034	0.00500	0.1	0.004252	99.1	80 - 120				
Zinc	0.3844	0.00500	0.1	0.2884	96.0	80 - 120				

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

QC BATCH REPORT

Batch ID: 143326 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19070622-01SD** Units: **mg/L** Analysis Date: **25-Jul-2019 12:24**
Client ID: **ICT 13A_071119** Run ID: **ICPMS05_343031** SeqNo: **5180877** PrepDate: **24-Jul-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.7236	0.0500					0.6768	6.91	10	
Antimony	0.00250	0.0250					0.00029	0	10	U
Arsenic	0.002208	0.0250					0.00149	0	10	J
Barium	0.06576	0.0250					0.06556	0.294	10	
Beryllium	0.00250	0.0100					0.000221	0	10	U
Cadmium	0.00250	0.0100					0.000062	0	10	U
Calcium	4.072	2.50					3.928	3.66	10	
Chromium	0.01575	0.0250					0.01546	0	10	J
Cobalt	0.007085	0.0250					0.006955	0	10	J
Copper	0.007844	0.0250					0.00803	0	10	J
Iron	5.554	1.00					5.487	1.21	10	
Lead	0.00500	0.0250					0.000925	0	10	U
Magnesium	3.434	1.00					3.51	2.17	10	
Manganese	0.1354	0.0250					0.1325	2.2	10	
Nickel	0.01393	0.0250					0.01449	0	10	J
Potassium	0.7268	1.00					0.7083	0	10	J
Selenium	0.0125	0.0250					0.001273	0	10	U
Silver	0.00250	0.0250					0.000012	0	10	U
Sodium	70.58	1.00					70.04	0.783	10	
Thallium	0.00250	0.0100					0.000243	0	10	U
Vanadium	0.00722	0.0250					0.004252	0	10	J
Zinc	0.2884	0.0250					0.2884	0.00312	10	

The following samples were analyzed in this batch: HS19070622-01

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

QC BATCH REPORT

Batch ID: 143466 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-143466** Units: **mg/L** Analysis Date: **26-Jul-2019 15:27**
Client ID: Run ID: **HG03_343146** SeqNo: **5182823** PrepDate: **26-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-143466** Units: **mg/L** Analysis Date: **26-Jul-2019 15:28**
Client ID: Run ID: **HG03_343146** SeqNo: **5182824** PrepDate: **26-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00528	0.000200	0.005	0	106	80 - 120				

MS Sample ID: **HS19071258-01MS** Units: **mg/L** Analysis Date: **26-Jul-2019 15:32**
Client ID: Run ID: **HG03_343146** SeqNo: **5182826** PrepDate: **26-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00529	0.000200	0.005	-0.00001700	106	75 - 125				

MSD Sample ID: **HS19071258-01MSD** Units: **mg/L** Analysis Date: **26-Jul-2019 15:33**
Client ID: Run ID: **HG03_343146** SeqNo: **5182827** PrepDate: **26-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00530	0.000200	0.005	-0.00001700	106	75 - 125	0.005290	0.189	20	

The following samples were analyzed in this batch: HS19070622-01

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190715** Units: **UG/L** Analysis Date: **15-Jul-2019 13:10**
Client ID: Run ID: **VOA6_342424** SeqNo: **5166706** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190715** Units: **UG/L** Analysis Date: **15-Jul-2019 13:10**
Client ID: Run ID: **VOA6_342424** SeqNo: **5166706** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*49.57*	*1.0*	*50*	*0*	*99.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.04*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*49.56*	*1.0*	*50*	*0*	*99.1*	*80 - 119*				
Surr: Toluene-d8	*55.68*	*1.0*	*50*	*0*	*111*	*89 - 112*				

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190715** Units: **UG/L** Analysis Date: **15-Jul-2019 11:59**
Client ID: Run ID: **VOA6_342424** SeqNo: **5166705** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	23.08	1.0	20	0	115	78 - 124				
1,1,1-Trichloroethane	20.55	1.0	20	0	103	74 - 131				
1,1,2,2-Tetrachloroethane	21.83	1.0	20	0	109	71 - 121				
1,1,2-Trichloroethane	22.64	1.0	20	0	113	80 - 119				
1,1-Dichloroethane	21.04	1.0	20	0	105	77 - 125				
1,1-Dichloroethene	19.8	1.0	20	0	99.0	71 - 131				
1,1-Dichloropropene	21.29	1.0	20	0	106	78 - 125				
1,2,3-Trichlorobenzene	19.96	1.0	20	0	99.8	69 - 129				
1,2,3-Trichloropropane	20.27	1.0	20	0	101	73 - 122				
1,2,4-Trichlorobenzene	20.69	1.0	20	0	103	69 - 130				
1,2,4-Trimethylbenzene	21.91	1.0	20	0	110	76 - 124				
1,2-Dibromo-3-chloropropane	20.59	1.0	20	0	103	62 - 128				
1,2-Dibromoethane	22.03	1.0	20	0	110	77 - 121				
1,2-Dichlorobenzene	21.64	1.0	20	0	108	80 - 119				
1,2-Dichloroethane	21.68	1.0	20	0	108	73 - 128				
1,2-Dichloropropane	22.98	1.0	20	0	115	78 - 122				
1,3,5-Trimethylbenzene	21.81	1.0	20	0	109	75 - 124				
1,3-Dichlorobenzene	22.13	1.0	20	0	111	80 - 119				
1,3-Dichloropropane	22.31	1.0	20	0	112	80 - 119				
1,4-Dichlorobenzene	21.13	1.0	20	0	106	79 - 118				
2,2-Dichloropropane	21.18	1.0	20	0	106	60 - 139				
2-Butanone	46.06	2.0	40	0	115	56 - 143				
2-Chlorotoluene	21.23	1.0	20	0	106	79 - 122				
2-Hexanone	45.11	2.0	40	0	113	57 - 139				
4-Chlorotoluene	21.32	1.0	20	0	107	78 - 122				
4-Isopropyltoluene	22.03	1.0	20	0	110	77 - 127				
4-Methyl-2-pentanone	44.64	2.0	40	0	112	67 - 130				
Acetone	54.2	2.0	40	0	136	39 - 160				
Benzene	21.8	1.0	20	0	109	79 - 120				
Bromobenzene	22.31	1.0	20	0	112	80 - 120				
Bromochloromethane	21.02	1.0	20	0	105	78 - 123				
Bromodichloromethane	22.31	1.0	20	0	112	79 - 125				
Bromoform	22.62	1.0	20	0	113	66 - 130				
Bromomethane	24.56	1.0	20	0	123	53 - 141				

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190715** Units: **UG/L** Analysis Date: **15-Jul-2019 11:59**
Client ID: Run ID: **VOA6_342424** SeqNo: **5166705** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	42.96	2.0	40	0	107	64 - 133				
Carbon tetrachloride	20.69	1.0	20	0	103	72 - 136				
Chlorobenzene	22.26	1.0	20	0	111	82 - 118				
Chloroethane	19.53	1.0	20	0	97.6	60 - 138				
Chloroform	21.85	1.0	20	0	109	79 - 124				
Chloromethane	21.86	1.0	20	0	109	50 - 139				
cis-1,2-Dichloroethene	21.2	1.0	20	0	106	78 - 123				
cis-1,3-Dichloropropene	22.97	1.0	20	0	115	75 - 124				
Dibromochloromethane	22.9	1.0	20	0	115	74 - 126				
Dibromomethane	21.79	1.0	20	0	109	79 - 123				
Dichlorodifluoromethane	20.91	1.0	20	0	105	32 - 152				
Ethylbenzene	22.45	1.0	20	0	112	79 - 121				
Hexachlorobutadiene	23.73	1.0	20	0	119	66 - 134				
Isopropylbenzene	22.67	1.0	20	0	113	72 - 131				
m,p-Xylene	45.25	2.0	40	0	113	80 - 121				
Methylene chloride	20.66	2.0	20	0	103	74 - 124				
Naphthalene	18.45	1.0	20	0	92.3	61 - 128				
n-Butylbenzene	23.5	1.0	20	0	118	75 - 128				
n-Propylbenzene	21.56	1.0	20	0	108	76 - 126				
o-Xylene	22.24	1.0	20	0	111	78 - 122				
sec-Butylbenzene	21.67	1.0	20	0	108	77 - 126				
Styrene	22.78	1.0	20	0	114	78 - 123				
tert-Butylbenzene	21.61	1.0	20	0	108	78 - 124				
Tetrachloroethene	23.77	1.0	20	0	119	74 - 129				
Toluene	22.66	1.0	20	0	113	80 - 121				
trans-1,2-Dichloroethene	21.15	1.0	20	0	106	75 - 124				
trans-1,3-Dichloropropene	22.36	1.0	20	0	112	73 - 127				
Trichloroethene	21.49	1.0	20	0	107	79 - 123				
Trichlorofluoromethane	19.87	1.0	20	0	99.3	65 - 141				
Vinyl chloride	19.88	1.0	20	0	99.4	58 - 137				
Surr: 1,2-Dichloroethane-d4	*49.08*	*1.0*	*50*	*0*	*98.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.54*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*49.16*	*1.0*	*50*	*0*	*98.3*	*80 - 119*				
Surr: Toluene-d8	*51.11*	*1.0*	*50*	*0*	*102*	*89 - 112*				

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19070656-99MS** Units: **UG/L** Analysis Date: **15-Jul-2019 15:58**
Client ID: Run ID: **VOA6_342424** SeqNo: **5167080** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	22.19	1.0	20	0	111	78 - 124				
1,1,1-Trichloroethane	20.93	1.0	20	0	105	74 - 131				
1,1,2,2-Tetrachloroethane	21.31	1.0	20	0	107	71 - 121				
1,1,2-Trichloroethane	21.42	1.0	20	0	107	80 - 119				
1,1-Dichloroethane	19.94	1.0	20	0	99.7	77 - 125				
1,1-Dichloroethene	19.89	1.0	20	0	99.4	71 - 131				
1,1-Dichloropropene	21.77	1.0	20	0	109	78 - 125				
1,2,3-Trichlorobenzene	20	1.0	20	0	100.0	69 - 129				
1,2,3-Trichloropropane	19.55	1.0	20	0	97.7	73 - 122				
1,2,4-Trichlorobenzene	20.88	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	22.01	1.0	20	0	110	76 - 124				
1,2-Dibromo-3-chloropropane	20.38	1.0	20	0	102	62 - 128				
1,2-Dibromoethane	21.35	1.0	20	0	107	77 - 121				
1,2-Dichlorobenzene	21.3	1.0	20	0	107	80 - 119				
1,2-Dichloroethane	20.74	1.0	20	0	104	73 - 128				
1,2-Dichloropropane	21.01	1.0	20	0	105	78 - 122				
1,3,5-Trimethylbenzene	22.34	1.0	20	0	112	75 - 124				
1,3-Dichlorobenzene	21.82	1.0	20	0	109	80 - 119				
1,3-Dichloropropane	21.23	1.0	20	0	106	80 - 119				
1,4-Dichlorobenzene	20.63	1.0	20	0	103	79 - 118				
2,2-Dichloropropane	20.62	1.0	20	0	103	60 - 139				
2-Butanone	46.35	2.0	40	7.115	98.1	56 - 143				
2-Chlorotoluene	21.8	1.0	20	0	109	79 - 122				
2-Hexanone	41.12	2.0	40	0	103	57 - 139				
4-Chlorotoluene	21.3	1.0	20	0	106	78 - 122				
4-Isopropyltoluene	22.48	1.0	20	0	112	77 - 127				
4-Methyl-2-pentanone	42.61	2.0	40	0	107	67 - 130				
Acetone	37.96	2.0	40	0	94.9	39 - 160				
Benzene	21.01	1.0	20	0	105	79 - 120				
Bromobenzene	21.94	1.0	20	0	110	80 - 120				
Bromochloromethane	19.37	1.0	20	0	96.9	78 - 123				
Bromodichloromethane	20.89	1.0	20	0	104	79 - 125				
Bromoform	21.69	1.0	20	0	108	66 - 130				
Bromomethane	20.3	1.0	20	0	101	53 - 141				

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19070656-99MS** Units: **UG/L** Analysis Date: **15-Jul-2019 15:58**
Client ID: Run ID: **VOA6_342424** SeqNo: **5167080** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	42.12	2.0	40	0	105	64 - 133				
Carbon tetrachloride	21.53	1.0	20	0	108	72 - 136				
Chlorobenzene	21.44	1.0	20	0	107	82 - 118				
Chloroethane	18.08	1.0	20	0	90.4	60 - 138				
Chloroform	20.3	1.0	20	0	102	79 - 124				
Chloromethane	20.45	1.0	20	0	102	50 - 139				
cis-1,2-Dichloroethene	19.61	1.0	20	0	98.0	78 - 123				
cis-1,3-Dichloropropene	21.18	1.0	20	0	106	75 - 124				
Dibromochloromethane	21.69	1.0	20	0	108	74 - 126				
Dibromomethane	19.78	1.0	20	0	98.9	79 - 123				
Dichlorodifluoromethane	15.49	1.0	20	0	77.5	32 - 152				
Ethylbenzene	22.57	1.0	20	0	113	79 - 121				
Hexachlorobutadiene	20.96	1.0	20	0	105	66 - 134				
Isopropylbenzene	23.29	1.0	20	0	116	72 - 131				
m,p-Xylene	45.27	2.0	40	0	113	80 - 121				
Methylene chloride	19.09	2.0	20	0	95.5	74 - 124				
Naphthalene	18.74	1.0	20	0	93.7	61 - 128				
n-Butylbenzene	23.43	1.0	20	0	117	75 - 128				
n-Propylbenzene	22.6	1.0	20	0	113	76 - 126				
o-Xylene	21.81	1.0	20	0	109	78 - 122				
sec-Butylbenzene	22.65	1.0	20	0	113	77 - 126				
Styrene	22.07	1.0	20	0	110	78 - 123				
tert-Butylbenzene	22.57	1.0	20	0	113	78 - 124				
Tetrachloroethene	24.52	1.0	20	0	123	74 - 129				
Toluene	22.62	1.0	20	0	113	80 - 121				
trans-1,2-Dichloroethene	20.36	1.0	20	0	102	75 - 124				
trans-1,3-Dichloropropene	20.06	1.0	20	0	100	73 - 127				
Trichloroethene	21.75	1.0	20	1.3	102	79 - 123				
Trichlorofluoromethane	19.75	1.0	20	0	98.8	65 - 141				
Vinyl chloride	17.97	1.0	20	0	89.9	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.57*	*1.0*	*50*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*53.96*	*1.0*	*50*	*0*	*108*	*85 - 114*				
Surr: Dibromofluoromethane	*51.4*	*1.0*	*50*	*0*	*103*	*80 - 119*				
Surr: Toluene-d8	*55.82*	*1.0*	*50*	*0*	*112*	*89 - 112*				

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19070656-99MSD** Units: **UG/L** Analysis Date: **15-Jul-2019 16:22**
Client ID: Run ID: **VOA6_342424** SeqNo: **5167081** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	22.48	1.0	20	0	112	78 - 124	22.19	1.31	20	
1,1,1-Trichloroethane	20.66	1.0	20	0	103	74 - 131	20.93	1.33	20	
1,1,2,2-Tetrachloroethane	22.12	1.0	20	0	111	71 - 121	21.31	3.75	20	
1,1,2-Trichloroethane	22.14	1.0	20	0	111	80 - 119	21.42	3.32	20	
1,1-Dichloroethane	19.77	1.0	20	0	98.8	77 - 125	19.94	0.854	20	
1,1-Dichloroethene	19.87	1.0	20	0	99.3	71 - 131	19.89	0.107	20	
1,1-Dichloropropene	21.58	1.0	20	0	108	78 - 125	21.77	0.865	20	
1,2,3-Trichlorobenzene	21.32	1.0	20	0	107	69 - 129	20	6.39	20	
1,2,3-Trichloropropane	20.07	1.0	20	0	100	73 - 122	19.55	2.63	20	
1,2,4-Trichlorobenzene	21.47	1.0	20	0	107	69 - 130	20.88	2.78	20	
1,2,4-Trimethylbenzene	22.09	1.0	20	0	110	76 - 124	22.01	0.371	20	
1,2-Dibromo-3-chloropropane	20.51	1.0	20	0	103	62 - 128	20.38	0.633	20	
1,2-Dibromoethane	21.74	1.0	20	0	109	77 - 121	21.35	1.84	20	
1,2-Dichlorobenzene	21.77	1.0	20	0	109	80 - 119	21.3	2.17	20	
1,2-Dichloroethane	21.09	1.0	20	0	105	73 - 128	20.74	1.68	20	
1,2-Dichloropropane	21.54	1.0	20	0	108	78 - 122	21.01	2.49	20	
1,3,5-Trimethylbenzene	22.25	1.0	20	0	111	75 - 124	22.34	0.412	20	
1,3-Dichlorobenzene	22.15	1.0	20	0	111	80 - 119	21.82	1.49	20	
1,3-Dichloropropane	21.81	1.0	20	0	109	80 - 119	21.23	2.73	20	
1,4-Dichlorobenzene	21.29	1.0	20	0	106	79 - 118	20.63	3.15	20	
2,2-Dichloropropane	20.26	1.0	20	0	101	60 - 139	20.62	1.75	20	
2-Butanone	47.81	2.0	40	7.115	102	56 - 143	46.35	3.1	20	
2-Chlorotoluene	21.74	1.0	20	0	109	79 - 122	21.8	0.277	20	
2-Hexanone	43.06	2.0	40	0	108	57 - 139	41.12	4.6	20	
4-Chlorotoluene	21.37	1.0	20	0	107	78 - 122	21.3	0.333	20	
4-Isopropyltoluene	22.46	1.0	20	0	112	77 - 127	22.48	0.0765	20	
4-Methyl-2-pentanone	44.2	2.0	40	0	110	67 - 130	42.61	3.65	20	
Acetone	39.46	2.0	40	0	98.7	39 - 160	37.96	3.89	20	
Benzene	21.3	1.0	20	0	107	79 - 120	21.01	1.37	20	
Bromobenzene	22.41	1.0	20	0	112	80 - 120	21.94	2.08	20	
Bromochloromethane	19.5	1.0	20	0	97.5	78 - 123	19.37	0.687	20	
Bromodichloromethane	20.98	1.0	20	0	105	79 - 125	20.89	0.413	20	
Bromoform	22.22	1.0	20	0	111	66 - 130	21.69	2.42	20	
Bromomethane	19.56	1.0	20	0	97.8	53 - 141	20.3	3.69	20	

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: HS19070622

QC BATCH REPORT

Batch ID: R342424 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19070656-99MSD** Units: **UG/L** Analysis Date: **15-Jul-2019 16:22**
Client ID: Run ID: **VOA6_342424** SeqNo: **5167081** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	41.77	2.0	40	0	104	64 - 133	42.12	0.843	20	
Carbon tetrachloride	21.34	1.0	20	0	107	72 - 136	21.53	0.868	20	
Chlorobenzene	21.78	1.0	20	0	109	82 - 118	21.44	1.6	20	
Chloroethane	18.46	1.0	20	0	92.3	60 - 138	18.08	2.08	20	
Chloroform	20.66	1.0	20	0	103	79 - 124	20.3	1.76	20	
Chloromethane	19.16	1.0	20	0	95.8	50 - 139	20.45	6.5	20	
cis-1,2-Dichloroethene	19.9	1.0	20	0	99.5	78 - 123	19.61	1.45	20	
cis-1,3-Dichloropropene	21.57	1.0	20	0	108	75 - 124	21.18	1.83	20	
Dibromochloromethane	21.78	1.0	20	0	109	74 - 126	21.69	0.436	20	
Dibromomethane	20.72	1.0	20	0	104	79 - 123	19.78	4.63	20	
Dichlorodifluoromethane	15.06	1.0	20	0	75.3	32 - 152	15.49	2.84	20	
Ethylbenzene	22.64	1.0	20	0	113	79 - 121	22.57	0.314	20	
Hexachlorobutadiene	21.26	1.0	20	0	106	66 - 134	20.96	1.39	20	
Isopropylbenzene	23.47	1.0	20	0	117	72 - 131	23.29	0.765	20	
m,p-Xylene	45.17	2.0	40	0	113	80 - 121	45.27	0.208	20	
Methylene chloride	19.2	2.0	20	0	96.0	74 - 124	19.09	0.533	20	
Naphthalene	20.18	1.0	20	0	101	61 - 128	18.74	7.38	20	
n-Butylbenzene	23.6	1.0	20	0	118	75 - 128	23.43	0.724	20	
n-Propylbenzene	22.52	1.0	20	0	113	76 - 126	22.6	0.355	20	
o-Xylene	21.84	1.0	20	0	109	78 - 122	21.81	0.127	20	
sec-Butylbenzene	22.53	1.0	20	0	113	77 - 126	22.65	0.536	20	
Styrene	22.39	1.0	20	0	112	78 - 123	22.07	1.45	20	
tert-Butylbenzene	22.68	1.0	20	0	113	78 - 124	22.57	0.48	20	
Tetrachloroethene	24.11	1.0	20	0	121	74 - 129	24.52	1.65	20	
Toluene	22.43	1.0	20	0	112	80 - 121	22.62	0.848	20	
trans-1,2-Dichloroethene	20.37	1.0	20	0	102	75 - 124	20.36	0.0286	20	
trans-1,3-Dichloropropene	20.9	1.0	20	0	105	73 - 127	20.06	4.1	20	
Trichloroethene	21.62	1.0	20	1.3	102	79 - 123	21.75	0.565	20	
Trichlorofluoromethane	19.75	1.0	20	0	98.7	65 - 141	19.75	0.0166	20	
Vinyl chloride	17.66	1.0	20	0	88.3	58 - 137	17.97	1.8	20	
Surr: 1,2-Dichloroethane-d4	*51.8*	*1.0*	*50*	*0*	*104*	*81 - 118*	*50.57*	*2.41*	*20*	
Surr: 4-Bromofluorobenzene	*53.88*	*1.0*	*50*	*0*	*108*	*85 - 114*	*53.96*	*0.148*	*20*	
Surr: Dibromofluoromethane	*51.96*	*1.0*	*50*	*0*	*104*	*80 - 119*	*51.4*	*1.08*	*20*	
Surr: Toluene-d8	*55.78*	*1.0*	*50*	*0*	*112*	*89 - 112*	*55.82*	*0.066*	*20*	

ALS Houston, US Date: 29-Jul-19

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP /ICT Wells
WorkOrder:	HS19070622

QC BATCH REPORT

Batch ID:	**R342424 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch:	HS19070622-01	HS19070622-02

ALS Houston, US Date: 29-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
WorkOrder: **HS19070622**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 29-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP /ICT Wells
Work Order: HS19070622

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19070622-01	ICT 13A_071119	Login	12/07/2019 16:02:08	NDR	MET098
HS19070622-01	ICT 13A_071119	Login	12/07/2019 16:02:08	NDR	Sub
HS19070622-01	ICT 13A_071119	Login	12/07/2019 16:02:08	NDR	VOA087

ALS Houston, US Date: 29-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19070622
Date/Time Received: **12-Jul-2019 09:00**
Received by: **PMG**

Checklist completed by: *Nilesh D. Ranchod* eSignature 12-Jul-2019 Date
Reviewed by: *RJ Modashia* eSignature 13-Jul-2019 Date

Matrices: **Groundwater/Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.4c U/c	IR25
Cooler(s)/Kit(s):	44888	
Date/Time sample(s) sent to storage:	07/12/2019 16:30	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

bhate
ENVIRONMENTAL ASSOCIATES, INC.

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: ____ of ____

Project/Phase No: NWO1312.0150

COC Number(1): ____

LIMS Number: ____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / ICT Wells

Client Name:

Collected by: Scott Beesinger

Sample Analysis Requested (5) | Quality Assurance Samples (6)

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (6)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS								Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
ICT 13A_071119		11 July 2019	09:40	-	N		WG	5	X	X	X											
Trip Blank		11 July 2019		-	TB		W	2	X													
				-																		
				-																		
				-																		
				-																		
				-																		
				-																		
				-																		

HS1907062 2

Bhate Environmental Associates, Inc.
LHAAP /ICT Wells

COMMENTS: ____

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	7/11/19	1430	1. PG	07/12/19	09:00
2.			2.		
3.			3.		

Cooler # 44588 Temp 0.4 ICE 25

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: ____ Shipped ____ No.:

Method of Shipment: ____

Fed Ex ____ Airbill Number: ____

Analytical Lab. ALS 10450 Stanlift Rd, Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.] Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.] Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.] Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.] Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.] Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.] Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

00942340

ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

44888

CUSTODY SEAL

Date: 7/11/19 Time: 1430
Name: Scott Beesinger
Company: BHATE

Seal Broken By: SN
Date: 07/12/19

44888

Must Deliver Next Business Day
Time and Tempature Sensitive!

44888

ORIGIN ID:SGRA (903) 930-6193
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202

MARSHALL, TX 75670
UNITED STATES US

SHIP DATE: 24MAY19
ACTWGT: 1.00 LB MAN
CAD: 3001130/CAFE3211
DIMS: 26x14x14 IN

TO CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656
REF: LHAAP/18/24 & SURFACE WATER - RJ

RMA:

FedEx Express

FedEx. Ship
0221 4809 7834 3218

FRI - 12 JUL 10:30A
PRIORITY OVERNIGHT

AB SGRA

77099
TX-US
IAH

FTA 162705 11JUL19 ESGA 563C2/A6F9/0C0A

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1920034; 1920122; 1920123; 1920571; 1920572; 1920581

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2273 (244098)

General Set Information: There were eleven field samples in this Work Order. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field samples 1920122001 and 1920581001 were analyzed and reported from 1:100 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 664922) was less than 1/2 the CRDL. The recovery for the LCS (664923) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on sample 1920123002 (Client ID: HBW10_071119). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 664920) is reported from the analysis of the Laboratory Control Sample (LCS – 664923) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafile 23JULD03.

Thomas Bosch July 25, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: July 25, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1920122**
Project ID: HS19070622
Purchase Order: HS19070622
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
ICT 13A_071119	1920122001	07/11/19	07/13/19	

ANALYTICAL REPORT

Workorder: 34-1920122
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **ICT 13A_071119**	Sampling Site: NA	Collected: 07/11/2019
Lab ID: 1920122001	Media: 125 mL Nalgene	Received: 07/13/2019
Matrix: Water	Sampling Parameter: NA	

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable	**Analysis:** EPA 6850, DoD QSM Water	**Instrument ID:** LCMS04
	Batch: ELMS/2274 (HBN: 244098)	**Percent Solid:** NA
	Analyzed: 07/23/2019 09:43	**Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**540**	100	200	400	100	

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/25/2019 15:05	/S/ Stephen Brose 07/25/2019 16:18

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1920122
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1920122

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2274 (HBN: 244098)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 664922
Analyzed: 07/23/2019 09:15
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 664923
Analyzed: 07/23/2019 08:47
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.24	4.00	106	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1920123002	**MS:**	664924	**MSD:**	664925
Analyzed:	07/23/2019 10:11	**Analyzed:**	07/23/2019 10:25	**Analyzed:**	07/23/2019 10:39
Dilution:	1	**Dilution:**	1	**Dilution:**	1
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	4.12	4	103	78.8	123.8	4.14	104	0.46	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/25/2019 15:11	07/25/2019 16:18

Symbols and Definitions

* - Analyte above reporting limit or outside of control limits
▲ - Sample result is greater than 4 times the spike added
◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
● - Result is above the calibration range
- The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

1920122

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

18698/# 2

SAMPLING STATE: **Texas**

COC ID: **11765**

1920122

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19070622
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19070622-01**	**ICT 13A_071119**	**Groundwater**	**11 Jul 2019 09:40**
	SUB_Perch-6850			26 Jul 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 7.12.19 . 18-20

Received By: _____ Date/Time: 7/13/19 925

Cooler ID(s): _____ Temperature(s): 2°

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19070622	***Split:***	**Workorder ID:** 1920122	**Level:** ENV_LVL4	**Requested Analysis**	
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly		
Comments:			**Preservatives**		
			COOL		
			Containers		

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	ID(s)	Count	EPA 6850, DoD QSM
1	07/11/2019 09:40	ICT 13A_071119	1920122001		Water	A	1	A
2								
3								
4								
5								
6								
7								
8								
9								
10								

40 of 129

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Coates, Gayleen	07/13/2019 09:25	ALS Sample Receiving	Sample Login
R.33.1	7.15.19 0958	13B	STORAGE
	7.19.19/14:00	T. Bush	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ **Lab Notebook No.:** _____

Prepared / Analyzed by: _____ **Date / Time:** _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00942349

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site:

Date/Time of Receipt: 7/13/19 925

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:					
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9748	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Meredith Hunt (Signature) Meredith Hunt (Printed Name) 7/13/19 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Headspace in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

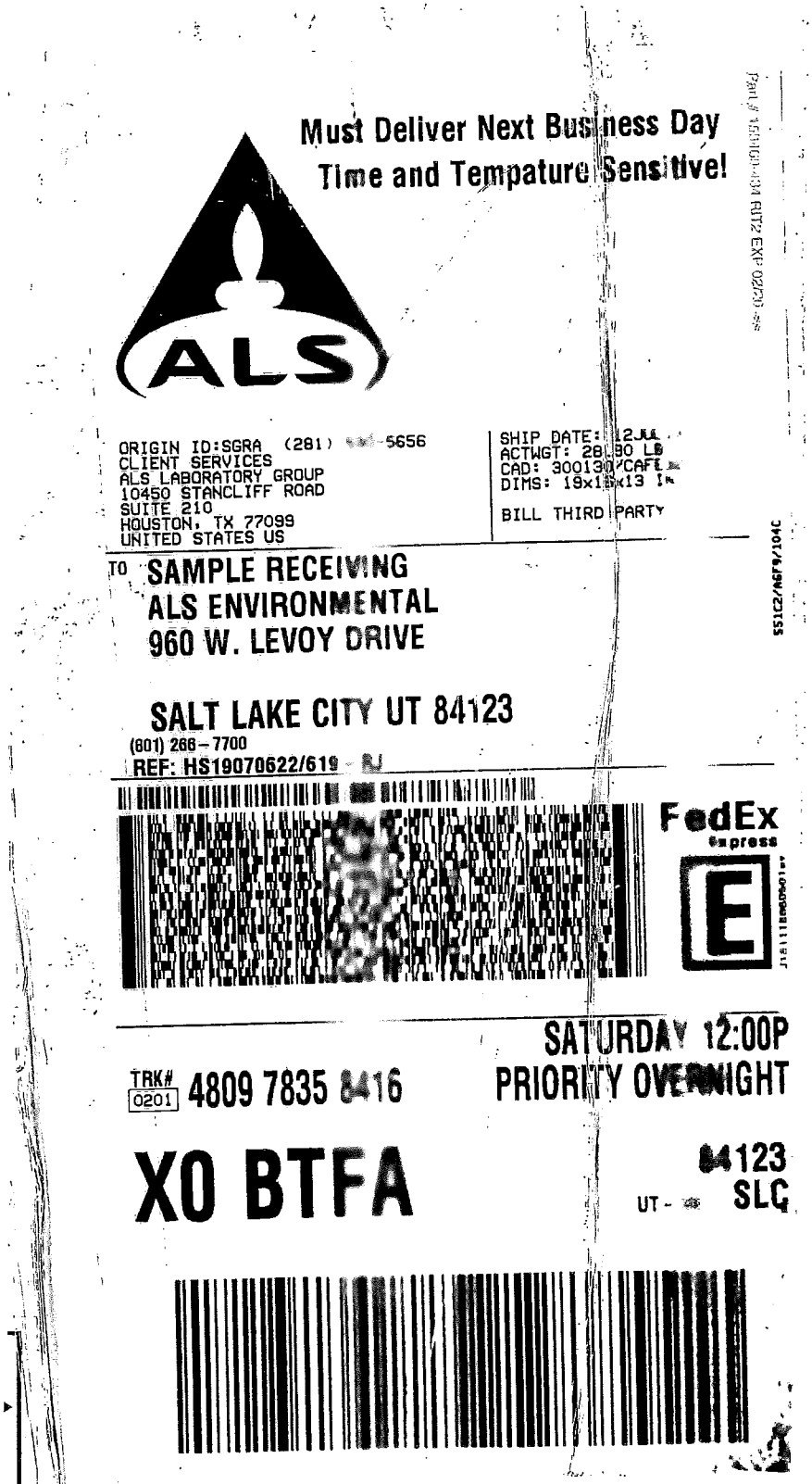
Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018



Must Deliver Next Business Day
Time and Tempature Sensitive!

ORIGIN ID:SGRA (281) [redacted]-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 12JUL
ACTWGT: 28.90 LB
CAD: 3001307/CAFE
DIMS: 19x15x13 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19070622/619

FedEx Express

SATURDAY 12:00P
PRIORITY OVERNIGHT

TRK# 0201 4809 7835 [redacted]416

XO BTFA

84123
UT - SLC

Batch Worklist

Batch: ELMS/ 2274 **Created:** 7/23/2019 08:01 **Instrument:** **HBN:** 244098

Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1920034 [ENV_LVL4]
Workorder: 1920122 [ENV_LVL4]
Workorder: 1920123 [ENV_LVL4]
Workorder: 1920571 [ENV_LVL4]
Workorder: 1920572 [ENV_LVL4]
Workorder: 1920581 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	664919	CCV for HBN 244098 [ELMS/2274]				CCV	3		E685041C3Q	5311		7/25/2019	
2	664920	RLVS for HBN 244098 [ELMS/2274				RLVS	3		E685041C3Q	5311		7/25/2019	
3	664921	ICS for HBN 244098 [ELMS/2274]				ICS	3		E6850..D3Q	5311		7/25/2019	
4	664922	LMB for HBN 244098 [ELMS/2274]				LMB	3		E6850Q413Q	5311		7/25/2019	
5	664923	LCS for HBN 244098 [ELMS/2274]				LCS	3		E6850Q413Q	5311		7/25/2019	
6	1920034001	LH18/24-SP650_070919_BIX Water				SAMPLE	3	1920034001-A	E6850Q41.3	5480	8/6/2019	7/25/2019	
7	1920122001	ICT 13A_071119				SAMPLE	3	1920122001-A	E6850Q41.3	5480	8/8/2019	7/26/2019	
8	1920123001	HBW7_071119				SAMPLE	3	1920123001-A	E6850Q41.3	5480	8/8/2019	7/25/2019	
9	1920123002	HBW10_071119				SAMPLE	3	1920123002-A	E6850Q41.3	5480	8/8/2019	7/25/2019	
10	664924	HBW10_071119(1920123002MS)				MS	3		E6850Q413Q	5311		7/25/2019	
11	664925	HBW10_071119(1920123002MSD)				MSD	3		E6850Q413Q	5311		7/25/2019	
12	1920123003	HBW1_071119				SAMPLE	3	1920123003-A	E6850Q41.3	5480	8/8/2019	7/25/2019	
13	1920123004	GPW1_071119				SAMPLE	3	1920123004-A	E6850Q41.3	5480	8/8/2019	7/25/2019	
14	1920123005	GPW1_071119_a				SAMPLE	3	1920123005-A	E6850Q41.3	5480	8/8/2019	7/25/2019	
15	1920123006	GPW3_071119				SAMPLE	3	1920123006-A	E6850Q41.3	5480	8/8/2019	7/25/2019	
16	664926	CCV for HBN 244098 [ELMS/2274]				CCV	3		E685041C3Q	5311		7/25/2019	
17	1920571001	LH18/24-SP650_071619-BIX				SAMPLE	3	1920571001-A	E6850Q41.3	5480	8/13/2019	7/31/2019	
18	1920572001	LH18/24-SP650_071619_BIX				SAMPLE	3	1920572001-A	E6850Q41.3	5480	8/13/2019	7/31/2019	
19	1920581001	LH18/24-SP140_071619				SAMPLE	3	1920581001-A	E6850Q41.3	5480	8/13/2019	7/31/2019	
20	664927	CCV for HBN 244098 [ELMS/2274]				CCV	3		E685041C3Q	5311		7/25/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1920034 (001); 1920122 (001); 1920123 (001-06); 1920571 (001); 1920572 (001); 1920581 (001) ELMS Batch/HBN ID: 2274 (244098)
Prep Date: 07/19/2019 Analysis Date: 07/23/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\23JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 8 Injection Volume: 35µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 664923; Target = 4.0µg/L. ASTM type II water was used for LMB 664922.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1920123002 (Client ID: HBW10_071119). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L. Field samples 1920122001 and 1920581001 were analyzed and reported from 1:100 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\244098-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 664920) is reported from the analysis of the Laboratory Control Sample (LCS – 664923) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafile 23JULD03.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2274 HBN: 244098 1920034/1920122/1920123 Sample Set IDs if Applicable: 1920571/1920572/192058]	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK		Description - 6850 Stock AccStd 1,000ug/mL
Standard: 43659	Created By: Thomas Bosch	Amount: 100 mL
MFG: AccuStandard	Create Date: 09/17/2018 09:09AM	Expires: 07/25/2020
MFG Lot: 218065075		Usable: No
Part ID: IC-PER-10X-1		Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — Description - 6850 QC WKG STD 100ug/L

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — Description - 6850 QC Stock STD 1,000ug/mL

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED ACCREDITED REFERENCE MATERIAL
ANAB ACCREDITED ACCREDITED TESTING LABORATORY

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: JCC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

GHS

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

AccuStandard

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Report: C:\HPCHEM\1\DATA\23JUL19D\23JUL19S.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	664919 CCV@25	Vial 71	1	Control	1	1.62672e6	8.125	25.50485
*	664923 QC@4.0	Vial 72	1	Control	2	3.26276e5	7.968	4.23719
*	664921 ICS@4.0	Vial 73	1	Control	3	2.26823e5	7.809	3.59795
*	664922 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1920034001	Vial 75	1	Sample	5	3.78721e5	7.756	5.76393
*	1920122001 100	Vial 76	1	Sample	6	3.81315e5	8.340	535.80529
*	1920123001	Vial 77	1	Sample	7	1.88703e6	7.880	27.30710
*	1920123002	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	664924 201232S	Vial 79	1	Sample	9	2.94719e5	7.909	4.12417
*	664925 201232D	Vial 80	1	Sample	10	2.98082e5	7.931	4.14318
*	1920123003	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1920123004	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1920123005	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1920123006	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	664926 CCV@25	Vial 71	1	Control	15	1.58424e6	8.147	26.09295
*	1920571001	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1920572001	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1920581001 100	Vial 87	1	Sample	18	4.74247e6	8.368	6892.89270
*	664927 CCV@25	Vial 71	1	Control	19	1.56539e6	8.160	26.50991

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	664919 CCV@25	Vial 71	1	Control	1	4.82242e5	8.132	25.47735
*	664923 QC@4.0	Vial 72	1	Control	2	1.06930e5	7.986	4.52240
*	664921 ICS@4.0	Vial 73	1	Control	3	8.07927e4	7.808	4.14216
*	664922 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1920034001	Vial 75	1	Sample	5	1.32207e5	7.757	6.61445
*	1920122001 100	Vial 76	1	Sample	6	1.27974e5	8.359	590.20800
*	1920123001	Vial 77	1	Sample	7	5.71392e5	7.909	27.84268
*	1920123002	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	664924 201232S	Vial 79	1	Sample	9	9.30343e4	7.927	4.23661
*	664925 201232D	Vial 80	1	Sample	10	9.90502e4	7.949	4.47914
*	1920123003	Vial 81	1	Sample	11	0.00000	0.000	0.00000
*	1920123004	Vial 82	1	Sample	12	0.00000	0.000	0.00000
*	1920123005	Vial 83	1	Sample	13	0.00000	0.000	0.00000
*	1920123006	Vial 84	1	Sample	14	0.00000	0.000	0.00000
*	664926 CCV@25	Vial 71	1	Control	15	4.73538e5	8.163	26.27353
*	1920571001	Vial 85	1	Sample	16	0.00000	0.000	0.00000
*	1920572001	Vial 86	1	Sample	17	0.00000	0.000	0.00000
*	1920581001 100	Vial 87	1	Sample	18	1.37287e6	8.381	6775.22031
*	664927 CCV@25	Vial 71	1	Control	19	4.66031e5	8.186	26.59490

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	664919 CCV@25	Vial 71	1	Control	1	1.93813e5	8.141	5.00000
*	664923 QC@4.0	Vial 72	1	Control	2	2.53019e5	7.996	5.00000
*	664921 ICS@4.0	Vial 73	1	Control	3	2.08874e5	7.820	5.00000
*	664922 LMB	Vial 74	1	Control	4	2.28613e5	8.332	5.00000
*	1920034001	Vial 75	1	Sample	5	2.12986e5	7.778	5.00000
*	1920122001 100	Vial 76	1	Sample	6	2.31390e5	8.370	500.00000
*	1920123001	Vial 77	1	Sample	7	2.09097e5	7.906	5.00000
*	1920123002	Vial 78	1	Sample	8	2.14312e5	7.946	5.00000
*	664924 201232S	Vial 79	1	Sample	9	2.35117e5	7.946	5.00000
*	664925 201232D	Vial 80	1	Sample	10	2.36657e5	7.943	5.00000
*	1920123003	Vial 81	1	Sample	11	2.72320e5	7.956	5.00000
*	1920123004	Vial 82	1	Sample	12	2.70263e5	7.966	5.00000
*	1920123005	Vial 83	1	Sample	13	2.50554e5	7.967	5.00000
*	1920123006	Vial 84	1	Sample	14	2.77086e5	7.979	5.00000

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	664926 CCV@25	Vial 71	1	Control	15	1.84240e5	8.170	5.00000
*	1920571001	Vial 85	1	Sample	16	2.24657e5	7.814	5.00000
*	1920572001	Vial 86	1	Sample	17	2.04102e5	7.796	5.00000
*	1920581001 100	Vial 87	1	Sample	18	1.90565e5	8.391	500.00000
*	664927 CCV@25	Vial 71	1	Control	19	1.79008e5	8.198	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\23JUL19D.S

Sequence Table:

Method and Injection Info Part:

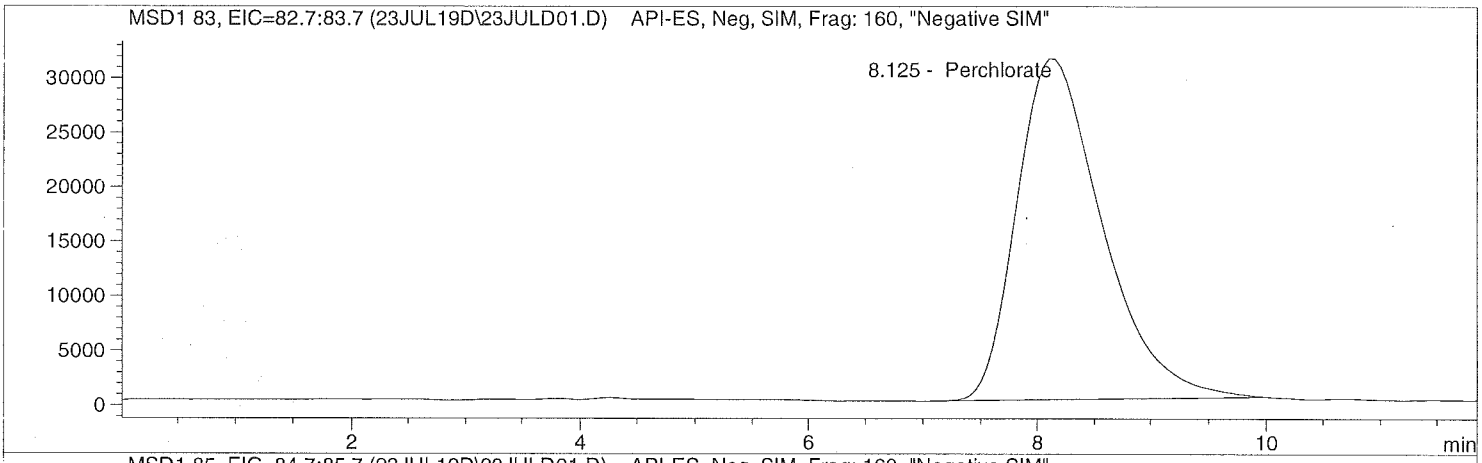
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	664919	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	664923	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	664921	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	664922	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1920034001		CLO4-AQN	1	Sample		
6	Vial 76	1920122001	100	CLO4-AQN	1	Sample		
7	Vial 77	1920123001		CLO4-AQN	1	Sample		
8	Vial 78	1920123002		CLO4-AQN	1	Sample		
9	Vial 79	664924	201232S	CLO4-AQN	1	Sample		
10	Vial 80	664925	201232D	CLO4-AQN	1	Sample		
11	Vial 81	1920123003		CLO4-AQN	1	Sample		
12	Vial 82	1920123004		CLO4-AQN	1	Sample		
13	Vial 83	1920123005		CLO4-AQN	1	Sample		
14	Vial 84	1920123006		CLO4-AQN	1	Sample		
15	Vial 71	664926	CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1920571001		CLO4-AQN	1	Sample		
17	Vial 86	1920572001		CLO4-AQN	1	Sample		
18	Vial 87	1920581001	100	CLO4-AQN	1	Sample		
19	Vial 71	664927	CCV@25	CLO4-AQN	1	Ctrl Samp		

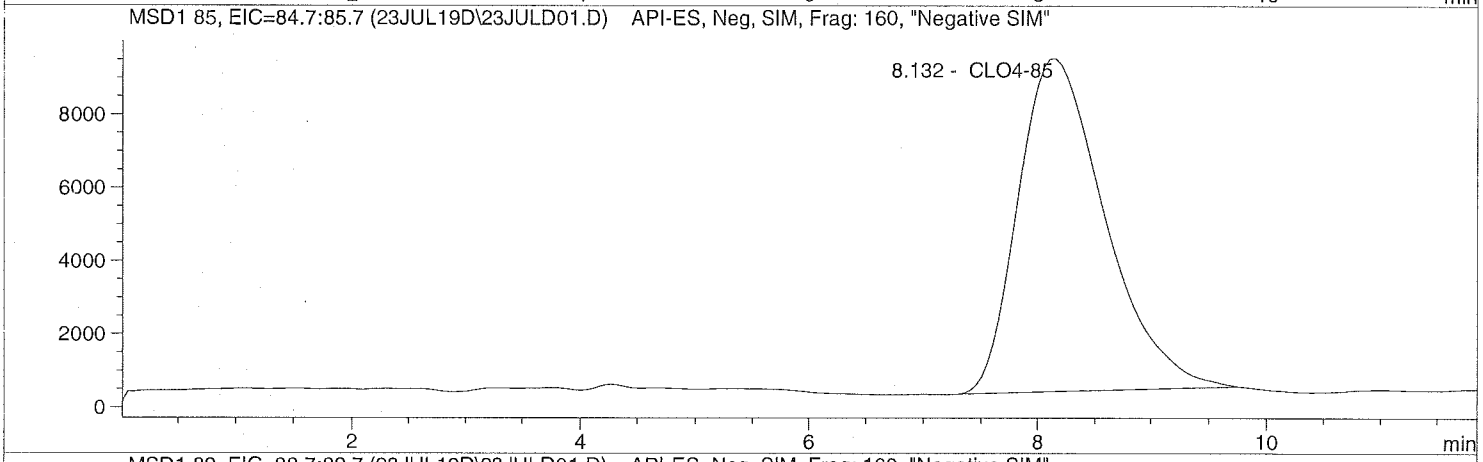
Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD01.D Sample Name: 664919 CCV@25

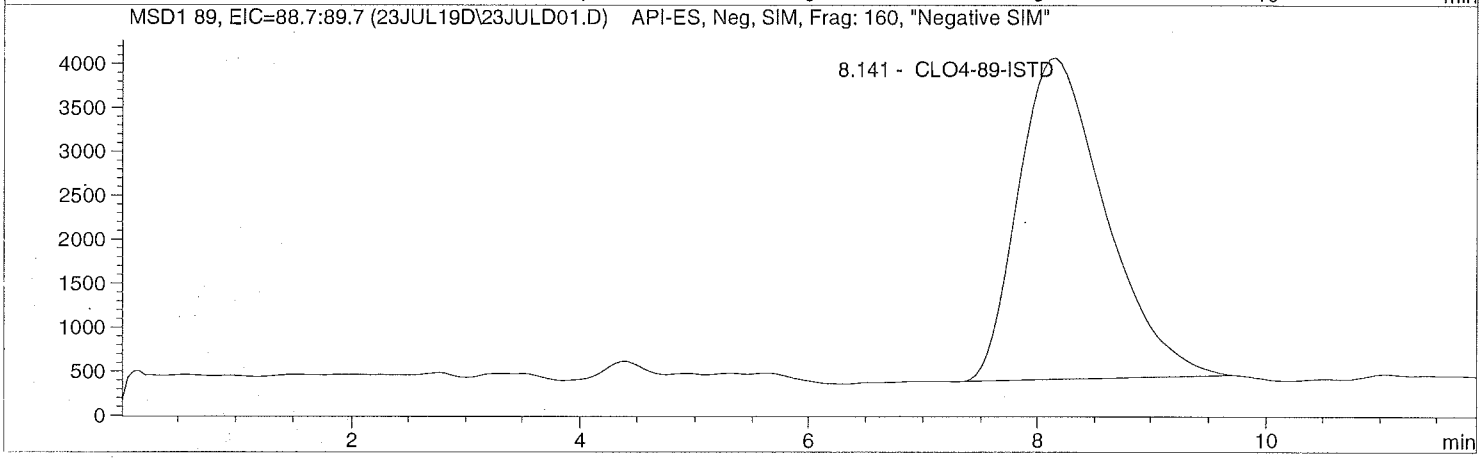
Injection Date:	7/23/2019 08:31:50	Seq Line:	1
Sample Name:	664919 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD01.D Sample Name: 664919 CCV@25

Injection Date:	7/23/2019 08:31:50	Seq Line:	1
Sample Name:	664919 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.125	PBA	1626721.4	25.5049	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.132	PBA	482242.2	25.4774	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.141	PBA	193813.0	5.0000	CLO4-89-ISTD

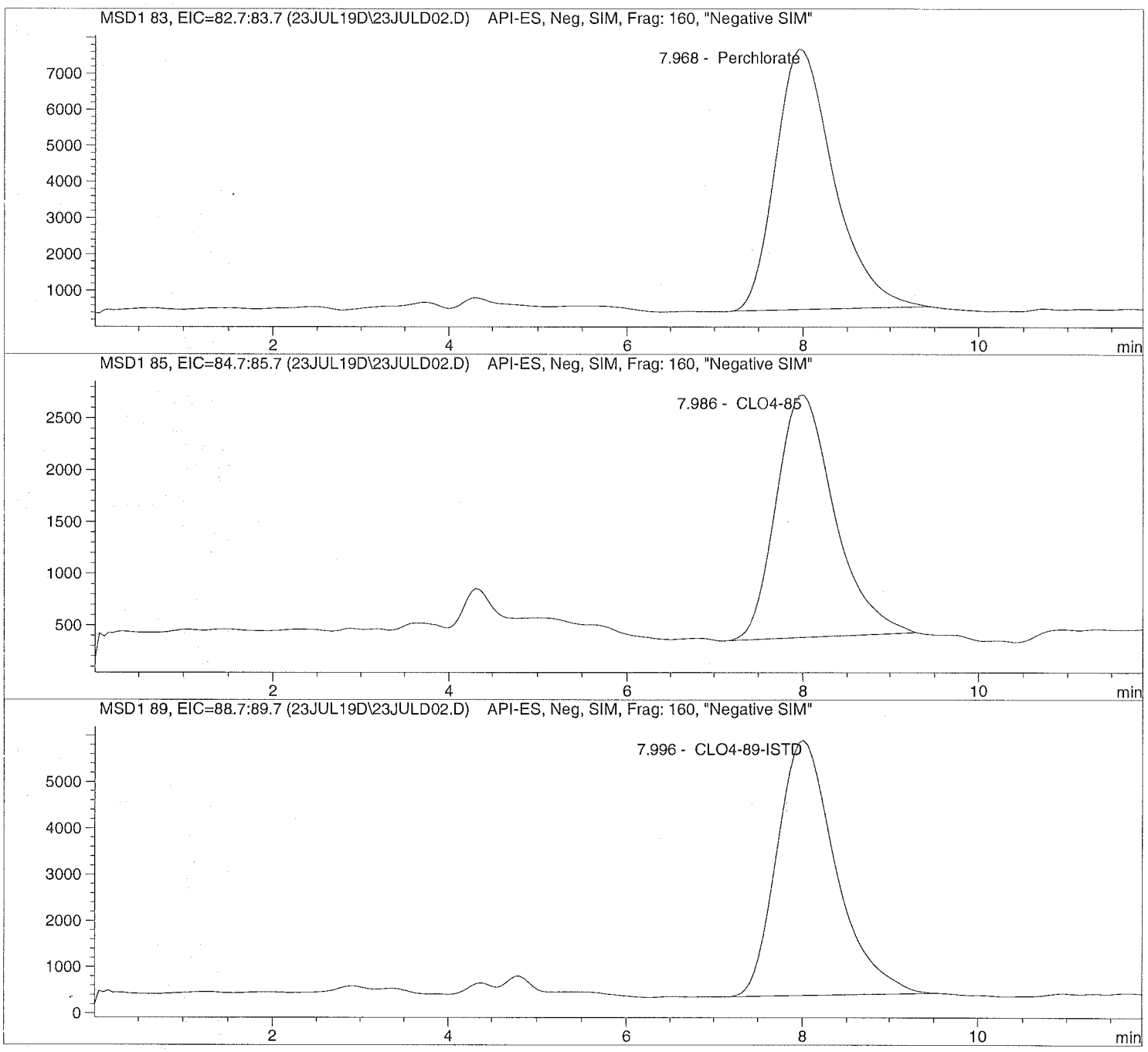
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD02.D Sample Name: 664923 QC@4.0

Injection Date:	7/23/2019 08:47:43	Seq Line:	2
Sample Name:	664923 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD02.D Sample Name: 664923 QC@4.0

Injection Date:	7/23/2019 08:47:43	Seq Line:	2
Sample Name:	664923 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.968	PBA	326275.9	4.2372	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.986	PBA	106930.0	4.5224	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.996	PBA	253018.7	5.0000	CLO4-89-ISTD

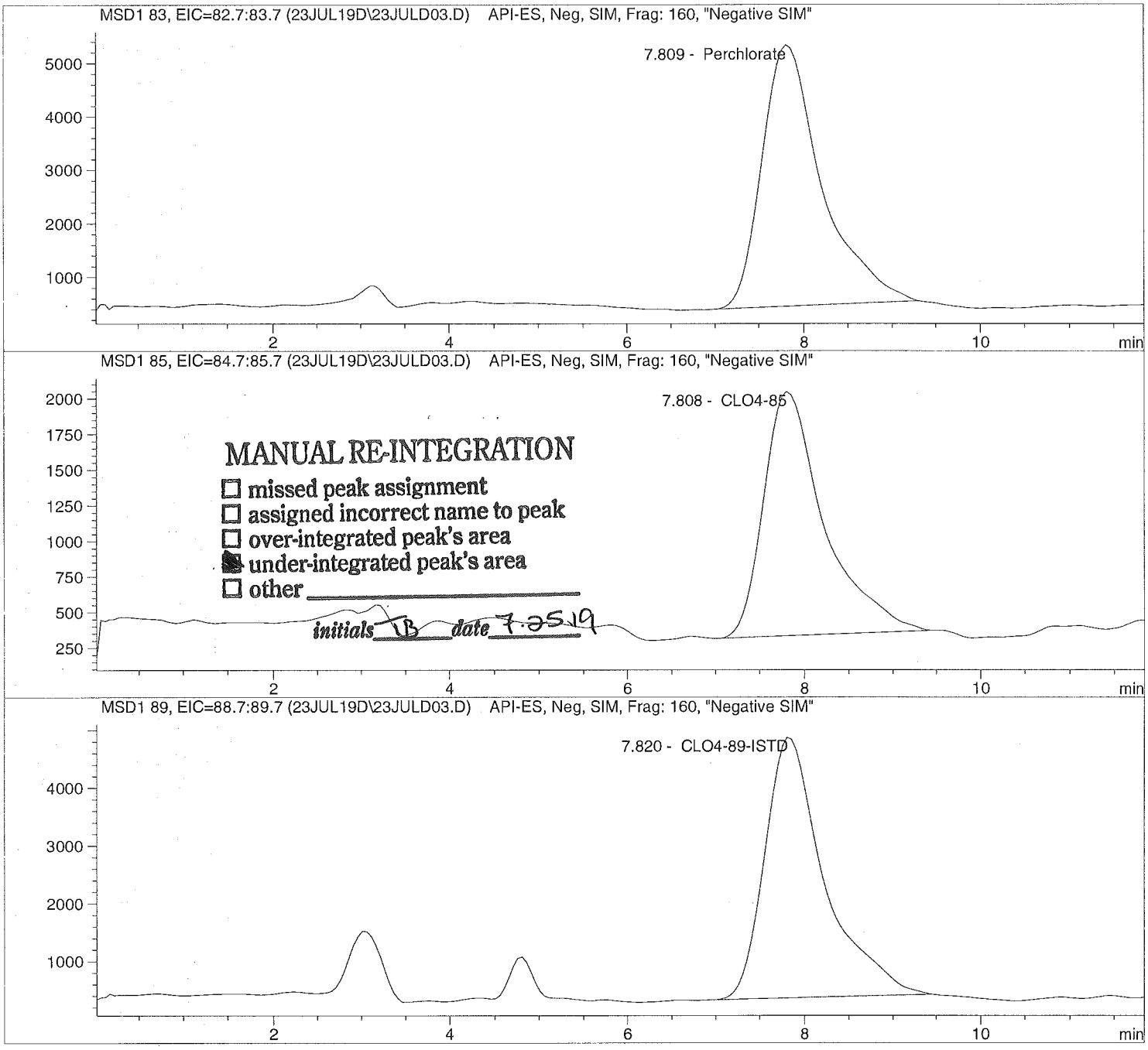
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD03.D Sample Name: 664921 ICS@4.0

Injection Date:	7/23/2019 09:01:39	Seq Line:	3
Sample Name:	664921 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD03.D Sample Name: 664921 ICS@4.0

Injection Date:	7/23/2019 09:01:39	Seq Line:	3
Sample Name:	664921 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.809	PBA	226823.0	3.5980	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.808	MM	80792.7	4.1422	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.820	PBA	208873.6	5.0000	CLO4-89-ISTD

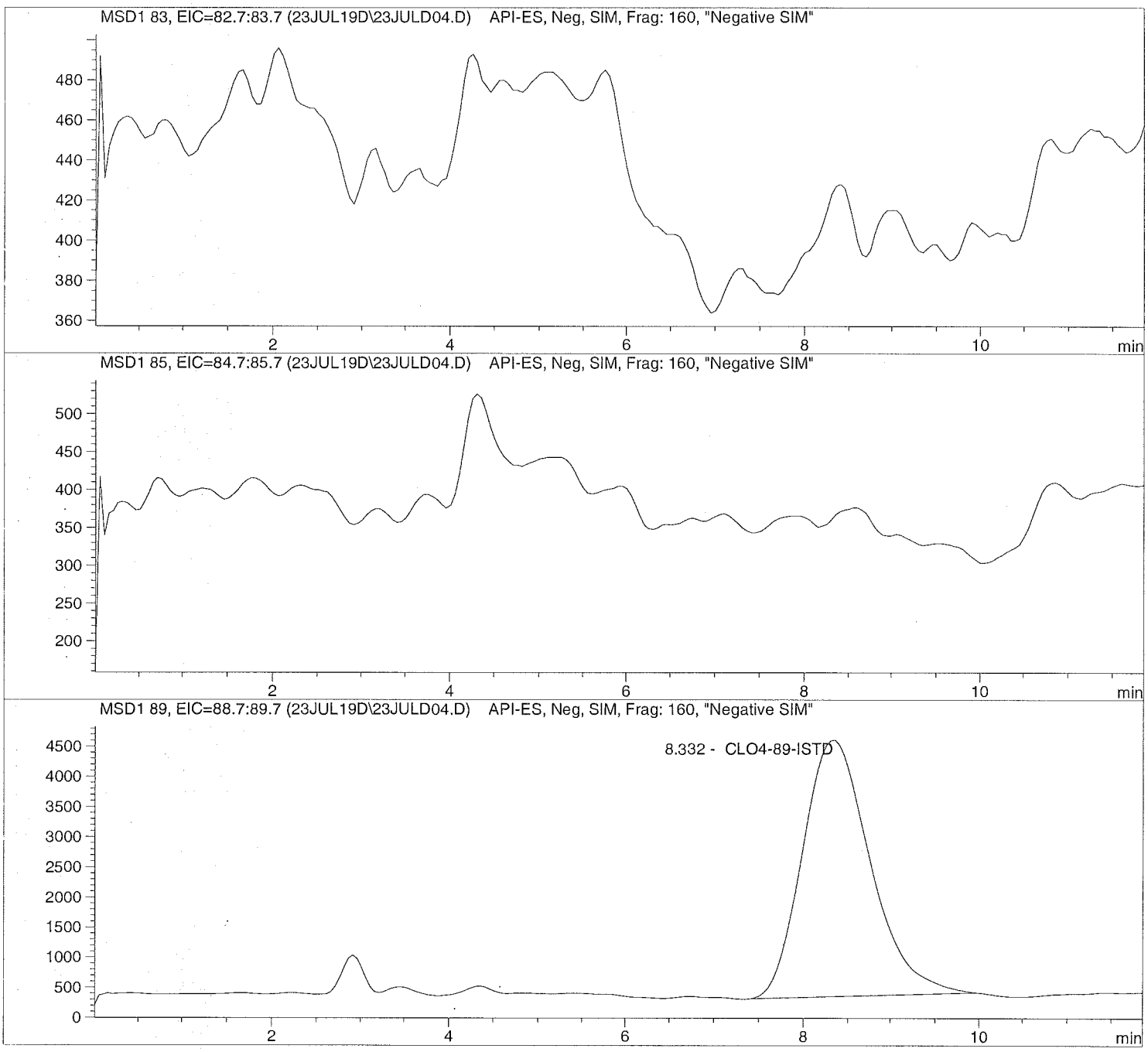
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD04.D Sample Name: 664922 LMB

Injection Date:	7/23/2019 09:15:35	Seq Line:	4
Sample Name:	664922 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD04.D Sample Name: 664922 LMB

Injection Date:	7/23/2019 09:15:35	Seq Line:	4
Sample Name:	664922 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.332	PBA	228612.6	5.0000	CLO4-89-ISTD

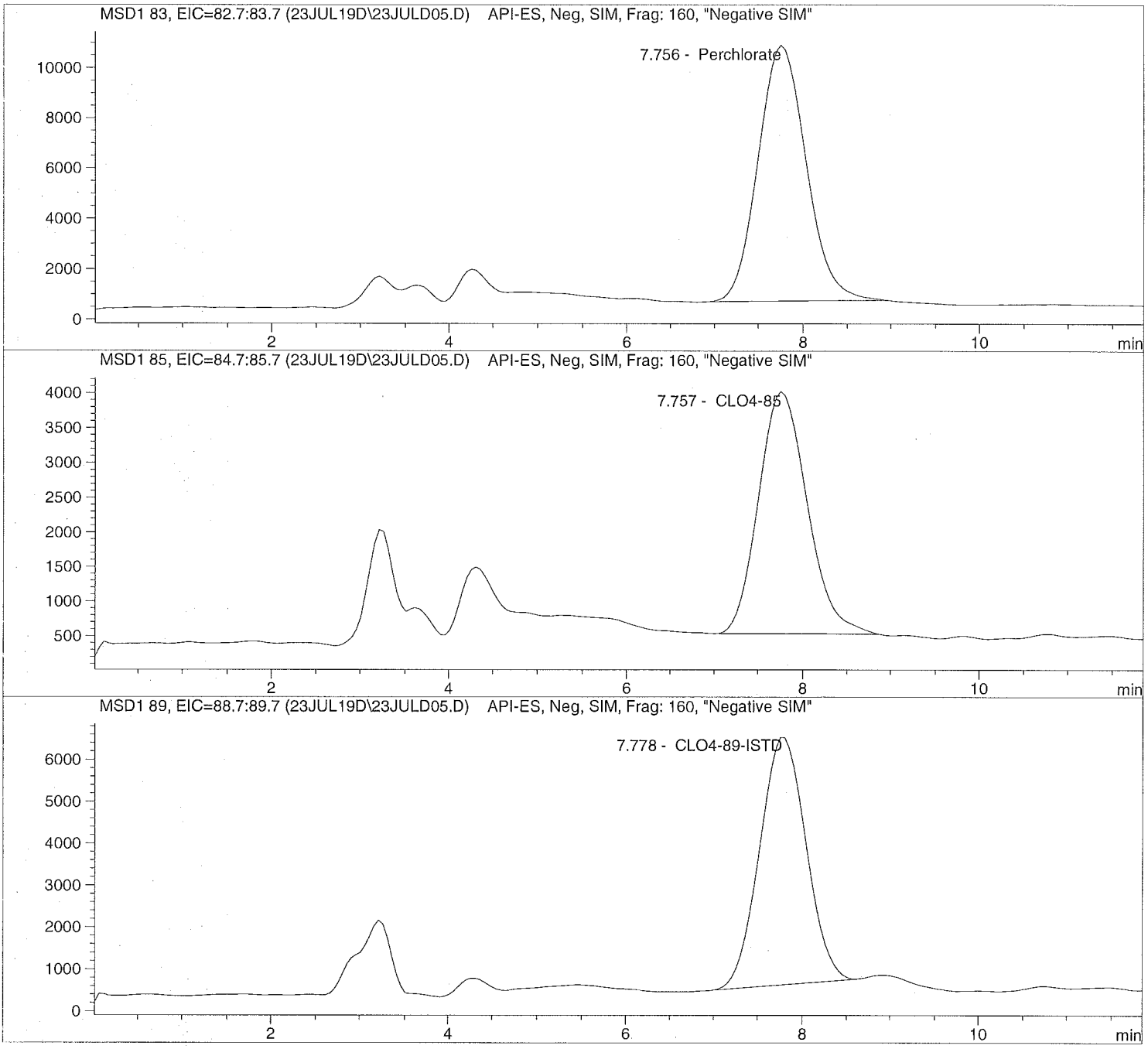
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD05.D Sample Name: 1920034001

Injection Date:	7/23/2019 09:29:31	Seq Line:	5
Sample Name:	1920034001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD05.D Sample Name: 1920034001

Injection Date:	7/23/2019 09:29:31	Seq Line:	5
Sample Name:	1920034001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.756	PBA	378721.2	5.7639	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.757	PBA	132206.6	6.6144	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.778	PBA	212985.8	5.0000	CLO4-89-ISTD

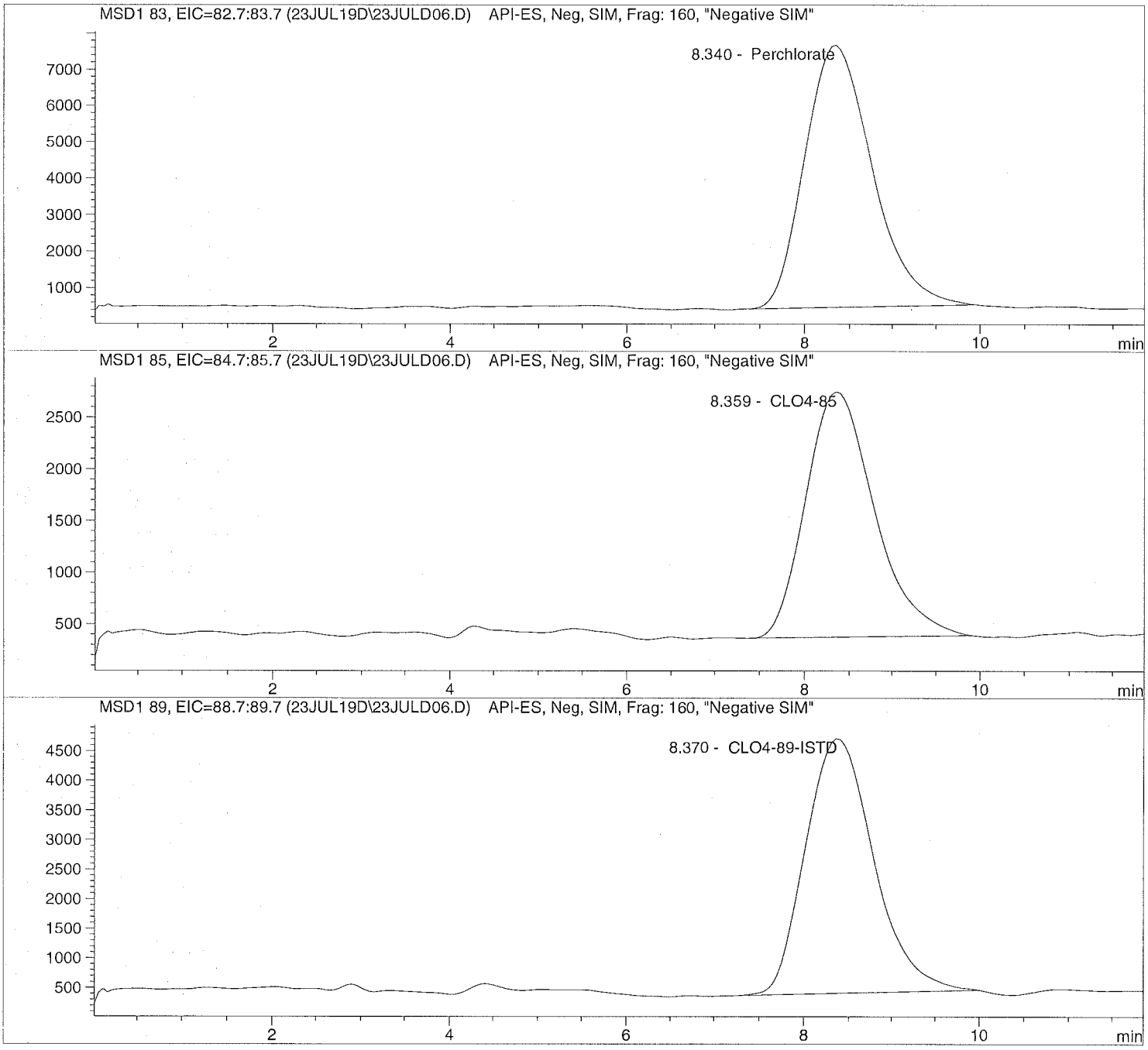
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD06.D Sample Name: 1920122001 100

Injection Date:	7/23/2019 09:43:25	Seq Line:	6
Sample Name:	1920122001 100	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD06.D Sample Name: 1920122001 100

Injection Date:	7/23/2019 09:43:25	Seq Line:	6
Sample Name:	1920122001 100	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.340	PBA	381315.1	535.8053	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.359	PBA	127974.4	590.2080	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.370	PBA	231390.0	500.0000	CLO4-89-ISTD

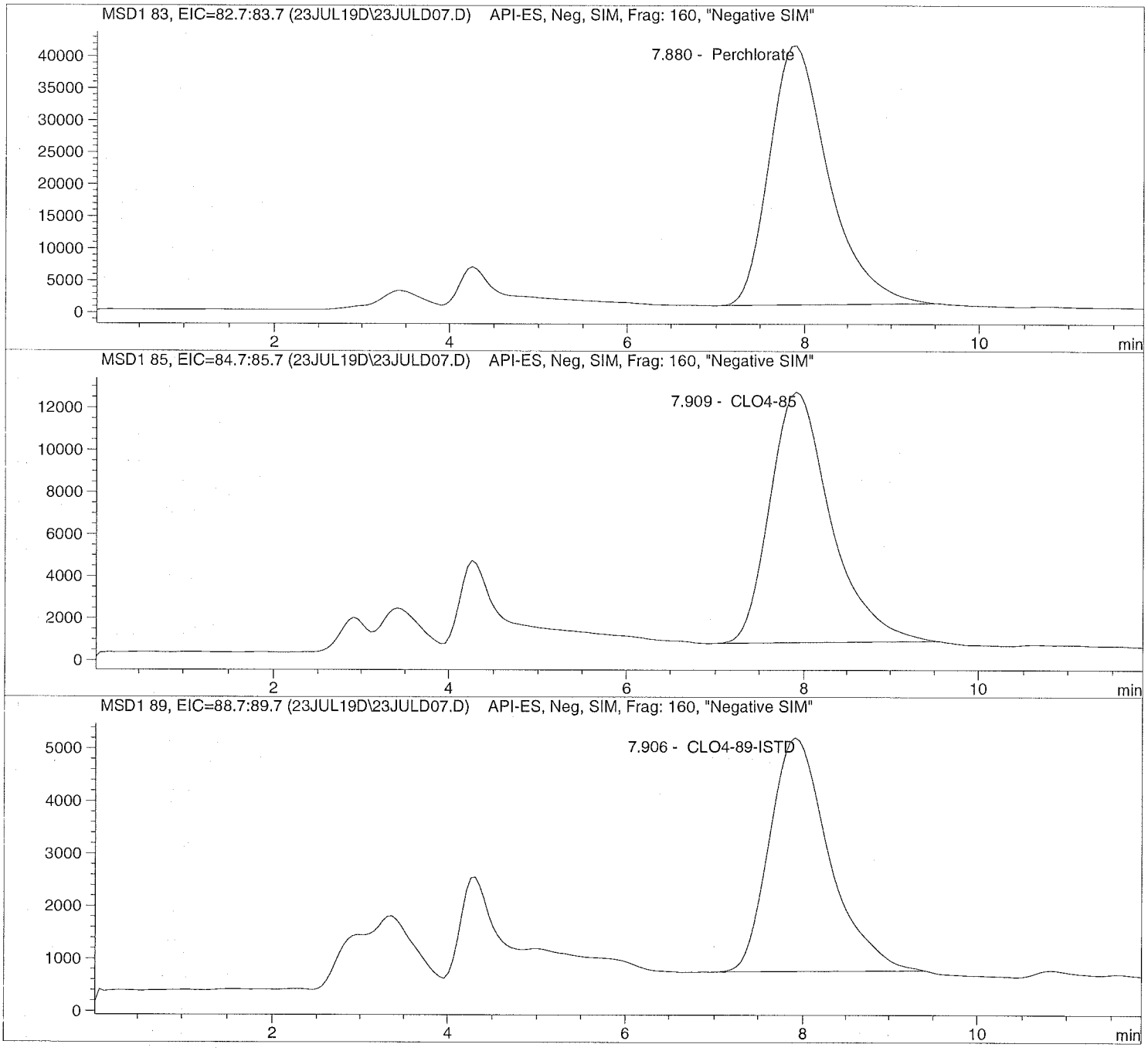
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD07.D Sample Name: 1920123001

Injection Date:	7/23/2019 09:57:24	Seq Line:	7
Sample Name:	1920123001	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD07.D Sample Name: 1920123001

Injection Date:	7/23/2019 09:57:24	Seq Line:	7
Sample Name:	1920123001	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.880	PBA	1887029.5	27.3071	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.909	PBA	571391.9	27.8427	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.906	PBA	209097.0	5.0000	CLO4-89-ISTD

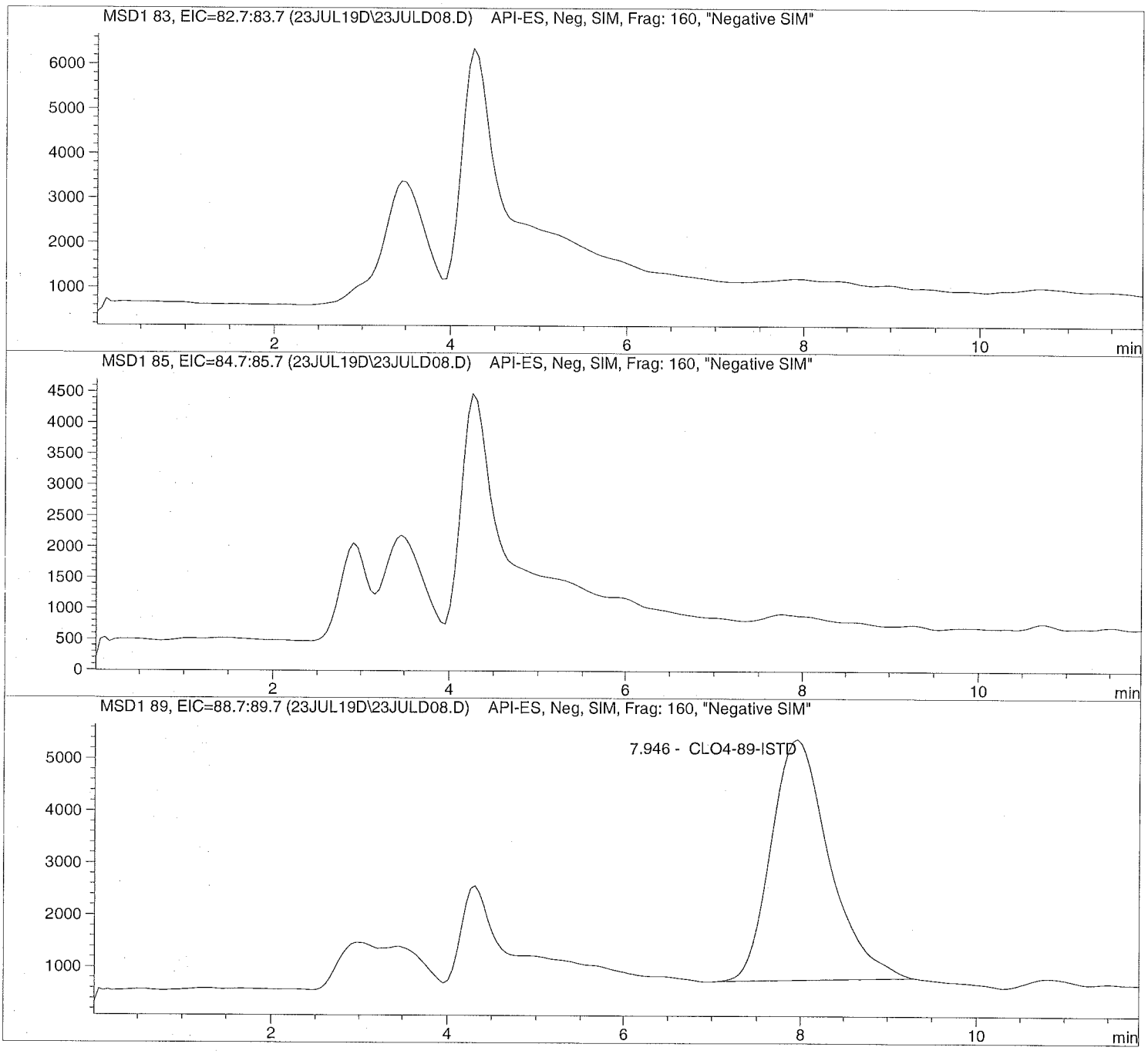
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD08.D Sample Name: 1920123002

Injection Date:	7/23/2019 10:11:24	Seq Line:	8
Sample Name:	1920123002	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD08.D Sample Name: 1920123002

Injection Date:	7/23/2019 10:11:24	Seq Line:	8
Sample Name:	1920123002	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.946	PBA	214312.1	5.0000	CLO4-89-ISTD

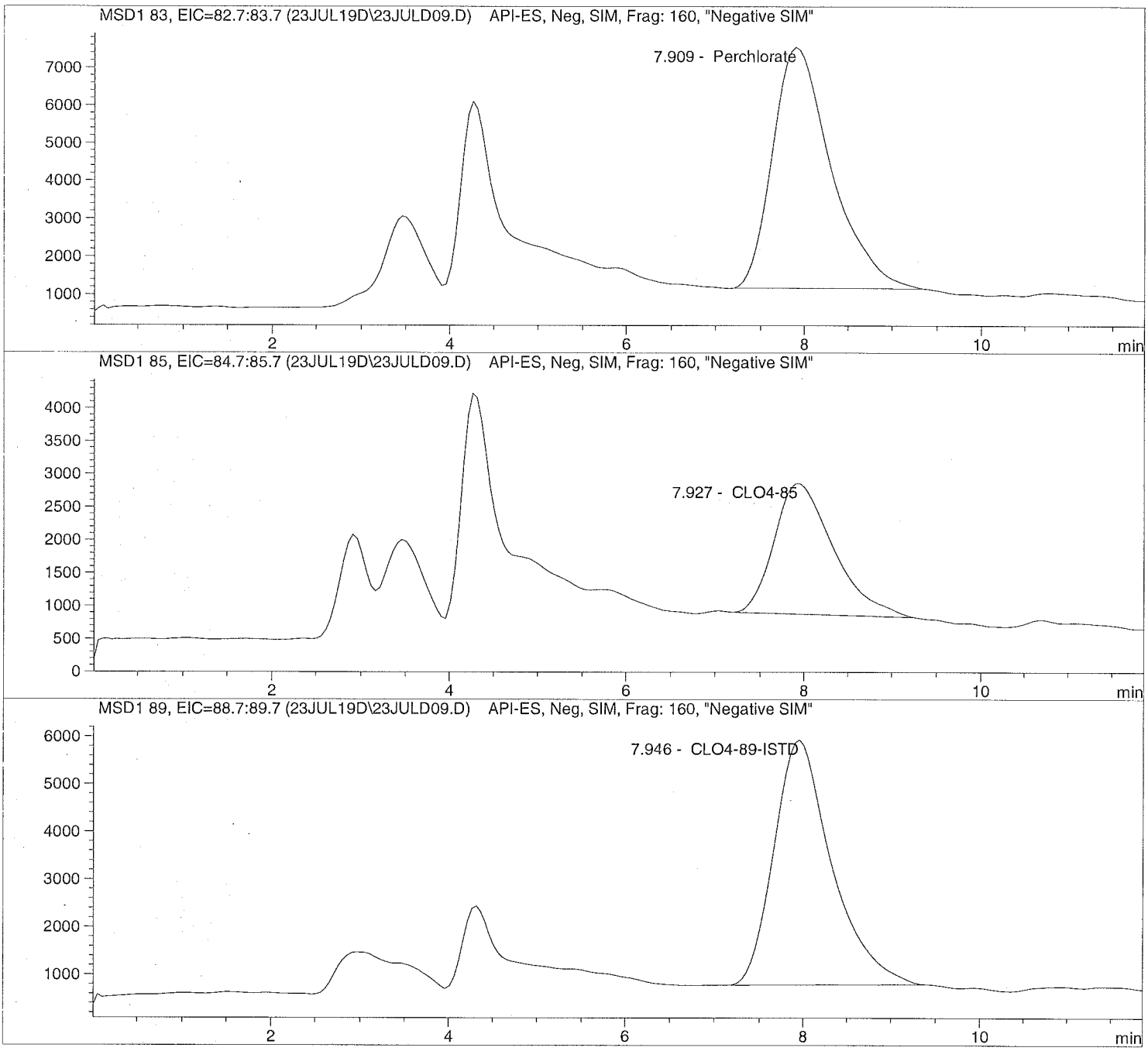
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD09.D Sample Name: 664924 201232S

Injection Date:	7/23/2019 10:25:26	Seq Line:	9
Sample Name:	664924 201232S	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	7/23/2019 10:25:26	Seq Line:	9
Sample Name:	664924 201232S	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.909	PBA	294718.6	4.1242	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.927	PBA	93034.3	4.2366	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.946	PBA	235117.5	5.0000	CLO4-89-ISTD

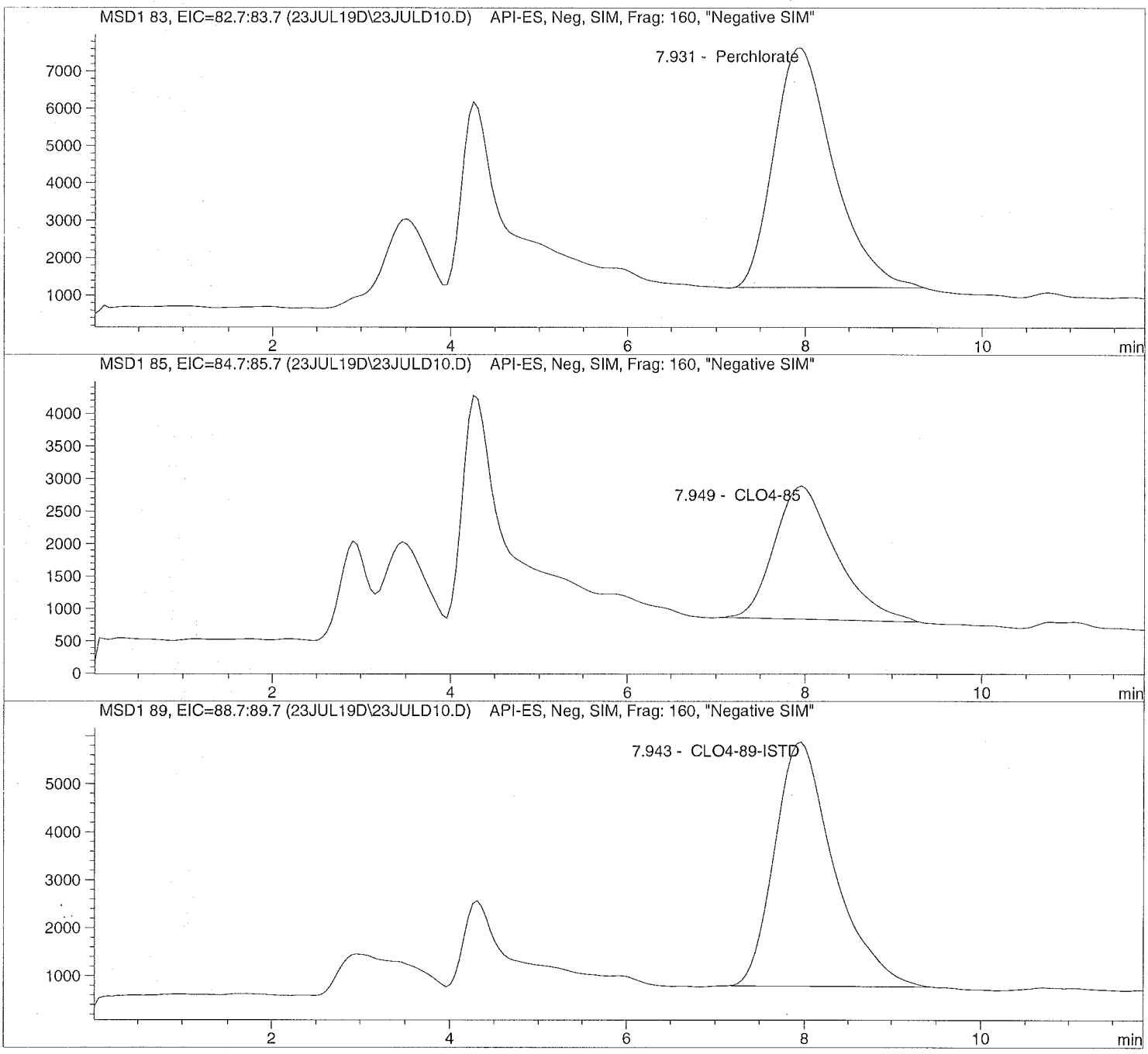
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD10.D Sample Name: 664925 201232D

Injection Date:	7/23/2019 10:39:29	Seq Line:	10
Sample Name:	664925 201232D	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Injection Date:	7/23/2019 10:39:29	Seq Line:	10
Sample Name:	664925 201232D	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.931	PBA	298082.3	4.1432	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.949	PBA	99050.2	4.4791	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.943	PBA	236656.9	5.0000	CLO4-89-ISTD

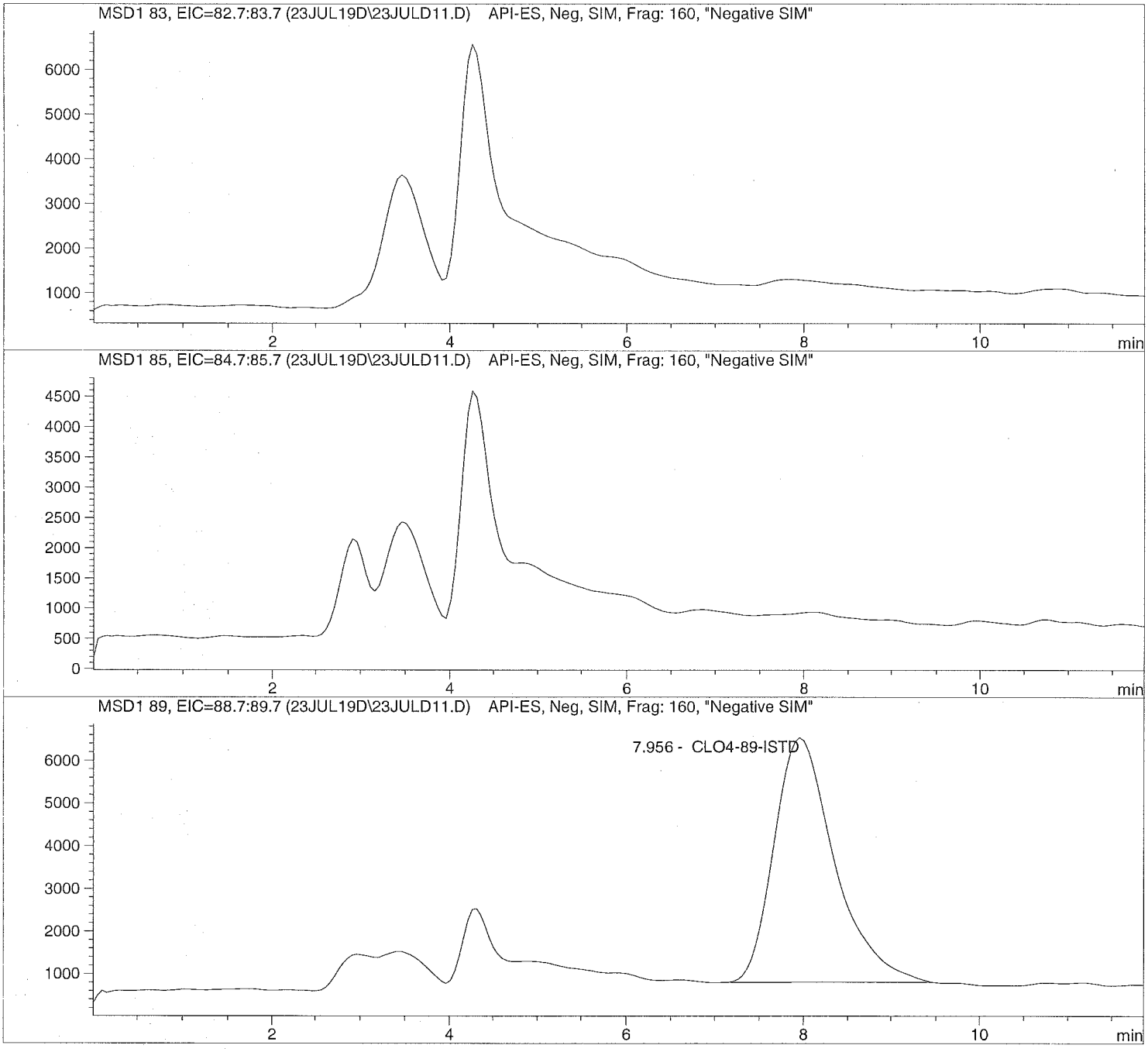
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD11.D Sample Name: 1920123003

Injection Date:	7/23/2019 10:53:24	Seq Line:	11
Sample Name:	1920123003	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD11.D Sample Name: 1920123003

Injection Date:	7/23/2019 10:53:24	Seq Line:	11
Sample Name:	1920123003	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.956	PBA	272319.7	5.0000	CLO4-89-ISTD

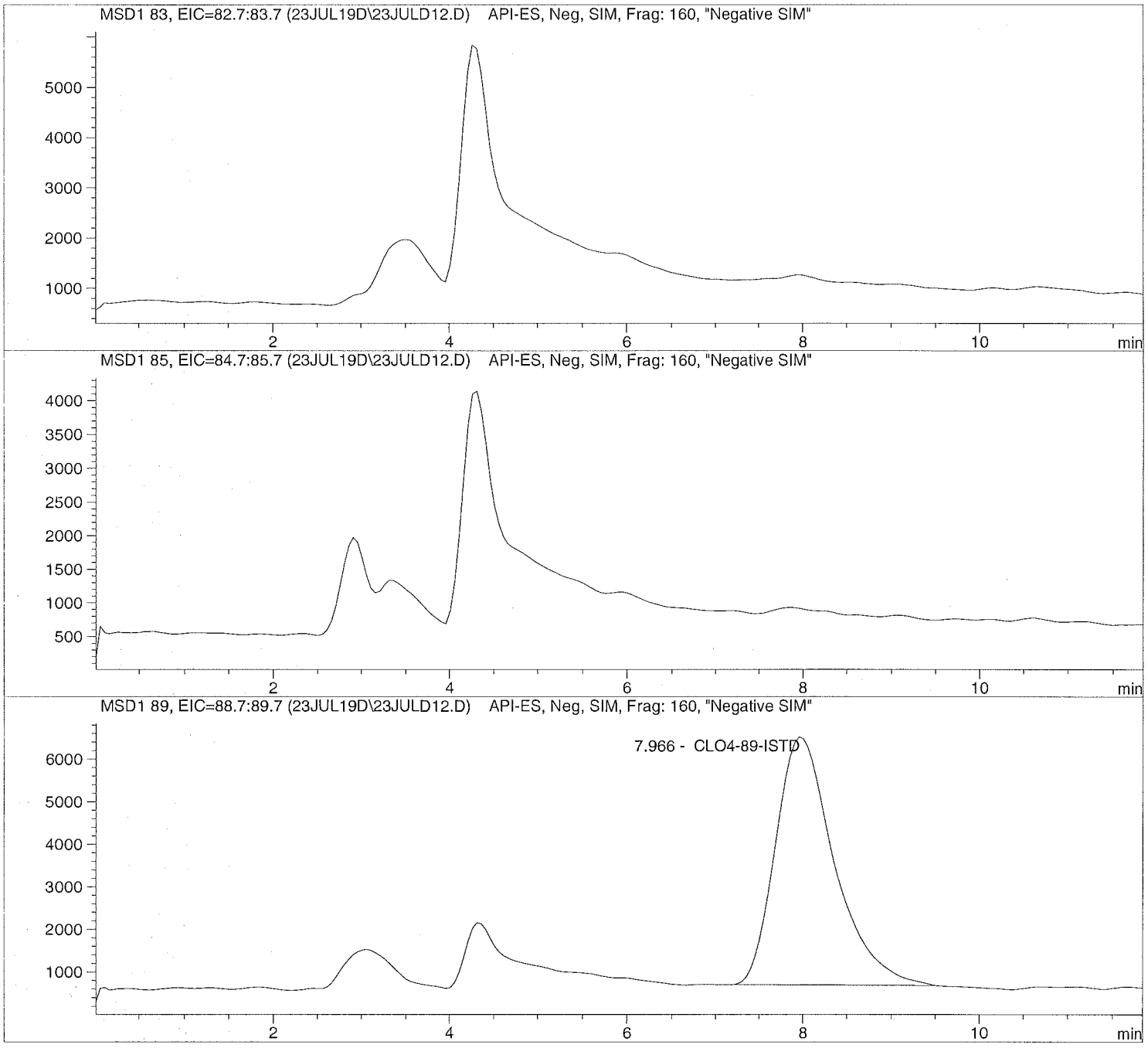
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD12.D Sample Name: 1920123004

Injection Date:	7/23/2019 11:07:17	Seq Line:	12
Sample Name:	1920123004	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD12.D Sample Name: 1920123004

Injection Date:	7/23/2019 11:07:17	Seq Line:	12
Sample Name:	1920123004	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.966	PBA	270262.5	5.0000	CLO4-89-ISTD

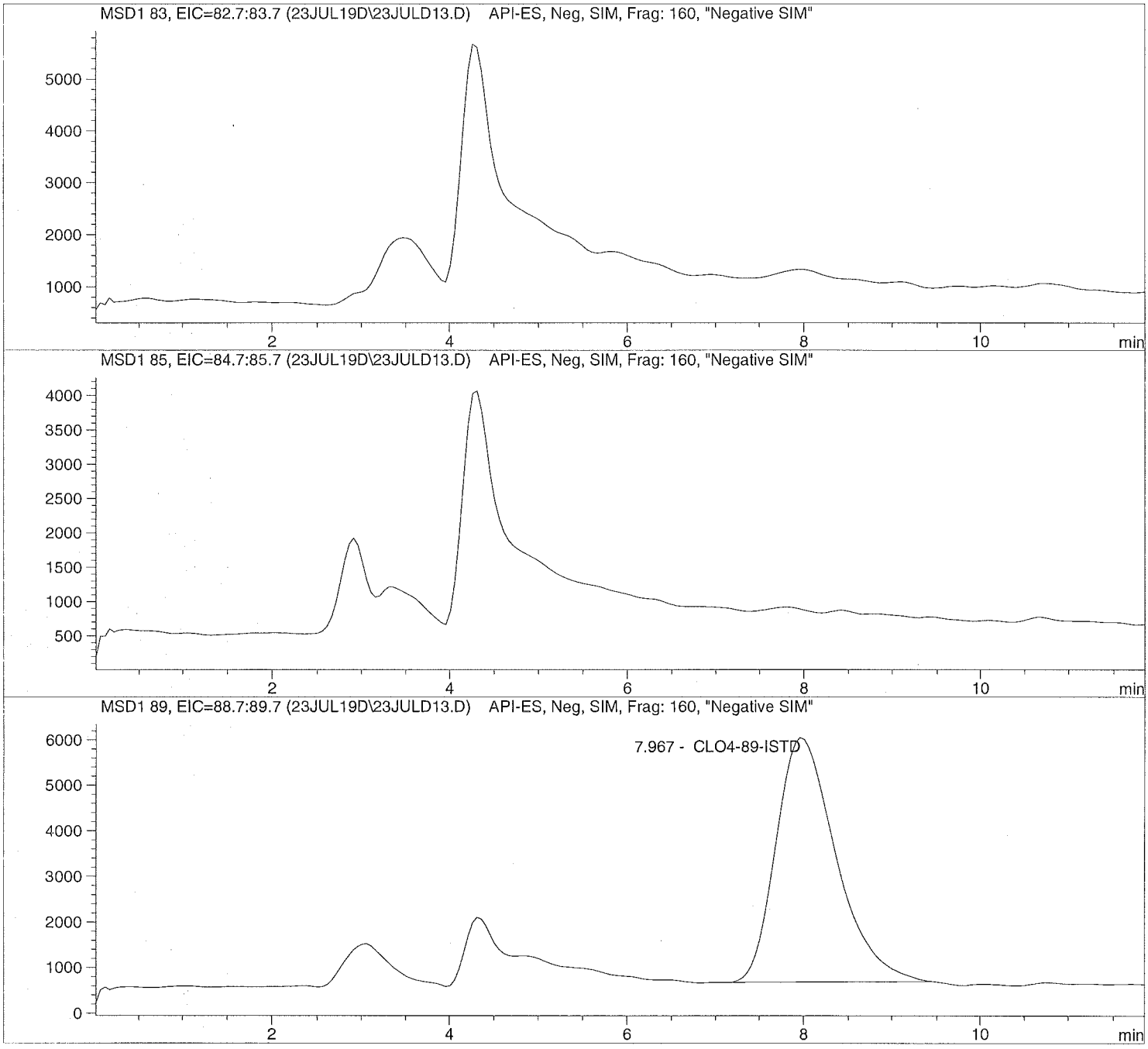
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD13.D Sample Name: 1920123005

Injection Date:	7/23/2019 11:21:18	Seq Line:	13
Sample Name:	1920123005	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD13.D Sample Name: 1920123005

Injection Date:	7/23/2019 11:21:18	Seq Line:	13
Sample Name:	1920123005	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.967	PBA	250553.8	5.0000	CLO4-89-ISTD

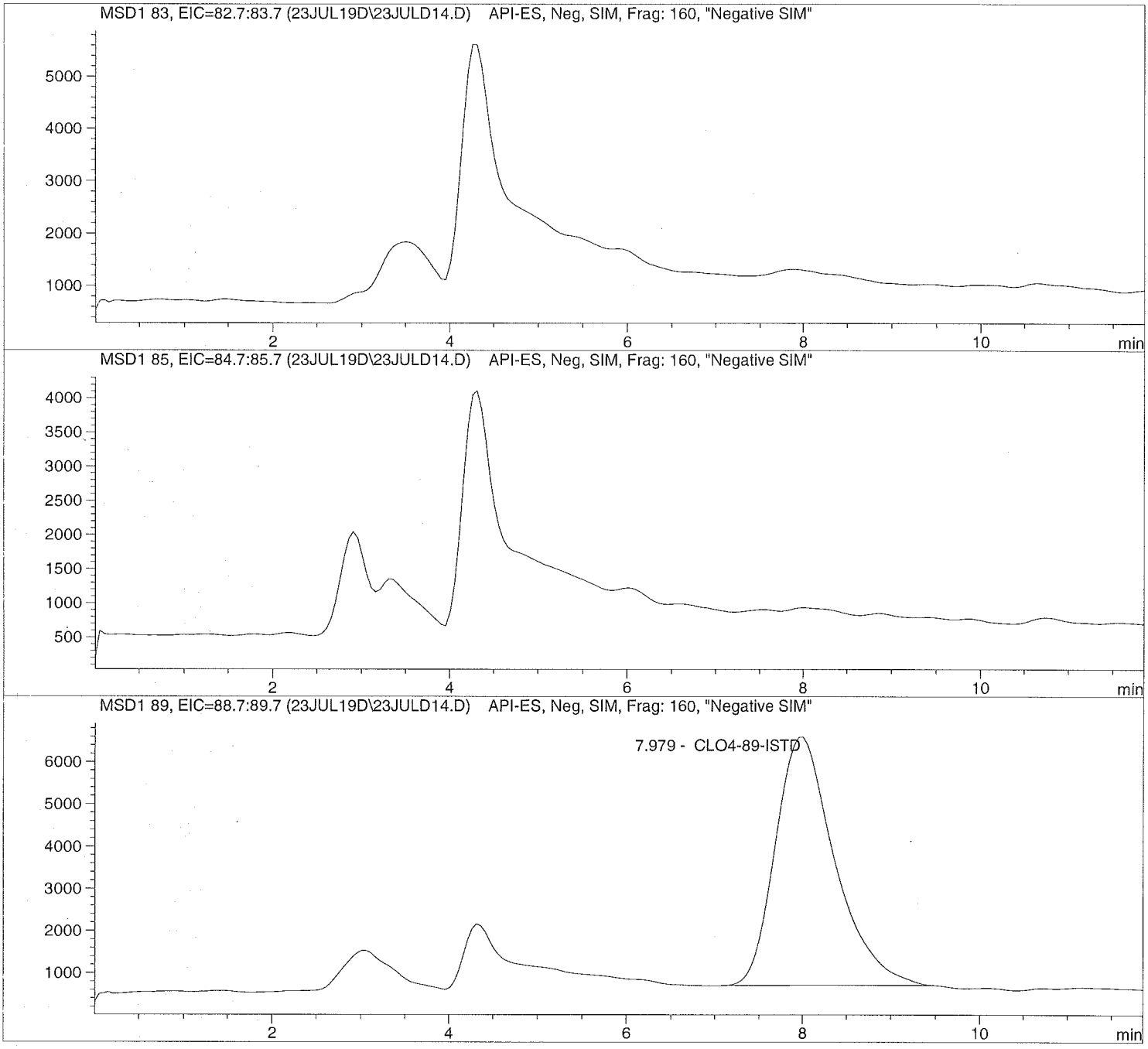
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD14.D Sample Name: 1920123006

Injection Date:	7/23/2019 11:35:11	Seq Line:	14
Sample Name:	1920123006	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD14.D Sample Name: 1920123006

Injection Date:	7/23/2019 11:35:11	Seq Line:	14
Sample Name:	1920123006	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.979	PBA	277086.1	5.0000	CLO4-89-ISTD

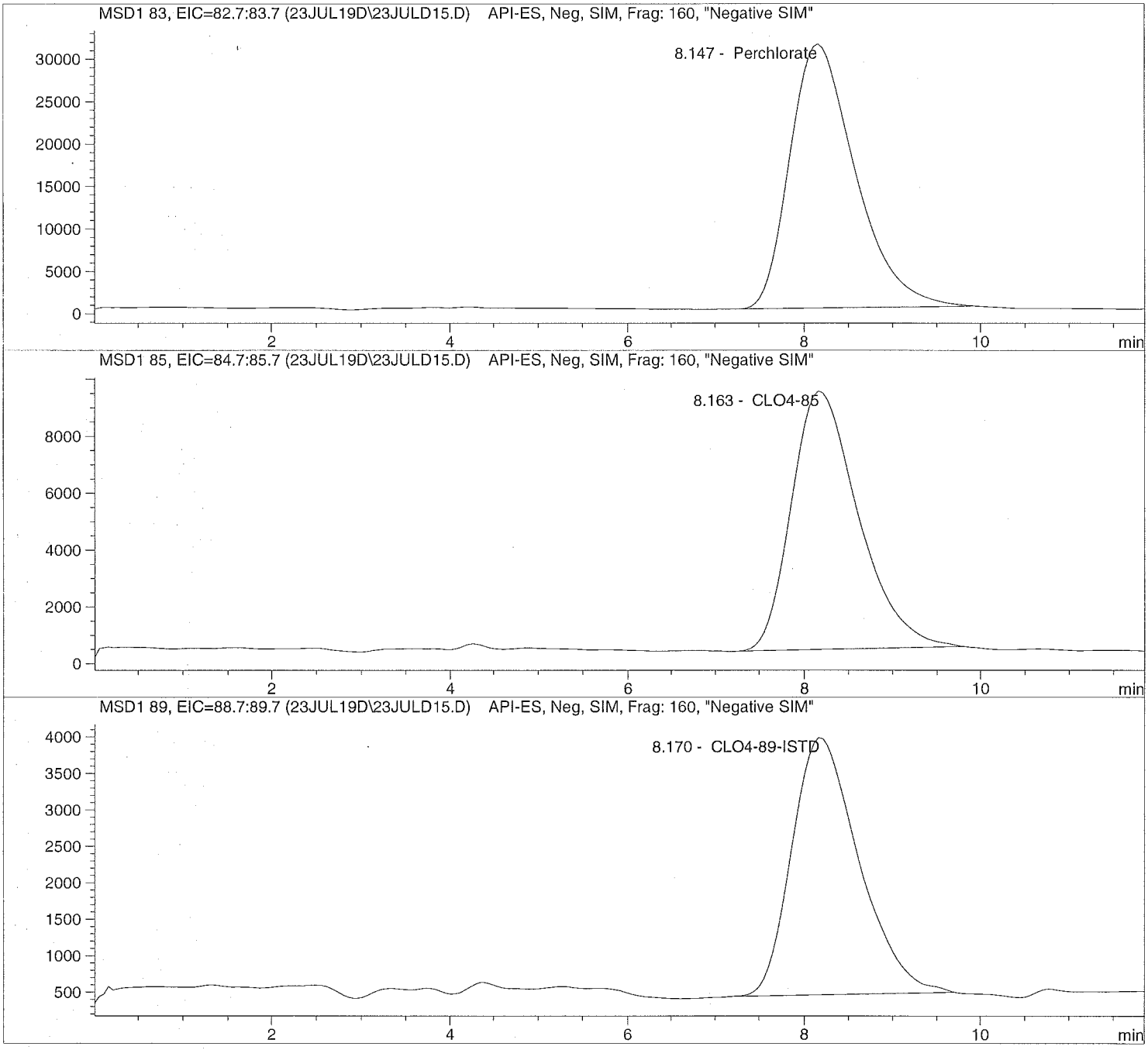
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD15.D Sample Name: 664926 CCV@25

Injection Date:	7/23/2019 11:49:04	Seq Line:	15
Sample Name:	664926 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD15.D Sample Name: 664926 CCV@25

Injection Date:	7/23/2019 11:49:04	Seq Line:	15
Sample Name:	664926 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.147	PBA	1584242.1	26.0929	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.163	PBA	473537.8	26.2735	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.170	PBA	184240.3	5.0000	CLO4-89-ISTD

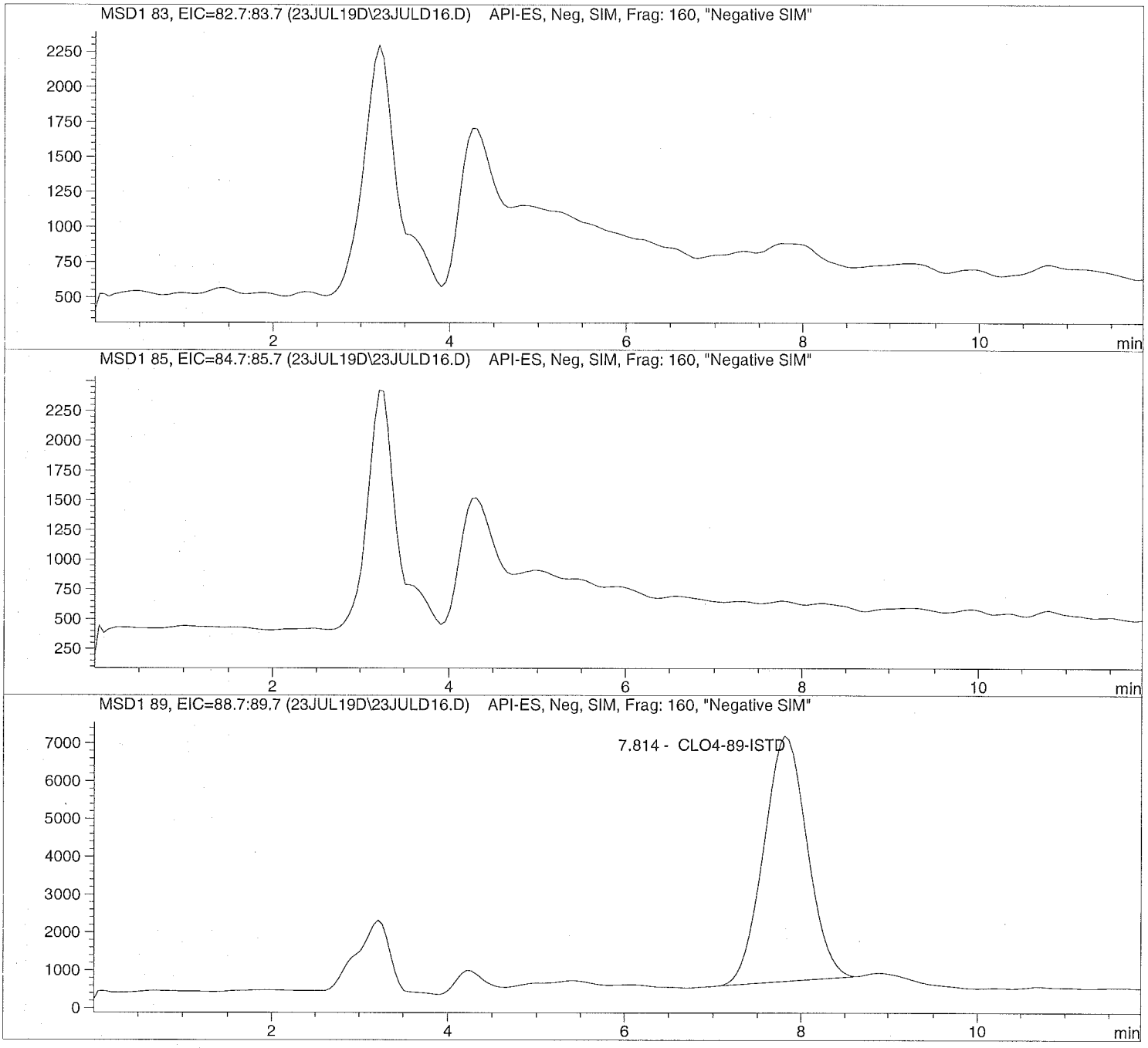
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD16.D Sample Name: 1920571001

Injection Date:	7/23/2019 12:03:02	Seq Line:	16
Sample Name:	1920571001	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD16.D Sample Name: 1920571001

Injection Date:	7/23/2019 12:03:02	Seq Line:	16
Sample Name:	1920571001	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.814	PBA	224656.6	5.0000	CLO4-89-ISTD

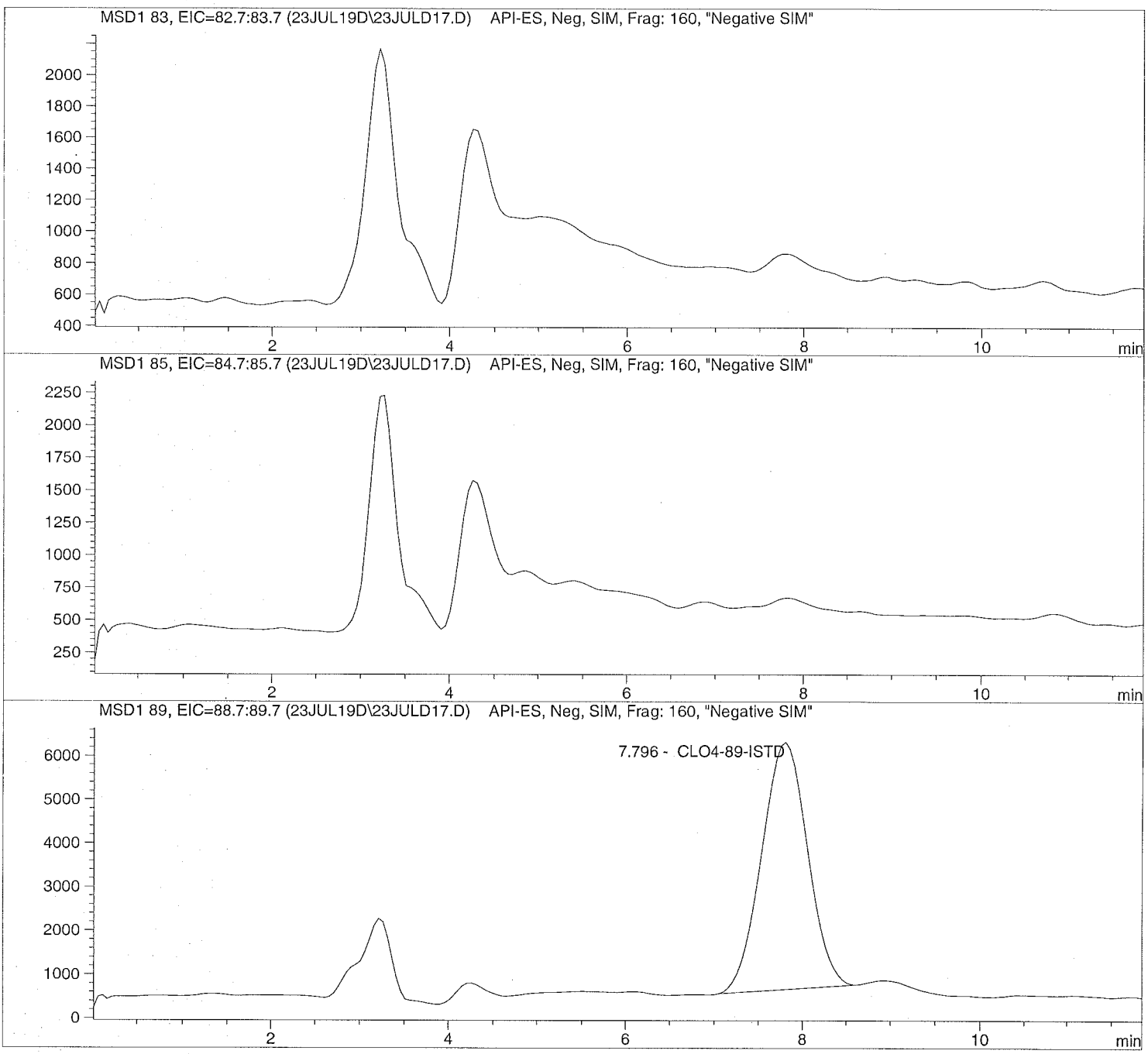
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD17.D Sample Name: 1920572001

Injection Date:	7/23/2019 12:16:58	Seq Line:	17
Sample Name:	1920572001	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD17.D Sample Name: 1920572001

Injection Date:	7/23/2019 12:16:58	Seq Line:	17
Sample Name:	1920572001	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.796	PBA	204102.5	5.0000	CLO4-89-ISTD

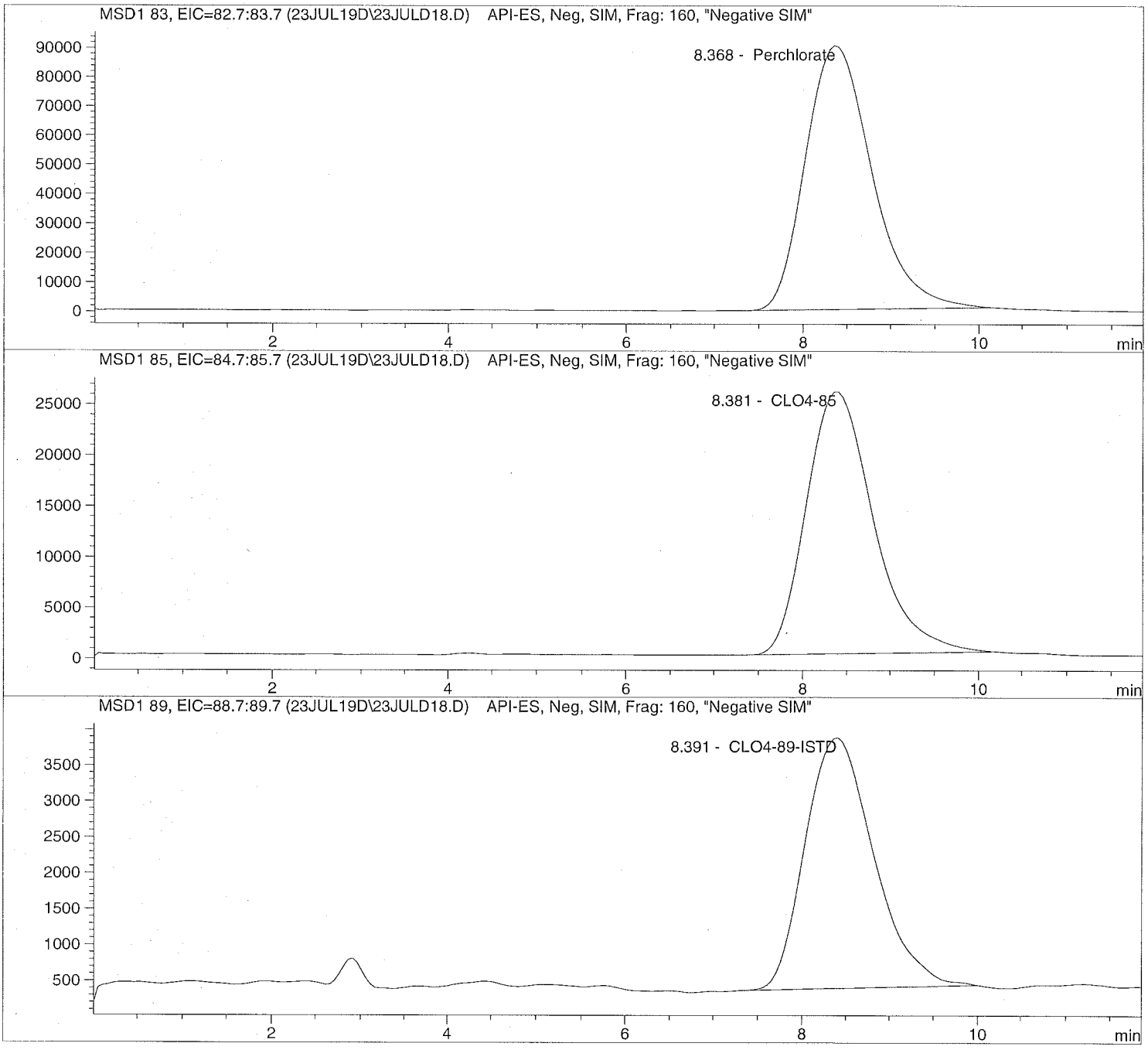
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD18.D Sample Name: 1920581001 100

Injection Date:	7/23/2019 12:30:57	Seq Line:	18
Sample Name:	1920581001 100	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD18.D Sample Name: 1920581001 100

Injection Date:	7/23/2019 12:30:57	Seq Line:	18
Sample Name:	1920581001 100	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.368	PBA	4742469.5	6892.8927	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.381	PBA	1372874.8	6775.2203	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.391	PBA	190565.5	500.0000	CLO4-89-ISTD

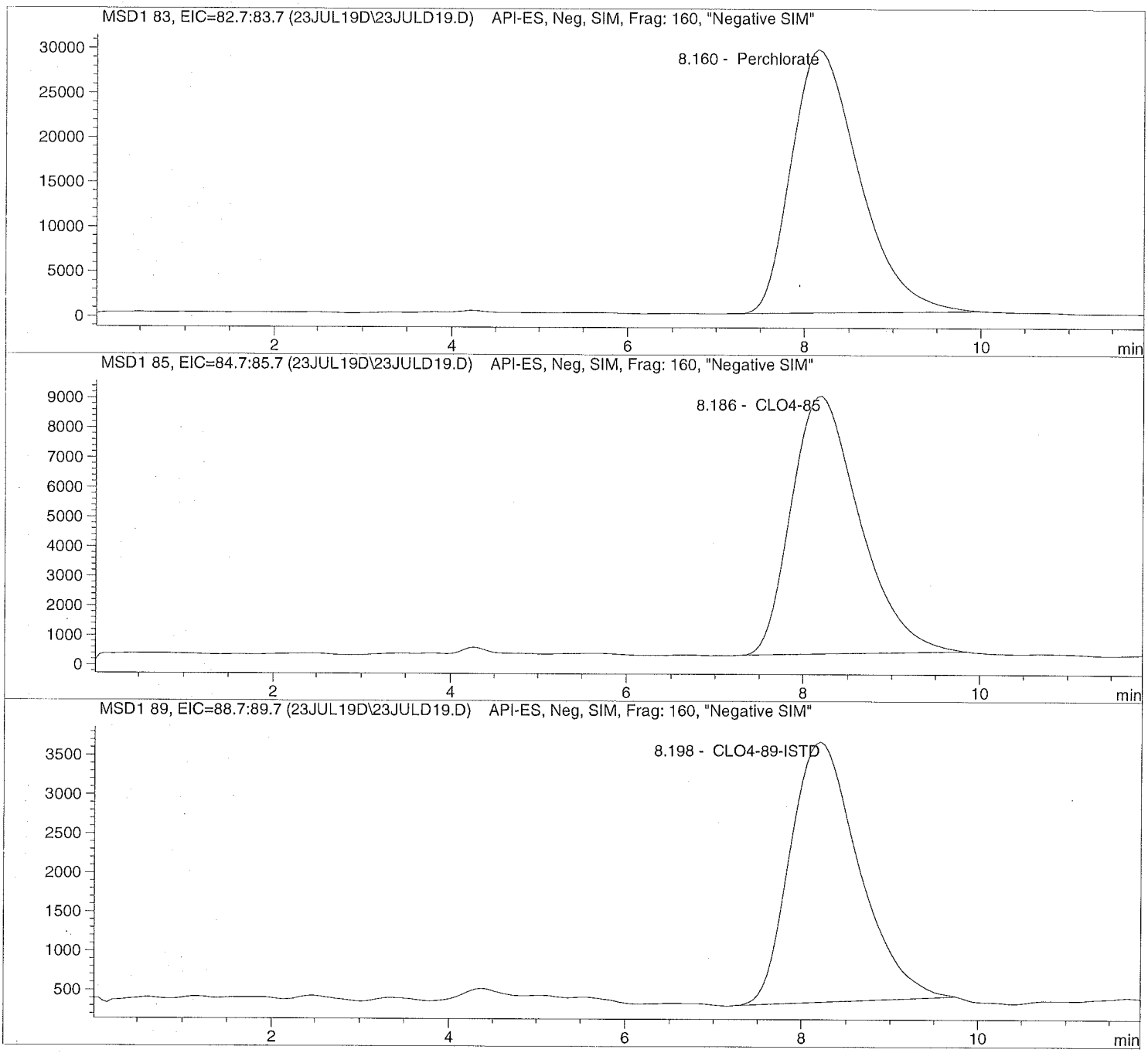
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD19.D Sample Name: 664927 CCV@25

Injection Date:	7/23/2019 12:44:47	Seq Line:	19
Sample Name:	664927 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD19.D Sample Name: 664927 CCV@25

Injection Date:	7/23/2019 12:44:47	Seq Line:	19
Sample Name:	664927 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.160	PBA	1565389.9	26.5099	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.186	PBA	466030.6	26.5949	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.198	PBA	179008.0	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
		7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

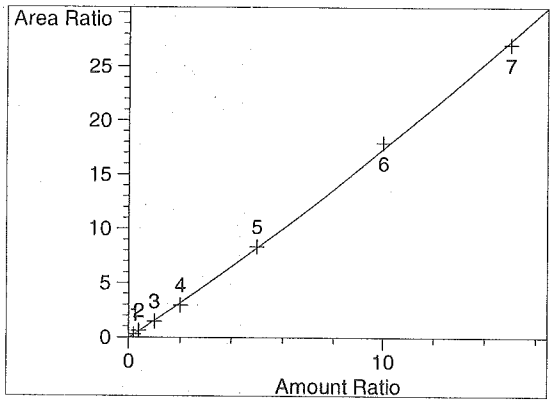
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

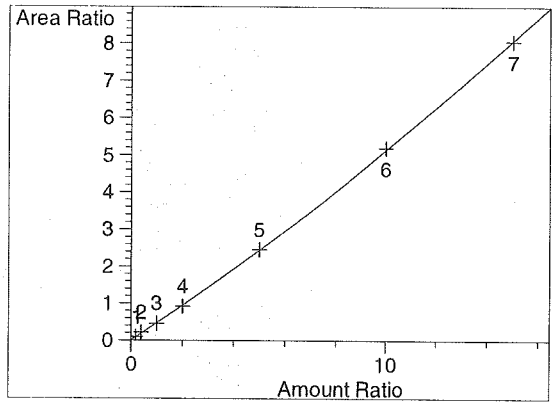
Peak Sum Table

No Entries in table

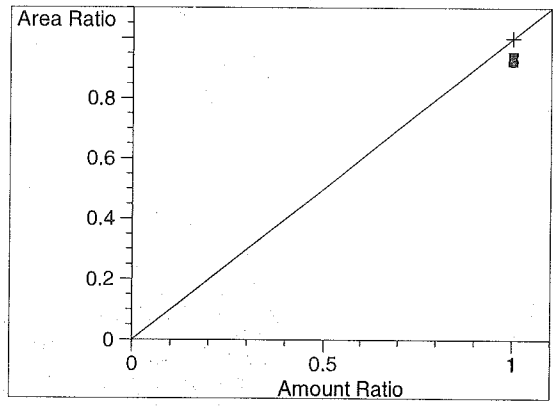
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Report: C:\HPCHEM\1\DATA\19MAR19I\19MAR19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

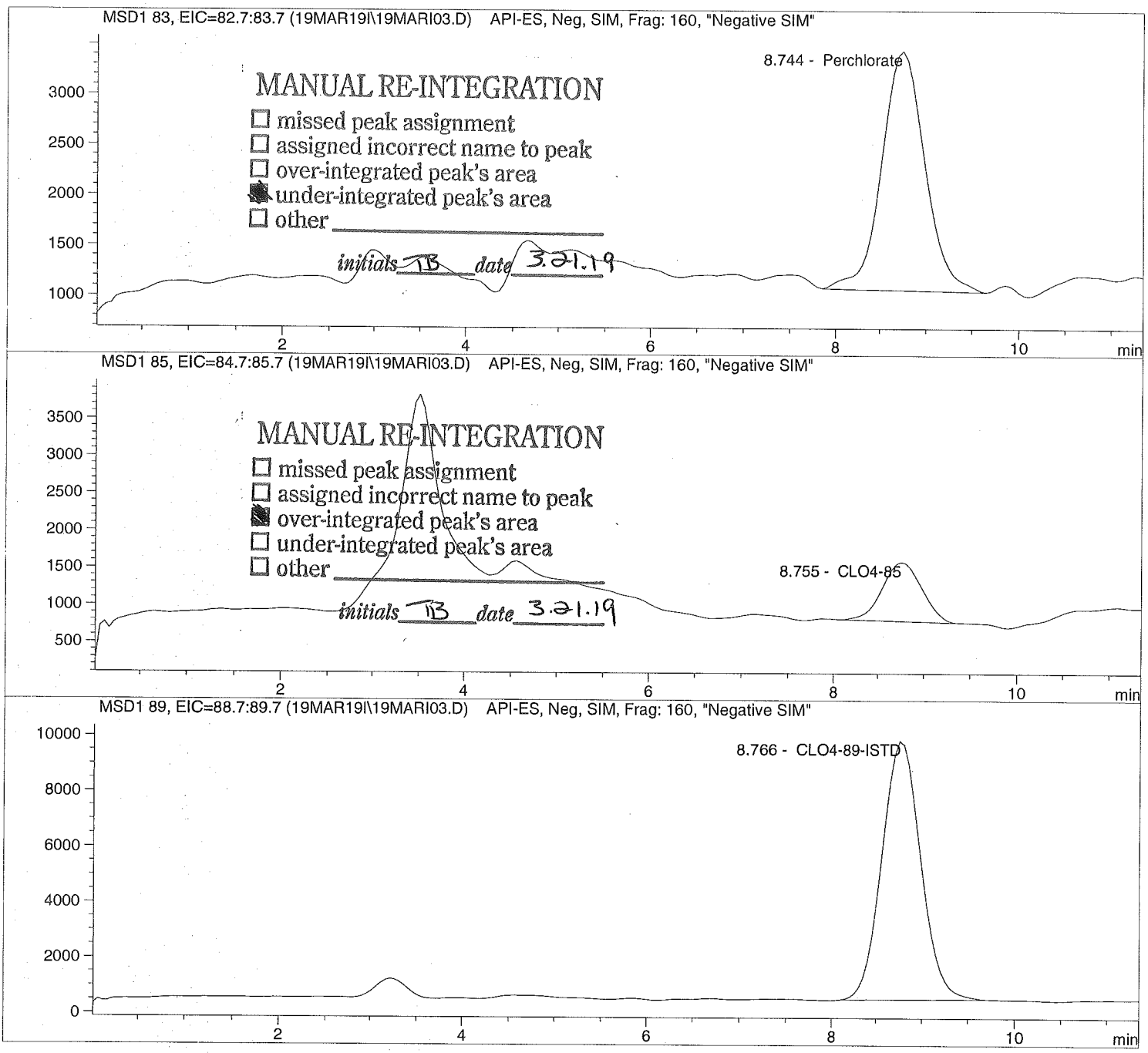
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

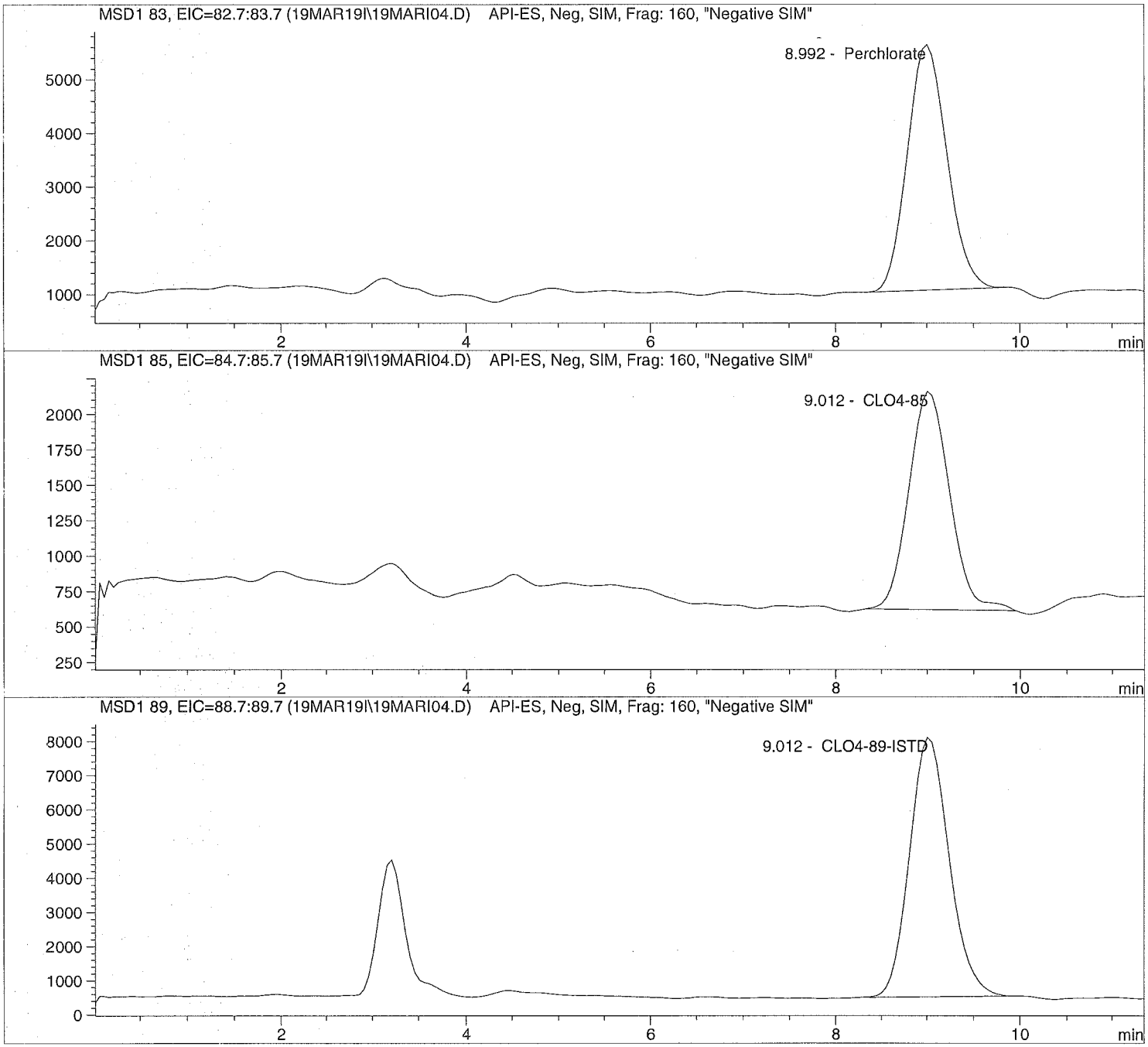
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

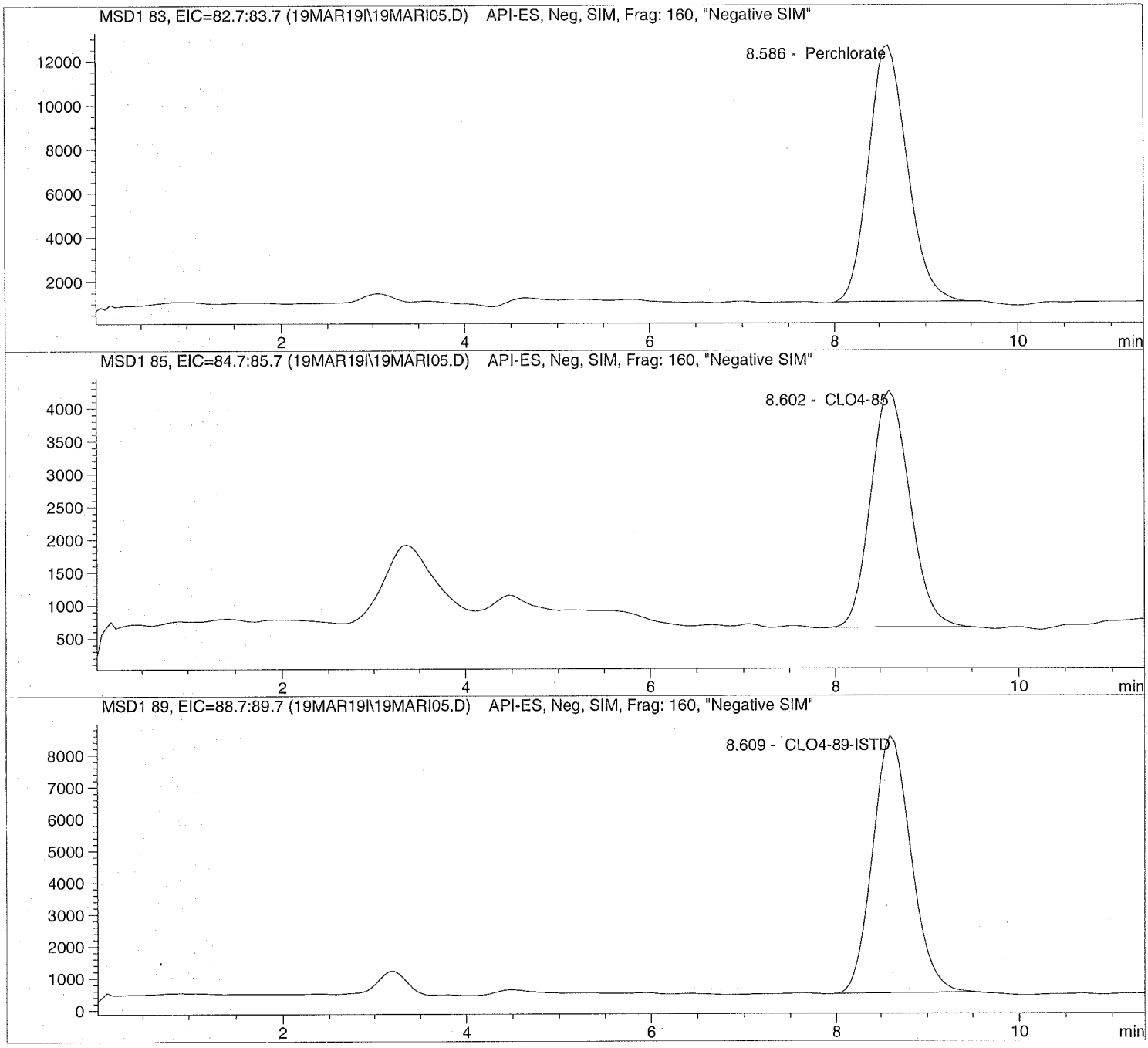
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

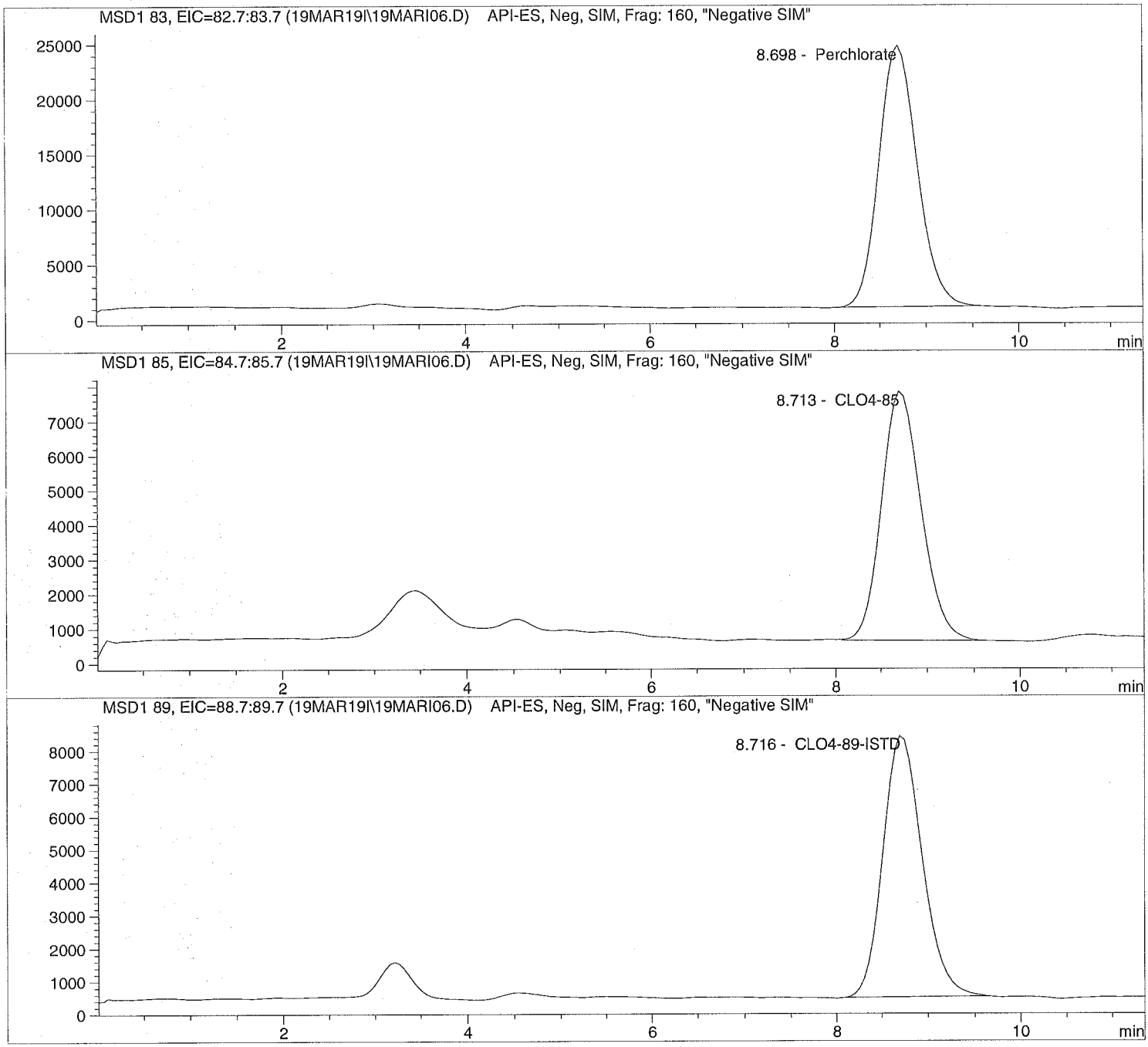
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

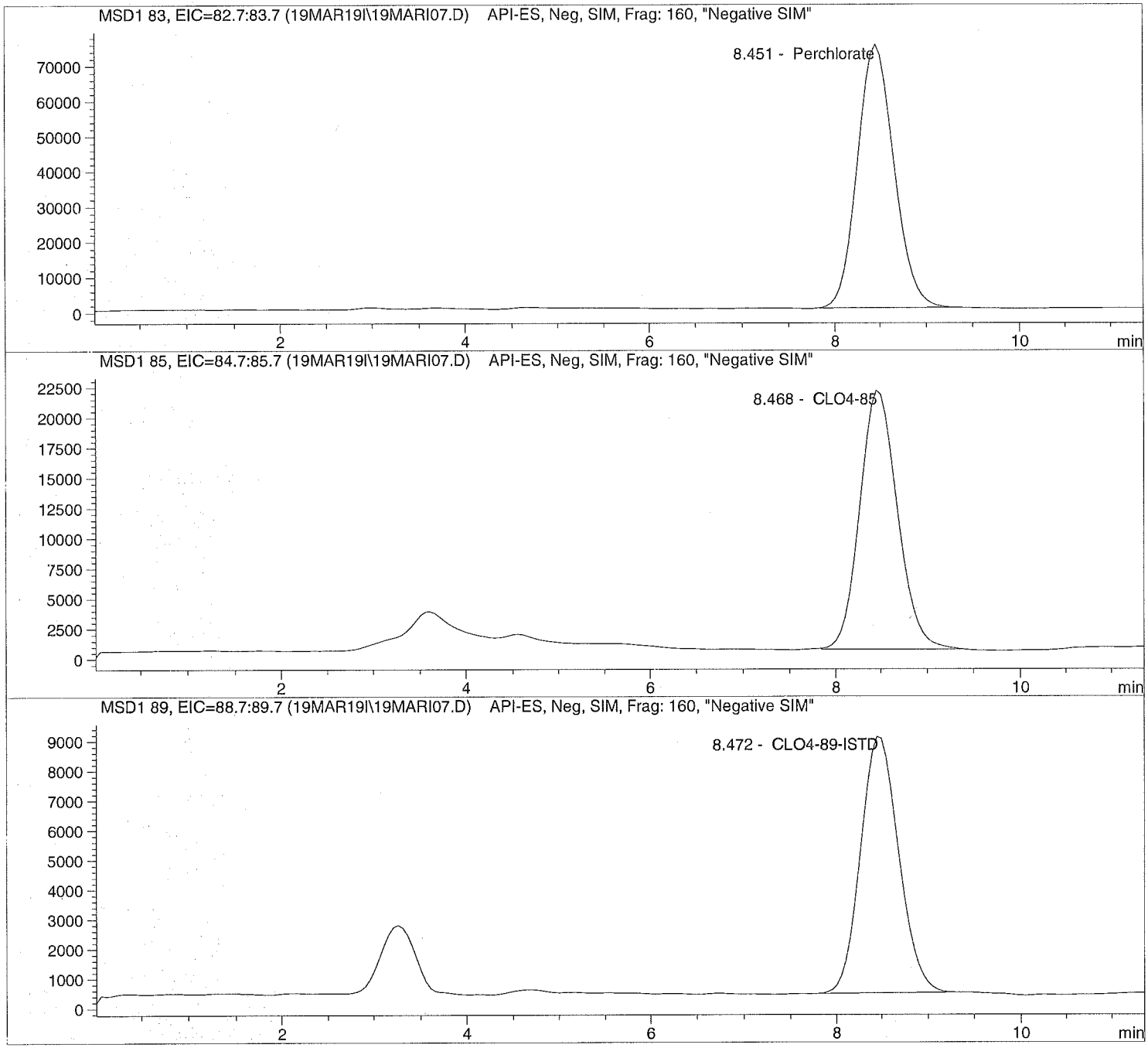
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

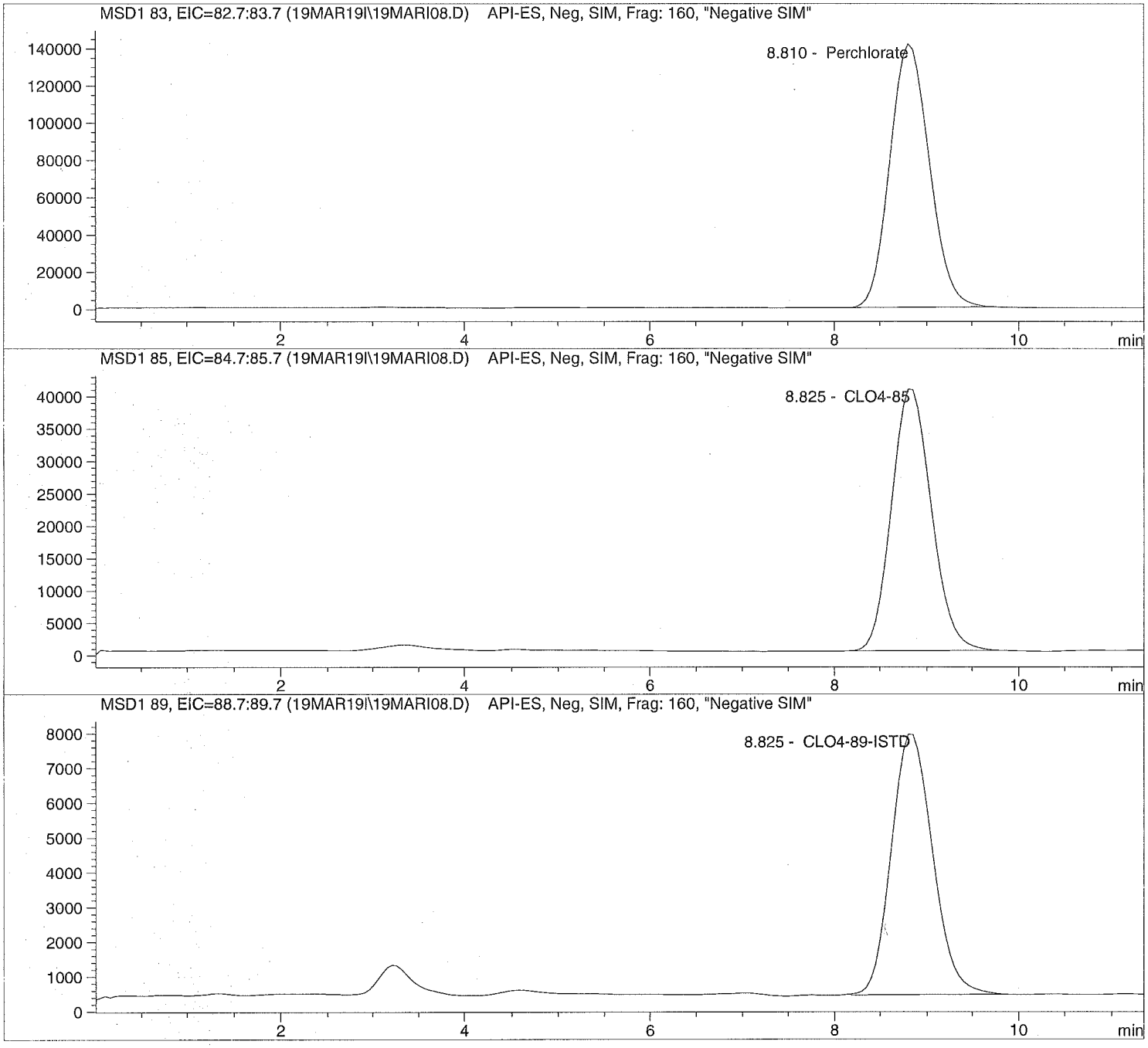
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

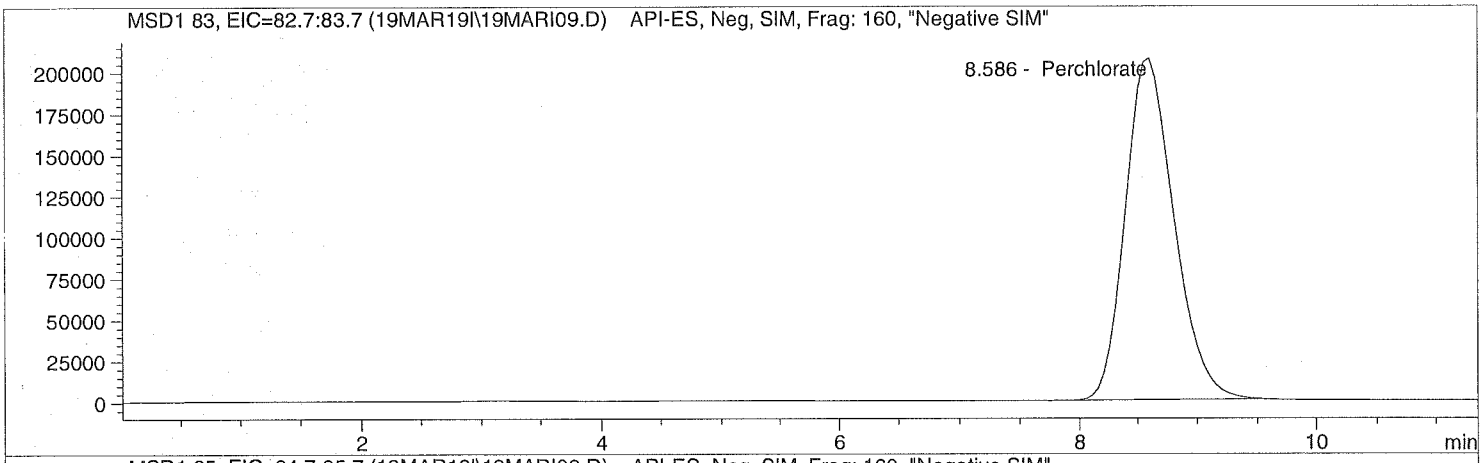
*** End of Report ***

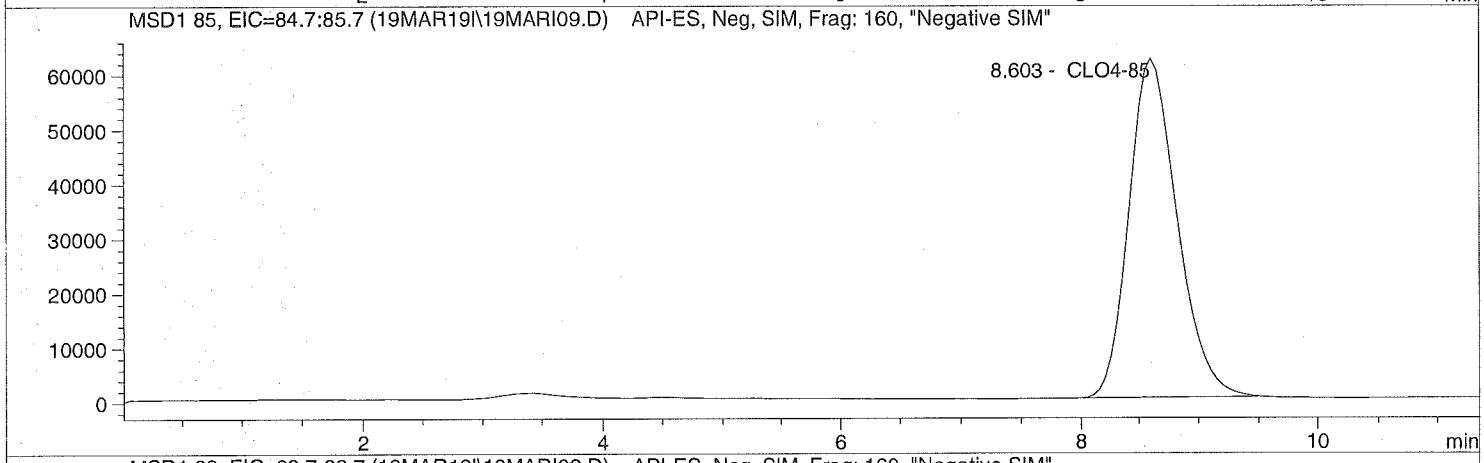
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

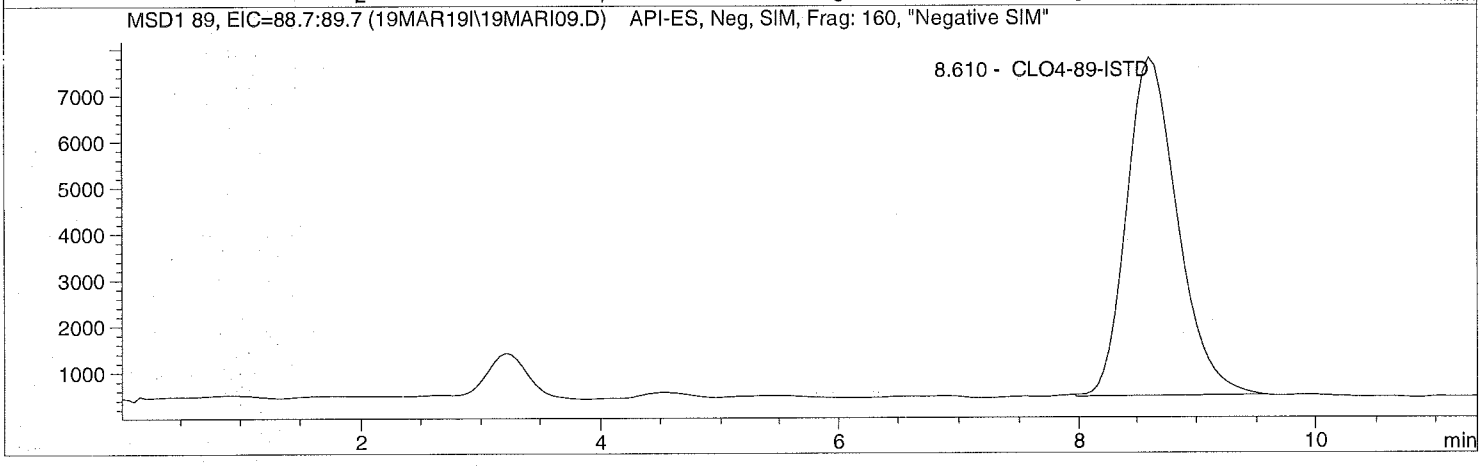
Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

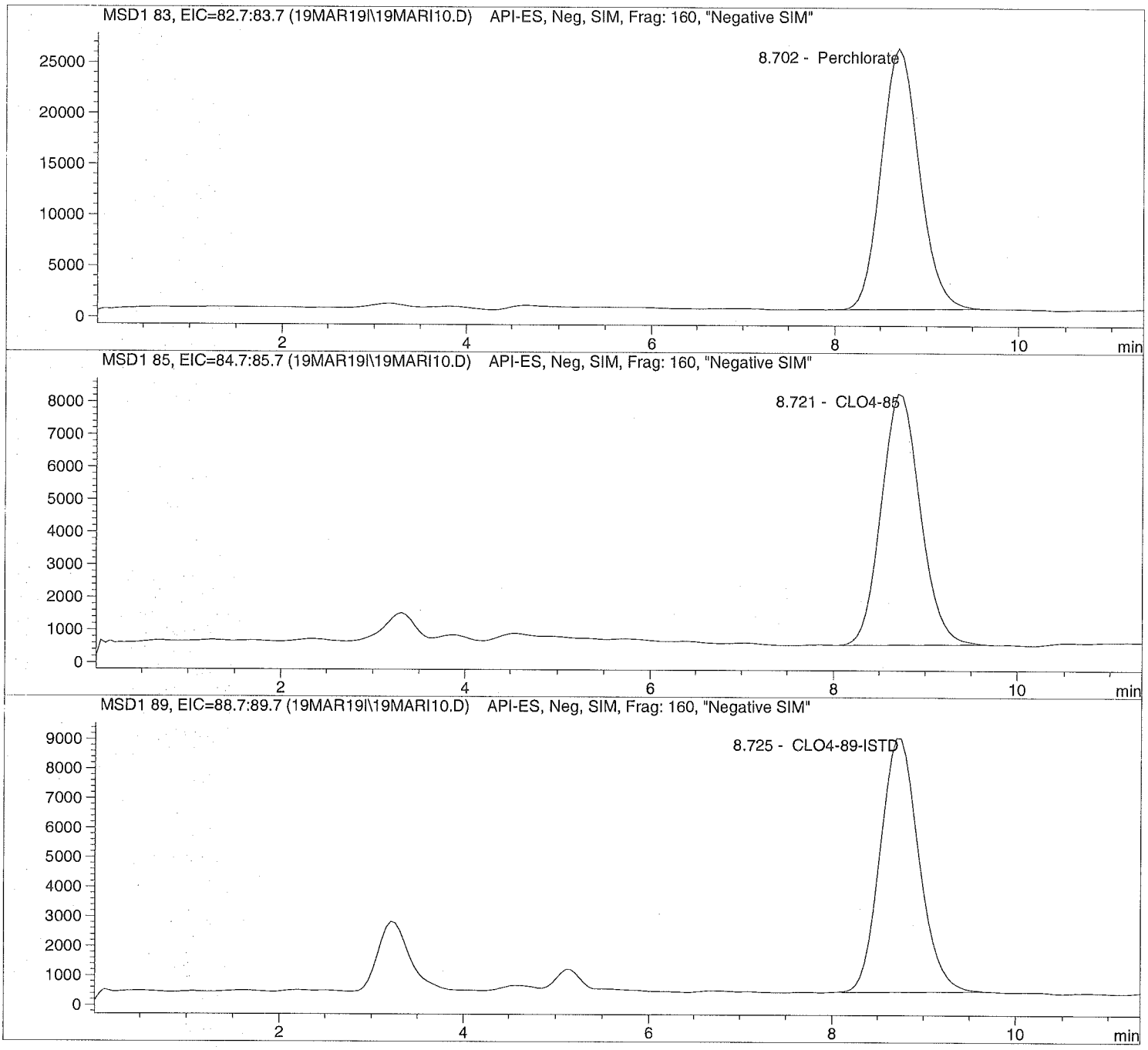
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

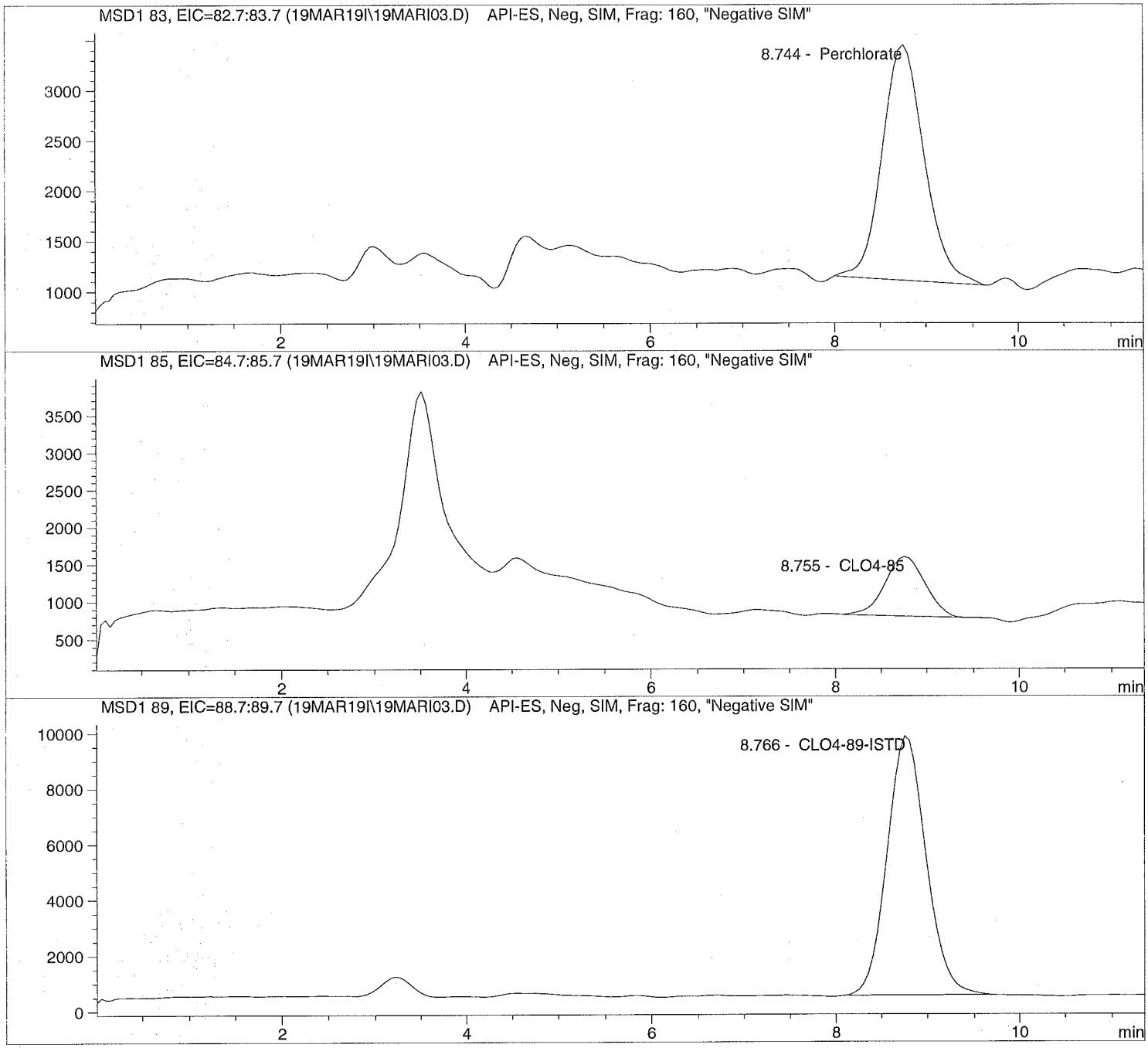
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

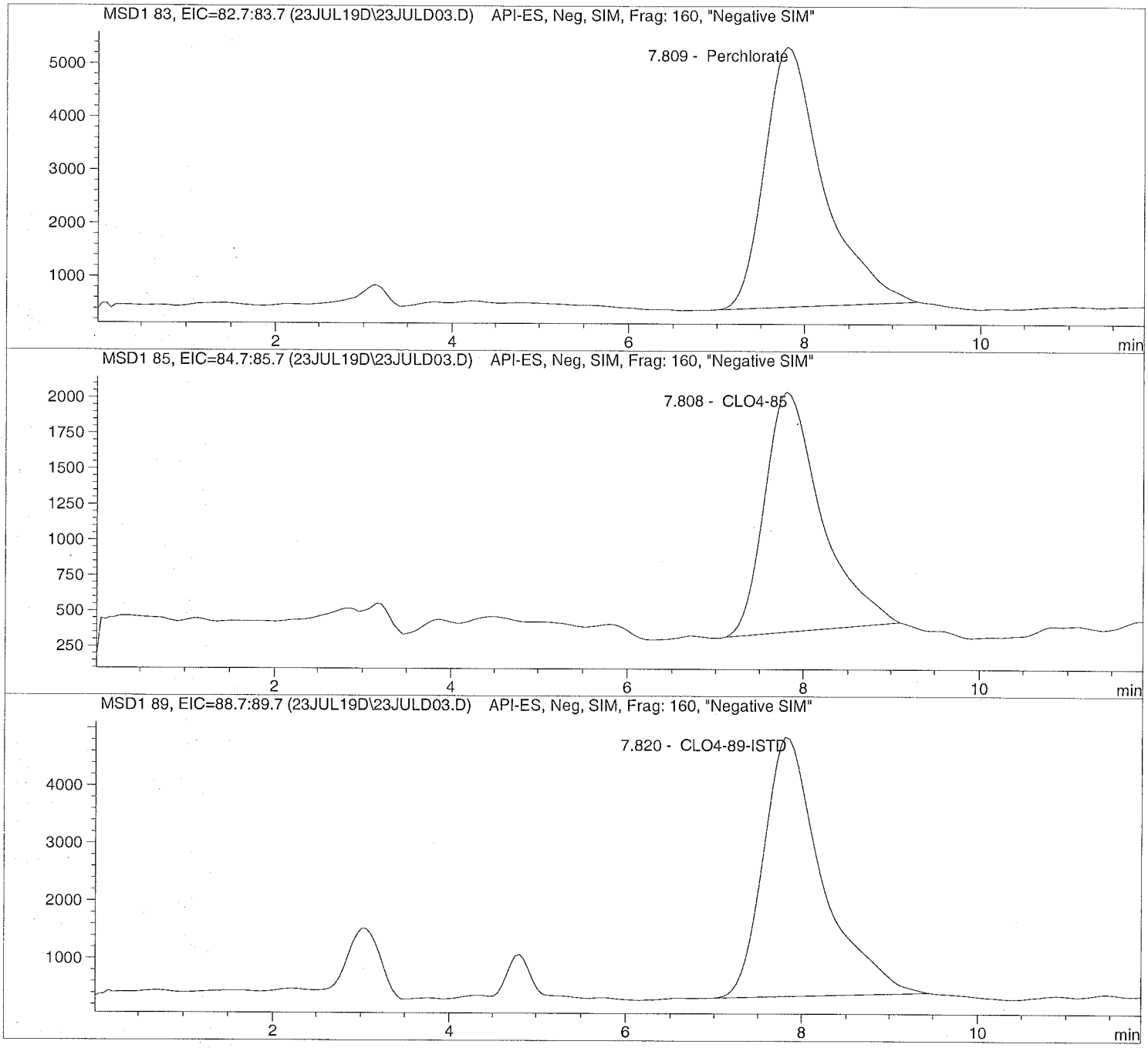
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD03.D Sample Name: 664921 ICS@4.0

Injection Date:	7/23/2019 09:01:39	Seq Line:	3
Sample Name:	664921 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\23JUL19D\23JULD03.D Sample Name: 664921 ICS@4.0

Injection Date:	7/23/2019 09:01:39	Seq Line:	3
Sample Name:	664921 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	35 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.809	PBA	226823.0	3.5980	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.808	PBA	75774.9	3.8868	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.820	PBA	208873.6	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Houston, US Date: 17-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Work Order: HS19070016

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19070016-01	ICT2_062819	Groundwater		28-Jun-2019 06:50	29-Jun-2019 08:45	☐
HS19070016-02	ICT4_062819	Groundwater		28-Jun-2019 07:10	29-Jun-2019 08:45	☐
HS19070016-03	ICT7_062819	Groundwater		28-Jun-2019 07:25	29-Jun-2019 08:45	☐
HS19070016-04	ICT8_062819	Groundwater		28-Jun-2019 07:35	29-Jun-2019 08:45	☐
HS19070016-05	ICT11_062819	Groundwater		28-Jun-2019 07:50	29-Jun-2019 08:45	☐
HS19070016-06	ICT11_062819_a	Groundwater		28-Jun-2019 07:50	29-Jun-2019 08:45	☐
HS19070016-07	ICT14B_062819	Groundwater		28-Jun-2019 08:05	29-Jun-2019 08:45	☐
HS19070016-08	ICT14C_062819	Groundwater		28-Jun-2019 08:15	29-Jun-2019 08:45	☐
HS19070016-09	ICT14D_062819	Groundwater		28-Jun-2019 08:35	29-Jun-2019 08:45	☐
HS19070016-10	ICT12B_062819	Groundwater		28-Jun-2019 09:05	29-Jun-2019 08:45	☐
HS19070016-11	ICT12B_062819_a	Groundwater		28-Jun-2019 09:05	29-Jun-2019 08:45	☐
HS19070016-12	ICT12C_062819	Groundwater		28-Jun-2019 09:20	29-Jun-2019 08:45	☐
HS19070016-13	ICT12D_062819	Groundwater		28-Jun-2019 09:35	29-Jun-2019 08:45	☐
HS19070016-14	ICT12E_062819	Groundwater		28-Jun-2019 09:30	29-Jun-2019 08:45	☐
HS19070016-15	ICT13B_062819	Groundwater		28-Jun-2019 09:10	29-Jun-2019 08:45	☐
HS19070016-16	ICT13D_062819	Groundwater		28-Jun-2019 08:20	29-Jun-2019 08:45	☐
HS19070016-17	ICT13E_062819	Groundwater		28-Jun-2019 08:00	29-Jun-2019 08:45	☐
HS19070016-18	ICT13F_062819	Groundwater		28-Jun-2019 07:20	29-Jun-2019 08:45	☐
HS19070016-19	Trip Blank	Water		28-Jun-2019 00:00	29-Jun-2019 08:45	☐

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24/ICT Wells
Work Order: HS19070016

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Environmental in Salt Lake City Utah. Final report attached.

GCMS Volatiles by Method SW8260

Batch ID: R342223

Sample ID: ICT14D_062819 (HS19070016-09MS)

• MS/MSD failed QC limits for some few compounds

Batch ID: R342283

Sample ID: ICT2_062819 (HS19070016-01MS)

• MS/MSD failed surrogates due to matrix.

Batch ID: R342382

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW7470

Batch ID: 142769,142867

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

Metals by Method SW6020

Batch ID: 142750

Sample ID: ICT11_062819 (HS19070016-05MSD)

• The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Barium and Sodium

Batch ID: 142828

Sample ID: ICT14D_062819 (HS19070016-09MS)

• Iron failed on the MS\MSD but passed on the PDS.

• The MS and/or MSD recovery was outside of the control; however, the result in the parent sample is greater than 4x the spike amount. Barium, Calcium, Magnesium, Manganese, Sodium.

Sample ID: ICT14D_062819 (HS19070016-09MSD)

• Aluminum failed on MSD but passed for MS and PDS.

Sample ID: ICT14D_062819 (HS19070016-09PDS)

• The PDS recovery was outside method control limits, however the result in the parent sample is greater than 4x the spike amount. Calcium, Manganese.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT2_062819
Collection Date: 28-Jun-2019 06:50

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,1-Dichloroethene	**2.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 14:18
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,2-Dichloroethane	**40**		**0.20**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 14:18
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:18
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:18
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	11-Jul-2019 14:18
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	11-Jul-2019 14:18
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:18
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	11-Jul-2019 14:18
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	11-Jul-2019 14:18
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	11-Jul-2019 14:18
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:18

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT2_062819
Collection Date: 28-Jun-2019 06:50

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:18
cis-1,2-Dichloroethene	**35**		**0.20**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 14:18
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	11-Jul-2019 14:18
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	11-Jul-2019 14:18
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	11-Jul-2019 14:18
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:18
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Tetrachloroethene	**0.90**	J	**0.30**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 14:18
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:18
trans-1,2-Dichloroethene	**1.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 14:18
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Trichloroethene	**670**		**5.0**	**12**	**25**	**UG/L**	25	11-Jul-2019 16:18
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:18
Vinyl chloride	**0.95**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 14:18
Surr: 1,2-Dichloroethane-d4	*90.3*			**0**	*81-118*	*%REC*	*1*	*11-Jul-2019 14:18*
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*25*	*11-Jul-2019 16:18*
Surr: 4-Bromofluorobenzene	*96.2*			**0**	*85-114*	*%REC*	*1*	*11-Jul-2019 14:18*
Surr: 4-Bromofluorobenzene	*98.1*			**0**	*85-114*	*%REC*	*25*	*11-Jul-2019 16:18*
Surr: Dibromofluoromethane	*92.1*			**0**	*80-119*	*%REC*	*1*	*11-Jul-2019 14:18*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*25*	*11-Jul-2019 16:18*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*11-Jul-2019 14:18*
Surr: Toluene-d8	*99.7*			**0**	*89-112*	*%REC*	*25*	*11-Jul-2019 16:18*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT2_062819
Collection Date: 28-Jun-2019 06:50

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.139**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 14:50
Antimony	**0.000493**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:30
Arsenic	**0.00229**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:30
Barium	**0.167**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:30
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:30
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:30
Calcium	**19.5**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:30
Chromium	**0.00284**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:30
Cobalt	**0.0116**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:30
Copper	**0.0501**		**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:30
Iron	**4.17**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:30
Lead	**0.00446**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:30
Magnesium	**20.0**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:30
Manganese	**0.336**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:30
Nickel	**0.0139**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:30
Potassium	**1.24**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:30
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:30
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 14:50
Sodium	**155**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:30
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:30
Vanadium	**0.00189**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:30
Zinc	**0.196**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:30
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	05-Jul-2019 15:37
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT4_062819
Collection Date: 28-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,1,2-Trichloroethane	**0.73**	J	**0.30**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 14:42
1,1-Dichloroethane	**0.55**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 14:42
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,2-Dichloroethane	**110**		**0.20**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 14:42
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:42
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:42
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	11-Jul-2019 14:42
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	11-Jul-2019 14:42
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:42
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	11-Jul-2019 14:42
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	11-Jul-2019 14:42
Benzene	**1.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 14:42
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	11-Jul-2019 14:42
Carbon tetrachloride	**13**		**0.50**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 14:42
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Chloroform	**9.1**		**0.20**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 14:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT4_062819
Collection Date: 28-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:42
cis-1,2-Dichloroethene	**2,000**		**10**	**25**	**50**	**UG/L**	50	11-Jul-2019 19:30
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	11-Jul-2019 14:42
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	11-Jul-2019 14:42
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	11-Jul-2019 14:42
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 14:42
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Tetrachloroethene	**1.8**		**0.30**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 14:42
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:42
trans-1,2-Dichloroethene	**5.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 14:42
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Trichloroethene	**6,000**		**10**	**25**	**50**	**UG/L**	50	11-Jul-2019 19:30
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 14:42
Vinyl chloride	**10**		**0.20**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 14:42
Surr: 1,2-Dichloroethane-d4	*93.7*			**0**	*81-118*	*%REC*	*1*	*11-Jul-2019 14:42*
Surr: 1,2-Dichloroethane-d4	*104*			**0**	*81-118*	*%REC*	*50*	*11-Jul-2019 19:30*
Surr: 4-Bromofluorobenzene	*99.7*			**0**	*85-114*	*%REC*	*50*	*11-Jul-2019 19:30*
Surr: 4-Bromofluorobenzene	*99.2*			**0**	*85-114*	*%REC*	*1*	*11-Jul-2019 14:42*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*1*	*11-Jul-2019 14:42*
Surr: Dibromofluoromethane	*102*			**0**	*80-119*	*%REC*	*50*	*11-Jul-2019 19:30*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*50*	*11-Jul-2019 19:30*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*11-Jul-2019 14:42*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT4_062819
Collection Date: 28-Jun-2019 07:10

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.0112**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 14:53
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:32
Arsenic	**0.000680**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:32
Barium	**0.134**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:32
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:32
Cadmium	**0.000394**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:32
Calcium	**35.8**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:32
Chromium	**0.0321**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:32
Cobalt	**0.00928**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:32
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	09-Jul-2019 00:32
Iron	**0.404**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:32
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 00:32
Magnesium	**31.8**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:32
Manganese	**0.311**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:32
Nickel	**0.265**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:32
Potassium	**1.54**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:32
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:32
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 14:53
Sodium	**259**		**0.140**	**0.500**	**2.00**	**mg/L**	10	09-Jul-2019 14:55
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:32
Vanadium	**0.00174**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:32
Zinc	**0.0164**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:32
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	05-Jul-2019 15:25
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT7_062819
Collection Date: 28-Jun-2019 07:25

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 18:42
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	11-Jul-2019 18:42
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	11-Jul-2019 18:42
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 18:42
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	11-Jul-2019 18:42
Acetone	**2.8**		**0.40**	**1.0**	**2.0**	**UG/L**	1	11-Jul-2019 18:42
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	11-Jul-2019 18:42
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT7_062819
Collection Date: 28-Jun-2019 07:25

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	11-Jul-2019 18:42
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	11-Jul-2019 18:42
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	11-Jul-2019 18:42
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 18:42
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Trichloroethene	**1.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	11-Jul-2019 18:42
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 18:42
Surr: 1,2-Dichloroethane-d4	*95.1*			**0**	*81-118*	*%REC*	*1*	*11-Jul-2019 18:42*
Surr: 4-Bromofluorobenzene	*98.0*			**0**	*85-114*	*%REC*	*1*	*11-Jul-2019 18:42*
Surr: Dibromofluoromethane	*96.5*			**0**	*80-119*	*%REC*	*1*	*11-Jul-2019 18:42*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*11-Jul-2019 18:42*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT7_062819
Collection Date: 28-Jun-2019 07:25

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-03
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.211**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 14:57
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:34
Arsenic	**0.000594**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:34
Barium	**0.217**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:34
Beryllium	**0.000549**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:34
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:34
Calcium	**2.41**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:34
Chromium	**0.00142**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:34
Cobalt	**0.00298**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:34
Copper	**0.00281**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:34
Iron	**0.836**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:34
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 00:34
Magnesium	**2.46**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:34
Manganese	**0.0961**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:34
Nickel	**0.0181**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:34
Potassium	**1.45**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:34
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:34
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 14:57
Sodium	**13.3**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:34
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:34
Vanadium	**0.00136**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:34
Zinc	**0.0553**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:34
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	05-Jul-2019 15:27
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT8_062819
Collection Date: 28-Jun-2019 07:35

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,1-Dichloroethane	**9.3**	J	**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:28
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,2-Dichloroethane	**47**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:28
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:28
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:28
2-Butanone	10	U	5.0	10	20	UG/L	10	10-Jul-2019 20:28
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
2-Hexanone	10	U	10	10	20	UG/L	10	10-Jul-2019 20:28
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:28
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	10-Jul-2019 20:28
Acetone	10	U	4.0	10	20	UG/L	10	10-Jul-2019 20:28
Benzene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Bromochloromethane	**8.8**	J	**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:28
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Carbon disulfide	10	U	6.0	10	20	UG/L	10	10-Jul-2019 20:28
Carbon tetrachloride	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Chloroform	**16**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT8_062819
Collection Date: 28-Jun-2019 07:35

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:28
cis-1,2-Dichloroethene	**3,200**		**20**	**50**	**100**	**UG/L**	100	11-Jul-2019 17:54
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Hexachlorobutadiene	10	U	10	10	10	UG/L	10	10-Jul-2019 20:28
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
m,p-Xylene	10	U	5.0	10	20	UG/L	10	10-Jul-2019 20:28
Methylene chloride	**8,400**		**40**	**100**	**200**	**UG/L**	100	11-Jul-2019 17:54
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:28
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Styrene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Tetrachloroethene	**240**		**3.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:28
Toluene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:28
trans-1,2-Dichloroethene	**9.8**	J	**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:28
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Trichloroethene	**7,500**		**20**	**50**	**100**	**UG/L**	100	11-Jul-2019 17:54
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:28
Vinyl chloride	**13**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:28
Surr: 1,2-Dichloroethane-d4	*104*			**0**	*81-118*	*%REC*	*10*	*10-Jul-2019 20:28*
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*100*	*11-Jul-2019 17:54*
Surr: 4-Bromofluorobenzene	*96.5*			**0**	*85-114*	*%REC*	*10*	*10-Jul-2019 20:28*
Surr: 4-Bromofluorobenzene	*97.4*			**0**	*85-114*	*%REC*	*100*	*11-Jul-2019 17:54*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*10*	*10-Jul-2019 20:28*
Surr: Dibromofluoromethane	*98.2*			**0**	*80-119*	*%REC*	*100*	*11-Jul-2019 17:54*
Surr: Toluene-d8	*97.1*			**0**	*89-112*	*%REC*	*10*	*10-Jul-2019 20:28*
Surr: Toluene-d8	*98.3*			**0**	*89-112*	*%REC*	*100*	*11-Jul-2019 17:54*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT8_062819
Collection Date: 28-Jun-2019 07:35

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-04
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.0188**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 14:59
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:36
Arsenic	**0.00649**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:36
Barium	**0.303**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:36
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:36
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:36
Calcium	**12.8**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:36
Chromium	**0.00144**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:36
Cobalt	**0.00314**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:36
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	09-Jul-2019 00:36
Iron	**16.0**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:36
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 00:36
Magnesium	**10.3**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:36
Manganese	**0.228**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:36
Nickel	**0.0213**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:36
Potassium	**1.48**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:36
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:36
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 14:59
Sodium	**69.6**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:36
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:36
Vanadium	**0.00195**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:36
Zinc	**0.0101**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:36
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	05-Jul-2019 15:28
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT11_062819
Collection Date: 28-Jun-2019 07:50

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,2-Dichloroethane	**0.99**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 13:17
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:17
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 13:17
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Jul-2019 13:17
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:17
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Jul-2019 13:17
Acetone	**6.4**		**0.40**	**1.0**	**2.0**	**UG/L**	1	10-Jul-2019 13:17
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Jul-2019 13:17
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT11_062819
Collection Date: 28-Jun-2019 07:50

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17
cis-1,2-Dichloroethene	**32**		**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 13:17
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Jul-2019 13:17
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 13:17
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Jul-2019 13:17
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:17
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Trichloroethene	**270**		**1.0**	**2.5**	**5.0**	**UG/L**	5	10-Jul-2019 17:16
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:17
Surr: 1,2-Dichloroethane-d4	*94.8*			**0**	*81-118*	*%REC*	*1*	*10-Jul-2019 13:17*
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*5*	*10-Jul-2019 17:16*
Surr: 4-Bromofluorobenzene	*97.1*			**0**	*85-114*	*%REC*	*1*	*10-Jul-2019 13:17*
Surr: 4-Bromofluorobenzene	*96.2*			**0**	*85-114*	*%REC*	*5*	*10-Jul-2019 17:16*
Surr: Dibromofluoromethane	*94.9*			**0**	*80-119*	*%REC*	*1*	*10-Jul-2019 13:17*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*5*	*10-Jul-2019 17:16*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*10-Jul-2019 13:17*
Surr: Toluene-d8	*98.4*			**0**	*89-112*	*%REC*	*5*	*10-Jul-2019 17:16*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT11_062819
Collection Date: 28-Jun-2019 07:50

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-05
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.00846**	J	**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 00:14
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:14
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:14
Barium	**0.443**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:14
Beryllium	**0.000285**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:14
Cadmium	**0.000354**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:14
Calcium	**10.3**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:14
Chromium	**0.142**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:14
Cobalt	**0.00481**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:14
Copper	**0.00472**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:14
Iron	**1.00**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:14
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 00:14
Magnesium	**7.04**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:14
Manganese	**0.205**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:14
Nickel	**0.564**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:14
Potassium	**0.934**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:14
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:14
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 00:14
Sodium	**64.8**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:14
Thallium	**0.000618**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:14
Vanadium	**0.00109**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:14
Zinc	**0.0902**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:14
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	05-Jul-2019 15:30
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT11_062819_a
Collection Date: 28-Jun-2019 07:50

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,2-Dichloroethane	**0.87**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 13:41
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:41
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 13:41
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Jul-2019 13:41
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:41
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Jul-2019 13:41
Acetone	**3.6**		**0.40**	**1.0**	**2.0**	**UG/L**	1	10-Jul-2019 13:41
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Jul-2019 13:41
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT11_062819_a
Collection Date: 28-Jun-2019 07:50

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41
cis-1,2-Dichloroethene	**27**		**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 13:41
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Jul-2019 13:41
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 13:41
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Jul-2019 13:41
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 13:41
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Trichloroethene	**210**		**1.0**	**2.5**	**5.0**	**UG/L**	5	10-Jul-2019 17:40
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 13:41
Surr: 1,2-Dichloroethane-d4	*105*			**0**	*81-118*	*%REC*	*5*	*10-Jul-2019 17:40*
Surr: 1,2-Dichloroethane-d4	*96.9*			**0**	*81-118*	*%REC*	*1*	*10-Jul-2019 13:41*
Surr: 4-Bromofluorobenzene	*99.7*			**0**	*85-114*	*%REC*	*1*	*10-Jul-2019 13:41*
Surr: 4-Bromofluorobenzene	*97.9*			**0**	*85-114*	*%REC*	*5*	*10-Jul-2019 17:40*
Surr: Dibromofluoromethane	*97.8*			**0**	*80-119*	*%REC*	*1*	*10-Jul-2019 13:41*
Surr: Dibromofluoromethane	*103*			**0**	*80-119*	*%REC*	*5*	*10-Jul-2019 17:40*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*10-Jul-2019 13:41*
Surr: Toluene-d8	*99.8*			**0**	*89-112*	*%REC*	*5*	*10-Jul-2019 17:40*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT11_062819_a
Collection Date: 28-Jun-2019 07:50

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-06
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.0149**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 16:03
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:39
Arsenic	**0.000576**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:39
Barium	**0.446**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:39
Beryllium	**0.000280**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:39
Cadmium	**0.000314**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:39
Calcium	**10.4**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:39
Chromium	**0.219**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:39
Cobalt	**0.00468**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:39
Copper	**0.00424**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:39
Iron	**1.58**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:39
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 00:39
Magnesium	**7.20**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:39
Manganese	**0.200**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:39
Nickel	**0.547**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:39
Potassium	**0.968**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:39
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:39
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 16:03
Sodium	**67.2**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:39
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:39
Vanadium	**0.00243**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:39
Zinc	**0.0793**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:39
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	05-Jul-2019 15:32
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT14B_062819
Collection Date: 28-Jun-2019 08:05

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,1-Dichloroethane	**1.4**		**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 19:16
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 19:16
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 19:16
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 19:16
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Jul-2019 19:16
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 19:16
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Jul-2019 19:16
Acetone	**6.2**		**0.40**	**1.0**	**2.0**	**UG/L**	1	10-Jul-2019 19:16
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Jul-2019 19:16
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 19:16

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT14B_062819
Collection Date: 28-Jun-2019 08:05

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 19:16
cis-1,2-Dichloroethene	**31**		**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 19:16
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Jul-2019 19:16
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 19:16
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Jul-2019 19:16
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 19:16
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 19:16
trans-1,2-Dichloroethene	**0.60**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 19:16
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Trichloroethene	**190**		**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 19:16
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 19:16
Vinyl chloride	**0.68**	J	**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 19:16
Surr: 1,2-Dichloroethane-d4	*95.4*			**0**	*81-118*	*%REC*	*1*	*10-Jul-2019 19:16*
Surr: 4-Bromofluorobenzene	*95.7*			**0**	*85-114*	*%REC*	*1*	*10-Jul-2019 19:16*
Surr: Dibromofluoromethane	*95.9*			**0**	*80-119*	*%REC*	*1*	*10-Jul-2019 19:16*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*1*	*10-Jul-2019 19:16*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT14B_062819
Collection Date: 28-Jun-2019 08:05

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-07
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 05-Jul-2019		Analyst: JHD
Aluminum	**0.0254**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 16:06
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:41
Arsenic	**0.00114**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:41
Barium	**0.447**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:41
Beryllium	**0.000259**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:41
Cadmium	**0.000225**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:41
Calcium	**12.4**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:41
Chromium	**0.0489**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:41
Cobalt	**0.00274**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:41
Copper	**0.00307**	J	**0.00100**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:41
Iron	**0.842**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:41
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 00:41
Magnesium	**11.6**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:41
Manganese	**0.239**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:41
Nickel	**0.0822**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:41
Potassium	**0.565**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:41
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:41
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 16:06
Sodium	**85.8**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:41
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:41
Vanadium	**0.00184**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:41
Zinc	**0.0305**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:41
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	05-Jul-2019 15:33
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT14C_062819
Collection Date: 28-Jun-2019 08:15

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,1,2-Trichloroethane	**5.1**	J	**3.0**	**5.0**	**10**	**UG/L**	10	11-Jul-2019 16:42
1,1-Dichloroethane	**10**		**2.0**	**5.0**	**10**	**UG/L**	10	11-Jul-2019 16:42
1,1-Dichloroethene	**140**		**2.0**	**5.0**	**10**	**UG/L**	10	11-Jul-2019 16:42
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,2-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 16:42
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 16:42
2-Butanone	10	U	5.0	10	20	UG/L	10	11-Jul-2019 16:42
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
2-Hexanone	10	U	10	10	20	UG/L	10	11-Jul-2019 16:42
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 16:42
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	11-Jul-2019 16:42
Acetone	10	U	4.0	10	20	UG/L	10	11-Jul-2019 16:42
Benzene	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Bromochloromethane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Carbon disulfide	10	U	6.0	10	20	UG/L	10	11-Jul-2019 16:42
Carbon tetrachloride	5.0	U	5.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Chloroform	**39**		**2.0**	**5.0**	**10**	**UG/L**	10	11-Jul-2019 16:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT14C_062819
Collection Date: 28-Jun-2019 08:15

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 16:42
cis-1,2-Dichloroethene	**11,000**		**40**	**100**	**200**	**UG/L**	200	12-Jul-2019 12:45
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Hexachlorobutadiene	10	U	10	10	10	UG/L	10	11-Jul-2019 16:42
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
m,p-Xylene	10	U	5.0	10	20	UG/L	10	11-Jul-2019 16:42
Methylene chloride	**1,000**		**4.0**	**10**	**20**	**UG/L**	10	11-Jul-2019 16:42
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 16:42
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Styrene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Tetrachloroethene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Toluene	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 16:42
trans-1,2-Dichloroethene	**51**		**2.0**	**5.0**	**10**	**UG/L**	10	11-Jul-2019 16:42
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Trichloroethene	**120**		**2.0**	**5.0**	**10**	**UG/L**	10	11-Jul-2019 16:42
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 16:42
Vinyl chloride	**1,600**		**2.0**	**5.0**	**10**	**UG/L**	10	11-Jul-2019 16:42
Surr: 1,2-Dichloroethane-d4	*101*			**0**	*81-118*	*%REC*	*10*	*11-Jul-2019 16:42*
Surr: 1,2-Dichloroethane-d4	*102*			**0**	*81-118*	*%REC*	*200*	*12-Jul-2019 12:45*
Surr: 4-Bromofluorobenzene	*98.6*			**0**	*85-114*	*%REC*	*10*	*11-Jul-2019 16:42*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*200*	*12-Jul-2019 12:45*
Surr: Dibromofluoromethane	*101*			**0**	*80-119*	*%REC*	*10*	*11-Jul-2019 16:42*
Surr: Dibromofluoromethane	*102*			**0**	*80-119*	*%REC*	*200*	*12-Jul-2019 12:45*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*10*	*11-Jul-2019 16:42*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*200*	*12-Jul-2019 12:45*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT14C_062819
Collection Date: 28-Jun-2019 08:15

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-08
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 08-Jul-2019		Analyst: JC
Aluminum	**0.00742**	J	**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	08-Jul-2019 23:55
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	08-Jul-2019 23:55
Arsenic	**0.0108**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	08-Jul-2019 23:55
Barium	**1.07**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	08-Jul-2019 23:55
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	08-Jul-2019 23:55
Cadmium	**0.000219**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	08-Jul-2019 23:55
Calcium	**78.9**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	08-Jul-2019 23:55
Chromium	**0.0341**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	08-Jul-2019 23:55
Cobalt	**0.0331**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	08-Jul-2019 23:55
Copper	**0.00281**	J	**0.00100**	**0.00250**	**0.00500**	**mg/L**	1	08-Jul-2019 23:55
Iron	**274**		**0.240**	**1.00**	**4.00**	**mg/L**	20	09-Jul-2019 13:48
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	08-Jul-2019 23:55
Magnesium	**80.4**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	08-Jul-2019 23:55
Manganese	**2.33**		**0.0140**	**0.0200**	**0.100**	**mg/L**	20	09-Jul-2019 13:48
Nickel	**0.120**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	08-Jul-2019 23:55
Potassium	**1.41**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	08-Jul-2019 23:55
Selenium	**0.0109**		**0.00110**	**0.00250**	**0.00500**	**mg/L**	1	08-Jul-2019 23:55
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	08-Jul-2019 23:55
Sodium	**265**		**0.280**	**1.00**	**4.00**	**mg/L**	20	09-Jul-2019 13:48
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	08-Jul-2019 23:55
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	08-Jul-2019 23:55
Zinc	**0.0439**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	08-Jul-2019 23:55
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	05-Jul-2019 15:35
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT14D_062819
Collection Date: 28-Jun-2019 08:35

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,1-Dichloroethane	**25**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:53
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,2-Dichloroethane	**13**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:53
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:53
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:53
2-Butanone	10	U	5.0	10	20	UG/L	10	10-Jul-2019 14:53
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
2-Hexanone	10	U	10	10	20	UG/L	10	10-Jul-2019 14:53
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:53
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	10-Jul-2019 14:53
Acetone	10	U	4.0	10	20	UG/L	10	10-Jul-2019 14:53
Benzene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Bromochloromethane	**22**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:53
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Carbon disulfide	10	U	6.0	10	20	UG/L	10	10-Jul-2019 14:53
Carbon tetrachloride	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Chloroform	**29**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:53

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT14D_062819
Collection Date: 28-Jun-2019 08:35

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:53
cis-1,2-Dichloroethene	**21,000**		**50**	**120**	**250**	**UG/L**	250	10-Jul-2019 16:05
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Hexachlorobutadiene	10	U	10	10	10	UG/L	10	10-Jul-2019 14:53
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
m,p-Xylene	10	U	5.0	10	20	UG/L	10	10-Jul-2019 14:53
Methylene chloride	**11,000**		**100**	**250**	**500**	**UG/L**	250	10-Jul-2019 16:05
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:53
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Styrene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Tetrachloroethene	**13**		**3.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:53
Toluene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:53
trans-1,2-Dichloroethene	**44**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:53
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Trichloroethene	**1,400**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:53
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:53
Vinyl chloride	**1,100**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:53
Surr: 1,2-Dichloroethane-d4	*105*			**0**	*81-118*	*%REC*	*10*	*10-Jul-2019 14:53*
Surr: 1,2-Dichloroethane-d4	*115*			**0**	*81-118*	*%REC*	*250*	*10-Jul-2019 16:05*
Surr: 4-Bromofluorobenzene	*97.7*			**0**	*85-114*	*%REC*	*10*	*10-Jul-2019 14:53*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*250*	*10-Jul-2019 16:05*
Surr: Dibromofluoromethane	*103*			**0**	*80-119*	*%REC*	*10*	*10-Jul-2019 14:53*
Surr: Dibromofluoromethane	*113*			**0**	*80-119*	*%REC*	*250*	*10-Jul-2019 16:05*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*250*	*10-Jul-2019 16:05*
Surr: Toluene-d8	*96.9*			**0**	*89-112*	*%REC*	*10*	*10-Jul-2019 14:53*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT14D_062819
Collection Date: 28-Jun-2019 08:35

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-09
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 08-Jul-2019		Analyst: JC
Aluminum	**0.0223**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	08-Jul-2019 23:41
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	08-Jul-2019 23:41
Arsenic	**0.00810**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	08-Jul-2019 23:41
Barium	**1.18**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	08-Jul-2019 23:41
Beryllium	**0.000518**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	08-Jul-2019 23:41
Cadmium	**0.000514**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	08-Jul-2019 23:41
Calcium	**80.0**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	08-Jul-2019 23:41
Chromium	**0.00422**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	08-Jul-2019 23:41
Cobalt	**0.0141**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	08-Jul-2019 23:41
Copper	**0.00411**	J	**0.00100**	**0.00250**	**0.00500**	**mg/L**	1	08-Jul-2019 23:41
Iron	**19.5**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	08-Jul-2019 23:41
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	08-Jul-2019 23:41
Magnesium	**57.2**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	08-Jul-2019 23:41
Manganese	**1.31**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	08-Jul-2019 23:41
Nickel	**0.0474**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	08-Jul-2019 23:41
Potassium	**1.46**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	08-Jul-2019 23:41
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	08-Jul-2019 23:41
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	08-Jul-2019 23:41
Sodium	**295**		**0.140**	**0.500**	**2.00**	**mg/L**	10	09-Jul-2019 13:42
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	08-Jul-2019 23:41
Vanadium	**0.000634**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	08-Jul-2019 23:41
Zinc	**0.141**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	08-Jul-2019 23:41
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 05-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	05-Jul-2019 15:04
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT12B_062819
Collection Date: 28-Jun-2019 09:05

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,1-Dichloroethane	**11**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:05
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,2-Dichloroethane	**91**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:05
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:05
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:05
2-Butanone	10	U	5.0	10	20	UG/L	10	10-Jul-2019 14:05
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
2-Hexanone	10	U	10	10	20	UG/L	10	10-Jul-2019 14:05
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:05
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	10-Jul-2019 14:05
Acetone	10	U	4.0	10	20	UG/L	10	10-Jul-2019 14:05
Benzene	**16**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:05
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Bromochloromethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Carbon disulfide	10	U	6.0	10	20	UG/L	10	10-Jul-2019 14:05
Carbon tetrachloride	**68**		**5.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:05
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Chloroform	**74**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:05

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT12B_062819
Collection Date: 28-Jun-2019 09:05

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:05
cis-1,2-Dichloroethene	**930**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:05
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Hexachlorobutadiene	10	U	10	10	10	UG/L	10	10-Jul-2019 14:05
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
m,p-Xylene	10	U	5.0	10	20	UG/L	10	10-Jul-2019 14:05
Methylene chloride	**12**	J	**4.0**	**10**	**20**	**UG/L**	10	10-Jul-2019 14:05
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:05
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Styrene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Tetrachloroethene	**6.6**	J	**3.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:05
Toluene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:05
trans-1,2-Dichloroethene	**5.3**	J	**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:05
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Trichloroethene	**14,000**		**50**	**120**	**250**	**UG/L**	250	10-Jul-2019 15:17
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:05
Vinyl chloride	**28**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:05
Surr: 1,2-Dichloroethane-d4	*111*			**0**	*81-118*	*%REC*	*10*	*10-Jul-2019 14:05*
Surr: 1,2-Dichloroethane-d4	*105*			**0**	*81-118*	*%REC*	*250*	*10-Jul-2019 15:17*
Surr: 4-Bromofluorobenzene	*98.2*			**0**	*85-114*	*%REC*	*10*	*10-Jul-2019 14:05*
Surr: 4-Bromofluorobenzene	*96.8*			**0**	*85-114*	*%REC*	*250*	*10-Jul-2019 15:17*
Surr: Dibromofluoromethane	*105*			**0**	*80-119*	*%REC*	*10*	*10-Jul-2019 14:05*
Surr: Dibromofluoromethane	*103*			**0**	*80-119*	*%REC*	*250*	*10-Jul-2019 15:17*
Surr: Toluene-d8	*98.9*			**0**	*89-112*	*%REC*	*250*	*10-Jul-2019 15:17*
Surr: Toluene-d8	*97.9*			**0**	*89-112*	*%REC*	*10*	*10-Jul-2019 14:05*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT12B_062819
Collection Date: 28-Jun-2019 09:05

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-10
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 08-Jul-2019		Analyst: JC
Aluminum	**0.0271**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	08-Jul-2019 23:57
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	08-Jul-2019 23:57
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	08-Jul-2019 23:57
Barium	**0.286**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	08-Jul-2019 23:57
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	08-Jul-2019 23:57
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	08-Jul-2019 23:57
Calcium	**26.6**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	08-Jul-2019 23:57
Chromium	**0.0412**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	08-Jul-2019 23:57
Cobalt	**0.00545**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	08-Jul-2019 23:57
Copper	**0.0824**		**0.00100**	**0.00250**	**0.00500**	**mg/L**	1	08-Jul-2019 23:57
Iron	**1.68**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	08-Jul-2019 23:57
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	08-Jul-2019 23:57
Magnesium	**18.6**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	08-Jul-2019 23:57
Manganese	**0.165**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	08-Jul-2019 23:57
Nickel	**0.345**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	08-Jul-2019 23:57
Potassium	**0.743**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	08-Jul-2019 23:57
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	08-Jul-2019 23:57
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	08-Jul-2019 23:57
Sodium	**195**		**0.140**	**0.500**	**2.00**	**mg/L**	10	09-Jul-2019 13:50
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	08-Jul-2019 23:57
Vanadium	**0.000667**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	08-Jul-2019 23:57
Zinc	**0.105**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	08-Jul-2019 23:57
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 09-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	09-Jul-2019 15:30
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT12B_062819_a
Collection Date: 28-Jun-2019 09:05

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,1-Dichloroethane	**12**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:29
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,2-Dichloroethane	**68**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:29
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:29
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:29
2-Butanone	10	U	5.0	10	20	UG/L	10	10-Jul-2019 14:29
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
2-Hexanone	10	U	10	10	20	UG/L	10	10-Jul-2019 14:29
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:29
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	10-Jul-2019 14:29
Acetone	10	U	4.0	10	20	UG/L	10	10-Jul-2019 14:29
Benzene	**11**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:29
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Bromochloromethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Carbon disulfide	10	U	6.0	10	20	UG/L	10	10-Jul-2019 14:29
Carbon tetrachloride	**49**		**5.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:29
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Chloroform	**60**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:29

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT12B_062819_a
Collection Date: 28-Jun-2019 09:05

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:29
cis-1,2-Dichloroethene	**1,100**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:29
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Hexachlorobutadiene	10	U	10	10	10	UG/L	10	10-Jul-2019 14:29
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
m,p-Xylene	10	U	5.0	10	20	UG/L	10	10-Jul-2019 14:29
Methylene chloride	**11**	J	**4.0**	**10**	**20**	**UG/L**	10	10-Jul-2019 14:29
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 14:29
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Styrene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Tetrachloroethene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Toluene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:29
trans-1,2-Dichloroethene	**5.2**	J	**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:29
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Trichloroethene	**15,000**		**50**	**120**	**250**	**UG/L**	250	10-Jul-2019 15:41
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 14:29
Vinyl chloride	**32**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 14:29
Surr: 1,2-Dichloroethane-d4	*107*			**0**	*81-118*	*%REC*	*250*	*10-Jul-2019 15:41*
Surr: 1,2-Dichloroethane-d4	*107*			**0**	*81-118*	*%REC*	*10*	*10-Jul-2019 14:29*
Surr: 4-Bromofluorobenzene	*98.2*			**0**	*85-114*	*%REC*	*250*	*10-Jul-2019 15:41*
Surr: 4-Bromofluorobenzene	*98.1*			**0**	*85-114*	*%REC*	*10*	*10-Jul-2019 14:29*
Surr: Dibromofluoromethane	*104*			**0**	*80-119*	*%REC*	*10*	*10-Jul-2019 14:29*
Surr: Dibromofluoromethane	*105*			**0**	*80-119*	*%REC*	*250*	*10-Jul-2019 15:41*
Surr: Toluene-d8	*98.8*			**0**	*89-112*	*%REC*	*250*	*10-Jul-2019 15:41*
Surr: Toluene-d8	*99.4*			**0**	*89-112*	*%REC*	*10*	*10-Jul-2019 14:29*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT12B_062819_a
Collection Date: 28-Jun-2019 09:05

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-11
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 08-Jul-2019		Analyst: JC
Aluminum	**0.0285**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	08-Jul-2019 23:59
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	08-Jul-2019 23:59
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	08-Jul-2019 23:59
Barium	**0.285**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	08-Jul-2019 23:59
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	08-Jul-2019 23:59
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	08-Jul-2019 23:59
Calcium	**27.2**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	08-Jul-2019 23:59
Chromium	**0.0449**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	08-Jul-2019 23:59
Cobalt	**0.00515**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	08-Jul-2019 23:59
Copper	**0.0802**		**0.00100**	**0.00250**	**0.00500**	**mg/L**	1	08-Jul-2019 23:59
Iron	**1.58**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	08-Jul-2019 23:59
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	08-Jul-2019 23:59
Magnesium	**18.6**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	08-Jul-2019 23:59
Manganese	**0.155**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	08-Jul-2019 23:59
Nickel	**0.328**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	08-Jul-2019 23:59
Potassium	**0.749**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	08-Jul-2019 23:59
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	08-Jul-2019 23:59
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	08-Jul-2019 23:59
Sodium	**192**		**0.140**	**0.500**	**2.00**	**mg/L**	10	09-Jul-2019 13:52
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	08-Jul-2019 23:59
Vanadium	**0.000792**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	08-Jul-2019 23:59
Zinc	**0.120**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	08-Jul-2019 23:59
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 09-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	09-Jul-2019 15:36
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT12C_062819
Collection Date: 28-Jun-2019 09:20

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,1,2-Trichloroethane	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,1-Dichloroethane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,1-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,2-Dichloroethane	**27**		**2.0**	**5.0**	**10**	**UG/L**	10	11-Jul-2019 15:54
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 15:54
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 15:54
2-Butanone	10	U	5.0	10	20	UG/L	10	11-Jul-2019 15:54
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
2-Hexanone	10	U	10	10	20	UG/L	10	11-Jul-2019 15:54
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 15:54
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	11-Jul-2019 15:54
Acetone	10	U	4.0	10	20	UG/L	10	11-Jul-2019 15:54
Benzene	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Bromochloromethane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Carbon disulfide	10	U	6.0	10	20	UG/L	10	11-Jul-2019 15:54
Carbon tetrachloride	**11**		**5.0**	**5.0**	**10**	**UG/L**	10	11-Jul-2019 15:54
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Chloroform	**16**		**2.0**	**5.0**	**10**	**UG/L**	10	11-Jul-2019 15:54

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT12C_062819
Collection Date: 28-Jun-2019 09:20

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 15:54
cis-1,2-Dichloroethene	**140**		**2.0**	**5.0**	**10**	**UG/L**	10	11-Jul-2019 15:54
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Ethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Hexachlorobutadiene	10	U	10	10	10	UG/L	10	11-Jul-2019 15:54
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
m,p-Xylene	10	U	5.0	10	20	UG/L	10	11-Jul-2019 15:54
Methylene chloride	10	U	4.0	10	20	UG/L	10	11-Jul-2019 15:54
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	11-Jul-2019 15:54
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
o-Xylene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Styrene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Tetrachloroethene	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Toluene	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 15:54
trans-1,2-Dichloroethene	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 15:54
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Trichloroethene	**3,900**		**40**	**100**	**200**	**UG/L**	200	11-Jul-2019 20:41
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Vinyl chloride	5.0	U	2.0	5.0	10	UG/L	10	11-Jul-2019 15:54
Surr: 1,2-Dichloroethane-d4	*98.0*			**0**	*81-118*	*%REC*	*200*	*11-Jul-2019 20:41*
Surr: 1,2-Dichloroethane-d4	*103*			**0**	*81-118*	*%REC*	*10*	*11-Jul-2019 15:54*
Surr: 4-Bromofluorobenzene	*98.4*			**0**	*85-114*	*%REC*	*10*	*11-Jul-2019 15:54*
Surr: 4-Bromofluorobenzene	*95.4*			**0**	*85-114*	*%REC*	*200*	*11-Jul-2019 20:41*
Surr: Dibromofluoromethane	*97.1*			**0**	*80-119*	*%REC*	*200*	*11-Jul-2019 20:41*
Surr: Dibromofluoromethane	*102*			**0**	*80-119*	*%REC*	*10*	*11-Jul-2019 15:54*
Surr: Toluene-d8	*96.5*			**0**	*89-112*	*%REC*	*200*	*11-Jul-2019 20:41*
Surr: Toluene-d8	*100*			**0**	*89-112*	*%REC*	*10*	*11-Jul-2019 15:54*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT12C_062819
Collection Date: 28-Jun-2019 09:20

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-12
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 08-Jul-2019		Analyst: JC
Aluminum	**0.0415**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 00:01
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:01
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:01
Barium	**0.123**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:01
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:01
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:01
Calcium	**6.85**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:01
Chromium	**0.0972**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:01
Cobalt	**0.000998**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:01
Copper	0.00250	U	0.00100	0.00250	0.00500	mg/L	1	09-Jul-2019 00:01
Iron	**0.969**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:01
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 00:01
Magnesium	**5.56**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:01
Manganese	**0.0176**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:01
Nickel	**0.0408**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:01
Potassium	**0.301**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:01
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:01
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 00:01
Sodium	**96.2**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:01
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:01
Vanadium	**0.00125**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:01
Zinc	**0.0188**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:01
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 09-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	09-Jul-2019 15:37
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT12D_062819
Collection Date: 28-Jun-2019 09:35

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 19:40
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 19:40
1,1,2-Trichloroethane	**9.8**	J	**3.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 19:40
1,1-Dichloroethane	**75**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 19:40
1,1-Dichloroethene	**370**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 19:40
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 19:40
1,2,3-Trichloropropane	**350**		**5.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 19:40
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 19:40
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 19:40
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 19:40
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 19:40
1,2-Dichloroethane	**160**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 19:40
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 19:40
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 19:40
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 19:40
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 19:40
2-Butanone	10	U	5.0	10	20	UG/L	10	10-Jul-2019 19:40
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
2-Hexanone	10	U	10	10	20	UG/L	10	10-Jul-2019 19:40
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 19:40
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	10-Jul-2019 19:40
Acetone	10	U	4.0	10	20	UG/L	10	10-Jul-2019 19:40
Benzene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Bromochloromethane	**55**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 19:40
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Bromoform	**7.8**	J	**4.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 19:40
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Carbon disulfide	10	U	6.0	10	20	UG/L	10	10-Jul-2019 19:40
Carbon tetrachloride	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Chloroform	**61**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 19:40

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT12D_062819
Collection Date: 28-Jun-2019 09:35

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 19:40
cis-1,2-Dichloroethene	**10,000**		**50**	**120**	**250**	**UG/L**	250	11-Jul-2019 18:18
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Ethylbenzene	**6.0**	J	**3.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 19:40
Hexachlorobutadiene	10	U	10	10	10	UG/L	10	10-Jul-2019 19:40
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
m,p-Xylene	**7.1**	J	**5.0**	**10**	**20**	**UG/L**	10	10-Jul-2019 19:40
Methylene chloride	**11,000**		**100**	**250**	**500**	**UG/L**	250	11-Jul-2019 18:18
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 19:40
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
o-Xylene	**5.3**	J	**3.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 19:40
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Styrene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Tetrachloroethene	**10**		**3.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 19:40
Toluene	**17**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 19:40
trans-1,2-Dichloroethene	**29**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 19:40
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Trichloroethene	**44,000**		**50**	**120**	**250**	**UG/L**	250	11-Jul-2019 18:18
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 19:40
Vinyl chloride	**320**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 19:40
Surr: 1,2-Dichloroethane-d4	*112*			**0**	*81-118*	*%REC*	*10*	*10-Jul-2019 19:40*
Surr: 1,2-Dichloroethane-d4	*104*			**0**	*81-118*	*%REC*	*250*	*11-Jul-2019 18:18*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*10*	*10-Jul-2019 19:40*
Surr: 4-Bromofluorobenzene	*97.2*			**0**	*85-114*	*%REC*	*250*	*11-Jul-2019 18:18*
Surr: Dibromofluoromethane	*108*			**0**	*80-119*	*%REC*	*10*	*10-Jul-2019 19:40*
Surr: Dibromofluoromethane	*103*			**0**	*80-119*	*%REC*	*250*	*11-Jul-2019 18:18*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*10*	*10-Jul-2019 19:40*
Surr: Toluene-d8	*98.7*			**0**	*89-112*	*%REC*	*250*	*11-Jul-2019 18:18*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT12D_062819
Collection Date: 28-Jun-2019 09:35

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-13
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 08-Jul-2019		Analyst: JC
Aluminum	**0.595**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 00:03
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:03
Arsenic	**0.00524**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:03
Barium	**0.444**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:03
Beryllium	**0.000829**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:03
Cadmium	**0.000738**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:03
Calcium	**20.5**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:03
Chromium	**0.338**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:03
Cobalt	**0.0404**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:03
Copper	**0.721**		**0.00100**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:03
Iron	**20.4**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:03
Lead	**0.0259**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:03
Magnesium	**17.2**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:03
Manganese	**1.13**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:03
Nickel	**0.850**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:03
Potassium	**1.05**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:03
Selenium	**0.00224**	J	**0.00110**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:03
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 00:03
Sodium	**175**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:03
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:03
Vanadium	**0.00303**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:03
Zinc	**0.0862**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:03
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 09-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	09-Jul-2019 15:39
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT12E_062819
Collection Date: 28-Jun-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
1,1,1-Trichloroethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:04
1,1,2,2-Tetrachloroethane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 20:04
1,1,2-Trichloroethane	**14**		**3.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:04
1,1-Dichloroethane	**100**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:04
1,1-Dichloroethene	**550**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:04
1,1-Dichloropropene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
1,2,3-Trichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:04
1,2,3-Trichloropropane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 20:04
1,2,4-Trichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 20:04
1,2,4-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
1,2-Dibromo-3-chloropropane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:04
1,2-Dibromoethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:04
1,2-Dichlorobenzene	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 20:04
1,2-Dichloroethane	**63**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:04
1,2-Dichloropropane	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 20:04
1,3,5-Trimethylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
1,3-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:04
1,3-Dichloropropane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
1,4-Dichlorobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:04
2,2-Dichloropropane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:04
2-Butanone	10	U	5.0	10	20	UG/L	10	10-Jul-2019 20:04
2-Chlorotoluene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
2-Hexanone	10	U	10	10	20	UG/L	10	10-Jul-2019 20:04
4-Chlorotoluene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:04
4-Isopropyltoluene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
4-Methyl-2-pentanone	10	U	7.0	10	20	UG/L	10	10-Jul-2019 20:04
Acetone	**180**		**4.0**	**10**	**20**	**UG/L**	10	10-Jul-2019 20:04
Benzene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Bromobenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Bromochloromethane	**40**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:04
Bromodichloromethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Bromoform	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Bromomethane	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Carbon disulfide	10	U	6.0	10	20	UG/L	10	10-Jul-2019 20:04
Carbon tetrachloride	5.0	U	5.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Chlorobenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Chloroethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Chloroform	**84**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT12E_062819
Collection Date: 28-Jun-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:04
cis-1,2-Dichloroethene	**17,000**		**100**	**250**	**500**	**UG/L**	500	11-Jul-2019 19:06
cis-1,3-Dichloropropene	5.0	U	1.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Dibromochloromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Dibromomethane	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Dichlorodifluoromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Ethylbenzene	**7.7**	J	**3.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:04
Hexachlorobutadiene	10	U	10	10	10	UG/L	10	10-Jul-2019 20:04
Isopropylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
m,p-Xylene	**12**	J	**5.0**	**10**	**20**	**UG/L**	10	10-Jul-2019 20:04
Methylene chloride	**120,000**		**400**	**1000**	**2000**	**UG/L**	1000	12-Jul-2019 12:21
n-Butylbenzene	5.0	U	4.0	5.0	10	UG/L	10	10-Jul-2019 20:04
n-Propylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Naphthalene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
o-Xylene	**8.6**	J	**3.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:04
sec-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Styrene	**41**		**3.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:04
tert-Butylbenzene	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Tetrachloroethene	**14**		**3.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:04
Toluene	**28**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:04
trans-1,2-Dichloroethene	**43**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:04
trans-1,3-Dichloropropene	5.0	U	2.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Trichloroethene	**84,000**		**100**	**250**	**500**	**UG/L**	500	11-Jul-2019 19:06
Trichlorofluoromethane	5.0	U	3.0	5.0	10	UG/L	10	10-Jul-2019 20:04
Vinyl chloride	**440**		**2.0**	**5.0**	**10**	**UG/L**	10	10-Jul-2019 20:04
Surr: 1,2-Dichloroethane-d4	*106*			**0**	*81-118*	*%REC*	*10*	*10-Jul-2019 20:04*
Surr: 1,2-Dichloroethane-d4	*111*			**0**	*81-118*	*%REC*	*500*	*11-Jul-2019 19:06*
Surr: 1,2-Dichloroethane-d4	*92.7*			**0**	*81-118*	*%REC*	*1000*	*12-Jul-2019 12:21*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*10*	*10-Jul-2019 20:04*
Surr: 4-Bromofluorobenzene	*101*			**0**	*85-114*	*%REC*	*500*	*11-Jul-2019 19:06*
Surr: 4-Bromofluorobenzene	*93.4*			**0**	*85-114*	*%REC*	*1000*	*12-Jul-2019 12:21*
Surr: Dibromofluoromethane	*105*			**0**	*80-119*	*%REC*	*10*	*10-Jul-2019 20:04*
Surr: Dibromofluoromethane	*109*			**0**	*80-119*	*%REC*	*500*	*11-Jul-2019 19:06*
Surr: Dibromofluoromethane	*93.2*			**0**	*80-119*	*%REC*	*1000*	*12-Jul-2019 12:21*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*10*	*10-Jul-2019 20:04*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*500*	*11-Jul-2019 19:06*
Surr: Toluene-d8	*94.1*			**0**	*89-112*	*%REC*	*1000*	*12-Jul-2019 12:21*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT12E_062819
Collection Date: 28-Jun-2019 09:30

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-14
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 08-Jul-2019		Analyst: JC
Aluminum	**0.0433**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 00:05
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:05
Arsenic	**0.00106**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:05
Barium	**0.197**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:05
Beryllium	**0.000205**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:05
Cadmium	**0.000355**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:05
Calcium	**37.7**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:05
Chromium	**0.142**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:05
Cobalt	**0.0315**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:05
Copper	**0.0229**		**0.00100**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:05
Iron	**3.22**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:05
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 00:05
Magnesium	**29.8**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:05
Manganese	**1.28**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:05
Nickel	**0.178**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:05
Potassium	**2.43**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:05
Selenium	**0.00349**	J	**0.00110**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:05
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 00:05
Sodium	**339**		**0.140**	**0.500**	**2.00**	**mg/L**	10	09-Jul-2019 13:54
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:05
Vanadium	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 00:05
Zinc	**0.0387**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:05
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 09-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	09-Jul-2019 15:41
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT13B_062819
Collection Date: 28-Jun-2019 09:10

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,1-Dichloroethane	**1.0**		**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 18:52
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,2-Dichloroethane	**42**		**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 18:52
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:52
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:52
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 18:52
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Jul-2019 18:52
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:52
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Jul-2019 18:52
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Jul-2019 18:52
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Jul-2019 18:52
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:52

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT13B_062819
Collection Date: 28-Jun-2019 09:10

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:52
cis-1,2-Dichloroethene	**140**		**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 18:52
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Jul-2019 18:52
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 18:52
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Jul-2019 18:52
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:52
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Tetrachloroethene	**1.2**		**0.30**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 18:52
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:52
trans-1,2-Dichloroethene	**1.2**		**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 18:52
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Trichloroethene	**1,200**		**5.0**	**12**	**25**	**UG/L**	25	11-Jul-2019 19:53
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:52
Vinyl chloride	**3.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 18:52
Surr: 1,2-Dichloroethane-d4	*96.9*			**0**	*81-118*	*%REC*	*1*	*10-Jul-2019 18:52*
Surr: 1,2-Dichloroethane-d4	*112*			**0**	*81-118*	*%REC*	*25*	*11-Jul-2019 19:53*
Surr: 4-Bromofluorobenzene	*98.1*			**0**	*85-114*	*%REC*	*1*	*10-Jul-2019 18:52*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*25*	*11-Jul-2019 19:53*
Surr: Dibromofluoromethane	*97.8*			**0**	*80-119*	*%REC*	*1*	*10-Jul-2019 18:52*
Surr: Dibromofluoromethane	*111*			**0**	*80-119*	*%REC*	*25*	*11-Jul-2019 19:53*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*10-Jul-2019 18:52*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*25*	*11-Jul-2019 19:53*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT13B_062819
Collection Date: 28-Jun-2019 09:10

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-15
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 08-Jul-2019		Analyst: JC
Aluminum	**0.0158**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	09-Jul-2019 00:07
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:07
Arsenic	**0.00630**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:07
Barium	**0.203**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:07
Beryllium	**0.000547**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:07
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:07
Calcium	**13.3**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:07
Chromium	**0.0230**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:07
Cobalt	**0.105**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:07
Copper	**0.0276**		**0.00100**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:07
Iron	**20.3**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:07
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	09-Jul-2019 00:07
Magnesium	**17.7**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:07
Manganese	**4.05**		**0.0140**	**0.0200**	**0.100**	**mg/L**	20	09-Jul-2019 13:56
Nickel	**0.0245**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:07
Potassium	**2.37**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:07
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:07
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 00:07
Sodium	**103**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:07
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:07
Vanadium	**0.00112**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:07
Zinc	**0.0910**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:07
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 09-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	09-Jul-2019 15:42
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT13D_062819
Collection Date: 28-Jun-2019 08:20

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,2-Dichloroethane	**10**		**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 18:28
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:28
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:28
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 18:28
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Jul-2019 18:28
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:28
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Jul-2019 18:28
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Jul-2019 18:28
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Jul-2019 18:28
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:28

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT13D_062819
Collection Date: 28-Jun-2019 08:20

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:28
cis-1,2-Dichloroethene	**37**		**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 18:28
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Jul-2019 18:28
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 18:28
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Jul-2019 18:28
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:28
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:28
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:28
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Trichloroethene	**160**		**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 18:28
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:28
Vinyl chloride	**1.5**		**0.20**	**0.50**	**1.0**	**UG/L**	1	10-Jul-2019 18:28
Surr: 1,2-Dichloroethane-d4	*98.7*			**0**	*81-118*	*%REC*	*1*	*10-Jul-2019 18:28*
Surr: 4-Bromofluorobenzene	*98.3*			**0**	*85-114*	*%REC*	*1*	*10-Jul-2019 18:28*
Surr: Dibromofluoromethane	*98.3*			**0**	*80-119*	*%REC*	*1*	*10-Jul-2019 18:28*
Surr: Toluene-d8	*104*			**0**	*89-112*	*%REC*	*1*	*10-Jul-2019 18:28*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT13D_062819
Collection Date: 28-Jun-2019 08:20

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-16
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 08-Jul-2019		Analyst: JHD
Aluminum	**1.41**		**0.0360**	**0.100**	**0.200**	**mg/L**	20	09-Jul-2019 19:02
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:09
Arsenic	**0.00193**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:09
Barium	**0.0962**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:09
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:09
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:09
Calcium	**3.50**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:09
Chromium	**0.121**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:09
Cobalt	**0.00316**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:09
Copper	**0.00533**		**0.00100**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:09
Iron	**9.93**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:09
Lead	**0.00505**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:09
Magnesium	**4.38**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:09
Manganese	**0.0744**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:09
Nickel	**0.0578**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:09
Potassium	**0.918**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:09
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:09
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 00:09
Sodium	**34.2**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:09
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:09
Vanadium	**0.00524**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:09
Zinc	**0.491**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:09
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 09-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	09-Jul-2019 15:47
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT13E_062819
Collection Date: 28-Jun-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:04
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 18:04
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	10-Jul-2019 18:04
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:04
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	10-Jul-2019 18:04
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	10-Jul-2019 18:04
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	10-Jul-2019 18:04
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT13E_062819
Collection Date: 28-Jun-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	10-Jul-2019 18:04
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	10-Jul-2019 18:04
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	10-Jul-2019 18:04
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	10-Jul-2019 18:04
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	10-Jul-2019 18:04
Surr: 1,2-Dichloroethane-d4	*97.2*			**0**	*81-118*	*%REC*	*1*	*10-Jul-2019 18:04*
Surr: 4-Bromofluorobenzene	*97.4*			**0**	*85-114*	*%REC*	*1*	*10-Jul-2019 18:04*
Surr: Dibromofluoromethane	*96.4*			**0**	*80-119*	*%REC*	*1*	*10-Jul-2019 18:04*
Surr: Toluene-d8	*102*			**0**	*89-112*	*%REC*	*1*	*10-Jul-2019 18:04*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT13E_062819
Collection Date: 28-Jun-2019 08:00

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-17
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 08-Jul-2019		Analyst: JHD
Aluminum	**6.70**		**0.0900**	**0.250**	**0.500**	**mg/L**	50	09-Jul-2019 19:04
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:11
Arsenic	**0.00294**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:11
Barium	**0.136**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:11
Beryllium	**0.00102**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:11
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:11
Calcium	**1.16**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:11
Chromium	**0.0248**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:11
Cobalt	**0.00491**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:11
Copper	**0.0168**		**0.00100**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:11
Iron	**12.1**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:11
Lead	**0.00889**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:11
Magnesium	**1.63**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:11
Manganese	**0.0546**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:11
Nickel	**0.0192**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:11
Potassium	**2.09**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:11
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:11
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 00:11
Sodium	**5.75**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:11
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:11
Vanadium	**0.0267**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:11
Zinc	**0.0557**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:11
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 09-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	09-Jul-2019 15:49
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT13F_062819
Collection Date: 28-Jun-2019 07:20

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:55
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	11-Jul-2019 13:55
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	11-Jul-2019 13:55
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:55
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	11-Jul-2019 13:55
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	11-Jul-2019 13:55
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	11-Jul-2019 13:55
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT13F_062819
Collection Date: 28-Jun-2019 07:20

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	11-Jul-2019 13:55
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	11-Jul-2019 13:55
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	11-Jul-2019 13:55
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:55
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:55
Surr: 1,2-Dichloroethane-d4	*93.0*			**0**	*81-118*	*%REC*	*1*	*11-Jul-2019 13:55*
Surr: 4-Bromofluorobenzene	*94.5*			**0**	*85-114*	*%REC*	*1*	*11-Jul-2019 13:55*
Surr: Dibromofluoromethane	*93.4*			**0**	*80-119*	*%REC*	*1*	*11-Jul-2019 13:55*
Surr: Toluene-d8	*101*			**0**	*89-112*	*%REC*	*1*	*11-Jul-2019 13:55*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: ICT13F_062819
Collection Date: 28-Jun-2019 07:20

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-18
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 08-Jul-2019		Analyst: JHD
Aluminum	**3.09**		**0.0900**	**0.250**	**0.500**	**mg/L**	50	09-Jul-2019 19:06
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	09-Jul-2019 00:13
Arsenic	**0.00162**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:13
Barium	**0.115**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:13
Beryllium	**0.000645**	J	**0.000200**	**0.000500**	**0.00200**	**mg/L**	1	09-Jul-2019 00:13
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:13
Calcium	**1.05**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	09-Jul-2019 00:13
Chromium	**0.0124**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:13
Cobalt	**0.00302**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	09-Jul-2019 00:13
Copper	**0.0127**		**0.00100**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:13
Iron	**6.24**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:13
Lead	**0.00438**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:13
Magnesium	**1.14**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:13
Manganese	**0.0357**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:13
Nickel	**0.00929**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:13
Potassium	**1.90**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:13
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	09-Jul-2019 00:13
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	09-Jul-2019 00:13
Sodium	**4.44**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	09-Jul-2019 00:13
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	09-Jul-2019 00:13
Vanadium	**0.0146**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	09-Jul-2019 00:13
Zinc	**0.0596**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	09-Jul-2019 00:13
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 09-Jul-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	09-Jul-2019 15:51
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	17-Jul-2019 09:42

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: Trip Blank
Collection Date: 28-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-19
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:31
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	11-Jul-2019 13:31
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	11-Jul-2019 13:31
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:31
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	11-Jul-2019 13:31
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	11-Jul-2019 13:31
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	11-Jul-2019 13:31
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Sample ID: Trip Blank
Collection Date: 28-Jun-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19070016
Lab ID:HS19070016-19
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	11-Jul-2019 13:31
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	11-Jul-2019 13:31
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	11-Jul-2019 13:31
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	11-Jul-2019 13:31
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	11-Jul-2019 13:31
Surr: 1,2-Dichloroethane-d4	*94.6*			**0**	*81-118*	*%REC*	*1*	*11-Jul-2019 13:31*
Surr: 4-Bromofluorobenzene	*100*			**0**	*85-114*	*%REC*	*1*	*11-Jul-2019 13:31*
Surr: Dibromofluoromethane	*96.1*			**0**	*80-119*	*%REC*	*1*	*11-Jul-2019 13:31*
Surr: Toluene-d8	*105*			**0**	*89-112*	*%REC*	*1*	*11-Jul-2019 13:31*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

Batch ID: 142750 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19070016-01	1	10	10 (mL)	1
HS19070016-02	1	10	10 (mL)	1
HS19070016-03	1	10	10 (mL)	1
HS19070016-04	1	10	10 (mL)	1
HS19070016-05	1	10	10 (mL)	1
HS19070016-06	1	10	10 (mL)	1
HS19070016-07	1	10	10 (mL)	1

Batch ID: 142769 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19070016-01	1	10 (mL)	10 (mL)	1
HS19070016-02	1	10 (mL)	10 (mL)	1
HS19070016-03	1	10 (mL)	10 (mL)	1
HS19070016-04	1	10 (mL)	10 (mL)	1
HS19070016-05	1	10 (mL)	10 (mL)	1
HS19070016-06	1	10 (mL)	10 (mL)	1
HS19070016-07	1	10 (mL)	10 (mL)	1
HS19070016-08	1	10 (mL)	10 (mL)	1
HS19070016-09	1	10 (mL)	10 (mL)	1

Batch ID: 142828 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19070016-08	1	10	10 (mL)	1
HS19070016-09	1	10	10 (mL)	1
HS19070016-10	1	10	10 (mL)	1
HS19070016-11	1	10	10 (mL)	1
HS19070016-12	1	10	10 (mL)	1
HS19070016-13	1	10	10 (mL)	1
HS19070016-14	1	10	10 (mL)	1
HS19070016-15	1	10	10 (mL)	1
HS19070016-16	1	10	10 (mL)	1
HS19070016-17	1	10	10 (mL)	1
HS19070016-18	1	10	10 (mL)	1

Batch ID: 142867 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19070016-10	1	10 (mL)	10 (mL)	1
HS19070016-11	1	10 (mL)	10 (mL)	1
HS19070016-12	1	10 (mL)	10 (mL)	1
HS19070016-13	1	10 (mL)	10 (mL)	1
HS19070016-14	1	10 (mL)	10 (mL)	1
HS19070016-15	1	10 (mL)	10 (mL)	1
HS19070016-16	1	10 (mL)	10 (mL)	1
HS19070016-17	1	10 (mL)	10 (mL)	1
HS19070016-18	1	10 (mL)	10 (mL)	1

ALS Houston, US Date: 17-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142750 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19070016-01	ICT2_062819	28 Jun 2019 06:50		05 Jul 2019 10:03	09 Jul 2019 14:50	1
HS19070016-01	ICT2_062819	28 Jun 2019 06:50		05 Jul 2019 10:03	09 Jul 2019 00:30	1
HS19070016-02	ICT4_062819	28 Jun 2019 07:10		05 Jul 2019 10:03	09 Jul 2019 14:55	10
HS19070016-02	ICT4_062819	28 Jun 2019 07:10		05 Jul 2019 10:03	09 Jul 2019 14:53	1
HS19070016-02	ICT4_062819	28 Jun 2019 07:10		05 Jul 2019 10:03	09 Jul 2019 00:32	1
HS19070016-03	ICT7_062819	28 Jun 2019 07:25		05 Jul 2019 10:03	09 Jul 2019 14:57	1
HS19070016-03	ICT7_062819	28 Jun 2019 07:25		05 Jul 2019 10:03	09 Jul 2019 00:34	1
HS19070016-04	ICT8_062819	28 Jun 2019 07:35		05 Jul 2019 10:03	09 Jul 2019 14:59	1
HS19070016-04	ICT8_062819	28 Jun 2019 07:35		05 Jul 2019 10:03	09 Jul 2019 00:36	1
HS19070016-05	ICT11_062819	28 Jun 2019 07:50		05 Jul 2019 10:03	09 Jul 2019 00:14	1
HS19070016-06	ICT11_062819_a	28 Jun 2019 07:50		05 Jul 2019 10:03	09 Jul 2019 16:03	1
HS19070016-06	ICT11_062819_a	28 Jun 2019 07:50		05 Jul 2019 10:03	09 Jul 2019 00:39	1
HS19070016-07	ICT14B_062819	28 Jun 2019 08:05		05 Jul 2019 10:03	09 Jul 2019 16:06	1
HS19070016-07	ICT14B_062819	28 Jun 2019 08:05		05 Jul 2019 10:03	09 Jul 2019 00:41	1
Batch ID: 142769 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19070016-01	ICT2_062819	28 Jun 2019 06:50		05 Jul 2019 10:30	05 Jul 2019 15:37	1
HS19070016-02	ICT4_062819	28 Jun 2019 07:10		05 Jul 2019 10:30	05 Jul 2019 15:25	1
HS19070016-03	ICT7_062819	28 Jun 2019 07:25		05 Jul 2019 10:30	05 Jul 2019 15:27	1
HS19070016-04	ICT8_062819	28 Jun 2019 07:35		05 Jul 2019 10:30	05 Jul 2019 15:28	1
HS19070016-05	ICT11_062819	28 Jun 2019 07:50		05 Jul 2019 10:30	05 Jul 2019 15:30	1
HS19070016-06	ICT11_062819_a	28 Jun 2019 07:50		05 Jul 2019 10:30	05 Jul 2019 15:32	1
HS19070016-07	ICT14B_062819	28 Jun 2019 08:05		05 Jul 2019 10:30	05 Jul 2019 15:33	1
HS19070016-08	ICT14C_062819	28 Jun 2019 08:15		05 Jul 2019 10:30	05 Jul 2019 15:35	1
HS19070016-09	ICT14D_062819	28 Jun 2019 08:35		05 Jul 2019 10:30	05 Jul 2019 15:04	1

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
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DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 142828 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19070016-08	ICT14C_062819	28 Jun 2019 08:15		08 Jul 2019 12:30	09 Jul 2019 13:48	20
HS19070016-08	ICT14C_062819	28 Jun 2019 08:15		08 Jul 2019 12:30	08 Jul 2019 23:55	1
HS19070016-09	ICT14D_062819	28 Jun 2019 08:35		08 Jul 2019 12:30	09 Jul 2019 13:42	10
HS19070016-09	ICT14D_062819	28 Jun 2019 08:35		08 Jul 2019 12:30	08 Jul 2019 23:41	1
HS19070016-10	ICT12B_062819	28 Jun 2019 09:05		08 Jul 2019 12:30	09 Jul 2019 13:50	10
HS19070016-10	ICT12B_062819	28 Jun 2019 09:05		08 Jul 2019 12:30	08 Jul 2019 23:57	1
HS19070016-11	ICT12B_062819_a	28 Jun 2019 09:05		08 Jul 2019 12:30	09 Jul 2019 13:52	10
HS19070016-11	ICT12B_062819_a	28 Jun 2019 09:05		08 Jul 2019 12:30	08 Jul 2019 23:59	1
HS19070016-12	ICT12C_062819	28 Jun 2019 09:20		08 Jul 2019 12:30	09 Jul 2019 00:01	1
HS19070016-13	ICT12D_062819	28 Jun 2019 09:35		08 Jul 2019 12:30	09 Jul 2019 00:03	1
HS19070016-14	ICT12E_062819	28 Jun 2019 09:30		08 Jul 2019 12:30	09 Jul 2019 13:54	10
HS19070016-14	ICT12E_062819	28 Jun 2019 09:30		08 Jul 2019 12:30	09 Jul 2019 00:05	1
HS19070016-15	ICT13B_062819	28 Jun 2019 09:10		08 Jul 2019 12:30	09 Jul 2019 13:56	20
HS19070016-15	ICT13B_062819	28 Jun 2019 09:10		08 Jul 2019 12:30	09 Jul 2019 00:07	1
HS19070016-16	ICT13D_062819	28 Jun 2019 08:20		08 Jul 2019 12:30	09 Jul 2019 19:02	20
HS19070016-16	ICT13D_062819	28 Jun 2019 08:20		08 Jul 2019 12:30	09 Jul 2019 00:09	1
HS19070016-17	ICT13E_062819	28 Jun 2019 08:00		08 Jul 2019 12:30	09 Jul 2019 19:04	50
HS19070016-17	ICT13E_062819	28 Jun 2019 08:00		08 Jul 2019 12:30	09 Jul 2019 00:11	1
HS19070016-18	ICT13F_062819	28 Jun 2019 07:20		08 Jul 2019 12:30	09 Jul 2019 19:06	50
HS19070016-18	ICT13F_062819	28 Jun 2019 07:20		08 Jul 2019 12:30	09 Jul 2019 00:13	1
Batch ID: 142867 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19070016-10	ICT12B_062819	28 Jun 2019 09:05		09 Jul 2019 10:30	09 Jul 2019 15:30	1
HS19070016-11	ICT12B_062819_a	28 Jun 2019 09:05		09 Jul 2019 10:30	09 Jul 2019 15:36	1
HS19070016-12	ICT12C_062819	28 Jun 2019 09:20		09 Jul 2019 10:30	09 Jul 2019 15:37	1
HS19070016-13	ICT12D_062819	28 Jun 2019 09:35		09 Jul 2019 10:30	09 Jul 2019 15:39	1
HS19070016-14	ICT12E_062819	28 Jun 2019 09:30		09 Jul 2019 10:30	09 Jul 2019 15:41	1
HS19070016-15	ICT13B_062819	28 Jun 2019 09:10		09 Jul 2019 10:30	09 Jul 2019 15:42	1
HS19070016-16	ICT13D_062819	28 Jun 2019 08:20		09 Jul 2019 10:30	09 Jul 2019 15:47	1
HS19070016-17	ICT13E_062819	28 Jun 2019 08:00		09 Jul 2019 10:30	09 Jul 2019 15:49	1
HS19070016-18	ICT13F_062819	28 Jun 2019 07:20		09 Jul 2019 10:30	09 Jul 2019 15:51	1

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells **DATES REPORT**
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Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R342223 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19070016-04	ICT8_062819	28 Jun 2019 07:35			10 Jul 2019 20:28	10
HS19070016-05	ICT11_062819	28 Jun 2019 07:50			10 Jul 2019 17:16	5
HS19070016-05	ICT11_062819	28 Jun 2019 07:50			10 Jul 2019 13:17	1
HS19070016-06	ICT11_062819_a	28 Jun 2019 07:50			10 Jul 2019 17:40	5
HS19070016-06	ICT11_062819_a	28 Jun 2019 07:50			10 Jul 2019 13:41	1
HS19070016-07	ICT14B_062819	28 Jun 2019 08:05			10 Jul 2019 19:16	1
HS19070016-09	ICT14D_062819	28 Jun 2019 08:35			10 Jul 2019 16:05	250
HS19070016-09	ICT14D_062819	28 Jun 2019 08:35			10 Jul 2019 14:53	10
HS19070016-10	ICT12B_062819	28 Jun 2019 09:05			10 Jul 2019 15:17	250
HS19070016-10	ICT12B_062819	28 Jun 2019 09:05			10 Jul 2019 14:05	10
HS19070016-11	ICT12B_062819_a	28 Jun 2019 09:05			10 Jul 2019 15:41	250
HS19070016-11	ICT12B_062819_a	28 Jun 2019 09:05			10 Jul 2019 14:29	10
HS19070016-13	ICT12D_062819	28 Jun 2019 09:35			10 Jul 2019 19:40	10
HS19070016-14	ICT12E_062819	28 Jun 2019 09:30			10 Jul 2019 20:04	10
HS19070016-15	ICT13B_062819	28 Jun 2019 09:10			10 Jul 2019 18:52	1
HS19070016-16	ICT13D_062819	28 Jun 2019 08:20			10 Jul 2019 18:28	1
HS19070016-17	ICT13E_062819	28 Jun 2019 08:00			10 Jul 2019 18:04	1
Batch ID: R342283 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19070016-19	Trip Blank	28 Jun 2019 00:00			11 Jul 2019 13:31	1
Batch ID: R342283 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19070016-01	ICT2_062819	28 Jun 2019 06:50			11 Jul 2019 16:18	25
HS19070016-01	ICT2_062819	28 Jun 2019 06:50			11 Jul 2019 14:18	1
HS19070016-02	ICT4_062819	28 Jun 2019 07:10			11 Jul 2019 19:30	50
HS19070016-02	ICT4_062819	28 Jun 2019 07:10			11 Jul 2019 14:42	1
HS19070016-03	ICT7_062819	28 Jun 2019 07:25			11 Jul 2019 18:42	1
HS19070016-04	ICT8_062819	28 Jun 2019 07:35			11 Jul 2019 17:54	100
HS19070016-08	ICT14C_062819	28 Jun 2019 08:15			11 Jul 2019 16:42	10
HS19070016-12	ICT12C_062819	28 Jun 2019 09:20			11 Jul 2019 20:41	200
HS19070016-12	ICT12C_062819	28 Jun 2019 09:20			11 Jul 2019 15:54	10
HS19070016-13	ICT12D_062819	28 Jun 2019 09:35			11 Jul 2019 18:18	250
HS19070016-14	ICT12E_062819	28 Jun 2019 09:30			11 Jul 2019 19:06	500
HS19070016-15	ICT13B_062819	28 Jun 2019 09:10			11 Jul 2019 19:53	25
HS19070016-18	ICT13F_062819	28 Jun 2019 07:20			11 Jul 2019 13:55	1
Batch ID: R342382 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19070016-08	ICT14C_062819	28 Jun 2019 08:15			12 Jul 2019 12:45	200
HS19070016-14	ICT12E_062819	28 Jun 2019 09:30			12 Jul 2019 12:21	1000

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Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: R342551 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19070016-01	ICT2_062819	28 Jun 2019 06:50			17 Jul 2019 09:42	1
HS19070016-02	ICT4_062819	28 Jun 2019 07:10			17 Jul 2019 09:42	1
HS19070016-03	ICT7_062819	28 Jun 2019 07:25			17 Jul 2019 09:42	1
HS19070016-04	ICT8_062819	28 Jun 2019 07:35			17 Jul 2019 09:42	1
HS19070016-05	ICT11_062819	28 Jun 2019 07:50			17 Jul 2019 09:42	1
HS19070016-06	ICT11_062819_a	28 Jun 2019 07:50			17 Jul 2019 09:42	1
HS19070016-07	ICT14B_062819	28 Jun 2019 08:05			17 Jul 2019 09:42	1
HS19070016-08	ICT14C_062819	28 Jun 2019 08:15			17 Jul 2019 09:42	1
HS19070016-09	ICT14D_062819	28 Jun 2019 08:35			17 Jul 2019 09:42	1
HS19070016-10	ICT12B_062819	28 Jun 2019 09:05			17 Jul 2019 09:42	1
HS19070016-11	ICT12B_062819_a	28 Jun 2019 09:05			17 Jul 2019 09:42	1
HS19070016-12	ICT12C_062819	28 Jun 2019 09:20			17 Jul 2019 09:42	1
HS19070016-13	ICT12D_062819	28 Jun 2019 09:35			17 Jul 2019 09:42	1
HS19070016-14	ICT12E_062819	28 Jun 2019 09:30			17 Jul 2019 09:42	1
HS19070016-15	ICT13B_062819	28 Jun 2019 09:10			17 Jul 2019 09:42	1
HS19070016-16	ICT13D_062819	28 Jun 2019 08:20			17 Jul 2019 09:42	1
HS19070016-17	ICT13E_062819	28 Jun 2019 08:00			17 Jul 2019 09:42	1
HS19070016-18	ICT13F_062819	28 Jun 2019 07:20			17 Jul 2019 09:42	1

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 14:46**
Client ID: Run ID: **ICPMS05_342082** SeqNo: **5159142** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.00500	0.0100								U
Antimony	0.00078	0.00500								J
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00100	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.000871	0.00500								J
Zinc	0.00250	0.00500								U

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 00:09**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157973** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.01569	0.0100								
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00100	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0188	0.200								J
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.01316	0.00500								

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 00:11**
Client ID: Run ID: **ICPMS05_341995** SeqNo: **5157974** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.105	0.0100	0.1	0	105	84 - 117				
Antimony	0.05026	0.00500	0.05	0	101	85 - 117				
Arsenic	0.05045	0.00500	0.05	0	101	84 - 116				
Barium	0.04898	0.00500	0.05	0	98.0	86 - 114				
Beryllium	0.0522	0.00200	0.05	0	104	83 - 121				
Cadmium	0.05062	0.00200	0.05	0	101	87 - 115				
Calcium	5.044	0.500	5	0	101	87 - 118				
Chromium	0.05022	0.00500	0.05	0	100	85 - 116				
Cobalt	0.05178	0.00500	0.05	0	104	86 - 115				
Copper	0.05054	0.00500	0.05	0	101	85 - 118				
Iron	5.157	0.200	5	0	103	87 - 118				
Lead	0.04892	0.00500	0.05	0	97.8	88 - 115				
Magnesium	5.207	0.200	5	0	104	83 - 118				
Manganese	0.05151	0.00500	0.05	0	103	87 - 115				
Nickel	0.05192	0.00500	0.05	0	104	85 - 117				
Potassium	5.01	0.200	5	0	100	87 - 115				
Selenium	0.05098	0.00500	0.05	0	102	80 - 120				
Sodium	5.131	0.200	5	0	103	85 - 117				
Thallium	0.04741	0.00200	0.05	0	94.8	82 - 116				
Vanadium	0.04942	0.00500	0.05	0	98.8	86 - 115				
Zinc	0.05405	0.00500	0.05	0	108	83 - 119				

LCS Sample ID: **LCS-142750** Units: **mg/L** Analysis Date: **09-Jul-2019 16:22**
Client ID: Run ID: **ICPMS05_342082** SeqNo: **5159203** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Silver	0.05104	0.00500	0.05	0	102	85 - 116				

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19070016-05MS** Units: **mg/L** Analysis Date: **09-Jul-2019 00:18**
Client ID: **ICT11_062819** Run ID: **ICPMS05_341995** SeqNo: **5157977** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09637	0.0100	0.1	0.008457	87.9	84 - 117				
Antimony	0.04754	0.00500	0.05	0.000233	94.6	85 - 117				
Arsenic	0.04735	0.00500	0.05	0.000332	94.0	84 - 116				
Barium	0.5018	0.00500	0.05	0.443	118	86 - 114				SO
Beryllium	0.05054	0.00200	0.05	0.000285	101	83 - 121				
Cadmium	0.04557	0.00200	0.05	0.000354	90.4	87 - 115				
Calcium	15.22	0.500	5	10.34	97.6	87 - 118				
Chromium	0.1883	0.00500	0.05	0.1422	92.1	85 - 116				
Cobalt	0.05284	0.00500	0.05	0.004809	96.1	86 - 115				
Copper	0.05149	0.00500	0.05	0.004724	93.5	85 - 118				
Iron	5.767	0.200	5	1.003	95.3	87 - 118				
Lead	0.04574	0.00500	0.05	0.000066	91.3	88 - 115				
Magnesium	11.72	0.200	5	7.041	93.6	83 - 118				
Manganese	0.255	0.00500	0.05	0.2048	100	87 - 115				O
Nickel	0.6207	0.00500	0.05	0.5635	114	85 - 117				O
Potassium	5.81	0.200	5	0.934	97.5	87 - 115				
Selenium	0.05067	0.00500	0.05	0.000254	101	80 - 120				
Silver	0.05394	0.00500	0.05	0.000034	108	85 - 116				
Sodium	70.47	0.200	5	64.83	113	85 - 117				O
Thallium	0.04418	0.00200	0.05	0.000618	87.1	82 - 116				
Vanadium	0.0472	0.00500	0.05	0.001088	92.2	86 - 115				
Zinc	0.1359	0.00500	0.05	0.09015	91.5	83 - 119				

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Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19070016-05MSD** Units: **mg/L** Analysis Date: **09-Jul-2019 00:21**
Client ID: **ICT11_062819** Run ID: **ICPMS05_341995** SeqNo: **5157978** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.0988	0.0100	0.1	0.008457	90.3	84 - 117	0.09637	2.49	20	
Antimony	0.04561	0.00500	0.05	0.000233	90.8	85 - 117	0.04754	4.15	20	
Arsenic	0.0475	0.00500	0.05	0.000332	94.3	84 - 116	0.04735	0.314	20	
Barium	0.5084	0.00500	0.05	0.443	131	86 - 114	0.5018	1.3	20	SO
Beryllium	0.05016	0.00200	0.05	0.000285	99.8	83 - 121	0.05054	0.751	20	
Cadmium	0.04804	0.00200	0.05	0.000354	95.4	87 - 115	0.04557	5.28	20	
Calcium	14.79	0.500	5	10.34	89.1	87 - 118	15.22	2.83	20	
Chromium	0.1943	0.00500	0.05	0.1422	104	85 - 116	0.1883	3.17	20	
Cobalt	0.05273	0.00500	0.05	0.004809	95.8	86 - 115	0.05284	0.201	20	
Copper	0.05346	0.00500	0.05	0.004724	97.5	85 - 118	0.05149	3.75	20	
Iron	5.694	0.200	5	1.003	93.8	87 - 118	5.767	1.28	20	
Lead	0.04407	0.00500	0.05	0.000066	88.0	88 - 115	0.04574	3.72	20	
Magnesium	11.29	0.200	5	7.041	85.1	83 - 118	11.72	3.73	20	
Manganese	0.2539	0.00500	0.05	0.2048	98.1	87 - 115	0.255	0.456	20	O
Nickel	0.6206	0.00500	0.05	0.5635	114	85 - 117	0.6207	0.00725	20	O
Potassium	5.591	0.200	5	0.934	93.1	87 - 115	5.81	3.84	20	
Selenium	0.0495	0.00500	0.05	0.000254	98.5	80 - 120	0.05067	2.33	20	
Silver	0.05636	0.00500	0.05	0.000034	113	85 - 116	0.05394	4.39	20	
Sodium	68.43	0.200	5	64.83	71.9	85 - 117	70.47	2.94	20	SO
Thallium	0.04256	0.00200	0.05	0.000618	83.9	82 - 116	0.04418	3.74	20	
Vanadium	0.04785	0.00500	0.05	0.001088	93.5	86 - 115	0.0472	1.37	20	
Zinc	0.1384	0.00500	0.05	0.09015	96.5	83 - 119	0.1359	1.82	20	

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19070016-05PDS** Units: **mg/L** Analysis Date: **09-Jul-2019 00:23**
Client ID: **ICT11_062819** Run ID: **ICPMS05_341995** SeqNo: **5157979** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1004	0.0100	0.1	0.008457	92.0	80 - 120				
Antimony	0.08827	0.00500	0.1	0.000233	88.0	80 - 120				
Arsenic	0.1014	0.00500	0.1	0.000332	101	80 - 120				
Barium	0.5467	0.00500	0.1	0.443	104	80 - 120				O
Beryllium	0.09789	0.00200	0.1	0.000285	97.6	80 - 120				
Cadmium	0.09739	0.00200	0.1	0.000354	97.0	80 - 120				
Calcium	19.93	0.500	10	10.34	96.0	80 - 120				
Chromium	0.2417	0.00500	0.1	0.1422	99.5	80 - 120				
Cobalt	0.1061	0.00500	0.1	0.004809	101	80 - 120				
Copper	0.1034	0.00500	0.1	0.004724	98.7	80 - 120				
Iron	11.04	0.200	10	1.003	100	80 - 120				
Lead	0.09432	0.00500	0.1	0.000066	94.2	80 - 120				
Magnesium	16.83	0.200	10	7.041	97.9	80 - 120				
Manganese	0.3036	0.00500	0.1	0.2048	98.8	80 - 120				
Nickel	0.652	0.00500	0.1	0.5635	88.5	80 - 120				O
Potassium	10.66	0.200	10	0.934	97.2	80 - 120				
Selenium	0.1067	0.00500	0.1	0.000254	106	80 - 120				
Silver	0.1124	0.00500	0.1	0.000034	112	80 - 120				
Sodium	73.52	0.200	10	64.83	86.9	80 - 120				O
Thallium	0.09198	0.00200	0.1	0.000618	91.4	80 - 120				
Vanadium	0.101	0.00500	0.1	0.001088	99.9	80 - 120				
Zinc	0.1865	0.00500	0.1	0.09015	96.3	80 - 120				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: 142750 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19070016-05SD** Units: **mg/L** Analysis Date: **09-Jul-2019 00:16**
Client ID: **ICT11_062819** Run ID: **ICPMS05_341995** SeqNo: **5157976** PrepDate: **05-Jul-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.0250	0.0500					0.008457	0	10	U
Antimony	0.00250	0.0250					0.000233	0	10	U
Arsenic	0.00250	0.0250					0.000332	0	10	U
Barium	0.4183	0.0250					0.443	5.57	10	
Beryllium	0.00250	0.0100					0.000285	0	10	U
Cadmium	0.00250	0.0100					0.000354	0	10	U
Calcium	10.41	2.50					10.34	0.714	10	
Chromium	0.1432	0.0250					0.1422	0.69	10	
Cobalt	0.005021	0.0250					0.004809	0	10	J
Copper	0.00500	0.0250					0.004724	0	10	U
Iron	1.017	1.00					1.003	1.35	10	
Lead	0.00500	0.0250					0.000066	0	10	U
Magnesium	6.942	1.00					7.041	1.41	10	
Manganese	0.2079	0.0250					0.2048	1.52	10	
Nickel	0.5877	0.0250					0.5635	4.3	10	
Potassium	0.9174	1.00					0.934	0	10	J
Selenium	0.0125	0.0250					0.000254	0	10	U
Silver	0.00250	0.0250					0.000034	0	10	U
Sodium	66.24	1.00					64.83	2.17	10	
Thallium	0.00250	0.0100					0.000618	0	10	U
Vanadium	0.00500	0.0250					0.001088	0	10	U
Zinc	0.08743	0.0250					0.09015	3.02	10	

The following samples were analyzed in this batch:

HS19070016-01	HS19070016-02	HS19070016-03	HS19070016-04
HS19070016-05	HS19070016-06	HS19070016-07	

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: 142769 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142769** Units: **mg/L** Analysis Date: **05-Jul-2019 15:01**
Client ID: Run ID: **HG03_341922** SeqNo: **5154872** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142769** Units: **mg/L** Analysis Date: **05-Jul-2019 15:03**
Client ID: Run ID: **HG03_341922** SeqNo: **5154873** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00505	0.000200	0.005	0	101	82 - 119				

MS Sample ID: **HS19070016-09MS** Units: **mg/L** Analysis Date: **05-Jul-2019 15:06**
Client ID: **ICT14D_062819** Run ID: **HG03_341922** SeqNo: **5154875** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00527	0.000200	0.005	-0.00001500	106	82 - 119				

MSD Sample ID: **HS19070016-09MSD** Units: **mg/L** Analysis Date: **05-Jul-2019 15:08**
Client ID: **ICT14D_062819** Run ID: **HG03_341922** SeqNo: **5154876** PrepDate: **05-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00517	0.000200	0.005	-0.00001500	104	82 - 119	0.005270	1.92	20	

The following samples were analyzed in this batch:

HS19070016-01	HS19070016-02	HS19070016-03	HS19070016-04
HS19070016-05	HS19070016-06	HS19070016-07	HS19070016-08
HS19070016-09			

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: 142828 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-142828** Units: **mg/L** Analysis Date: **08-Jul-2019 23:37**
Client ID: Run ID: **ICPMS04_341991** SeqNo: **5157837** PrepDate: **08-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.00500	0.0100								U
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00250	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.01146	0.200								J
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.0500	0.200								U
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.02792	0.200								J
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00250	0.00500								U

LCS Sample ID: **LCS-142828** Units: **mg/L** Analysis Date: **09-Jul-2019 18:55**
Client ID: Run ID: **ICPMS05_342082** SeqNo: **5159861** PrepDate: **08-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09625	0.0100	0.1	0	96.3	84 - 117				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: 142828 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-142828** Units: **mg/L** Analysis Date: **08-Jul-2019 23:39**
Client ID: Run ID: **ICPMS04_341991** SeqNo: **5157838** PrepDate: **08-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.0547	0.00500	0.05	0	109	85 - 117				
Arsenic	0.05111	0.00500	0.05	0	102	84 - 116				
Barium	0.05176	0.00500	0.05	0	104	86 - 114				
Beryllium	0.05253	0.00200	0.05	0	105	83 - 121				
Cadmium	0.05237	0.00200	0.05	0	105	87 - 115				
Calcium	4.993	0.500	5	0	99.9	87 - 118				
Chromium	0.05116	0.00500	0.05	0	102	85 - 116				
Cobalt	0.05126	0.00500	0.05	0	103	86 - 115				
Copper	0.05299	0.00500	0.05	0	106	85 - 118				
Iron	5.133	0.200	5	0	103	87 - 118				
Lead	0.04955	0.00500	0.05	0	99.1	88 - 115				
Magnesium	5.208	0.200	5	0	104	83 - 118				
Manganese	0.05141	0.00500	0.05	0	103	87 - 115				
Nickel	0.05332	0.00500	0.05	0	107	85 - 117				
Potassium	5.093	0.200	5	0	102	87 - 115				
Selenium	0.05492	0.00500	0.05	0	110	80 - 120				
Silver	0.05447	0.00500	0.05	0	109	85 - 116				
Sodium	5.288	0.200	5	0	106	85 - 117				
Thallium	0.05241	0.00200	0.05	0	105	82 - 116				
Vanadium	0.0514	0.00500	0.05	0	103	86 - 115				
Zinc	0.05606	0.00500	0.05	0	112	83 - 119				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: 142828 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19070016-09MS** Units: **mg/L** Analysis Date: **08-Jul-2019 23:45**
Client ID: **ICT14D_062819** Run ID: **ICPMS04_341991** SeqNo: **5157841** PrepDate: **08-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1353	0.0100	0.1	0.02227	113	84 - 117				
Antimony	0.05493	0.00500	0.05	0.000085	110	85 - 117				
Arsenic	0.06094	0.00500	0.05	0.008101	106	84 - 116				
Barium	1.235	0.00500	0.05	1.181	107	86 - 114				O
Beryllium	0.05474	0.00200	0.05	0.000518	108	83 - 121				
Cadmium	0.05079	0.00200	0.05	0.000514	101	87 - 115				
Calcium	88.6	0.500	5	79.96	173	87 - 118				SO
Chromium	0.05672	0.00500	0.05	0.004215	105	85 - 116				
Cobalt	0.06425	0.00500	0.05	0.01411	100	86 - 115				
Copper	0.05465	0.00500	0.05	0.004114	101	85 - 118				
Iron	25.44	0.200	5	19.47	119	87 - 118				S
Lead	0.05046	0.00500	0.05	0.000156	101	88 - 115				
Magnesium	64.43	0.200	5	57.21	144	83 - 118				SO
Manganese	1.393	0.00500	0.05	1.308	170	87 - 115				SO
Nickel	0.09869	0.00500	0.05	0.04744	102	85 - 117				
Potassium	6.665	0.200	5	1.456	104	87 - 115				
Selenium	0.05366	0.00500	0.05	0.000283	107	80 - 120				
Silver	0.05081	0.00500	0.05	0.000033	102	85 - 116				
Sodium	320	0.200	5	300.8	383	85 - 117				SEO
Thallium	0.05024	0.00200	0.05	0.000129	100	82 - 116				
Vanadium	0.05344	0.00500	0.05	0.000634	106	86 - 115				
Zinc	0.1974	0.00500	0.05	0.1409	113	83 - 119				

MSD Sample ID: **HS19070016-09MSD** Units: **mg/L** Analysis Date: **09-Jul-2019 18:59**
Client ID: **ICT14D_062819** Run ID: **ICPMS05_342082** SeqNo: **5159862** PrepDate: **08-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1542	0.0100	0.1	0.02227	132	84 - 117	0.1353	13.1	20	S

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: 142828 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19070016-09MSD** Units: **mg/L** Analysis Date: **08-Jul-2019 23:47**
Client ID: **ICT14D_062819** Run ID: **ICPMS04_341991** SeqNo: **5157842** PrepDate: **08-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.05438	0.00500	0.05	0.000085	109	85 - 117	0.05493	1	20	
Arsenic	0.06089	0.00500	0.05	0.008101	106	84 - 116	0.06094	0.0821	20	
Barium	1.263	0.00500	0.05	1.181	164	86 - 114	1.235	2.25	20	SO
Beryllium	0.05555	0.00200	0.05	0.000518	110	83 - 121	0.05474	1.48	20	
Cadmium	0.05177	0.00200	0.05	0.000514	103	87 - 115	0.05079	1.91	20	
Calcium	89.64	0.500	5	79.96	193	87 - 118	88.6	1.17	20	SO
Chromium	0.05629	0.00500	0.05	0.004215	104	85 - 116	0.05672	0.758	20	
Cobalt	0.06433	0.00500	0.05	0.01411	100	86 - 115	0.06425	0.115	20	
Copper	0.05394	0.00500	0.05	0.004114	99.6	85 - 118	0.05465	1.31	20	
Iron	25.85	0.200	5	19.47	128	87 - 118	25.44	1.59	20	S
Lead	0.05085	0.00500	0.05	0.000156	101	88 - 115	0.05046	0.776	20	
Magnesium	64.71	0.200	5	57.21	150	83 - 118	64.43	0.433	20	SO
Manganese	1.414	0.00500	0.05	1.308	212	87 - 115	1.393	1.48	20	SO
Nickel	0.1001	0.00500	0.05	0.04744	105	85 - 117	0.09869	1.44	20	
Potassium	6.652	0.200	5	1.456	104	87 - 115	6.665	0.203	20	
Selenium	0.05395	0.00500	0.05	0.000283	107	80 - 120	0.05366	0.533	20	
Silver	0.05113	0.00500	0.05	0.000033	102	85 - 116	0.05081	0.624	20	
Sodium	319.3	0.200	5	300.8	369	85 - 117	320	0.212	20	SEO
Thallium	0.0511	0.00200	0.05	0.000129	102	82 - 116	0.05024	1.69	20	
Vanadium	0.05355	0.00500	0.05	0.000634	106	86 - 115	0.05344	0.198	20	
Zinc	0.1978	0.00500	0.05	0.1409	114	83 - 119	0.1974	0.174	20	

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: 142828 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19070016-09PDS** Units: **mg/L** Analysis Date: **08-Jul-2019 23:49**
Client ID: **ICT14D_062819** Run ID: **ICPMS04_341991** SeqNo: **5157843** PrepDate: **08-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1066	0.0100	0.1	0.02227	84.4	80 - 120				
Antimony	0.0995	0.00500	0.1	0.000085	99.4	80 - 120				
Arsenic	0.1167	0.00500	0.1	0.008101	109	80 - 120				
Barium	1.289	0.00500	0.1	1.181	108	80 - 120				O
Beryllium	0.103	0.00200	0.1	0.000518	102	80 - 120				
Cadmium	0.1037	0.00200	0.1	0.000514	103	80 - 120				
Calcium	93.76	0.500	10	79.96	138	80 - 120				SO
Chromium	0.1111	0.00500	0.1	0.004215	107	80 - 120				
Cobalt	0.1142	0.00500	0.1	0.01411	100	80 - 120				
Copper	0.1044	0.00500	0.1	0.004114	100	80 - 120				
Iron	30.49	0.200	10	19.47	110	80 - 120				
Lead	0.1032	0.00500	0.1	0.000156	103	80 - 120				
Magnesium	68.53	0.200	10	57.21	113	80 - 120				O
Manganese	1.467	0.00500	0.1	1.308	159	80 - 120				SO
Nickel	0.1505	0.00500	0.1	0.04744	103	80 - 120				
Potassium	11.81	0.200	10	1.456	104	80 - 120				
Selenium	0.1085	0.00500	0.1	0.000283	108	80 - 120				
Silver	0.09825	0.00500	0.1	0.000033	98.2	80 - 120				
Thallium	0.1039	0.00200	0.1	0.000129	104	80 - 120				
Vanadium	0.1067	0.00500	0.1	0.000634	106	80 - 120				
Zinc	0.25	0.00500	0.1	0.1409	109	80 - 120				

PDS Sample ID: **HS19070016-09PDS** Units: **mg/L** Analysis Date: **09-Jul-2019 13:46**
Client ID: **ICT14D_062819** Run ID: **ICPMS04_342074** SeqNo: **5158725** PrepDate: **08-Jul-2019** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	392.4	2.00	100	295.2	97.3	80 - 120				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: 142828 (0) **Instrument: ICPMS04** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19070016-09SD** Units: **mg/L** Analysis Date: **08-Jul-2019 23:43**
Client ID: **ICT14D_062819** Run ID: **ICPMS04_341991** SeqNo: **5157840** PrepDate: **08-Jul-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.01551	0.0500					0.02227	0	10	J
Antimony	0.00250	0.0250					0.000085	0	10	U
Arsenic	0.005383	0.0250					0.008101	0	10	J
Barium	1.099	0.0250					1.181	6.94	10	
Beryllium	0.00250	0.0100					0.000518	0	10	U
Cadmium	0.00250	0.0100					0.000514	0	10	U
Calcium	78.57	2.50					79.96	1.75	10	
Chromium	0.004207	0.0250					0.004215	0	10	J
Cobalt	0.01499	0.0250					0.01411	0	10	J
Copper	0.0125	0.0250					0.004114	0	10	U
Iron	19.69	1.00					19.47	1.13	10	
Lead	0.00500	0.0250					0.000156	0	10	U
Magnesium	57.33	1.00					57.21	0.212	10	
Manganese	1.366	0.0250					1.308	4.45	10	
Nickel	0.04812	0.0250					0.04744	1.43	10	
Potassium	1.364	1.00					1.456	6.31	10	
Selenium	0.0125	0.0250					0.000283	0	10	U
Silver	0.00250	0.0250					0.000033	0	10	U
Thallium	0.00250	0.0100					0.000129	0	10	U
Vanadium	0.00500	0.0250					0.000634	0	10	U
Zinc	0.1414	0.0250					0.1409	0.4	10	

SD Sample ID: **HS19070016-09SD** Units: **mg/L** Analysis Date: **09-Jul-2019 13:44**
Client ID: **ICT14D_062819** Run ID: **ICPMS04_342074** SeqNo: **5158724** PrepDate: **08-Jul-2019** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	300.2	10.0					295.2	1.7	10	

The following samples were analyzed in this batch:

HS19070016-08	HS19070016-09	HS19070016-10	HS19070016-11
HS19070016-12	HS19070016-13	HS19070016-14	HS19070016-15
HS19070016-16	HS19070016-17	HS19070016-18	

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: 142867 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-142867** Units: **mg/L** Analysis Date: **09-Jul-2019 15:27**
Client ID: Run ID: **HG03_342101** SeqNo: **5159160** PrepDate: **09-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-142867** Units: **mg/L** Analysis Date: **09-Jul-2019 15:29**
Client ID: Run ID: **HG03_342101** SeqNo: **5159161** PrepDate: **09-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00507	0.000200	0.005	0	101	82 - 119				

MS Sample ID: **HS19070016-10MS** Units: **mg/L** Analysis Date: **09-Jul-2019 15:32**
Client ID: **ICT12B_062819** Run ID: **HG03_342101** SeqNo: **5159163** PrepDate: **09-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00483	0.000200	0.005	0.000003000	96.5	82 - 119				

MSD Sample ID: **HS19070016-10MSD** Units: **mg/L** Analysis Date: **09-Jul-2019 15:34**
Client ID: **ICT12B_062819** Run ID: **HG03_342101** SeqNo: **5159164** PrepDate: **09-Jul-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00507	0.000200	0.005	0.000003000	101	82 - 119	0.004830	4.85	20	

The following samples were analyzed in this batch:

HS19070016-10	HS19070016-11	HS19070016-12	HS19070016-13
HS19070016-14	HS19070016-15	HS19070016-16	HS19070016-17
HS19070016-18			

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190710** Units: **UG/L** Analysis Date: **10-Jul-2019 11:42**
Client ID: Run ID: **VOA6_342223** SeqNo: **5162121** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190710** Units: **UG/L** Analysis Date: **10-Jul-2019 11:42**
Client ID: Run ID: **VOA6_342223** SeqNo: **5162121** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*46.85*	*1.0*	*50*	*0*	*93.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.68*	*1.0*	*50*	*0*	*97.4*	*85 - 114*				
Surr: Dibromofluoromethane	*47.48*	*1.0*	*50*	*0*	*95.0*	*80 - 119*				
Surr: Toluene-d8	*51.24*	*1.0*	*50*	*0*	*102*	*89 - 112*				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190710** Units: **UG/L** Analysis Date: **10-Jul-2019 10:54**
Client ID: Run ID: **VOA6_342223** SeqNo: **5162120** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	20.81	1.0	20	0	104	78 - 124				
1,1,1-Trichloroethane	18.54	1.0	20	0	92.7	74 - 131				
1,1,2,2-Tetrachloroethane	19.9	1.0	20	0	99.5	71 - 121				
1,1,2-Trichloroethane	19.84	1.0	20	0	99.2	80 - 119				
1,1-Dichloroethane	18.35	1.0	20	0	91.8	77 - 125				
1,1-Dichloroethene	17.92	1.0	20	0	89.6	71 - 131				
1,1-Dichloropropene	18.67	1.0	20	0	93.3	78 - 125				
1,2,3-Trichlorobenzene	21.76	1.0	20	0	109	69 - 129				
1,2,3-Trichloropropane	21.19	1.0	20	0	106	73 - 122				
1,2,4-Trichlorobenzene	20.51	1.0	20	0	103	69 - 130				
1,2,4-Trimethylbenzene	19.3	1.0	20	0	96.5	76 - 124				
1,2-Dibromo-3-chloropropane	20.98	1.0	20	0	105	62 - 128				
1,2-Dibromoethane	20.25	1.0	20	0	101	77 - 121				
1,2-Dichlorobenzene	19.71	1.0	20	0	98.6	80 - 119				
1,2-Dichloroethane	19.2	1.0	20	0	96.0	73 - 128				
1,2-Dichloropropane	19.95	1.0	20	0	99.7	78 - 122				
1,3,5-Trimethylbenzene	19.12	1.0	20	0	95.6	75 - 124				
1,3-Dichlorobenzene	20.24	1.0	20	0	101	80 - 119				
1,3-Dichloropropane	19.62	1.0	20	0	98.1	80 - 119				
1,4-Dichlorobenzene	19.22	1.0	20	0	96.1	79 - 118				
2,2-Dichloropropane	18.87	1.0	20	0	94.4	60 - 139				
2-Butanone	38.33	2.0	40	0	95.8	56 - 143				
2-Chlorotoluene	18.83	1.0	20	0	94.2	79 - 122				
2-Hexanone	40.21	2.0	40	0	101	57 - 139				
4-Chlorotoluene	18.81	1.0	20	0	94.1	78 - 122				
4-Isopropyltoluene	19.29	1.0	20	0	96.4	77 - 127				
4-Methyl-2-pentanone	39.48	2.0	40	0	98.7	67 - 130				
Acetone	42.6	2.0	40	0	106	39 - 160				
Benzene	19.58	1.0	20	0	97.9	79 - 120				
Bromobenzene	20.57	1.0	20	0	103	80 - 120				
Bromochloromethane	18.33	1.0	20	0	91.7	78 - 123				
Bromodichloromethane	19.84	1.0	20	0	99.2	79 - 125				
Bromoform	21.68	1.0	20	0	108	66 - 130				
Bromomethane	20.98	1.0	20	0	105	53 - 141				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190710** Units: **UG/L** Analysis Date: **10-Jul-2019 10:54**
Client ID: Run ID: **VOA6_342223** SeqNo: **5162120** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	36.43	2.0	40	0	91.1	64 - 133				
Carbon tetrachloride	19.06	1.0	20	0	95.3	72 - 136				
Chlorobenzene	19.87	1.0	20	0	99.3	82 - 118				
Chloroethane	17.25	1.0	20	0	86.3	60 - 138				
Chloroform	20.32	1.0	20	0	102	79 - 124				
Chloromethane	18.07	1.0	20	0	90.3	50 - 139				
cis-1,2-Dichloroethene	18.34	1.0	20	0	91.7	78 - 123				
cis-1,3-Dichloropropene	20.29	1.0	20	0	101	75 - 124				
Dibromochloromethane	20.71	1.0	20	0	104	74 - 126				
Dibromomethane	19.81	1.0	20	0	99.0	79 - 123				
Dichlorodifluoromethane	19.07	1.0	20	0	95.4	32 - 152				
Ethylbenzene	20.2	1.0	20	0	101	79 - 121				
Hexachlorobutadiene	21.34	1.0	20	0	107	66 - 134				
Isopropylbenzene	19.76	1.0	20	0	98.8	72 - 131				
m,p-Xylene	40.44	2.0	40	0	101	80 - 121				
Methylene chloride	17.94	2.0	20	0	89.7	74 - 124				
Naphthalene	20.18	1.0	20	0	101	61 - 128				
n-Butylbenzene	20.34	1.0	20	0	102	75 - 128				
n-Propylbenzene	18.95	1.0	20	0	94.7	76 - 126				
o-Xylene	19.77	1.0	20	0	98.9	78 - 122				
sec-Butylbenzene	18.77	1.0	20	0	93.8	77 - 126				
Styrene	20.26	1.0	20	0	101	78 - 123				
tert-Butylbenzene	19.11	1.0	20	0	95.6	78 - 124				
Tetrachloroethene	21.08	1.0	20	0	105	74 - 129				
Toluene	20.27	1.0	20	0	101	80 - 121				
trans-1,2-Dichloroethene	18.43	1.0	20	0	92.2	75 - 124				
trans-1,3-Dichloropropene	20.13	1.0	20	0	101	73 - 127				
Trichloroethene	20.02	1.0	20	0	100	79 - 123				
Trichlorofluoromethane	17.77	1.0	20	0	88.8	65 - 141				
Vinyl chloride	17.77	1.0	20	0	88.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*48.33*	*1.0*	*50*	*0*	*96.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.26*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*48.5*	*1.0*	*50*	*0*	*97.0*	*80 - 119*				
Surr: Toluene-d8	*50.1*	*1.0*	*50*	*0*	*100*	*89 - 112*				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19070016-09MS** Units: **UG/L** Analysis Date: **10-Jul-2019 16:29**
Client ID: **ICT14D_062819** Run ID: **VOA6_342223** SeqNo: **5162133** PrepDate: DF: **250**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	4891	250	5000	0	97.8	78 - 124				
1,1,1-Trichloroethane	4523	250	5000	0	90.5	74 - 131				
1,1,2,2-Tetrachloroethane	4842	250	5000	0	96.8	71 - 121				
1,1,2-Trichloroethane	4780	250	5000	0	95.6	80 - 119				
1,1-Dichloroethane	4517	250	5000	0	90.3	77 - 125				
1,1-Dichloroethene	4557	250	5000	0	91.1	71 - 131				
1,1-Dichloropropene	4336	250	5000	0	86.7	78 - 125				
1,2,3-Trichlorobenzene	4758	250	5000	0	95.2	69 - 129				
1,2,3-Trichloropropane	4449	250	5000	0	89.0	73 - 122				
1,2,4-Trichlorobenzene	4765	250	5000	0	95.3	69 - 130				
1,2,4-Trimethylbenzene	4514	250	5000	0	90.3	76 - 124				
1,2-Dibromo-3-chloropropane	4917	250	5000	0	98.3	62 - 128				
1,2-Dibromoethane	4838	250	5000	0	96.8	77 - 121				
1,2-Dichlorobenzene	4663	250	5000	0	93.3	80 - 119				
1,2-Dichloroethane	4677	250	5000	0	93.5	73 - 128				
1,2-Dichloropropane	4687	250	5000	0	93.7	78 - 122				
1,3,5-Trimethylbenzene	4400	250	5000	0	88.0	75 - 124				
1,3-Dichlorobenzene	4680	250	5000	0	93.6	80 - 119				
1,3-Dichloropropane	4732	250	5000	0	94.6	80 - 119				
1,4-Dichlorobenzene	4506	250	5000	0	90.1	79 - 118				
2,2-Dichloropropane	4521	250	5000	0	90.4	60 - 139				
2-Butanone	9558	500	10000	0	95.6	56 - 143				
2-Chlorotoluene	4383	250	5000	0	87.7	79 - 122				
2-Hexanone	9453	500	10000	0	94.5	57 - 139				
4-Chlorotoluene	4362	250	5000	0	87.2	78 - 122				
4-Isopropyltoluene	4307	250	5000	0	86.1	77 - 127				
4-Methyl-2-pentanone	9526	500	10000	0	95.3	67 - 130				
Acetone	9253	500	10000	0	92.5	39 - 160				
Benzene	4636	250	5000	0	92.7	79 - 120				
Bromobenzene	4722	250	5000	0	94.4	80 - 120				
Bromochloromethane	4625	250	5000	0	92.5	78 - 123				
Bromodichloromethane	4749	250	5000	0	95.0	79 - 125				
Bromoform	5120	250	5000	0	102	66 - 130				
Bromomethane	4501	250	5000	0	90.0	53 - 141				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19070016-09MS** Units: **UG/L** Analysis Date: **10-Jul-2019 16:29**
Client ID: **ICT14D_062819** Run ID: **VOA6_342223** SeqNo: **5162133** PrepDate: DF: **250**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	8878	500	10000	0	88.8	64 - 133				
Carbon tetrachloride	4324	250	5000	0	86.5	72 - 136				
Chlorobenzene	4649	250	5000	0	93.0	82 - 118				
Chloroethane	4096	250	5000	0	81.9	60 - 138				
Chloroform	4954	250	5000	0	99.1	79 - 124				
Chloromethane	5011	250	5000	0	100	50 - 139				
cis-1,2-Dichloroethene	23100	250	5000	21140	39.2	78 - 123				SO
cis-1,3-Dichloropropene	4827	250	5000	0	96.5	75 - 124				
Dibromochloromethane	4878	250	5000	0	97.6	74 - 126				
Dibromomethane	4737	250	5000	0	94.7	79 - 123				
Dichlorodifluoromethane	3399	250	5000	0	68.0	32 - 152				
Ethylbenzene	4688	250	5000	0	93.8	79 - 121				
Hexachlorobutadiene	4446	250	5000	0	88.9	66 - 134				
Isopropylbenzene	4543	250	5000	0	90.9	72 - 131				
m,p-Xylene	9423	500	10000	0	94.2	80 - 121				
Methylene chloride	14100	500	5000	11040	61.2	74 - 124				S
Naphthalene	4749	250	5000	0	95.0	61 - 128				
n-Butylbenzene	4582	250	5000	0	91.6	75 - 128				
n-Propylbenzene	4342	250	5000	0	86.8	76 - 126				
o-Xylene	4615	250	5000	0	92.3	78 - 122				
sec-Butylbenzene	4264	250	5000	0	85.3	77 - 126				
Styrene	4772	250	5000	0	95.4	78 - 123				
tert-Butylbenzene	4332	250	5000	0	86.6	78 - 124				
Tetrachloroethene	4667	250	5000	0	93.3	74 - 129				
Toluene	4725	250	5000	0	94.5	80 - 121				
trans-1,2-Dichloroethene	4619	250	5000	0	92.4	75 - 124				
trans-1,3-Dichloropropene	4683	250	5000	0	93.7	73 - 127				
Trichloroethene	5077	250	5000	582.4	89.9	79 - 123				
Trichlorofluoromethane	4135	250	5000	0	82.7	65 - 141				
Vinyl chloride	5623	250	5000	2069	71.1	58 - 137				
Surr: 1,2-Dichloroethane-d4	*12590*	*250*	*12500*	*0*	*101*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*12440*	*250*	*12500*	*0*	*99.5*	*85 - 114*				
Surr: Dibromofluoromethane	*12510*	*250*	*12500*	*0*	*100*	*80 - 119*				
Surr: Toluene-d8	*12360*	*250*	*12500*	*0*	*98.9*	*89 - 112*				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19070016-09MSD** Units: **UG/L** Analysis Date: **10-Jul-2019 16:53**
Client ID: **ICT14D_062819** Run ID: **VOA6_342223** SeqNo: **5162134** PrepDate: DF: **250**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	4855	250	5000	0	97.1	78 - 124	4891	0.747	20	
1,1,1-Trichloroethane	4432	250	5000	0	88.6	74 - 131	4523	2.04	20	
1,1,2,2-Tetrachloroethane	4980	250	5000	0	99.6	71 - 121	4842	2.8	20	
1,1,2-Trichloroethane	4841	250	5000	0	96.8	80 - 119	4780	1.26	20	
1,1-Dichloroethane	4528	250	5000	0	90.6	77 - 125	4517	0.237	20	
1,1-Dichloroethene	4504	250	5000	0	90.1	71 - 131	4557	1.17	20	
1,1-Dichloropropene	4353	250	5000	0	87.1	78 - 125	4336	0.396	20	
1,2,3-Trichlorobenzene	4700	250	5000	0	94.0	69 - 129	4758	1.24	20	
1,2,3-Trichloropropane	4506	250	5000	0	90.1	73 - 122	4449	1.28	20	
1,2,4-Trichlorobenzene	4693	250	5000	0	93.9	69 - 130	4765	1.52	20	
1,2,4-Trimethylbenzene	4459	250	5000	0	89.2	76 - 124	4514	1.22	20	
1,2-Dibromo-3-chloropropane	4998	250	5000	0	100.0	62 - 128	4917	1.64	20	
1,2-Dibromoethane	4945	250	5000	0	98.9	77 - 121	4838	2.19	20	
1,2-Dichlorobenzene	4696	250	5000	0	93.9	80 - 119	4663	0.715	20	
1,2-Dichloroethane	4766	250	5000	0	95.3	73 - 128	4677	1.88	20	
1,2-Dichloropropane	4752	250	5000	0	95.0	78 - 122	4687	1.39	20	
1,3,5-Trimethylbenzene	4391	250	5000	0	87.8	75 - 124	4400	0.197	20	
1,3-Dichlorobenzene	4674	250	5000	0	93.5	80 - 119	4680	0.133	20	
1,3-Dichloropropane	4779	250	5000	0	95.6	80 - 119	4732	0.993	20	
1,4-Dichlorobenzene	4450	250	5000	0	89.0	79 - 118	4506	1.26	20	
2,2-Dichloropropane	4516	250	5000	0	90.3	60 - 139	4521	0.102	20	
2-Butanone	10040	500	10000	0	100	56 - 143	9558	4.88	20	
2-Chlorotoluene	4368	250	5000	0	87.4	79 - 122	4383	0.326	20	
2-Hexanone	9919	500	10000	0	99.2	57 - 139	9453	4.8	20	
4-Chlorotoluene	4331	250	5000	0	86.6	78 - 122	4362	0.724	20	
4-Isopropyltoluene	4310	250	5000	0	86.2	77 - 127	4307	0.0714	20	
4-Methyl-2-pentanone	9761	500	10000	0	97.6	67 - 130	9526	2.44	20	
Acetone	9893	500	10000	0	98.9	39 - 160	9253	6.69	20	
Benzene	4674	250	5000	0	93.5	79 - 120	4636	0.809	20	
Bromobenzene	4840	250	5000	0	96.8	80 - 120	4722	2.48	20	
Bromochloromethane	4665	250	5000	0	93.3	78 - 123	4625	0.855	20	
Bromodichloromethane	4817	250	5000	0	96.3	79 - 125	4749	1.42	20	
Bromoform	5133	250	5000	0	103	66 - 130	5120	0.254	20	
Bromomethane	4543	250	5000	0	90.9	53 - 141	4501	0.923	20	

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342223 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19070016-09MSD** Units: **UG/L** Analysis Date: **10-Jul-2019 16:53**
Client ID: **ICT14D_062819** Run ID: **VOA6_342223** SeqNo: **5162134** PrepDate: DF: **250**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	8808	500	10000	0	88.1	64 - 133	8878	0.796	20	
Carbon tetrachloride	4290	250	5000	0	85.8	72 - 136	4324	0.786	20	
Chlorobenzene	4660	250	5000	0	93.2	82 - 118	4649	0.236	20	
Chloroethane	4042	250	5000	0	80.8	60 - 138	4096	1.32	20	
Chloroform	4982	250	5000	0	99.6	79 - 124	4954	0.556	20	
Chloromethane	4668	250	5000	0	93.4	50 - 139	5011	7.09	20	
cis-1,2-Dichloroethene	23230	250	5000	21140	41.9	78 - 123	23100	0.574	20	SO
cis-1,3-Dichloropropene	4904	250	5000	0	98.1	75 - 124	4827	1.58	20	
Dibromochloromethane	4973	250	5000	0	99.5	74 - 126	4878	1.93	20	
Dibromomethane	4883	250	5000	0	97.7	79 - 123	4737	3.03	20	
Dichlorodifluoromethane	3338	250	5000	0	66.8	32 - 152	3399	1.8	20	
Ethylbenzene	4601	250	5000	0	92.0	79 - 121	4688	1.87	20	
Hexachlorobutadiene	4448	250	5000	0	89.0	66 - 134	4446	0.0369	20	
Isopropylbenzene	4460	250	5000	0	89.2	72 - 131	4543	1.85	20	
m,p-Xylene	9235	500	10000	0	92.3	80 - 121	9423	2.02	20	
Methylene chloride	14020	500	5000	11040	59.5	74 - 124	14100	0.608	20	S
Naphthalene	4658	250	5000	0	93.2	61 - 128	4749	1.93	20	
n-Butylbenzene	4615	250	5000	0	92.3	75 - 128	4582	0.715	20	
n-Propylbenzene	4231	250	5000	0	84.6	76 - 126	4342	2.59	20	
o-Xylene	4566	250	5000	0	91.3	78 - 122	4615	1.05	20	
sec-Butylbenzene	4265	250	5000	0	85.3	77 - 126	4264	0.0244	20	
Styrene	4815	250	5000	0	96.3	78 - 123	4772	0.89	20	
tert-Butylbenzene	4257	250	5000	0	85.1	78 - 124	4332	1.75	20	
Tetrachloroethene	4607	250	5000	0	92.1	74 - 129	4667	1.31	20	
Toluene	4683	250	5000	0	93.7	80 - 121	4725	0.908	20	
trans-1,2-Dichloroethene	4547	250	5000	0	90.9	75 - 124	4619	1.57	20	
trans-1,3-Dichloropropene	4835	250	5000	0	96.7	73 - 127	4683	3.2	20	
Trichloroethene	5061	250	5000	582.4	89.6	79 - 123	5077	0.303	20	
Trichlorofluoromethane	4088	250	5000	0	81.8	65 - 141	4135	1.14	20	
Vinyl chloride	5457	250	5000	2069	67.8	58 - 137	5623	3	20	
Surr: 1,2-Dichloroethane-d4	*12730*	*250*	*12500*	*0*	*102*	*81 - 118*	*12590*	*1.1*	*20*	
Surr: 4-Bromofluorobenzene	*12460*	*250*	*12500*	*0*	*99.7*	*85 - 114*	*12440*	*0.117*	*20*	
Surr: Dibromofluoromethane	*12790*	*250*	*12500*	*0*	*102*	*80 - 119*	*12510*	*2.19*	*20*	
Surr: Toluene-d8	*12220*	*250*	*12500*	*0*	*97.8*	*89 - 112*	*12360*	*1.11*	*20*	

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342223 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS19070016-04	HS19070016-05	HS19070016-06	HS19070016-07
HS19070016-09	HS19070016-10	HS19070016-11	HS19070016-13
HS19070016-14	HS19070016-15	HS19070016-16	HS19070016-17

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342283 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190711** Units: **UG/L** Analysis Date: **11-Jul-2019 13:07**
Client ID: Run ID: **VOA6_342283** SeqNo: **5163485** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342283 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190711** Units: **UG/L** Analysis Date: **11-Jul-2019 13:07**
Client ID: Run ID: **VOA6_342283** SeqNo: **5163485** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*48.54*	*1.0*	*50*	*0*	*97.1*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.88*	*1.0*	*50*	*0*	*102*	*85 - 114*				
Surr: Dibromofluoromethane	*49.5*	*1.0*	*50*	*0*	*99.0*	*80 - 119*				
Surr: Toluene-d8	*52.88*	*1.0*	*50*	*0*	*106*	*89 - 112*				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342283 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190711** Units: **UG/L** Analysis Date: **11-Jul-2019 11:55**
Client ID: Run ID: **VOA6_342283** SeqNo: **5163484** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.85	1.0	20	0	99.2	78 - 124				
1,1,1-Trichloroethane	17.66	1.0	20	0	88.3	74 - 131				
1,1,2,2-Tetrachloroethane	19.02	1.0	20	0	95.1	71 - 121				
1,1,2-Trichloroethane	18.9	1.0	20	0	94.5	80 - 119				
1,1-Dichloroethane	17.8	1.0	20	0	89.0	77 - 125				
1,1-Dichloroethene	17.13	1.0	20	0	85.6	71 - 131				
1,1-Dichloropropene	17.76	1.0	20	0	88.8	78 - 125				
1,2,3-Trichlorobenzene	21.24	1.0	20	0	106	69 - 129				
1,2,3-Trichloropropane	17.65	1.0	20	0	88.3	73 - 122				
1,2,4-Trichlorobenzene	20.74	1.0	20	0	104	69 - 130				
1,2,4-Trimethylbenzene	19.14	1.0	20	0	95.7	76 - 124				
1,2-Dibromo-3-chloropropane	18.87	1.0	20	0	94.3	62 - 128				
1,2-Dibromoethane	19	1.0	20	0	95.0	77 - 121				
1,2-Dichlorobenzene	19.48	1.0	20	0	97.4	80 - 119				
1,2-Dichloroethane	18.82	1.0	20	0	94.1	73 - 128				
1,2-Dichloropropane	19.44	1.0	20	0	97.2	78 - 122				
1,3,5-Trimethylbenzene	18.78	1.0	20	0	93.9	75 - 124				
1,3-Dichlorobenzene	19.96	1.0	20	0	99.8	80 - 119				
1,3-Dichloropropane	19.08	1.0	20	0	95.4	80 - 119				
1,4-Dichlorobenzene	19.15	1.0	20	0	95.7	79 - 118				
2,2-Dichloropropane	18.26	1.0	20	0	91.3	60 - 139				
2-Butanone	38.73	2.0	40	0	96.8	56 - 143				
2-Chlorotoluene	18.71	1.0	20	0	93.6	79 - 122				
2-Hexanone	37.62	2.0	40	0	94.1	57 - 139				
4-Chlorotoluene	18.65	1.0	20	0	93.2	78 - 122				
4-Isopropyltoluene	18.75	1.0	20	0	93.7	77 - 127				
4-Methyl-2-pentanone	37.36	2.0	40	0	93.4	67 - 130				
Acetone	43.88	2.0	40	0	110	39 - 160				
Benzene	18.87	1.0	20	0	94.4	79 - 120				
Bromobenzene	20.01	1.0	20	0	100	80 - 120				
Bromochloromethane	18.52	1.0	20	0	92.6	78 - 123				
Bromodichloromethane	19.33	1.0	20	0	96.6	79 - 125				
Bromoform	20.45	1.0	20	0	102	66 - 130				
Bromomethane	20.41	1.0	20	0	102	53 - 141				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342283 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190711** Units: **UG/L** Analysis Date: **11-Jul-2019 11:55**
Client ID: Run ID: **VOA6_342283** SeqNo: **5163484** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	36.23	2.0	40	0	90.6	64 - 133				
Carbon tetrachloride	17.33	1.0	20	0	86.6	72 - 136				
Chlorobenzene	19.08	1.0	20	0	95.4	82 - 118				
Chloroethane	17.07	1.0	20	0	85.4	60 - 138				
Chloroform	20.42	1.0	20	0	102	79 - 124				
Chloromethane	18.99	1.0	20	0	95.0	50 - 139				
cis-1,2-Dichloroethene	18.18	1.0	20	0	90.9	78 - 123				
cis-1,3-Dichloropropene	19.55	1.0	20	0	97.8	75 - 124				
Dibromochloromethane	19.58	1.0	20	0	97.9	74 - 126				
Dibromomethane	18.86	1.0	20	0	94.3	79 - 123				
Dichlorodifluoromethane	17.75	1.0	20	0	88.7	32 - 152				
Ethylbenzene	19.09	1.0	20	0	95.4	79 - 121				
Hexachlorobutadiene	21.01	1.0	20	0	105	66 - 134				
Isopropylbenzene	18.87	1.0	20	0	94.3	72 - 131				
m,p-Xylene	38.85	2.0	40	0	97.1	80 - 121				
Methylene chloride	17.62	2.0	20	0	88.1	74 - 124				
Naphthalene	19.23	1.0	20	0	96.1	61 - 128				
n-Butylbenzene	19.86	1.0	20	0	99.3	75 - 128				
n-Propylbenzene	18.18	1.0	20	0	90.9	76 - 126				
o-Xylene	19.02	1.0	20	0	95.1	78 - 122				
sec-Butylbenzene	18.08	1.0	20	0	90.4	77 - 126				
Styrene	19.59	1.0	20	0	97.9	78 - 123				
tert-Butylbenzene	18.51	1.0	20	0	92.5	78 - 124				
Tetrachloroethene	19.45	1.0	20	0	97.3	74 - 129				
Toluene	19.28	1.0	20	0	96.4	80 - 121				
trans-1,2-Dichloroethene	18.61	1.0	20	0	93.0	75 - 124				
trans-1,3-Dichloropropene	19.23	1.0	20	0	96.1	73 - 127				
Trichloroethene	19.2	1.0	20	0	96.0	79 - 123				
Trichlorofluoromethane	16.77	1.0	20	0	83.9	65 - 141				
Vinyl chloride	16.57	1.0	20	0	82.8	58 - 137				
Surr: 1,2-Dichloroethane-d4	*47.87*	*1.0*	*50*	*0*	*95.7*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.99*	*1.0*	*50*	*0*	*98.0*	*85 - 114*				
Surr: Dibromofluoromethane	*48.32*	*1.0*	*50*	*0*	*96.6*	*80 - 119*				
Surr: Toluene-d8	*49.38*	*1.0*	*50*	*0*	*98.8*	*89 - 112*				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342283 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19070016-01MS** Units: **UG/L** Analysis Date: **11-Jul-2019 17:06**
Client ID: **ICT2_062819** Run ID: **VOA6_342283** SeqNo: **5163493** PrepDate: DF: **25**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	511	25	500	0	102	78 - 124				
1,1,1-Trichloroethane	481.1	25	500	0	96.2	74 - 131				
1,1,2,2-Tetrachloroethane	513.7	25	500	0	103	71 - 121				
1,1,2-Trichloroethane	498.9	25	500	0	99.8	80 - 119				
1,1-Dichloroethane	478.2	25	500	0	95.6	77 - 125				
1,1-Dichloroethene	460.6	25	500	0	92.1	71 - 131				
1,1-Dichloropropene	456.1	25	500	0	91.2	78 - 125				
1,2,3-Trichlorobenzene	494.1	25	500	0	98.8	69 - 129				
1,2,3-Trichloropropane	473.2	25	500	0	94.6	73 - 122				
1,2,4-Trichlorobenzene	499.7	25	500	0	99.9	69 - 130				
1,2,4-Trimethylbenzene	492.6	25	500	0	98.5	76 - 124				
1,2-Dibromo-3-chloropropane	530.9	25	500	0	106	62 - 128				
1,2-Dibromoethane	507.6	25	500	0	102	77 - 121				
1,2-Dichlorobenzene	498	25	500	0	99.6	80 - 119				
1,2-Dichloroethane	530.6	25	500	44.69	97.2	73 - 128				
1,2-Dichloropropane	487.5	25	500	0	97.5	78 - 122				
1,3,5-Trimethylbenzene	491.2	25	500	0	98.2	75 - 124				
1,3-Dichlorobenzene	505.4	25	500	0	101	80 - 119				
1,3-Dichloropropane	497	25	500	0	99.4	80 - 119				
1,4-Dichlorobenzene	479.7	25	500	0	95.9	79 - 118				
2,2-Dichloropropane	474.6	25	500	0	94.9	60 - 139				
2-Butanone	1025	50	1000	0	103	56 - 143				
2-Chlorotoluene	478.3	25	500	0	95.7	79 - 122				
2-Hexanone	987.2	50	1000	0	98.7	57 - 139				
4-Chlorotoluene	477.9	25	500	0	95.6	78 - 122				
4-Isopropyltoluene	484.5	25	500	0	96.9	77 - 127				
4-Methyl-2-pentanone	1013	50	1000	0	101	67 - 130				
Acetone	1027	50	1000	0	103	39 - 160				
Benzene	480.7	25	500	0	96.1	79 - 120				
Bromobenzene	503	25	500	0	101	80 - 120				
Bromochloromethane	477	25	500	0	95.4	78 - 123				
Bromodichloromethane	489.6	25	500	0	97.9	79 - 125				
Bromoform	530.8	25	500	0	106	66 - 130				
Bromomethane	464.9	25	500	0	93.0	53 - 141				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342283 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MS Sample ID: **HS19070016-01MS** Units: **UG/L** Analysis Date: **11-Jul-2019 17:06**
Client ID: **ICT2_062819** Run ID: **VOA6_342283** SeqNo: **5163493** PrepDate: DF: **25**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	948.8	50	1000	0	94.9	64 - 133				
Carbon tetrachloride	462.7	25	500	0	92.5	72 - 136				
Chlorobenzene	484.9	25	500	0	97.0	82 - 118				
Chloroethane	444.5	25	500	0	88.9	60 - 138				
Chloroform	495.4	25	500	0	99.1	79 - 124				
Chloromethane	535	25	500	0	107	50 - 139				
cis-1,2-Dichloroethene	548	25	500	41.3	101	78 - 123				
cis-1,3-Dichloropropene	499.7	25	500	0	99.9	75 - 124				
Dibromochloromethane	500.7	25	500	0	100	74 - 126				
Dibromomethane	490.6	25	500	0	98.1	79 - 123				
Dichlorodifluoromethane	351.5	25	500	0	70.3	32 - 152				
Ethylbenzene	502.2	25	500	0	100	79 - 121				
Hexachlorobutadiene	491.2	25	500	0	98.2	66 - 134				
Isopropylbenzene	498.9	25	500	0	99.8	72 - 131				
m,p-Xylene	1000	50	1000	0	100.0	80 - 121				
Methylene chloride	471.5	50	500	0	94.3	74 - 124				
Naphthalene	492.7	25	500	0	98.5	61 - 128				
n-Butylbenzene	517.3	25	500	0	103	75 - 128				
n-Propylbenzene	485.5	25	500	0	97.1	76 - 126				
o-Xylene	489.9	25	500	0	98.0	78 - 122				
sec-Butylbenzene	484.4	25	500	0	96.9	77 - 126				
Styrene	507	25	500	0	101	78 - 123				
tert-Butylbenzene	487.5	25	500	0	97.5	78 - 124				
Tetrachloroethene	515.4	25	500	0	103	74 - 129				
Toluene	493	25	500	0	98.6	80 - 121				
trans-1,2-Dichloroethene	486.8	25	500	0	97.4	75 - 124				
trans-1,3-Dichloropropene	490.3	25	500	0	98.1	73 - 127				
Trichloroethene	1112	25	500	669	88.6	79 - 123				
Trichlorofluoromethane	452.3	25	500	0	90.5	65 - 141				
Vinyl chloride	412.4	25	500	0	82.5	58 - 137				
Surr: 1,2-Dichloroethane-d4	*1714*	*25*	*1250*	*0*	*137*	*81 - 118*				S
Surr: 4-Bromofluorobenzene	*1463*	*25*	*1250*	*0*	*117*	*85 - 114*				S
Surr: Dibromofluoromethane	*1679*	*25*	*1250*	*0*	*134*	*80 - 119*				S
Surr: Toluene-d8	*1526*	*25*	*1250*	*0*	*122*	*89 - 112*				S

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342283 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19070016-01MSD** Units: **UG/L** Analysis Date: **11-Jul-2019 17:30**
Client ID: **ICT2_062819** Run ID: **VOA6_342283** SeqNo: **5163494** PrepDate: DF: **25**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	519.8	25	500	0	104	78 - 124	511	1.7	20	
1,1,1-Trichloroethane	469.7	25	500	0	93.9	74 - 131	481.1	2.4	20	
1,1,2,2-Tetrachloroethane	544.8	25	500	0	109	71 - 121	513.7	5.89	20	
1,1,2-Trichloroethane	511.1	25	500	0	102	80 - 119	498.9	2.43	20	
1,1-Dichloroethane	462.6	25	500	0	92.5	77 - 125	478.2	3.32	20	
1,1-Dichloroethene	457.4	25	500	0	91.5	71 - 131	460.6	0.709	20	
1,1-Dichloropropene	454.3	25	500	0	90.9	78 - 125	456.1	0.392	20	
1,2,3-Trichlorobenzene	529.8	25	500	0	106	69 - 129	494.1	6.97	20	
1,2,3-Trichloropropane	493.4	25	500	0	98.7	73 - 122	473.2	4.19	20	
1,2,4-Trichlorobenzene	520.6	25	500	0	104	69 - 130	499.7	4.11	20	
1,2,4-Trimethylbenzene	499.3	25	500	0	99.9	76 - 124	492.6	1.34	20	
1,2-Dibromo-3-chloropropane	569.4	25	500	0	114	62 - 128	530.9	7	20	
1,2-Dibromoethane	523.3	25	500	0	105	77 - 121	507.6	3.06	20	
1,2-Dichlorobenzene	512.3	25	500	0	102	80 - 119	498	2.82	20	
1,2-Dichloroethane	524.7	25	500	44.69	96.0	73 - 128	530.6	1.13	20	
1,2-Dichloropropane	495	25	500	0	99.0	78 - 122	487.5	1.53	20	
1,3,5-Trimethylbenzene	500.6	25	500	0	100	75 - 124	491.2	1.88	20	
1,3-Dichlorobenzene	514.5	25	500	0	103	80 - 119	505.4	1.78	20	
1,3-Dichloropropane	504.7	25	500	0	101	80 - 119	497	1.53	20	
1,4-Dichlorobenzene	490.9	25	500	0	98.2	79 - 118	479.7	2.31	20	
2,2-Dichloropropane	471.6	25	500	0	94.3	60 - 139	474.6	0.65	20	
2-Butanone	1063	50	1000	0	106	56 - 143	1025	3.59	20	
2-Chlorotoluene	482.9	25	500	0	96.6	79 - 122	478.3	0.953	20	
2-Hexanone	1035	50	1000	0	103	57 - 139	987.2	4.72	20	
4-Chlorotoluene	488.1	25	500	0	97.6	78 - 122	477.9	2.11	20	
4-Isopropyltoluene	489.8	25	500	0	98.0	77 - 127	484.5	1.08	20	
4-Methyl-2-pentanone	1022	50	1000	0	102	67 - 130	1013	0.848	20	
Acetone	1052	50	1000	0	105	39 - 160	1027	2.43	20	
Benzene	477.3	25	500	0	95.5	79 - 120	480.7	0.711	20	
Bromobenzene	521.8	25	500	0	104	80 - 120	503	3.68	20	
Bromochloromethane	490	25	500	0	98.0	78 - 123	477	2.69	20	
Bromodichloromethane	498.4	25	500	0	99.7	79 - 125	489.6	1.78	20	
Bromoform	549.1	25	500	0	110	66 - 130	530.8	3.39	20	
Bromomethane	470.4	25	500	0	94.1	53 - 141	464.9	1.17	20	

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342283 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19070016-01MSD** Units: **UG/L** Analysis Date: **11-Jul-2019 17:30**
Client ID: **ICT2_062819** Run ID: **VOA6_342283** SeqNo: **5163494** PrepDate: DF: **25**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	930.2	50	1000	0	93.0	64 - 133	948.8	1.99	20	
Carbon tetrachloride	452.5	25	500	0	90.5	72 - 136	462.7	2.22	20	
Chlorobenzene	486.9	25	500	0	97.4	82 - 118	484.9	0.414	20	
Chloroethane	415.6	25	500	0	83.1	60 - 138	444.5	6.71	20	
Chloroform	495.1	25	500	0	99.0	79 - 124	495.4	0.0652	20	
Chloromethane	505.8	25	500	0	101	50 - 139	535	5.6	20	
cis-1,2-Dichloroethene	521.5	25	500	41.3	96.0	78 - 123	548	4.95	20	
cis-1,3-Dichloropropene	501.5	25	500	0	100	75 - 124	499.7	0.368	20	
Dibromochloromethane	516.8	25	500	0	103	74 - 126	500.7	3.17	20	
Dibromomethane	503.3	25	500	0	101	79 - 123	490.6	2.56	20	
Dichlorodifluoromethane	341.6	25	500	0	68.3	32 - 152	351.5	2.85	20	
Ethylbenzene	494.9	25	500	0	99.0	79 - 121	502.2	1.46	20	
Hexachlorobutadiene	506.3	25	500	0	101	66 - 134	491.2	3.03	20	
Isopropylbenzene	493.8	25	500	0	98.8	72 - 131	498.9	1.02	20	
m,p-Xylene	1007	50	1000	0	101	80 - 121	1000	0.694	20	
Methylene chloride	472.4	50	500	0	94.5	74 - 124	471.5	0.19	20	
Naphthalene	522.5	25	500	0	105	61 - 128	492.7	5.87	20	
n-Butylbenzene	521.4	25	500	0	104	75 - 128	517.3	0.775	20	
n-Propylbenzene	486.5	25	500	0	97.3	76 - 126	485.5	0.2	20	
o-Xylene	496	25	500	0	99.2	78 - 122	489.9	1.24	20	
sec-Butylbenzene	492.8	25	500	0	98.6	77 - 126	484.4	1.71	20	
Styrene	511.9	25	500	0	102	78 - 123	507	0.961	20	
tert-Butylbenzene	498.9	25	500	0	99.8	78 - 124	487.5	2.31	20	
Tetrachloroethene	511.4	25	500	0	102	74 - 129	515.4	0.764	20	
Toluene	495	25	500	0	99.0	80 - 121	493	0.404	20	
trans-1,2-Dichloroethene	471.7	25	500	0	94.3	75 - 124	486.8	3.15	20	
trans-1,3-Dichloropropene	495.7	25	500	0	99.1	73 - 127	490.3	1.1	20	
Trichloroethene	1102	25	500	669	86.7	79 - 123	1112	0.844	20	
Trichlorofluoromethane	436.4	25	500	0	87.3	65 - 141	452.3	3.59	20	
Vinyl chloride	398	25	500	0	79.6	58 - 137	412.4	3.55	20	
Surr: 1,2-Dichloroethane-d4	*1725*	*25*	*1250*	*0*	*138*	*81 - 118*	*1714*	*0.595*	*20*	S
Surr: 4-Bromofluorobenzene	*1477*	*25*	*1250*	*0*	*118*	*85 - 114*	*1463*	*0.945*	*20*	S
Surr: Dibromofluoromethane	*1706*	*25*	*1250*	*0*	*136*	*80 - 119*	*1679*	*1.56*	*20*	S
Surr: Toluene-d8	*1542*	*25*	*1250*	*0*	*123*	*89 - 112*	*1526*	*1.03*	*20*	S

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342283 (0)	Instrument: VOA6	Method: VOLATILES ORGANICS BY METHOD 8260C

The following samples were analyzed in this batch:

HS19070016-01	HS19070016-02	HS19070016-03	HS19070016-04
HS19070016-08	HS19070016-12	HS19070016-13	HS19070016-14
HS19070016-15	HS19070016-18	HS19070016-19	

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342382 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190712** Units: **UG/L** Analysis Date: **12-Jul-2019 10:45**
Client ID: Run ID: **VOA6_342382** SeqNo: **5165498** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	0.50	1.0								U
Methylene chloride	1.0	2.0								U
Surr: 1,2-Dichloroethane-d4	*45.81*	*1.0*	*50*	*0*	*91.6*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*48.96*	*1.0*	*50*	*0*	*97.9*	*85 - 114*				
Surr: Dibromofluoromethane	*46.24*	*1.0*	*50*	*0*	*92.5*	*80 - 119*				
Surr: Toluene-d8	*50.72*	*1.0*	*50*	*0*	*101*	*89 - 112*				

LCS Sample ID: **VLCSW-190712** Units: **UG/L** Analysis Date: **12-Jul-2019 09:57**
Client ID: Run ID: **VOA6_342382** SeqNo: **5165497** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	20	1.0	20	0	100.0	78 - 123				
Methylene chloride	19.35	2.0	20	0	96.7	74 - 124				
Surr: 1,2-Dichloroethane-d4	*49.91*	*1.0*	*50*	*0*	*99.8*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.42*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*50.22*	*1.0*	*50*	*0*	*100*	*80 - 119*				
Surr: Toluene-d8	*51.03*	*1.0*	*50*	*0*	*102*	*89 - 112*				

MS Sample ID: **HS19070432-01MS** Units: **UG/L** Analysis Date: **12-Jul-2019 13:09**
Client ID: Run ID: **VOA6_342382** SeqNo: **5165503** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	18.41	1.0	20	2.04	81.9	78 - 123				
Methylene chloride	16.18	2.0	20	0	80.9	74 - 124				
Surr: 1,2-Dichloroethane-d4	*48.59*	*1.0*	*50*	*0*	*97.2*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.36*	*1.0*	*50*	*0*	*105*	*85 - 114*				
Surr: Dibromofluoromethane	*49.53*	*1.0*	*50*	*0*	*99.1*	*80 - 119*				
Surr: Toluene-d8	*53.58*	*1.0*	*50*	*0*	*107*	*89 - 112*				

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: HS19070016

QC BATCH REPORT

Batch ID: R342382 (0) **Instrument:** VOA6 **Method:** VOLATILES ORGANICS BY METHOD 8260C

MSD Sample ID: **HS19070432-01MSD** Units: **UG/L** Analysis Date: **12-Jul-2019 13:33**
Client ID: Run ID: **VOA6_342382** SeqNo: **5165504** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
cis-1,2-Dichloroethene	18.89	1.0	20	2.04	84.3	78 - 123	18.41	2.58	20	
Methylene chloride	16.43	2.0	20	0	82.2	74 - 124	16.18	1.54	20	
Surr: 1,2-Dichloroethane-d4	*50.54*	*1.0*	*50*	*0*	*101*	*81 - 118*	*48.59*	*3.92*	*20*	
Surr: 4-Bromofluorobenzene	*53.09*	*1.0*	*50*	*0*	*106*	*85 - 114*	*52.36*	*1.37*	*20*	
Surr: Dibromofluoromethane	*50.62*	*1.0*	*50*	*0*	*101*	*80 - 119*	*49.53*	*2.18*	*20*	
Surr: Toluene-d8	*53.54*	*1.0*	*50*	*0*	*107*	*89 - 112*	*53.58*	*0.09*	*20*	

The following samples were analyzed in this batch: HS19070016-08 HS19070016-14

ALS Houston, US Date: 17-Jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
WorkOrder: **HS19070016**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2018-2019	31-Jul-2019
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 17-jul-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24/ICT Wells
Work Order: HS19070016

SAMPLE TRACKING

Lab Samp ID	Client Sample ID	Action	Date	Person	New Location
HS19070016-01	ICT2_062819	Login	01/07/2019 12:10:28	NDR	MET009
HS19070016-01	ICT2_062819	Login	01/07/2019 12:10:28	NDR	Sub
HS19070016-01	ICT2_062819	Login	01/07/2019 12:10:28	NDR	VOA252

ALS Houston, US Date: 17-Jul-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19070016
Date/Time Received: **29-Jun-2019 08:45**
Received by: **JRM**

Checklist completed by: *Nilesh D. Ranchod* 1-Jul-2019
eSignature | Date

Reviewed by: _____
eSignature | Date

Matrices: **Groundwater/Water**
Carrier name: **FedEx Priority Overnight**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	2 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☑	No ☐	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	

Temperature(s)/Thermometer(s):	1.2c U/c	IR11
Cooler(s)/Kit(s):	45005	
Date/Time sample(s) sent to storage:	07/01/2019 13:00	

Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

bhate

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24/ ICT Wells

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (3)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL METALS								Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
								Sample Analysis Requested (5)											Quality Assurance Samples (6)			
ICT2_062819		28 JUN 2019	0650	-	N		WG	5	X	X	X											
ICT4_062819		28 JUN 2019	0710	-	N		WG	5	X	X	X											
ICT7_062819		28 JUN 2019	0725	-	N		WG	5	X	X	X											
ICT8_062819		28 JUN 2019	0735	-	N		WG	5	X	X	X											
ICT1L_062819		28 JUN 2019	0750	-	N		WG	5	X	X	X											
ICT11_062819_d		28 JUN 2019	0750	-	FD		WG	5	X	X	X											
ICT14B_062819		28 JUN 2019	0805	-	N		WG	5	X	X	X											
ICT14C_062819		28 JUN 2019	0815	-	N		WG	5	X	X	X											
ICT14D_062819		28 JUN 2019	0835	-	N		WG	5	X	X	X											
ICT14D_062819_MS		28 JUN 2019	0835	-	MS		WG	5	X	X	X											
ICT14D_062819_MSD		28 JUN 2019	0835	-	SD		WG	5	X	X	X											

COMMENTS:
Cooler 45505 1:11
Temp 1.2 CF00

HS19070016

Bhate Environmental Associates, Inc.
LHAAP 18 24/ICT Wells

Custody Transfers Prior to Receipt by Laboratory

	Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1.	Scott Beesinger	6/28/19	1030	J. [illegible]	6/29/19	0845
2.						
3.						

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped _____ No.:

_____ Method of Shipment: _____

_____ Fed Ex _____ Airbill Number:

_____ Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

00942541

bhate

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

UMS Number: _____

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Chain of Custody and Analytical Request

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24/ ICT Wells

Client Name:

Collected by: Scott Beesinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code [2]	Sample Number [3]	Sample Matrix [4]	Number of containers	VOC	PERCHLORATE	TOTAL METALS								Ambient Blank Lot Control Number	Equipment Blank lot Control Number	Trip Blank Lot Control Number
ICT12B_062819		28Jun2019	0905	-	N		WG	5	X	X	X										
ICT12B_062819_a		28Jun2019	0905	-	FD		WG	5	X	X	X										
ICT12C_062819		28Jun2019	0920	-	N		WG	5	X	X	X										
ICT12D_062819		28Jun2019	0935		N		WG	5	X	X	X										
ICT12E_062819		28Jun2019	0930		N		WG	5	X	X	X										
ICT13B_062819		28Jun2019	0910	-	N		WG	5	X	X	X										
ICT13D_062819		28Jun2019	0820	-	N		WG	5	X	X	X										
ICT13E_062819		28Jun2019	0800	-	N		WG	5	X	X	X										
ICT13F_062819		28Jun2019	0720	-	N		WG	5	X	X	X										
TRIP BLANK		28Jun2019		-	TB		W	2	X												
				-																	

Sample Analysis Requested [5] | Quality Assurance Samples [6]

Cooler ID

HS1907016

Bhate Environmental Associates, Inc.
LHAAP 18 24/ICT Wells

COMMENTS:
Cooler 45305 1.2.11
Temp 1.2 COC

Custody Transfers Prior to Receipt by Laboratory

Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1. Scott Beesinger	6/28/19	1030	1. J. Simpson	6/29/19	08:45
2.			2.		
3.			3.		

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped _____ No.:

_____ Method of Shipment: _____

_____ Fed Ex _____ Airbill Number:

_____ Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

00942542

ALS
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

U5005

CUSTODY SEAL

Date: 6/28/19 Time: 1030
Name: Scott Beesinger
Company: Bhate

Seal Broken By: JCH
Date: 06/29/19

U5005

Must Deliver Next Business Day
Time and Tempature Sensitive!

U5005

5 B
12:00 3137
06.29

RT 809
ST 35

ORIGIN ID:SGRA (903) 930-6183
SCOTT BEESINER
BHATE ENVIRONMENTAL ASSOCIATES
1203-B EAST GRAND AVE. PMB202

MARSHALL, TX 75670
UNITED STATES US

LB MAN
J/CAFE3211
14x14 IN

TO **CLIENT SERVICES**
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON TX 77099
(281) 530-5656

REF: LHAAP/18/24 & SURFACE WATER- RJ

RMA:

FedEx Express

FedEx TRK# 0221 4809 7834 3137

SATURDAY 12:00P
PRIORITY OVERNIGHT

X0 SGRA

77099
TX-US
IAH

TUE 5121950 20JLA1E 553C1/9210/8C8A

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1919059

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2273 (243598)

General Set Information: There were twenty field samples in this Work Order. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: Field sample 1919059003/04/09/10/11 were analyzed and reported from 1:10 dilutions. Field samples 1919059001/05/06 were analyzed and reported from 1:100 dilutions. Field samples 1919059002/07/14/15/16 were analyzed and reported from 1:1,000 dilutions. Field samples 1919059012/13 were analyzed and reported from 1:10,000 dilutions. The reporting limits have been adjusted accordingly.

Method QC data: The method blank (LMB 663781) was less than 1/2 the CRDL. The recovery for the LCS (663782) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 1919059010/11 (Client ID: ICT14D_062819). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The parent sample and the MS/MSD were analyzed and reported from 1:10 dilutions. The effective spike target was 40.µg/L. The MS (1919059010MS) failed QC acceptance criteria for percent recovery. The MS/MSD relative percent difference was within the performance limits. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 663779) is reported from the analysis of the Laboratory Control Sample (LCS – 663782) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafile 16JULD12.

Thomas Bosch July 16, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: July 16, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1919059**
Project ID: HS19070016
Purchase Order: HS19070016
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
ICT2_062819	1919059001	06/28/19	07/02/19	
ICT4_062819	1919059002	06/28/19	07/02/19	
ICT7_062819	1919059003	06/28/19	07/02/19	
ICT8_062819	1919059004	06/28/19	07/02/19	
ICT11_062819	1919059005	06/28/19	07/02/19	
ICT11_062819_a	1919059006	06/28/19	07/02/19	
ICT14B_062819	1919059007	06/28/19	07/02/19	
ICT14C_062819	1919059008	06/28/19	07/02/19	
ICT14D_062819	1919059009	06/28/19	07/02/19	
ICT12B_062819	1919059012	06/28/19	07/02/19	
ICT12B_062819_a	1919059013	06/28/19	07/02/19	
ICT12C_062819	1919059014	06/28/19	07/02/19	
ICT12D_062819	1919059015	06/28/19	07/02/19	
ICT12E_062819	1919059016	06/28/19	07/02/19	
ICT13B_062819	1919059017	06/28/19	07/02/19	
ICT13D_062819	1919059018	06/28/19	07/02/19	
ICT13E_062819	1919059019	06/28/19	07/02/19	
ICT13F_062819	1919059020	06/28/19	07/02/19	

Client QC ID *	Lab ID	Collect Date	Receive Date	Sampling Site
ICT14D_062819 MS	1919059010	06/28/19	07/02/19	
ICT14D_062819 MSD	1919059011	06/28/19	07/02/19	

***Client QC is reported as part of the Quality Control results report, if requested.**

ANALYTICAL REPORT

Workorder: 34-1919059
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **ICT2_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059001 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 09:17 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**6900**	100	200	400	100	

Sample ID: **ICT4_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059002 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 14:22 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**7700**	1000	2000	4000	1000	

Sample ID: **ICT7_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059003 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 09:45 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**260**	10	20	40	10	

Sample ID: **ICT8_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059004 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 09:59 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**140**	10	20	40	10	

ANALYTICAL REPORT

Workorder: 34-1919059
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **ICT11_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059005 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 10:13 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**2500**	100	200	400	100	

Sample ID: **ICT11_062819_a** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059006 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 10:27 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**2600**	100	200	400	100	

Sample ID: **ICT14B_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059007 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 10:41 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**12000**	1000	2000	4000	1000	

Sample ID: **ICT14C_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059008 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 10:54 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

ANALYTICAL REPORT

Workorder: 34-1919059
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **ICT14D_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059009 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 11:08 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**210**	10	20	40	10	

Sample ID: **ICT12B_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059012 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 12:03 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**140000**	10000	20000	40000	10000	

Sample ID: **ICT12B_062819_a** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059013 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 12:17 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**150000**	10000	20000	40000	10000	

Sample ID: **ICT12C_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059014 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 12:31 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**6500**	1000	2000	4000	1000	

ANALYTICAL REPORT

Workorder: 34-1919059
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **ICT12D_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059015 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 12:45 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**13000**	1000	2000	4000	1000	

Sample ID: **ICT12E_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059016 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 12:59 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**28000**	1000	2000	4000	1000	

Sample ID: **ICT13B_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059017 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 13:13 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **ICT13D_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059018 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 13:26 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	**43**	1.0	2.0	4.0	1	

ANALYTICAL REPORT

Workorder: 34-1919059
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **ICT13E_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059019 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 13:40 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	3.8	1.0	2.0	4.0	1	J

Sample ID: **ICT13F_062819** | Sampling Site: NA | Collected: 06/28/2019
Lab ID: 1919059020 | Media: 125 mL Nalgene | Received: 07/02/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2273 (HBN: 243598) | **Percent Solid:** NA
Analyzed: 07/16/2019 13:54 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Comments

Quality Control: **EPA 6850, DoD QSM - (HBN: 243598)**

Field sample 1919059003/04/09/10/11 were analyzed and reported from 1:10 dilutions. Field samples 1919059001/05/06 were analyzed and reported from 1:100 dilutions. Field samples 1919059002/07/14/15/16 were analyzed and reported from 1:1,000 dilutions. Field samples 1919059012/13 were analyzed and reported from 1:10,000 dilutions. The reporting limits have been adjusted accordingly.

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 07/16/2019 15:20	/S/ Stephen Brose 07/16/2019 16:13

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1919059
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1919059

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2273 (HBN: 243598)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 663781
Analyzed: 07/16/2019 09:03
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 663782
Analyzed: 07/16/2019 08:34
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.35	4.00	109	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample:	1919059009	**MS:**	1919059010	**MSD:**	1919059011
Analyzed:	07/16/2019 11:08	**Analyzed:**	07/16/2019 11:22	**Analyzed:**	07/16/2019 11:50
Dilution:	10	**Dilution:**	10	**Dilution:**	10
Units:	ug/L	**Units:**	ug/L	**Units:**	ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	210	263	40	▲ 126	78.8	123.8	262	123	0.491	0.0	20.0

Comments

Field sample 1919059003/04/09/10/11 were analyzed and reported from 1:10 dilutions. Field samples 1919059001/05/06 were analyzed and reported from 1:100 dilutions. Field samples 1919059002/07/14/15/16 were analyzed and reported from 1:1,000 dilutions. Field samples 1919059012/13 were analyzed and reported from 1:10,000 dilutions. The reporting limits have been adjusted accordingly.

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
07/16/2019 15:31	07/16/2019 16:13

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

1919059

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

SAMPLING STATE: **Texas**

18698/2

COC ID: **11702**

SUBCONTRACT TO:

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	Jumoke M. Lawal
Email:	jumoke.lawal@alsglobal.com

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19070016
TSR:	Danielle Winnings

125

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19070016-01**	**ICT2_062819**	**Groundwater**	**28 Jun 2019 06:50**
	SUB_Perch-6850			10 Jul 2019
2.	**HS19070016-02**	**ICT4_062819**	**Groundwater**	**28 Jun 2019 07:10**
	SUB_Perch-6850			10 Jul 2019
3.	**HS19070016-03**	**ICT7_062819**	**Groundwater**	**28 Jun 2019 07:25**
	SUB_Perch-6850			10 Jul 2019
4.	**HS19070016-04**	**ICT8_062819**	**Groundwater**	**28 Jun 2019 07:35**
	SUB_Perch-6850			10 Jul 2019
5.	**HS19070016-05**	**ICT11_062819**	**Groundwater**	**28 Jun 2019 07:50**
	SUB_Perch-6850			10 Jul 2019
6.	**HS19070016-06**	**ICT11_062819_a**	**Groundwater**	**28 Jun 2019 07:50**
	SUB_Perch-6850			10 Jul 2019
7.	**HS19070016-07**	**ICT14B_062819**	**Groundwater**	**28 Jun 2019 08:05**
	SUB_Perch-6850			10 Jul 2019
8.	**HS19070016-08**	**ICT14C_062819**	**Groundwater**	**28 Jun 2019 08:15**
	SUB_Perch-6850			10 Jul 2019
9.	**HS19070016-09**	**ICT14D_062819**	**Groundwater**	**28 Jun 2019 08:35**

MS/MSD

Subcontract Chain of Custody

SAMPLING STATE: **Texas** **COC ID:** **11702**

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
		SUB_Perch-6850		10 Jul 2019
10.	**HS19070016-10**	**ICT12B_062819**	**Groundwater**	**28 Jun 2019 09:05**
		SUB_Perch-6850		10 Jul 2019
11.	**HS19070016-11**	**ICT12B_062819_a**	**Groundwater**	**28 Jun 2019 09:05**
		SUB_Perch-6850		10 Jul 2019
12.	**HS19070016-12**	**ICT12C_062819**	**Groundwater**	**28 Jun 2019 09:20**
		SUB_Perch-6850		10 Jul 2019
13.	**HS19070016-13**	**ICT12D_062819**	**Groundwater**	**28 Jun 2019 09:35**
		SUB_Perch-6850		10 Jul 2019
14.	**HS19070016-14**	**ICT12E_062819**	**Groundwater**	**28 Jun 2019 09:30**
		SUB_Perch-6850		10 Jul 2019
15.	**HS19070016-15**	**ICT13B_062819**	**Groundwater**	**28 Jun 2019 09:10**
		SUB_Perch-6850		10 Jul 2019
16.	**HS19070016-16**	**ICT13D_062819**	**Groundwater**	**28 Jun 2019 08:20**
		SUB_Perch-6850		10 Jul 2019
17.	**HS19070016-17**	**ICT13E_062819**	**Groundwater**	**28 Jun 2019 08:00**
		SUB_Perch-6850		10 Jul 2019
18.	**HS19070016-18**	**ICT13F_062819**	**Groundwater**	**28 Jun 2019 07:20**
		SUB_Perch-6850		10 Jul 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.
Use HS19070016-09 as MS/MSD

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 7/1/19 1800.

Received By: _____ Date/Time: 07-02-19 9:48

Cooler ID(s): _____ Temperature(s): _____

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19070016	***Split:***	**Workorder ID:** 1919059	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	Requested Analysis: EPA 6850, DoD QSM
1	06/28/2019 00:00	ICT2_062819	1919059001		Water	A	1	A
2	06/28/2019 00:00	ICT4_062819	1919059002		Water	A	1	A
3	06/28/2019 00:00	ICT7_062819	1919059003		Water	A	1	A
4	06/28/2019 00:00	ICT8_062819	1919059004		Water	A	1	A
5	06/28/2019 00:00	ICT11_062819	1919059005		Water	A	1	A
6	06/28/2019 00:00	ICT11_062819_a	1919059006		Water	A	1	A
7	06/28/2019 00:00	ICT14B_062819	1919059007		Water	A	1	A
8	06/28/2019 00:00	ICT14C_062819	1919059008		Water	A	1	A
9	06/28/2019 00:00	ICT14D_062819	1919059009		Water	A	1	A
10	06/28/2019 00:00	ICT14D_062819 MS	1919059010	MS	Water	A	1	A

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Coates, Gayleen	07/02/2019 09:48	ALS Sample Receiving	Sample Login
R-33-1	7-2-19 1455	CART	STORAGE
	7-15-19/14:40	T. Bosch	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ **Lab Notebook No.:** _____

Prepared / Analyzed by: _____ **Date / Time:** _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00942556

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19070016	***Split:***	**Workorder ID:** 1919059	**Level:** ENV_LVL4
Client: ALS Environmental (Houston)		**Account:** 8101	**Type:** 125Poly
Comments:			**Preservatives**

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Count	Requested Analysis: EPA 6850, DoD QSM
11	06/28/2019 00:00	ICT14D_062819 MSD	1919059011	MSD	Water	A	1	A
12	06/28/2019 00:00	ICT12B_062819	1919059012		Water	A	1	A
13	06/28/2019 00:00	ICT12B_062819_a	1919059013		Water	A	1	A
14	06/28/2019 00:00	ICT12C_062819	1919059014		Water	A	1	A
15	06/28/2019 00:00	ICT12D_062819	1919059015		Water	A	1	A
16	06/28/2019 00:00	ICT12E_062819	1919059016		Water	A	1	A
17	06/28/2019 00:00	ICT13B_062819	1919059017		Water	A	1	A
18	06/28/2019 00:00	ICT13D_062819	1919059018		Water	A	1	A
19	06/28/2019 00:00	ICT13E_062819	1919059019		Water	A	1	A
20	06/28/2019 00:00	ICT13F_062819	1919059020		Water	A	1	A

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ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Coates, Gayleen	07/02/2019 09:48	ALS Sample Receiving	Sample Login
	7.2.19 1455	CART	STORAGE
R.33.1	7.15.19/14:40	T. Bush	6850

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ **Lab Notebook No.:** _____

Prepared / Analyzed by: _____ **Date / Time:** _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00942557

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

Client Name: ALS Houston

Project/Task/Site:

Date/Time of Receipt: 07-0019 9:48

Number of Coolers Received: 1

Condition of Coolers:	Acceptable/Unacceptable	Temperature Control:	Present/Not Included
Cooler Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Location Temp Taken:	Control/Between Samples
Container Custody Seals:	Present/Absent/NA		
	Intact/Broken/NA	Are all temperatures within project specific guidelines?	Yes/No/NA
Ice Present:	Yes/No/NA		
	Frozen/Melted/NA	VOA Headspace Present?	Yes/No/NA

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9743	2 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Tamra Van Tassell (Signature) Tamra Van Tassell (Printed Name) 07-0019 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

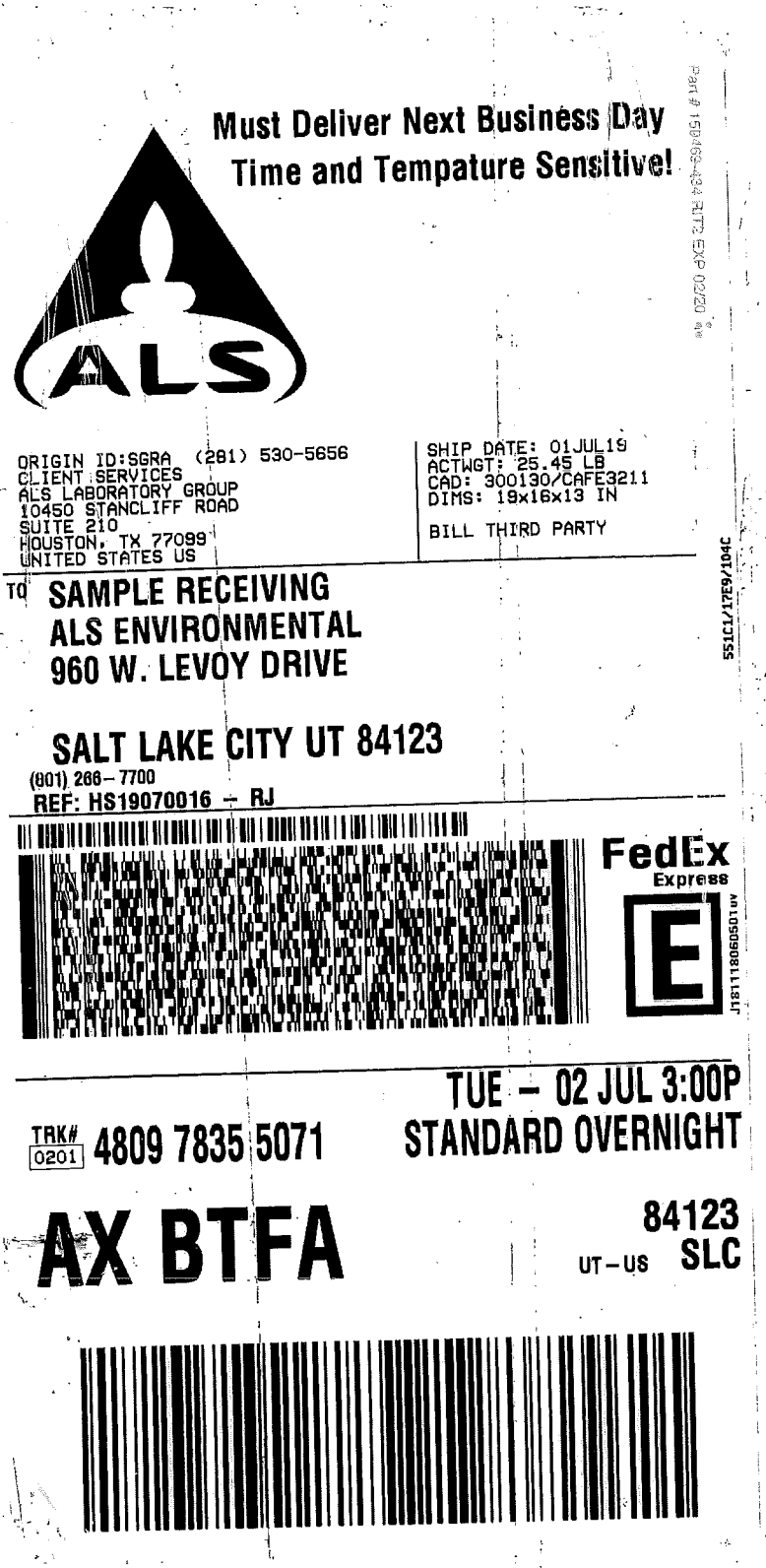
Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____



Must Deliver Next Business Day
Time and Tempature Sensitive!

Part # 158469-434 RTD EXP 02/20

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 01JUL19
ACTWGT: 25.45 LB
CAD: 300130/CAFE3211
DIMS: 19x16x13 IN

BILL THIRD PARTY

551C1/17E9/104C

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19070016 - RJ

FedEx Express

J1811180605011uv

TUE - 02 JUL 3:00P
STANDARD OVERNIGHT

TRK# 0201 4809 7835 5071

AX BTFA

84123
UT-US SLC

Batch Worklist

Batch: ELMS/ 2273 | Created: 7/16/2019 07:35 | Instrument: | HBN: 243598

Rule: EPA 6850, DoD QSM Water | Analyst: T. Bosch | Status: WP

Workorder: 1919059 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	663778	CCV for HBN 243598 [ELMS/2273]				CCV	3		E685041C3Q	5311		7/16/2019	
2	663779	RLVS for HBN 243598 [ELMS/2273				RLVS	3		E685041C3Q	5311		7/16/2019	
3	663780	ICS for HBN 243598 [ELMS/2273]				ICS	3		E6850..D3Q	5311		7/16/2019	
4	663781	LMB for HBN 243598 [ELMS/2273]				LMB	3		E6850Q413Q	5311		7/16/2019	
5	663782	LCS for HBN 243598 [ELMS/2273]				LCS	3		E6850Q413Q	5311		7/16/2019	
6	1919059001	ICT2_062819				SAMPLE	3	1919059001-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
7	1919059002	ICT4_062819				SAMPLE	3	1919059002-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
8	1919059003	ICT7_062819				SAMPLE	3	1919059003-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
9	1919059004	ICT8_062819				SAMPLE	3	1919059004-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
10	1919059005	ICT11_062819				SAMPLE	3	1919059005-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
11	1919059006	ICT11_062819_a				SAMPLE	3	1919059006-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
12	1919059007	ICT14B_062819				SAMPLE	3	1919059007-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
13	1919059008	ICT14C_062819				SAMPLE	3	1919059008-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
14	1919059009	ICT14D_062819				SAMPLE	3	1919059009-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
15	1919059010	ICT14D_062819 MS				MS	3	1919059010-A	E6850Q413Q	5480		7/16/2019	
16	663783	CCV for HBN 243598 [ELMS/2273]				CCV	3		E685041C3Q	5311		7/16/2019	
17	1919059011	ICT14D_062819 MSD				MSD	3	1919059011-A	E6850Q413Q	5480		7/16/2019	
18	1919059012	ICT12B_062819				SAMPLE	3	1919059012-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
19	1919059013	ICT12B_062819_a				SAMPLE	3	1919059013-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
20	1919059014	ICT12C_062819				SAMPLE	3	1919059014-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
21	1919059015	ICT12D_062819				SAMPLE	3	1919059015-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
22	1919059016	ICT12E_062819				SAMPLE	3	1919059016-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
23	1919059017	ICT13B_062819				SAMPLE	3	1919059017-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
24	1919059018	ICT13D_062819				SAMPLE	3	1919059018-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
25	1919059019	ICT13E_062819				SAMPLE	3	1919059019-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
26	1919059020	ICT13F_062819				SAMPLE	3	1919059020-A	E6850Q41.3	5480	7/26/2019	7/16/2019	
27	663784	CCV for HBN 243598 [ELMS/2273]				CCV	3		E685041C3Q	5311		7/16/2019	
28	663785	CCV for HBN 243598 [ELMS/2273]				CCV	3		E685041C3Q	5311		7/16/2019	

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

ALS Work Order #'s & Sample #( )'s: 1919059 (001-20)
ELMS Batch/HBN ID: 2273 (243598)
Prep Date: 07/15/2019 Analysis Date: 07/16/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\JUL\16JUL19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 7 Injection Volume: 30µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 663782; Target = 4.0µg/L. ASTM type II water was used for LMB 663781.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on samples 1919059010/11 (Client ID: ICT14D_062819). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L. The parent sample and the MS/MSD were analyzed and reported from 1:10 dilutions. The effective spike target was 40.µg/L.

COMMENTS:

1) Results reported in µg/L. Field sample 1919059003/04/09/10/11 were analyzed and reported from 1:10 dilutions. Field samples 1919059001/05/06 were analyzed and reported from 1:100 dilutions. Field samples 1919059002/07/14/15/16 were analyzed and reported from 1:1,000 dilutions. Field samples 1919059012/13 were analyzed and reported from 1:10,000 dilutions. The reporting limits have been adjusted accordingly.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters, except for the following. The MS (1919059010MS) failed QC acceptance criteria for percent recovery. MS/MSD passed QC criteria for the relative percent difference. The Matrix Spike and Matrix Spike duplicate is reported for the clients' information only. The sample matrix may be inappropriate for the method selected.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\JUL\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\243598-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 663779) is reported from the analysis of the Laboratory Control Sample (LCS – 663782) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafile 16JULD12.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2273 HBN: 243598 Sample Set IDs if Applicable: 1919059	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — **Description - 6850 QC Intrmdt Std-QC 10ug/mL**

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730
MFG: ALS/SLC
MFG Lot: TNB: 05/09/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 25 mL
Expires: 09/20/2019
Usable: Yes
Lab Lot: CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED Reference Material Producer
ANAB ACCREDITED Testing Laboratory

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through NIST, Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

AccuStandard

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy I. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
	*	663778 CCV@25	Vial 71	1	Control	1	1.58442e6	8.310	25.96242
	*	663782 QC@4.0	Vial 72	1	Control	2	3.12915e5	8.116	4.34545
	*	663780 ICS@4.0	Vial 73	1	Control	3	2.37678e5	7.896	4.14849
	*	663781 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
	*	1919059001 100	Vial 75	1	Sample	5	4.76826e6	8.462	6938.55005
	*	1919059002 100	Vial 76	1	Sample	6	5.49272e6	8.421	7938.85087
	*	1919059003 10X	Vial 77	1	Sample	7	1.70519e6	8.437	256.39942
	*	1919059004 10X	Vial 78	1	Sample	8	9.20503e5	8.341	138.67150
	*	1919059005 100	Vial 79	1	Sample	9	1.62840e6	8.484	2520.33885
	*	1919059006 100	Vial 80	1	Sample	10	1.73959e6	8.469	2559.28174
	*	1919059007 1K	Vial 81	1	Sample	11	8.10767e5	8.511	1.23334e4
	*	1919059008	Vial 82	1	Sample	12	0.00000	0.000	0.00000
	*	1919059009 10X	Vial 83	1	Sample	13	1.19587e6	8.226	212.94651
	*	1919059010 MS	Vial 84	1	Sample	14	1.52916e6	8.211	263.48693
	*	663783 CCV@25	Vial 71	1	Control	15	1.37096e6	8.317	25.34982
	*	1919059011 MSD	Vial 85	1	Sample	16	1.56092e6	8.148	262.19937
	*	1919059012 10K	Vial 86	1	Sample	17	8.47551e5	8.458	1.40974e5
	*	1919059013 10K	Vial 87	1	Sample	18	8.20714e5	8.470	1.48335e5
	*	1919059014 1K	Vial 88	1	Sample	19	3.45786e5	8.495	6505.86967
	*	1919059015 1K	Vial 89	1	Sample	20	7.96263e5	8.440	1.27595e4
	*	1919059016 1K	Vial 90	1	Sample	21	1.55953e6	8.474	2.82352e4
	*	1919059017	Vial 91	1	Sample	22	0.00000	0.000	0.00000
	*	1919059018	Vial 92	1	Sample	23	2.34216e6	8.083	42.64490
	*	1919059019	Vial 93	1	Sample	24	2.49822e5	8.385	3.82173
	*	1919059020	Vial 94	1	Sample	25	0.00000	0.000	0.00000
	*	663784 CCV@25	Vial 71	1	Control	26	1.37136e6	8.366	25.42405
	*	1919059002 1K	Vial 95	1	Sample	27	4.22100e5	8.495	7708.15626
	*	663785 CCV@25	Vial 71	1	Control	28	1.34413e6	8.328	25.23655

#	*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
	*	663778 CCV@25	Vial 71	1	Control	1	4.69188e5	8.306	25.91076
	*	663782 QC@4.0	Vial 72	1	Control	2	1.03568e5	8.126	4.68808
	*	663780 ICS@4.0	Vial 73	1	Control	3	7.57994e4	7.898	4.30607
	*	663781 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
	*	1919059001 100	Vial 75	1	Sample	5	1.38622e6	8.476	6846.02542
	*	1919059002 100	Vial 76	1	Sample	6	1.58530e6	8.437	7789.11544
	*	1919059003 10X	Vial 77	1	Sample	7	5.08688e5	8.450	257.66304
	*	1919059004 10X	Vial 78	1	Sample	8	2.89038e5	8.346	145.64673
	*	1919059005 100	Vial 79	1	Sample	9	4.90461e5	8.492	2555.62379
	*	1919059006 100	Vial 80	1	Sample	10	5.26819e5	8.513	2608.84751
	*	1919059007 1K	Vial 81	1	Sample	11	2.52949e5	8.523	1.28559e4
	*	1919059008	Vial 82	1	Sample	12	0.00000	0.000	0.00000
	*	1919059009 10X	Vial 83	1	Sample	13	3.74896e5	8.230	224.08591
	*	1919059010 MS	Vial 84	1	Sample	14	4.66376e5	8.236	270.43893
	*	663783 CCV@25	Vial 71	1	Control	15	4.08784e5	8.342	25.46113
	*	1919059011 MSD	Vial 85	1	Sample	16	4.75169e5	8.126	268.63113
	*	1919059012 10K	Vial 86	1	Sample	17	2.67187e5	8.492	1.48660e5
	*	1919059013 10K	Vial 87	1	Sample	18	2.59318e5	8.490	1.56847e5
	*	1919059014 1K	Vial 88	1	Sample	19	1.12574e5	8.479	6991.10866
	*	1919059015 1K	Vial 89	1	Sample	20	2.50606e5	8.466	1.34191e4
	*	1919059016 1K	Vial 90	1	Sample	21	4.71876e5	8.470	2.87741e4
	*	1919059017	Vial 91	1	Sample	22	0.00000	0.000	0.00000
	*	1919059018	Vial 92	1	Sample	23	6.98212e5	8.092	42.94367
	*	1919059019	Vial 93	1	Sample	24	8.36738e4	8.446	4.15028
	*	1919059020	Vial 94	1	Sample	25	0.00000	0.000	0.00000
	*	663784 CCV@25	Vial 71	1	Control	26	4.11775e5	8.400	25.70635
	*	1919059002 1K	Vial 95	1	Sample	27	1.36615e5	8.504	8266.44874
	*	663785 CCV@25	Vial 71	1	Control	28	4.14369e5	8.352	26.16117

Batch Report: C:\HPCHEM\1\DATA\16JUL19D\16JUL19S.B

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	663778 CCV@25	Vial 71	1	Control	1	1.85244e5	8.318	5.00000
*	663782 QC@4.0	Vial 72	1	Control	2	2.36327e5	8.134	5.00000
*	663780 ICS@4.0	Vial 73	1	Control	3	1.88447e5	7.919	5.00000
*	663781 LMB	Vial 74	1	Control	4	1.64613e5	8.459	5.00000
*	1919059001 100	Vial 75	1	Sample	5	1.90168e5	8.472	500.00000
*	1919059002 100	Vial 76	1	Sample	6	1.87734e5	8.470	500.00000
*	1919059003 10X	Vial 77	1	Sample	7	2.02027e5	8.443	50.00000
*	1919059004 10X	Vial 78	1	Sample	8	2.07941e5	8.386	50.00000
*	1919059005 100	Vial 79	1	Sample	9	1.96475e5	8.516	500.00000
*	1919059006 100	Vial 80	1	Sample	10	2.06504e5	8.488	500.00000
*	1919059007 1K	Vial 81	1	Sample	11	2.06918e5	8.522	5000.00000
*	1919059008	Vial 82	1	Sample	12	1.00822e5	7.602	5.00000
*	1919059009 10X	Vial 83	1	Sample	13	1.72412e5	8.265	50.00000
*	1919059010 MS	Vial 84	1	Sample	14	1.76001e5	8.215	50.00000
*	663783 CCV@25	Vial 71	1	Control	15	1.64401e5	8.350	5.00000
*	1919059011 MSD	Vial 85	1	Sample	16	1.80595e5	8.132	50.00000
*	1919059012 10K	Vial 86	1	Sample	17	1.88204e5	8.496	5.00000e4
*	1919059013 10K	Vial 87	1	Sample	18	1.72826e5	8.488	5.00000e4
*	1919059014 1K	Vial 88	1	Sample	19	1.71453e5	8.503	5000.00000
*	1919059015 1K	Vial 89	1	Sample	20	1.96162e5	8.469	5000.00000
*	1919059016 1K	Vial 90	1	Sample	21	1.66766e5	8.489	5000.00000
*	1919059017	Vial 91	1	Sample	22	2.13154e5	7.890	5.00000
*	1919059018	Vial 92	1	Sample	23	1.60594e5	8.115	5.00000
*	1919059019	Vial 93	1	Sample	24	2.15896e5	8.410	5.00000
*	1919059020	Vial 94	1	Sample	25	2.01956e5	8.445	5.00000
*	663784 CCV@25	Vial 71	1	Control	26	1.63939e5	8.398	5.00000
*	1919059002 1K	Vial 95	1	Sample	27	1.75498e5	8.490	5000.00000
*	663785 CCV@25	Vial 71	1	Control	28	1.61950e5	8.357	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

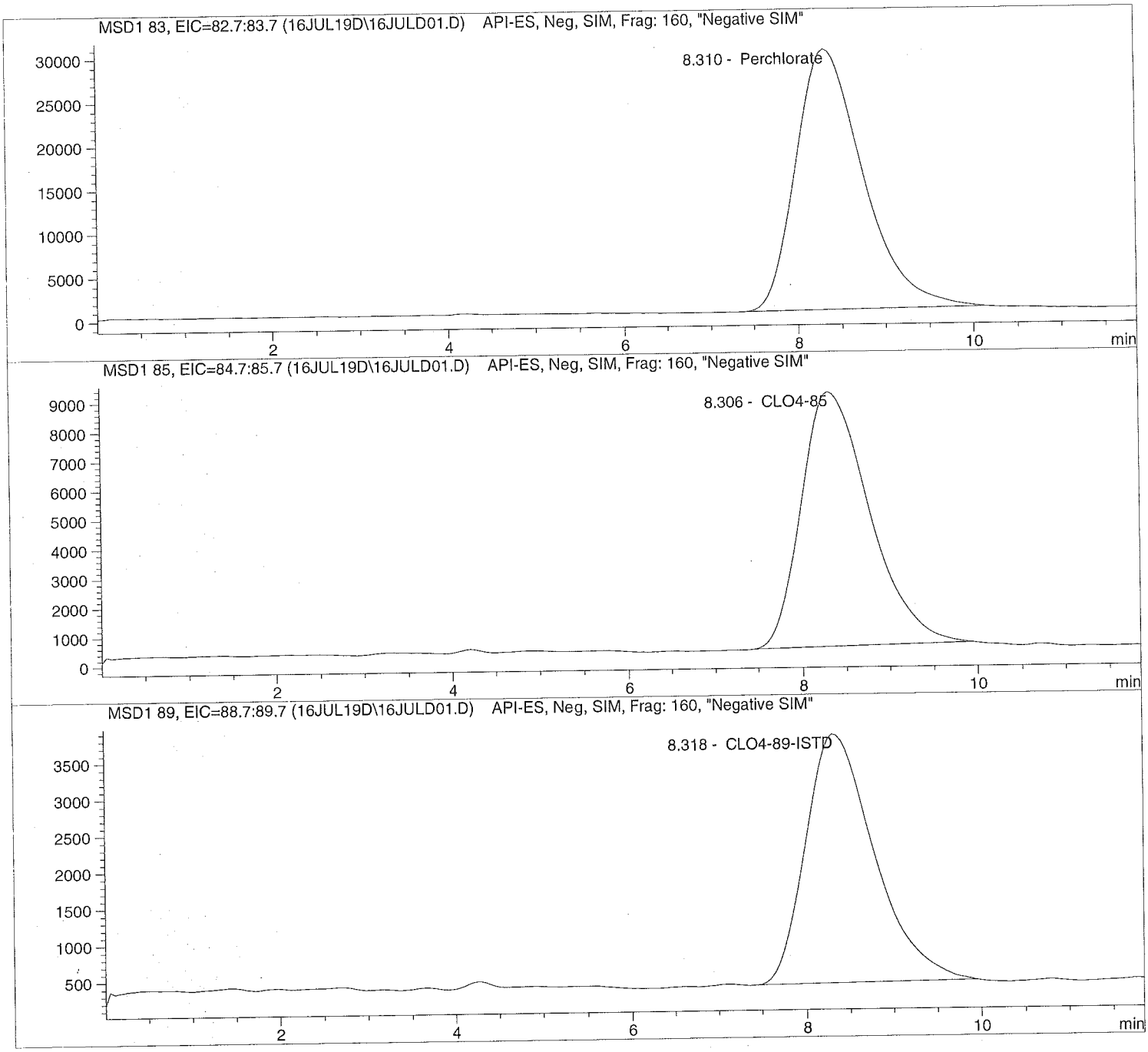
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	663778 CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	663782 QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	663780 ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	663781 LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1919059001 100	CLO4-AQN	1	Sample		
6	Vial 76	1919059002 100	CLO4-AQN	1	Sample		
7	Vial 77	1919059003 10X	CLO4-AQN	1	Sample		
8	Vial 78	1919059004 10X	CLO4-AQN	1	Sample		
9	Vial 79	1919059005 100	CLO4-AQN	1	Sample		
10	Vial 80	1919059006 100	CLO4-AQN	1	Sample		
11	Vial 81	1919059007 1K	CLO4-AQN	1	Sample		
12	Vial 82	1919059008	CLO4-AQN	1	Sample		
13	Vial 83	1919059009 10X	CLO4-AQN	1	Sample		
14	Vial 84	1919059010 MS	CLO4-AQN	1	Sample		
15	Vial 71	663783 CCV@25	CLO4-AQN	1	Ctrl Samp		
16	Vial 85	1919059011 MSD	CLO4-AQN	1	Sample		
17	Vial 86	1919059012 10K	CLO4-AQN	1	Sample		
18	Vial 87	1919059013 10K	CLO4-AQN	1	Sample		
19	Vial 88	1919059014 1K	CLO4-AQN	1	Sample		
20	Vial 89	1919059015 1K	CLO4-AQN	1	Sample		
21	Vial 90	1919059016 1K	CLO4-AQN	1	Sample		
22	Vial 91	1919059017	CLO4-AQN	1	Sample		
23	Vial 92	1919059018	CLO4-AQN	1	Sample		
24	Vial 93	1919059019	CLO4-AQN	1	Sample		
25	Vial 94	1919059020	CLO4-AQN	1	Sample		
26	Vial 71	663784 CCV@25	CLO4-AQN	1	Ctrl Samp		
27	Vial 95	1919059002 1K	CLO4-AQN	1	Sample		
28	Vial 71	663785 CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD01.D Sample Name: 663778 CCV@25

Injection Date:	7/16/2019 08:19:30	Seq Line:	1
Sample Name:	663778 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD01.D Sample Name: 663778 CCV@25

Injection Date:	7/16/2019 08:19:30	Seq Line:	1
Sample Name:	663778 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.310	PBA	1584416.7	25.9624	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.306	PBA	469188.1	25.9108	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.318	PBA	185244.2	5.0000	CLO4-89-ISTD

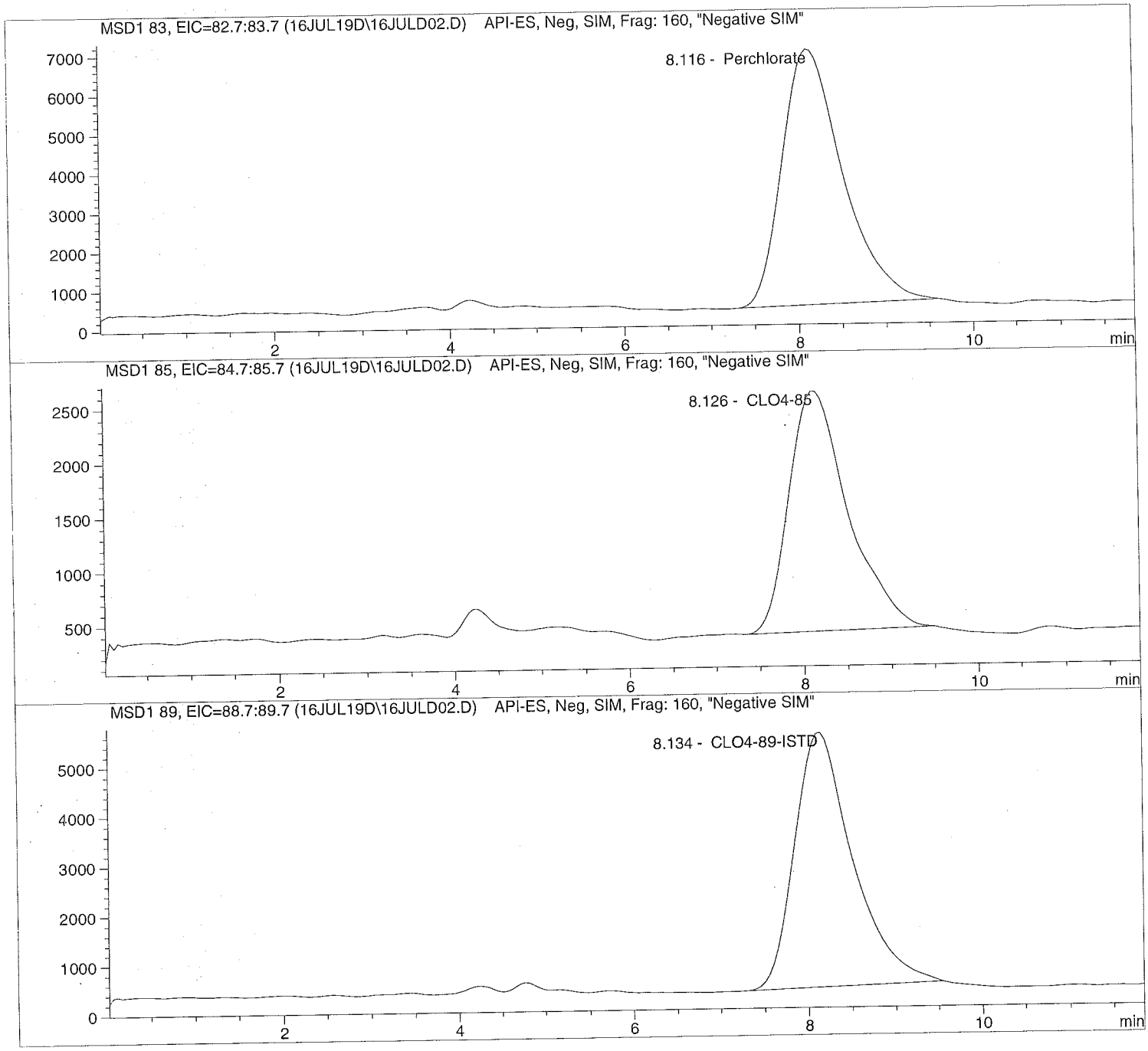
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD02.D Sample Name: 663782 QC@4.0

Injection Date:	7/16/2019 08:34:49	Seq Line:	2
Sample Name:	663782 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD02.D Sample Name: 663782 QC@4.0

Injection Date:	7/16/2019 08:34:49	Seq Line:	2
Sample Name:	663782 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.116	PBA	312914.5	4.3455	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.126	PBA	103568.2	4.6881	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.134	PBA	236327.2	5.0000	CLO4-89-ISTD

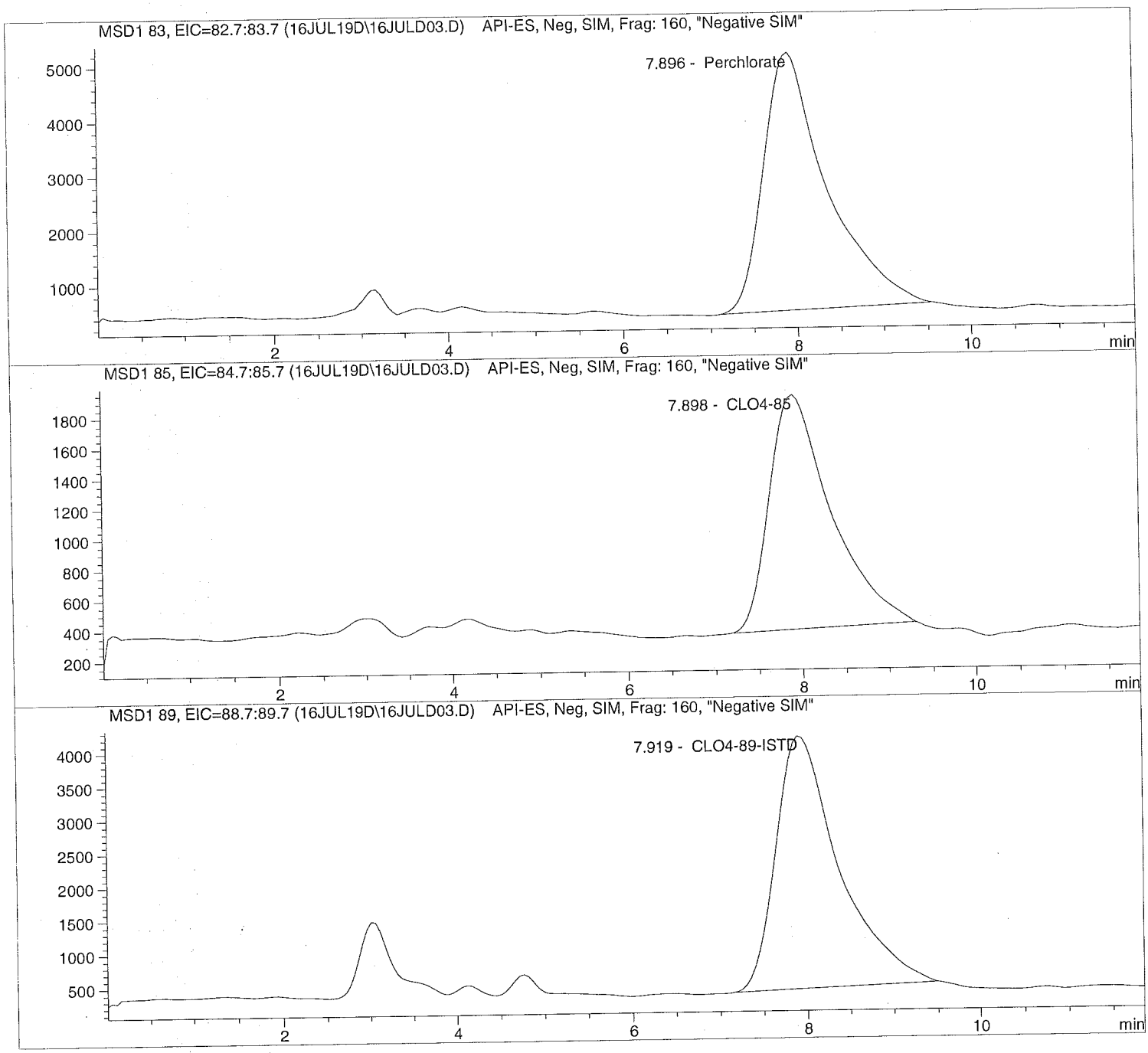
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD03.D Sample Name: 663780 ICS@4.0

Injection Date:	7/16/2019 08:48:35	Seq Line:	3
Sample Name:	663780 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD03.D Sample Name: 663780 ICS@4.0

Injection Date:	7/16/2019 08:48:35	Seq Line:	3
Sample Name:	663780 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.896	PBA	237677.8	4.1485	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.898	BBA	75799.4	4.3061	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.919	PBA	188446.6	5.0000	CLO4-89-ISTD

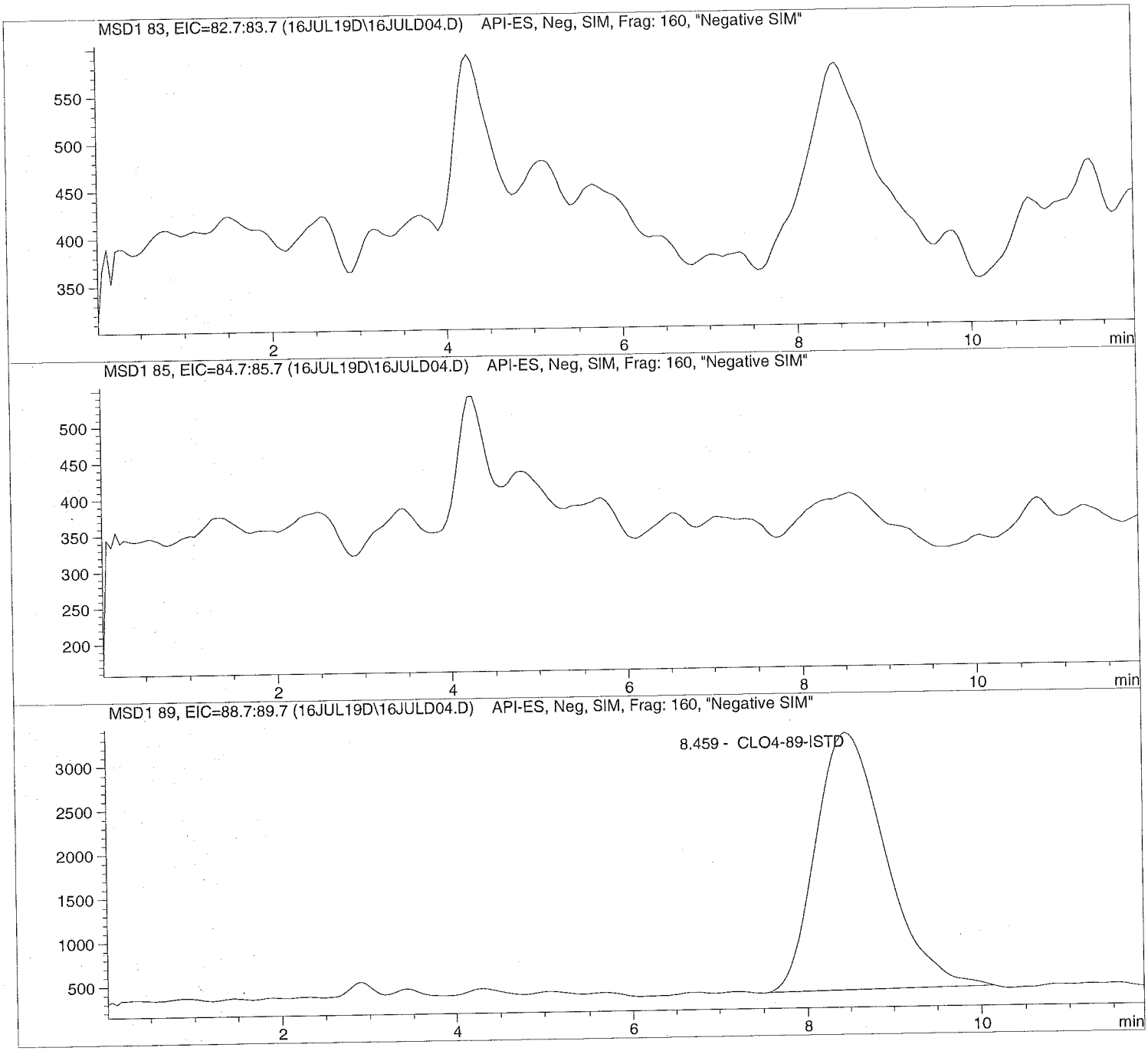
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD04.D Sample Name: 663781 LMB

Injection Date:	7/16/2019 09:03:33	Seq Line:	4
Sample Name:	663781 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD04.D Sample Name: 663781 LMB

Injection Date:	7/16/2019 09:03:33	Seq Line:	4
Sample Name:	663781 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.459	PBA	164613.3	5.0000	CLO4-89-ISTD

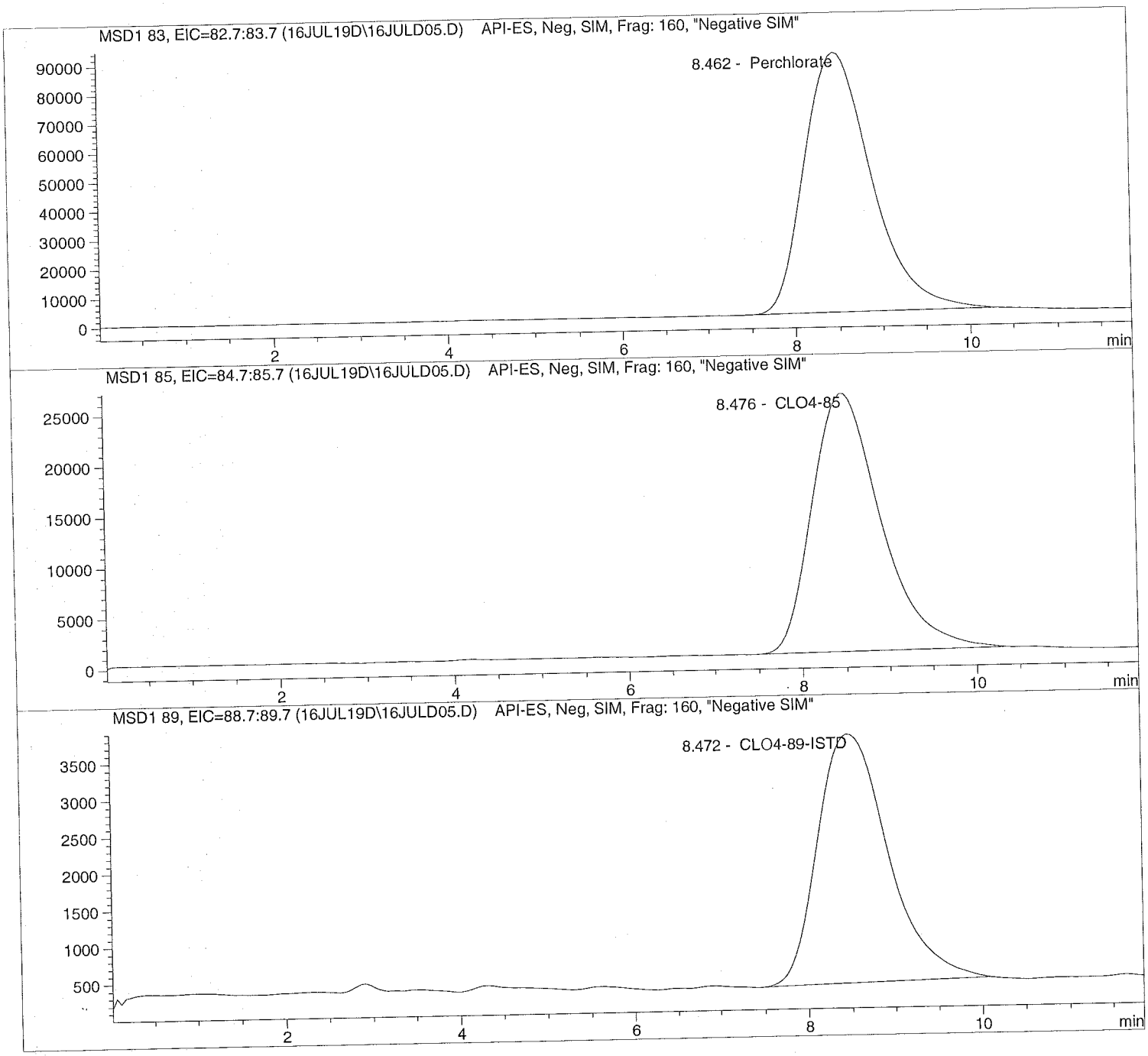
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD05.D Sample Name: 1919059001 100

Injection Date:	7/16/2019 09:17:21	Seq Line:	5
Sample Name:	1919059001 100	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD05.D Sample Name: 1919059001 100

Injection Date:	7/16/2019 09:17:21	Seq Line:	5
Sample Name:	1919059001 100	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.462	PBA	4768257.5	6938.5501	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.476	PBA	1386222.1	6846.0254	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	PBA	190168.2	500.0000	CLO4-89-ISTD

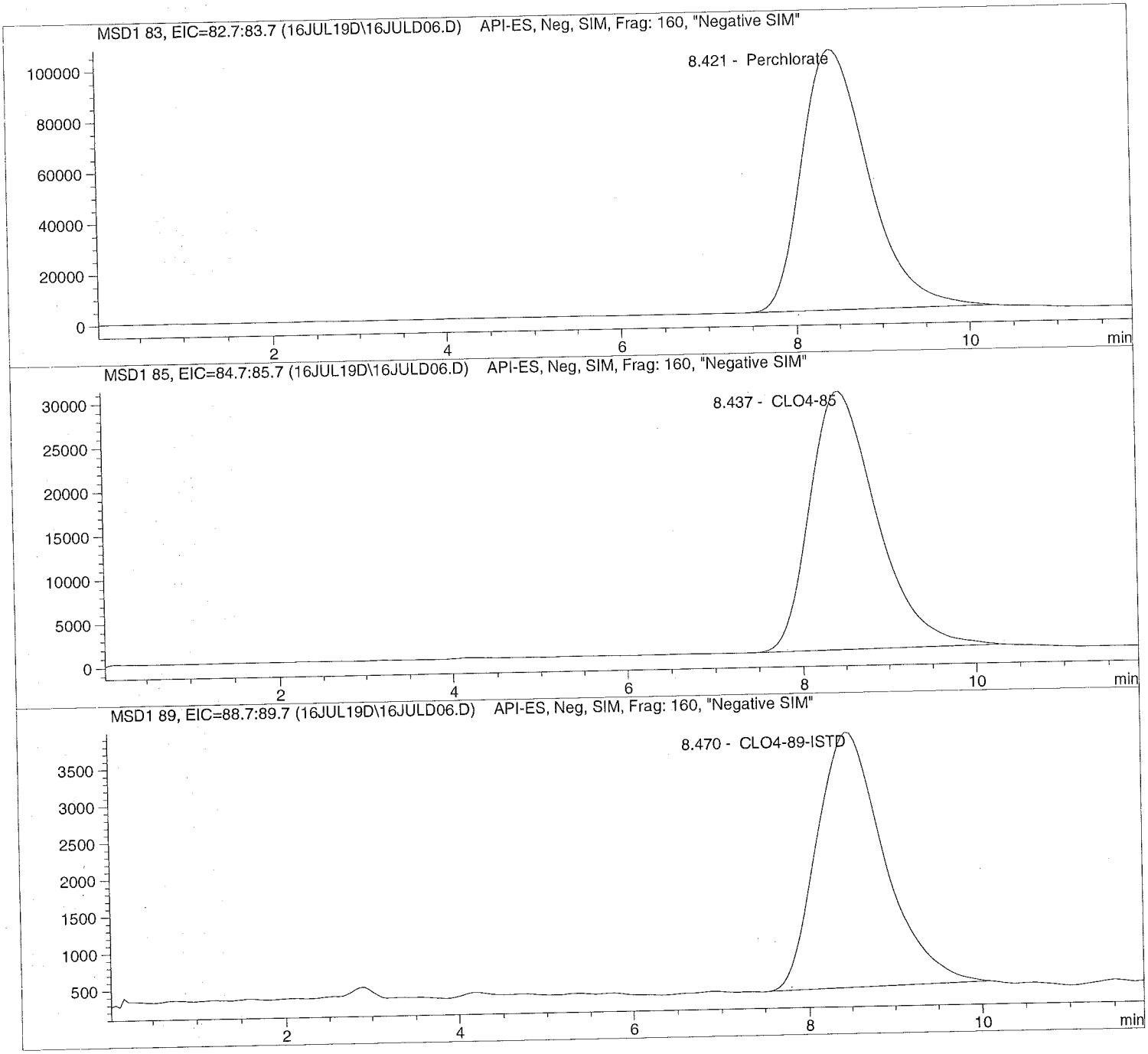
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD06.D Sample Name: 1919059002 100

Injection Date:	7/16/2019 09:31:57	Seq Line:	6
Sample Name:	1919059002 100	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD06.D Sample Name: 1919059002 100

Injection Date:	7/16/2019 09:31:57	Seq Line:	6
Sample Name:	1919059002 100	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.421	PBA	5492723.0	7938.8509	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.437	PBA	1585304.4	7789.1154	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.470	PBA	187734.1	500.0000	CLO4-89-ISTD

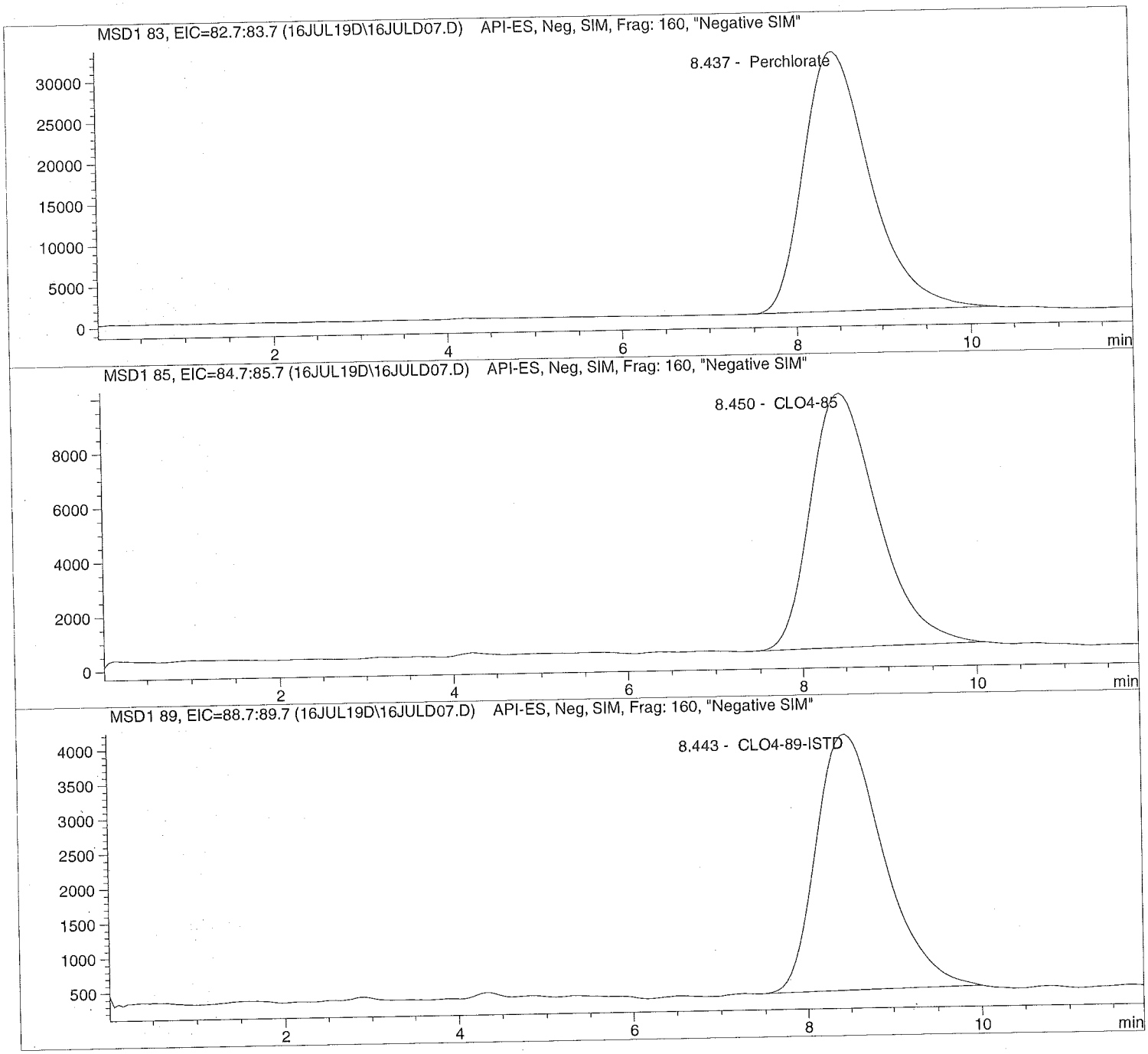
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD07.D Sample Name: 1919059003 10X

Injection Date:	7/16/2019 09:45:46	Seq Line:	7
Sample Name:	1919059003 10X	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD07.D Sample Name: 1919059003 10X

Injection Date:	7/16/2019 09:45:46	Seq Line:	7
Sample Name:	1919059003 10X	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.437	PBA	1705189.8	256.3994	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.450	PBA	508688.0	257.6630	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.443	PBA	202026.7	50.0000	CLO4-89-ISTD

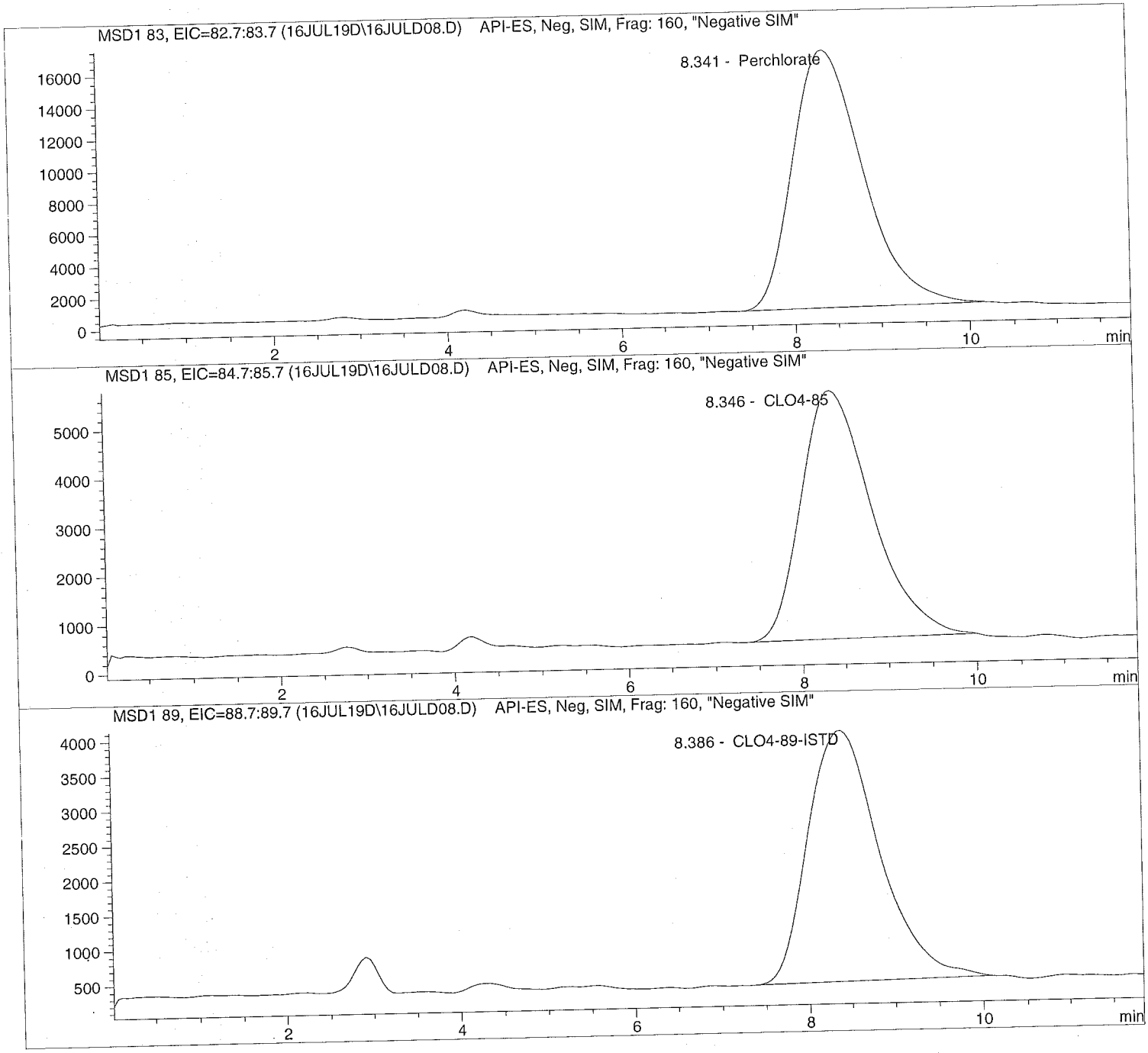
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD08.D Sample Name: 1919059004 10X

Injection Date:	7/16/2019 09:59:34	Seq Line:	8
Sample Name:	1919059004 10X	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD08.D Sample Name: 1919059004 10X

Injection Date:	7/16/2019 09:59:34	Seq Line:	8
Sample Name:	1919059004 10X	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.341	PBA	920503.1	138.6715	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.346	PBA	289037.6	145.6467	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.386	PBA	207941.3	50.0000	CLO4-89-ISTD

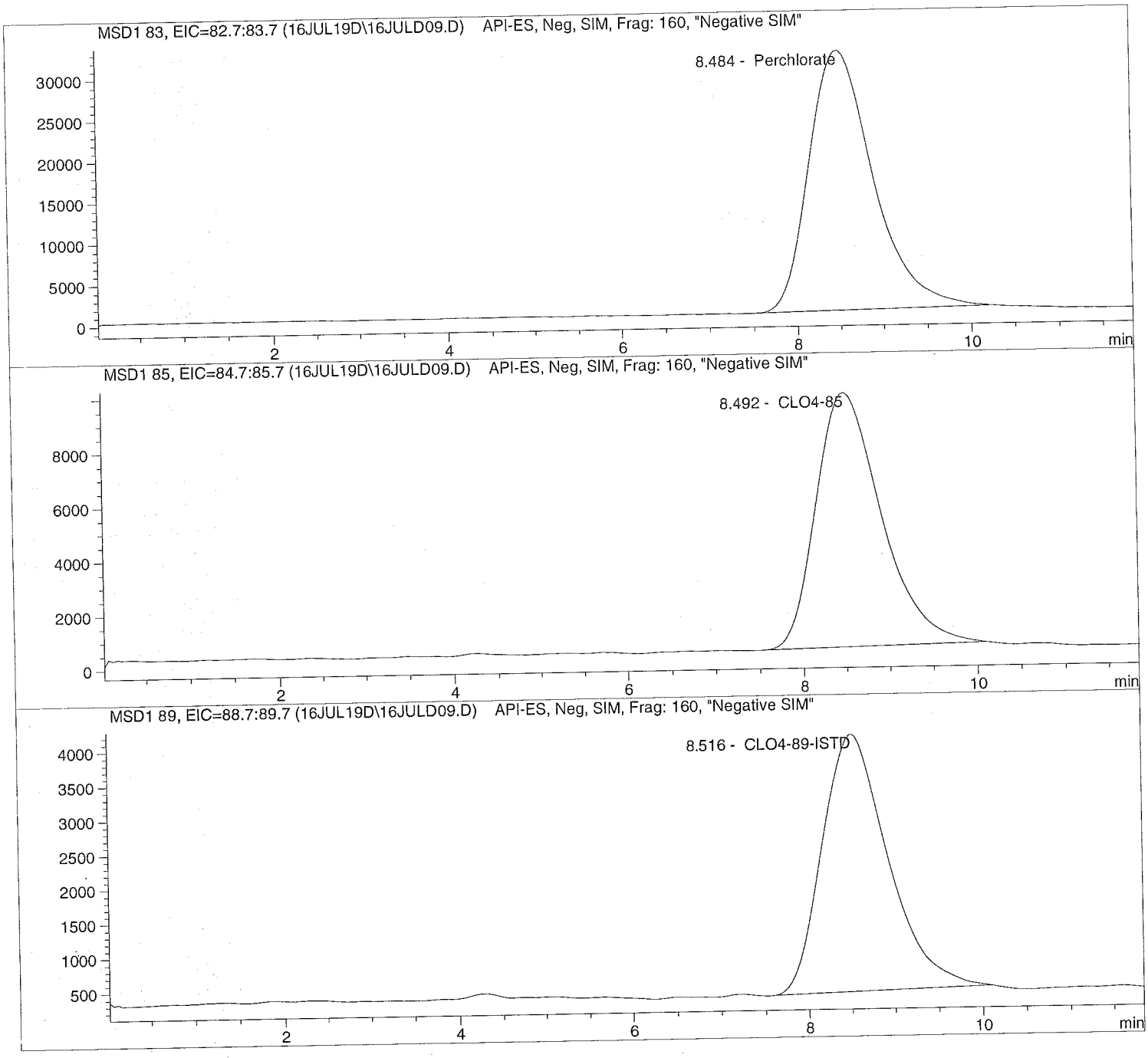
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD09.D Sample Name: 1919059005 100

Injection Date:	7/16/2019 10:13:20	Seq Line:	9
Sample Name:	1919059005 100	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD09.D Sample Name: 1919059005 100

Injection Date:	7/16/2019 10:13:20	Seq Line:	9
Sample Name:	1919059005 100	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.484	PBA	1628402.7	2520.3389	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.492	PBA	490460.8	2555.6238	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.516	PBA	196475.2	500.0000	CLO4-89-ISTD

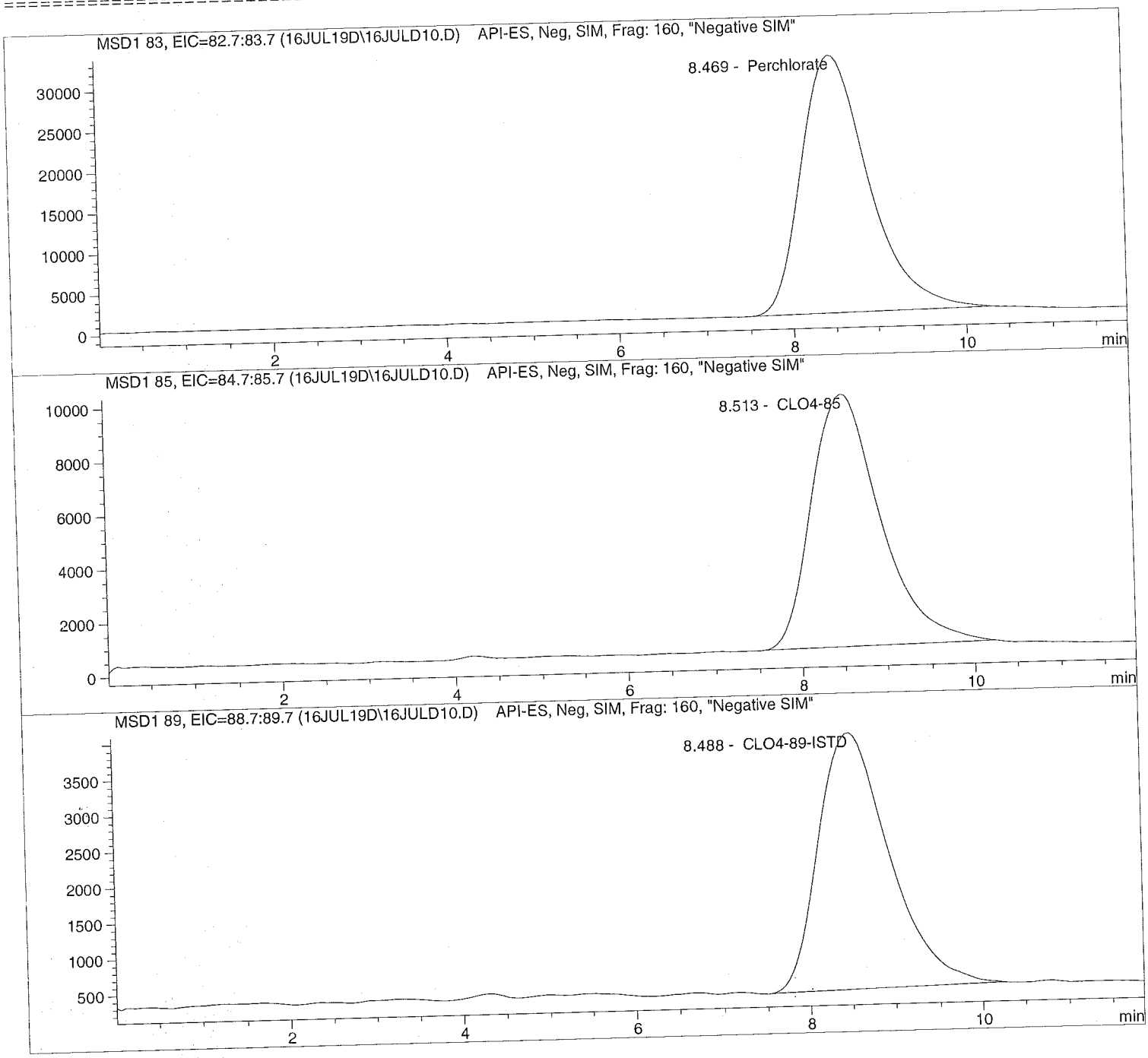
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD10.D Sample Name: 1919059006 100

Injection Date:	7/16/2019 10:27:13	Seq Line:	10
Sample Name:	1919059006 100	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD10.D Sample Name: 1919059006 100

Injection Date:	7/16/2019 10:27:13	Seq Line:	10
Sample Name:	1919059006 100	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	100.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.469	PBA	1739585.8	2559.2817	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.513	PBA	526819.3	2608.8475	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.488	PBA	206504.5	500.0000	CLO4-89-ISTD

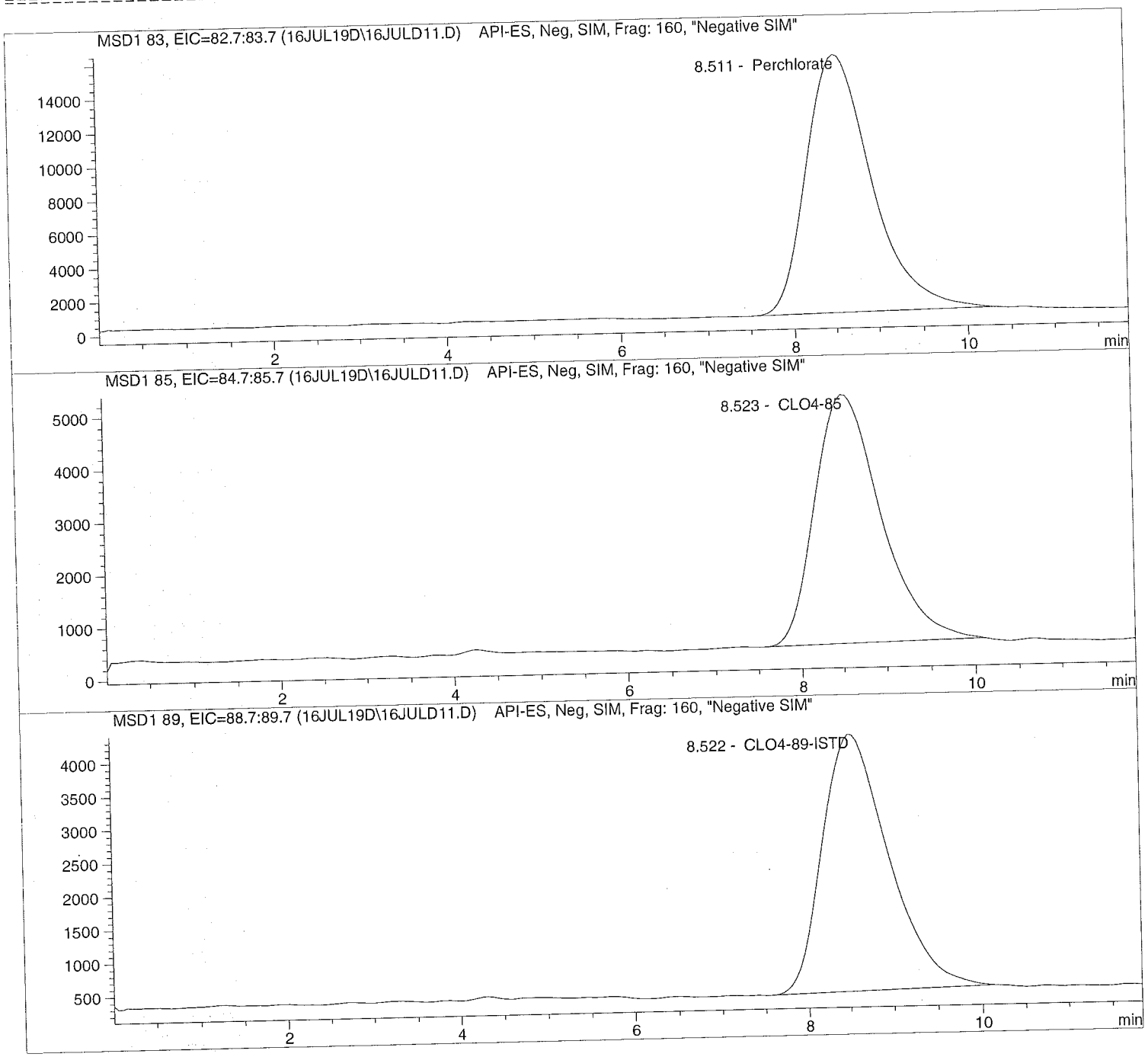
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD11.D Sample Name: 1919059007 1K

Injection Date:	7/16/2019 10:41:01	Seq Line:	11
Sample Name:	1919059007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD11.D Sample Name: 1919059007 1K

Injection Date:	7/16/2019 10:41:01	Seq Line:	11
Sample Name:	1919059007 1K	Location:	Vial 81
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.511	PBA	810766.9	12333.4400	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.523	PBA	252949.3	12855.8965	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.522	PBA	206917.6	5000.0000	CLO4-89-ISTD

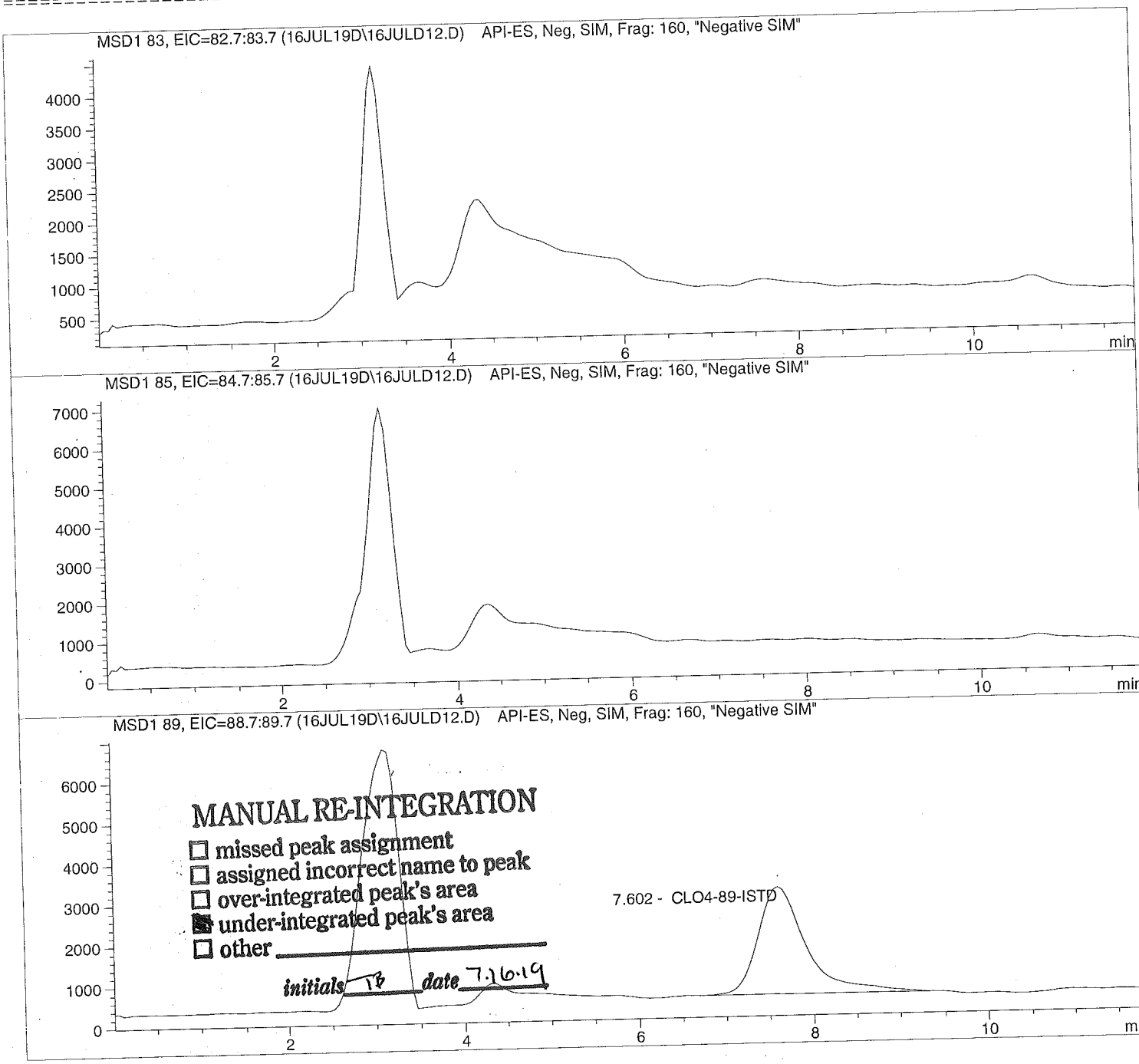
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD12.D Sample Name: 1919059008

Injection Date:	7/16/2019 10:54:46	Seq Line:	12
Sample Name:	1919059008	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



MANUAL RE-INTEGRATION
- ☐ missed peak assignment
- ☐ assigned incorrect name to peak
- ☐ over-integrated peak's area
- ☒ under-integrated peak's area
- ☐ other _____

initials TB date 7.16.19

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD12.D Sample Name: 1919059008

Injection Date:	7/16/2019 10:54:46	Seq Line:	12
Sample Name:	1919059008	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.602	MM	100822.0	5.0000	CLO4-89-ISTD

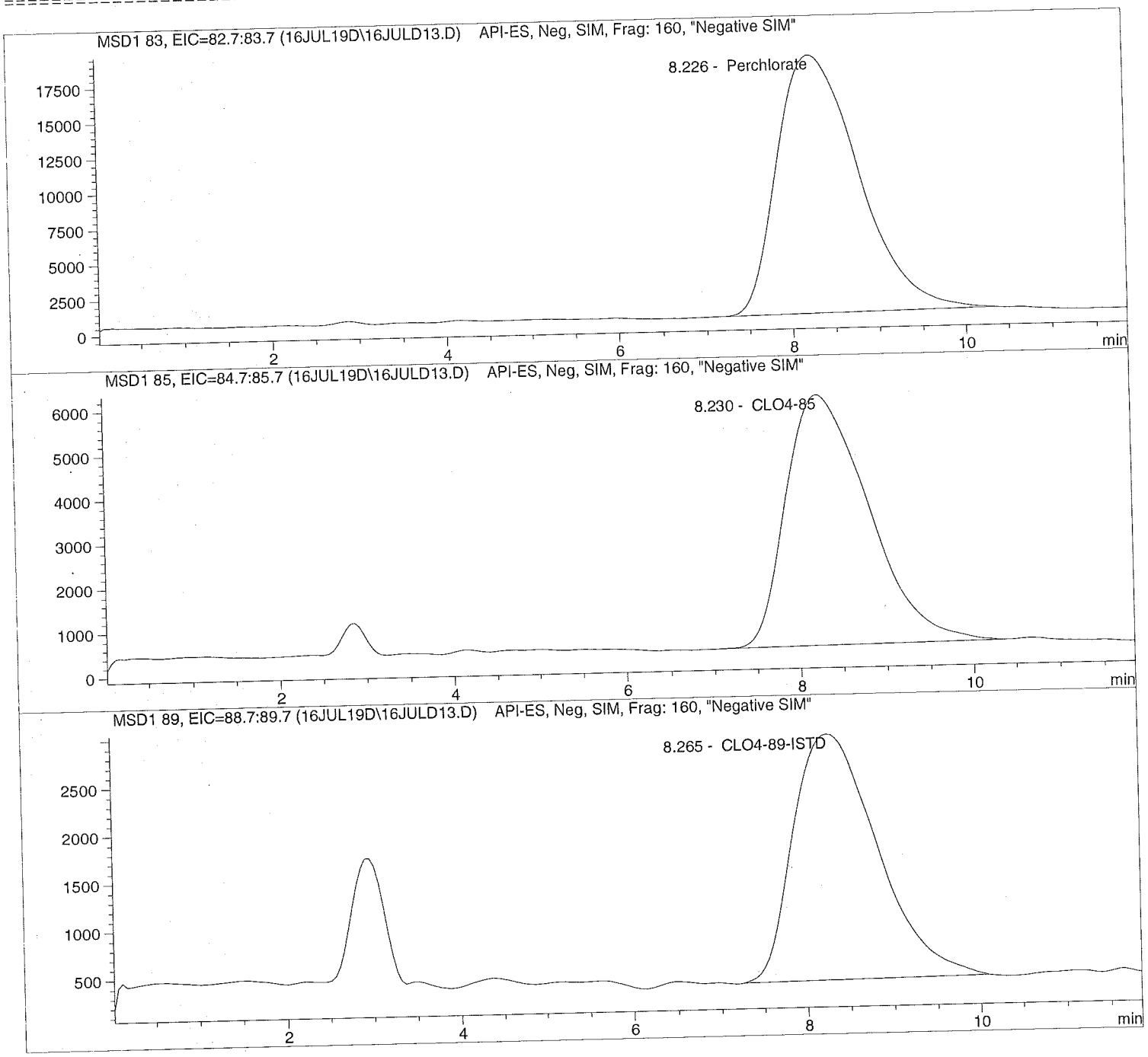
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD13.D Sample Name: 1919059009 10X

Injection Date:	7/16/2019 11:08:34	Seq Line:	13
Sample Name:	1919059009 10X	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD13.D Sample Name: 1919059009 10X

Injection Date:	7/16/2019 11:08:34	Seq Line:	13
Sample Name:	1919059009 10X	Location:	Vial 83
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.226	PBA	1195874.4	212.9465	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.230	PBA	374895.9	224.0859	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.265	PBA	172412.1	50.0000	CLO4-89-ISTD

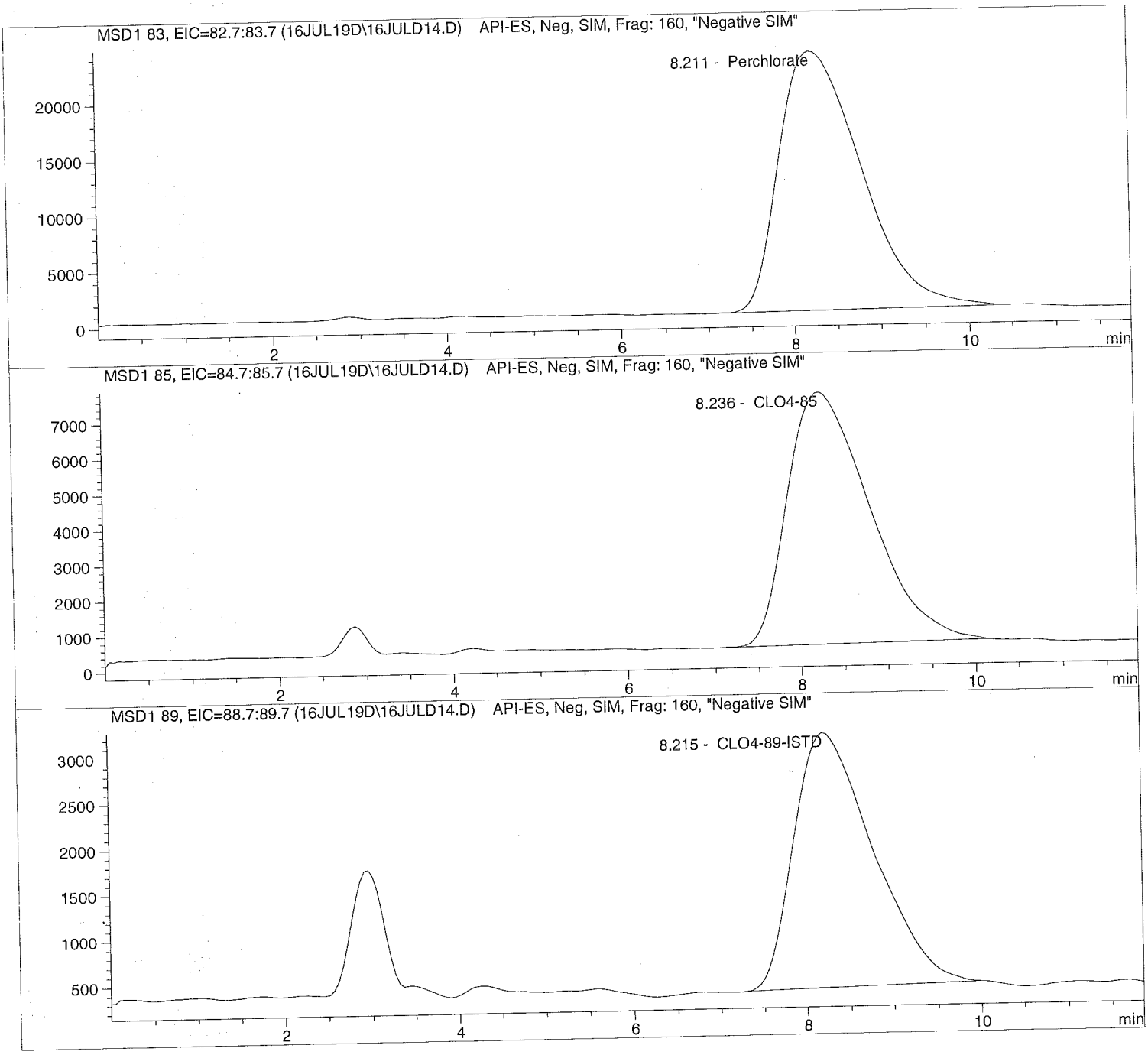
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD14.D Sample Name: 1919059010 MS

Injection Date:	7/16/2019 11:22:19	Seq Line:	14
Sample Name:	1919059010 MS	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD14.D Sample Name: 1919059010 MS

Injection Date:	7/16/2019 11:22:19	Seq Line:	14
Sample Name:	1919059010 MS	Location:	Vial 84
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.211	PBA	1529155.6	263.4869	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.236	PBA	466376.2	270.4389	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.215	PBA	176001.4	50.0000	CLO4-89-ISTD

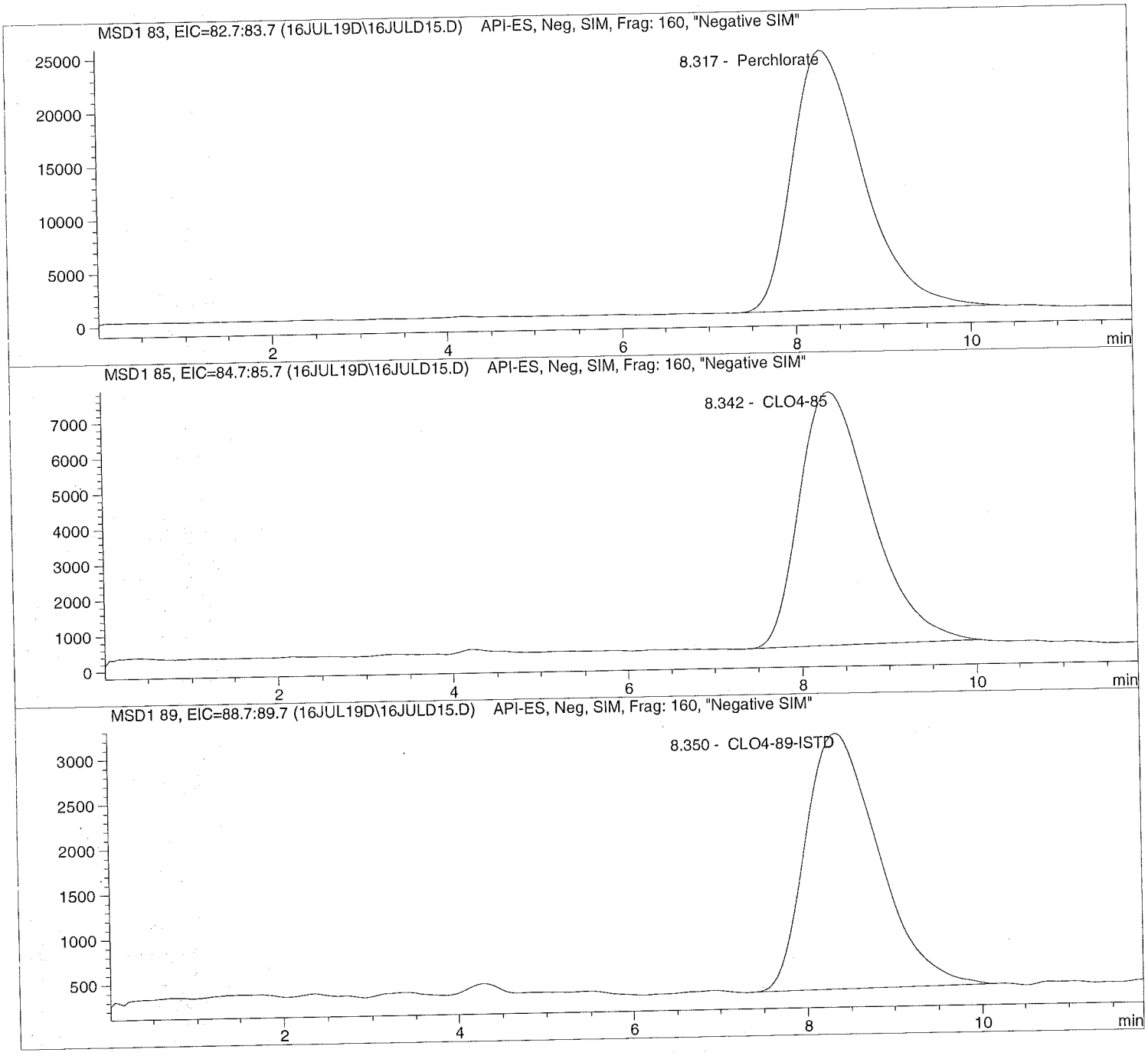
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD15.D Sample Name: 663783 CCV@25

Injection Date:	7/16/2019 11:36:20	Seq Line:	15
Sample Name:	663783 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD15.D Sample Name: 663783 CCV@25

Injection Date:	7/16/2019 11:36:20	Seq Line:	15
Sample Name:	663783 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.317	PBA	1370961.6	25.3498	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.342	PBA	408784.3	25.4611	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.350	PBA	164400.6	5.0000	CLO4-89-ISTD

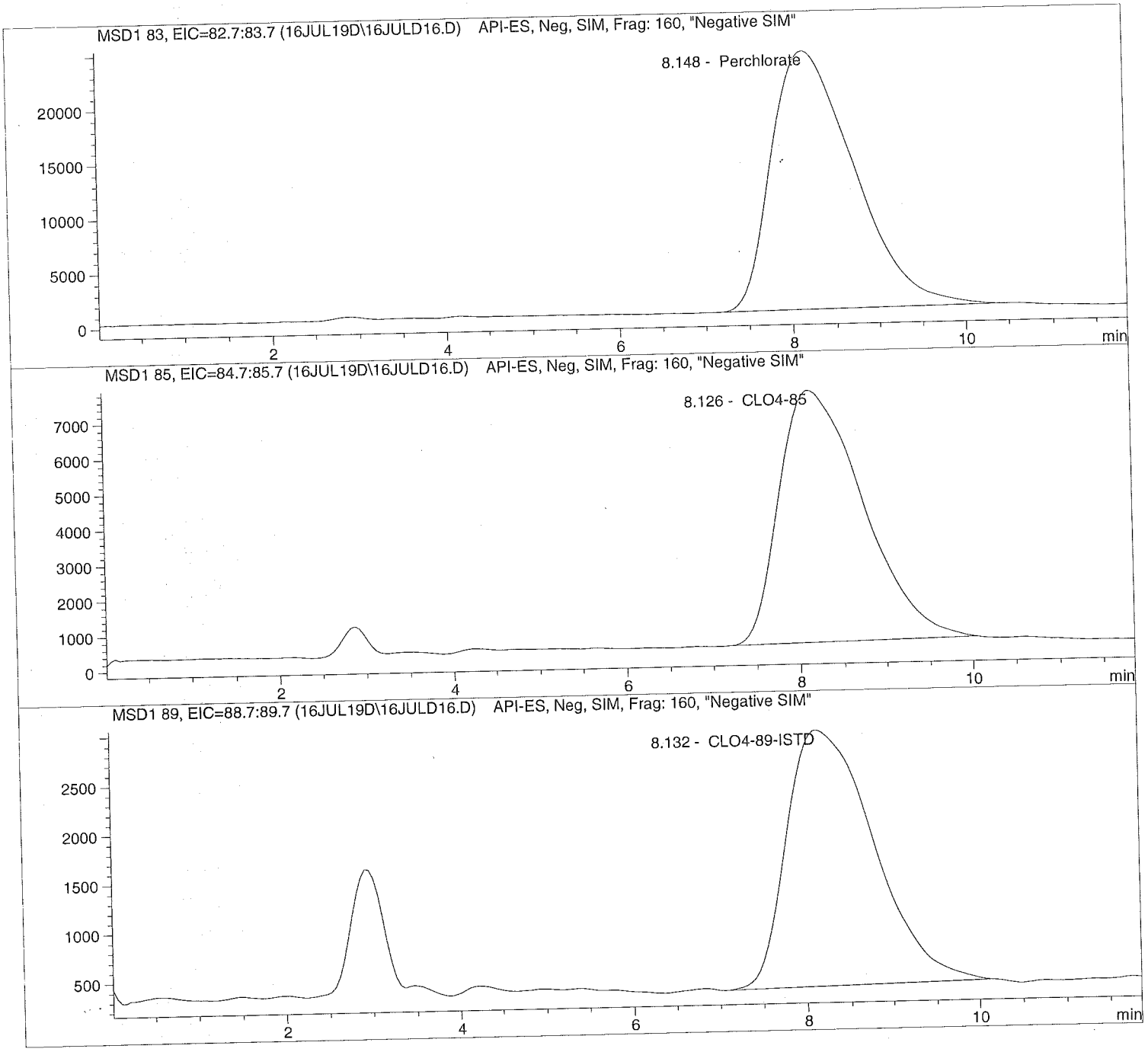
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD16.D Sample Name: 1919059011 MSD

Injection Date:	7/16/2019 11:50:08	Seq Line:	16
Sample Name:	1919059011 MSD	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD16.D Sample Name: 1919059011 MSD

Injection Date:	7/16/2019 11:50:08	Seq Line:	16
Sample Name:	1919059011 MSD	Location:	Vial 85
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.148	PBA	1560920.6	262.1994	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.126	PBA	475169.1	268.6311	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.132	PBA	180594.6	50.0000	CLO4-89-ISTD

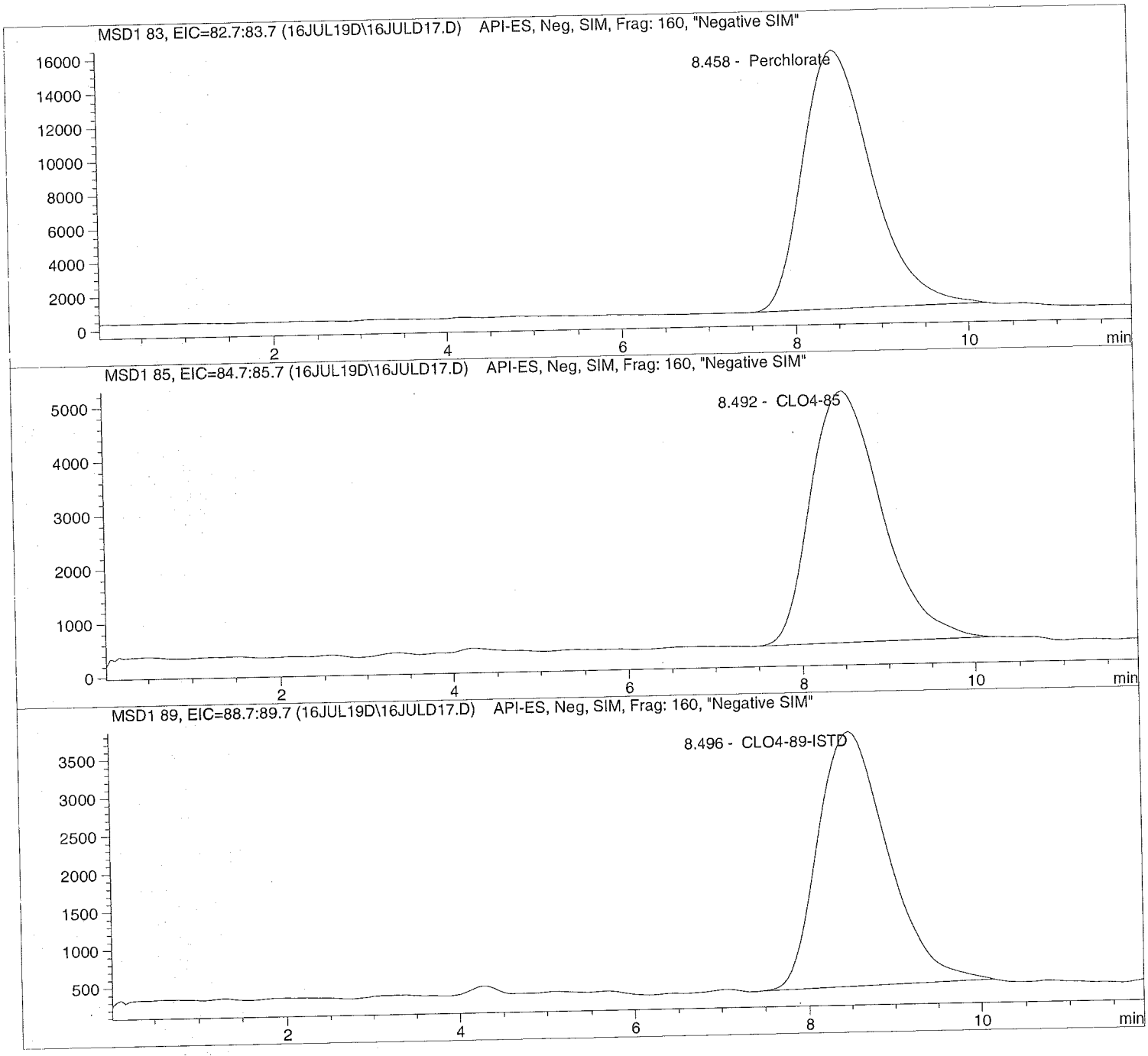
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD17.D Sample Name: 1919059012 10K

Injection Date:	7/16/2019 12:03:57	Seq Line:	17
Sample Name:	1919059012 10K	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD17.D Sample Name: 1919059012 10K

Injection Date:	7/16/2019 12:03:57	Seq Line:	17
Sample Name:	1919059012 10K	Location:	Vial 86
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.458	PBA	847550.9	140973.6899	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.492	PBA	267187.0	148659.9990	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.496	PBA	188204.5	50000.0000	CLO4-89-ISTD

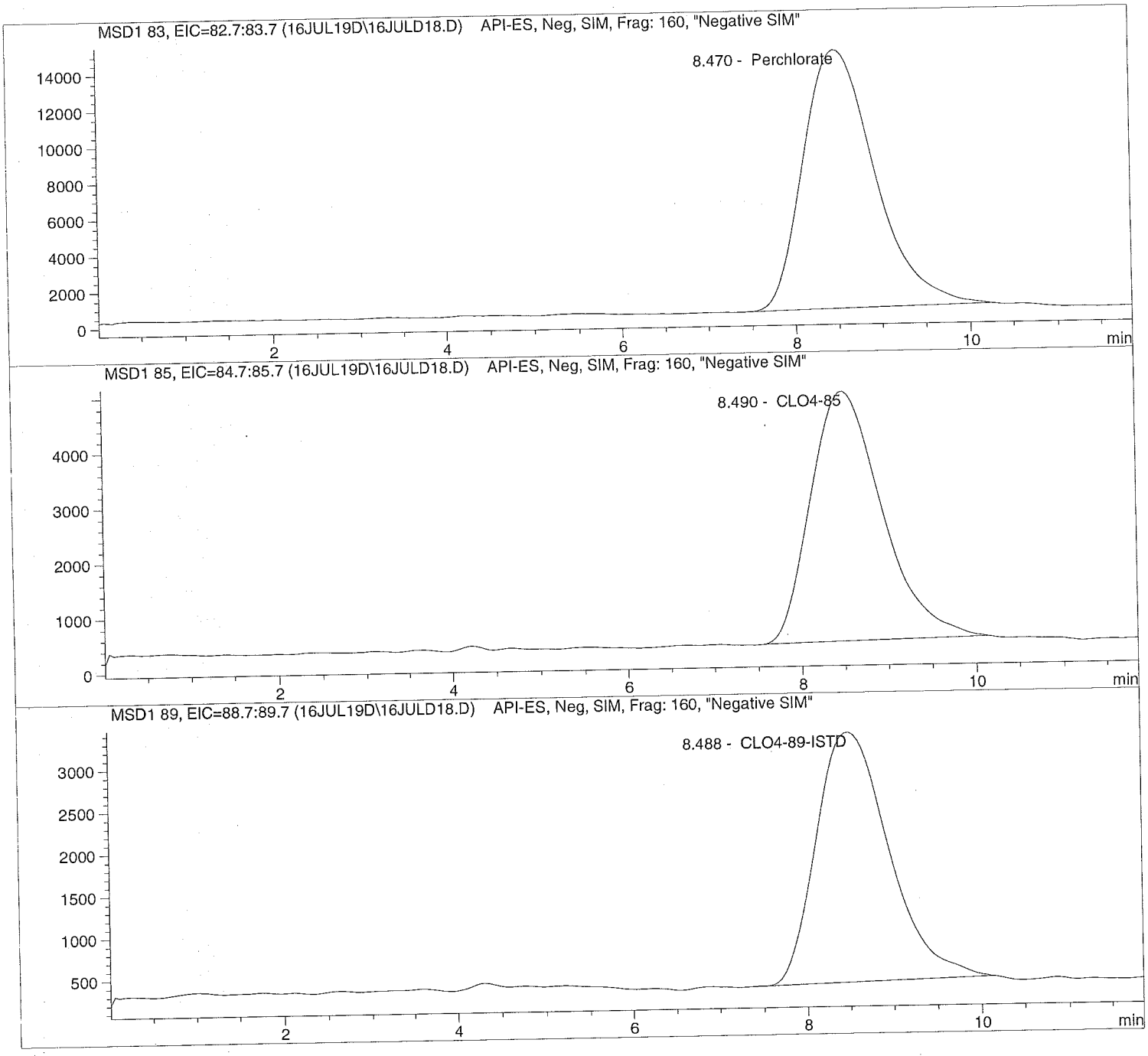
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD18.D Sample Name: 1919059013 10K

Injection Date:	7/16/2019 12:17:44	Seq Line:	18
Sample Name:	1919059013 10K	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD18.D Sample Name: 1919059013 10K

Injection Date:	7/16/2019 12:17:44	Seq Line:	18
Sample Name:	1919059013 10K	Location:	Vial 87
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	10000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.470	PBA	820714.3	148334.8753	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.490	PBA	259317.7	156847.3228	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.488	PBA	172825.5	50000.0000	CLO4-89-ISTD

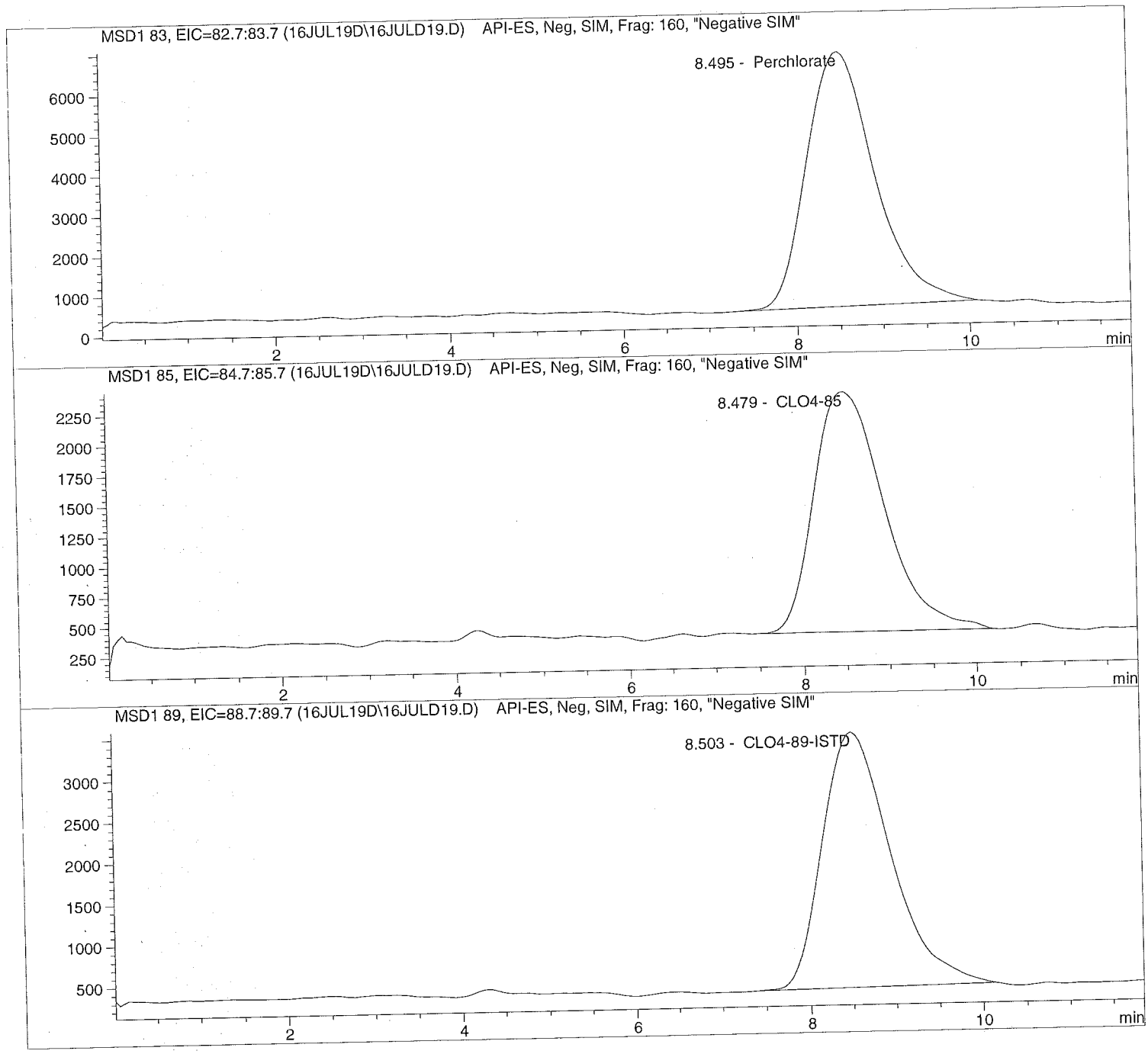
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD19.D Sample Name: 1919059014 1K

Injection Date:	7/16/2019 12:31:32	Seq Line:	19
Sample Name:	1919059014 1K	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD19.D Sample Name: 1919059014 1K

Injection Date:	7/16/2019 12:31:32	Seq Line:	19
Sample Name:	1919059014 1K	Location:	Vial 88
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method:	CLO4-AQN.M
Analysis Method:	C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed:	4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.495	PBA	345785.8	6505.8697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.479	PBA	112574.5	6991.1087	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.503	PBA	171453.3	5000.0000	CLO4-89-ISTD

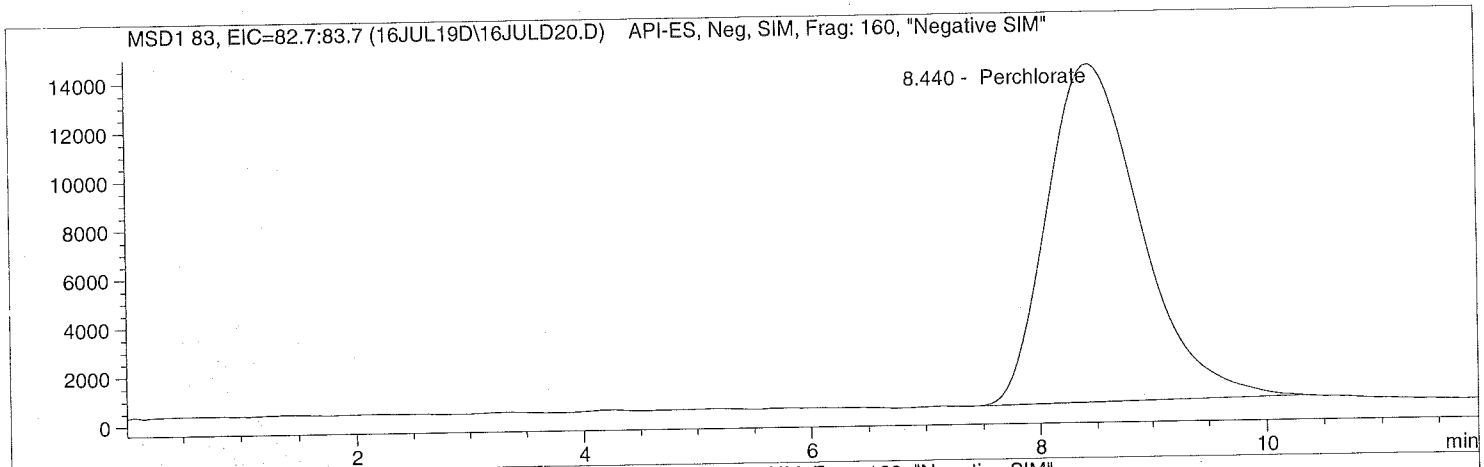
*** End of Report ***

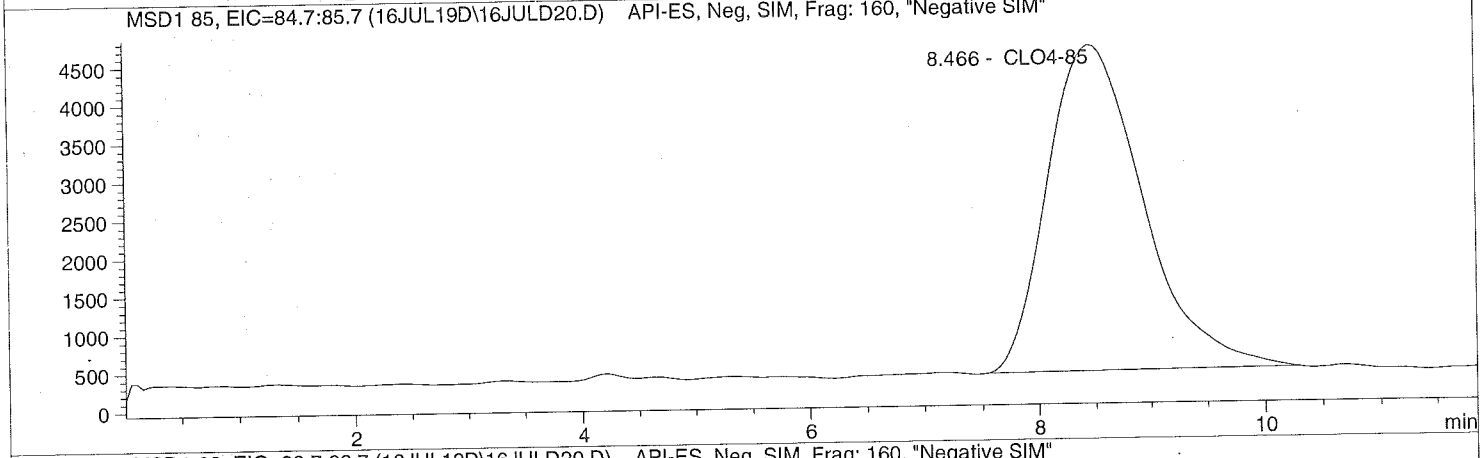
Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD20.D Sample Name: 1919059015 1K

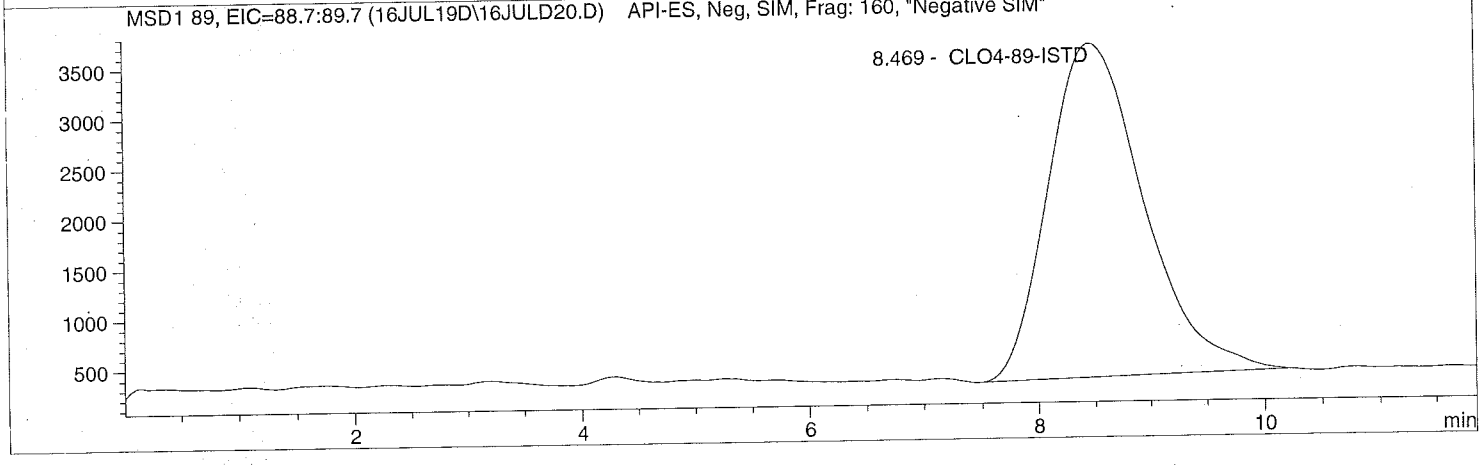
Injection Date:	7/16/2019 12:45:24	Seq Line:	20
Sample Name:	1919059015 1K	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD20.D Sample Name: 1919059015 1K

Injection Date:	7/16/2019 12:45:24	Seq Line:	20
Sample Name:	1919059015 1K	Location:	Vial 89
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.440	PBA	796263.4	12759.4967	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.466	PBA	250606.5	13419.0988	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.469	PBA	196161.9	5000.0000	CLO4-89-ISTD

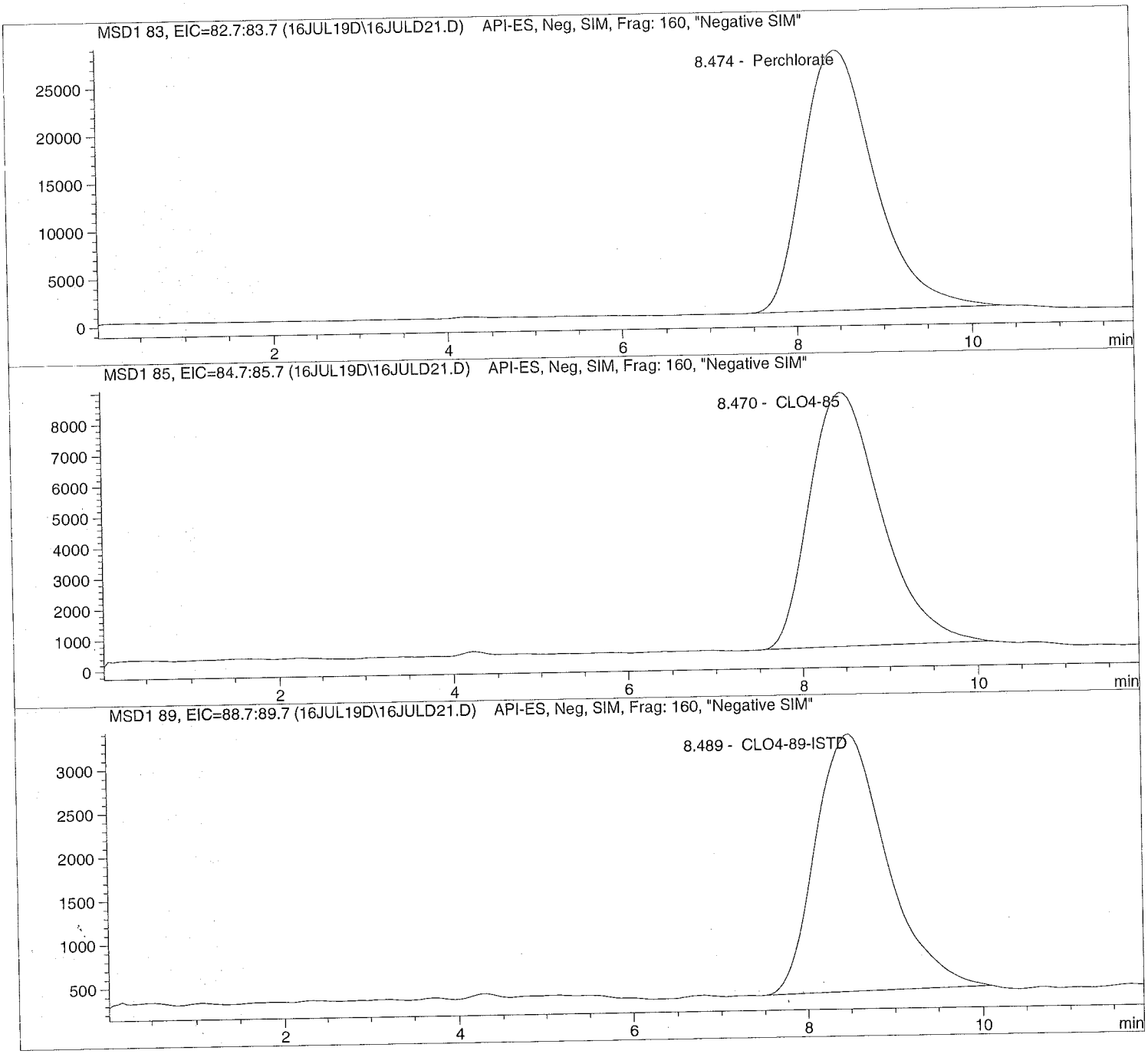
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD21.D Sample Name: 1919059016 1K

Injection Date:	7/16/2019 12:59:16	Seq Line:	21
Sample Name:	1919059016 1K	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD21.D Sample Name: 1919059016 1K

Injection Date:	7/16/2019 12:59:16	Seq Line:	21
Sample Name:	1919059016 1K	Location:	Vial 90
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.474	PBA	1559532.1	28235.2054	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.470	PBA	471875.9	28774.1139	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.489	PBA	166766.0	5000.0000	CLO4-89-ISTD

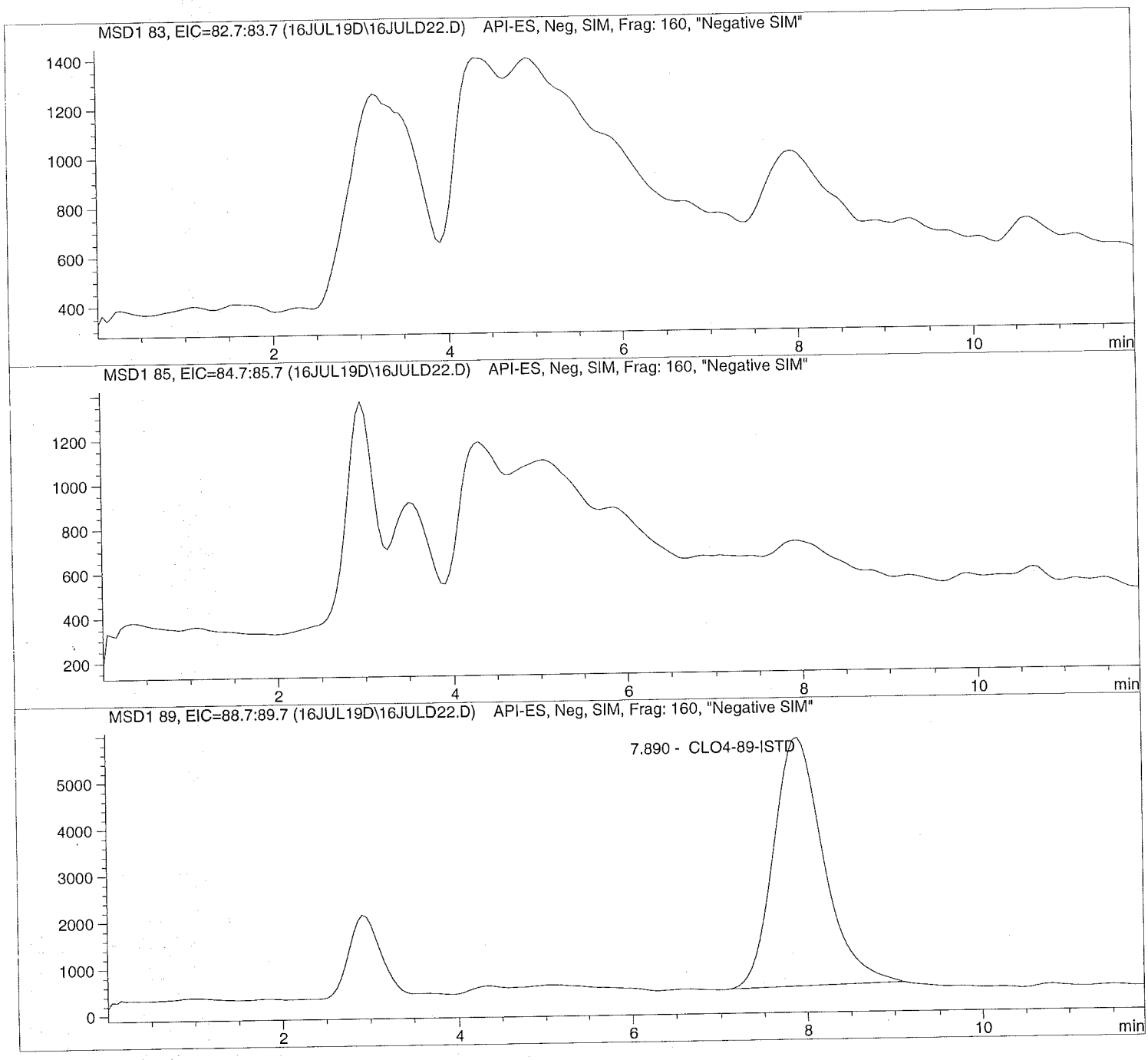
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD22.D Sample Name: 1919059017

Injection Date:	7/16/2019 13:13:06	Seq Line:	22
Sample Name:	1919059017	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD22.D Sample Name: 1919059017

Injection Date:	7/16/2019 13:13:06	Seq Line:	22
Sample Name:	1919059017	Location:	Vial 91
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.890	PBA	213153.9	5.0000	CLO4-89-ISTD

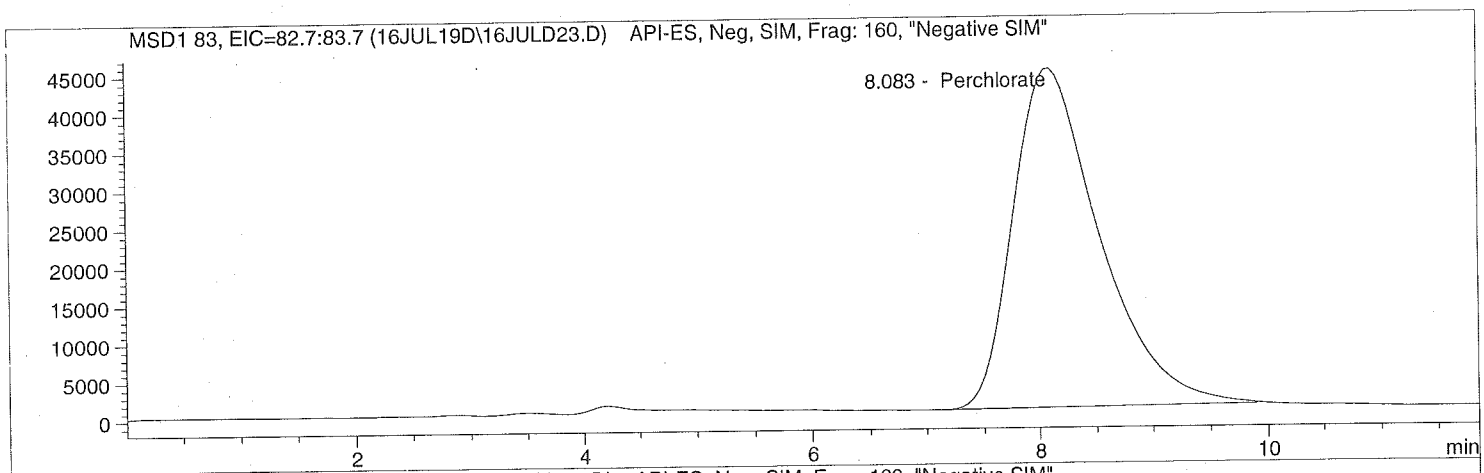
*** End of Report ***

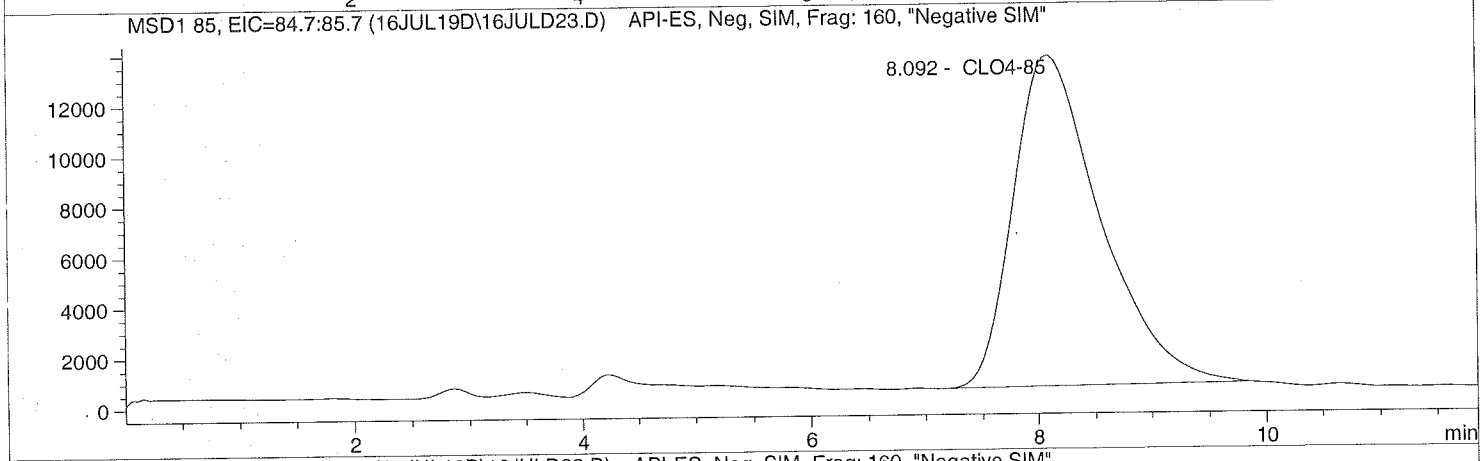
Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD23.D Sample Name: 1919059018

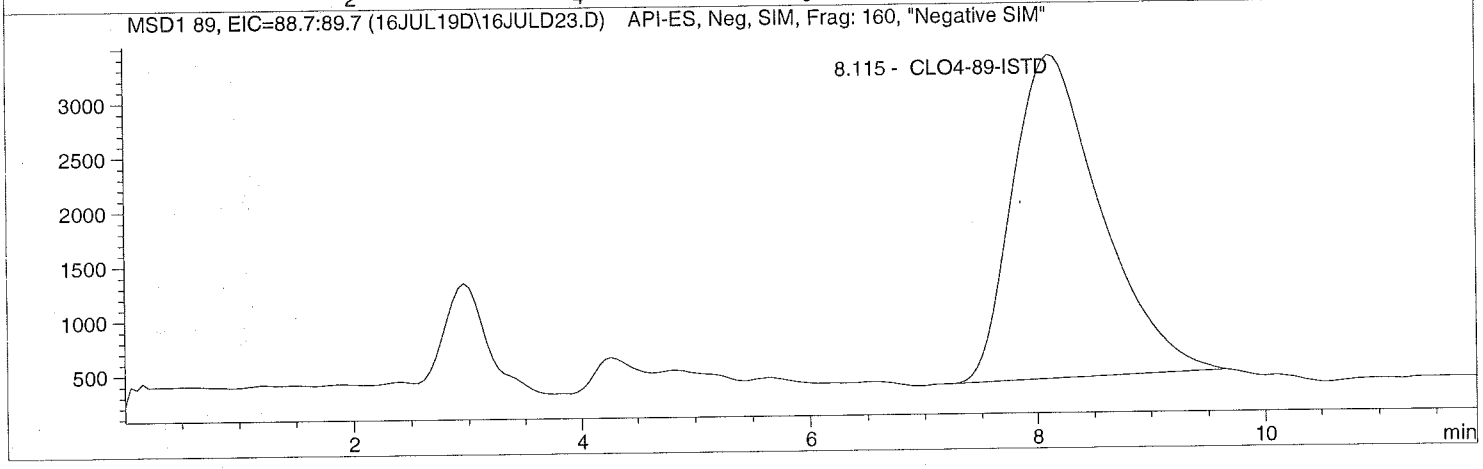
Injection Date:	7/16/2019 13:26:54	Seq Line:	23
Sample Name:	1919059018	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD23.D Sample Name: 1919059018

Injection Date:	7/16/2019 13:26:54	Seq Line:	23
Sample Name:	1919059018	Location:	Vial 92
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.083	PBA	2342159.7	42.6449	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.092	PBA	698212.2	42.9437	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.115	PBA	160594.2	5.0000	CLO4-89-ISTD

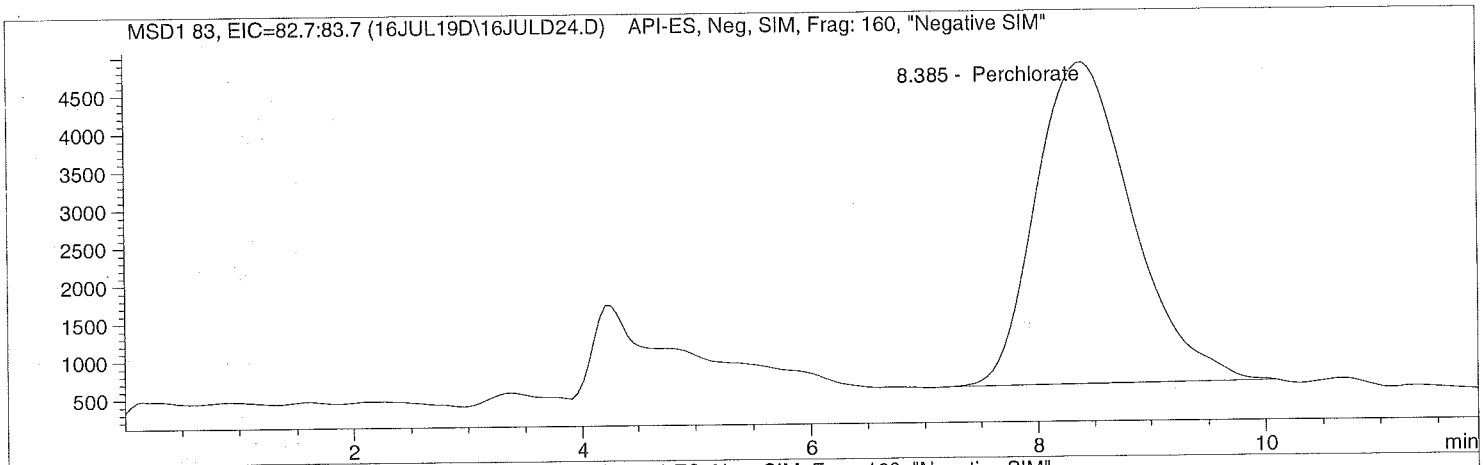
*** End of Report ***

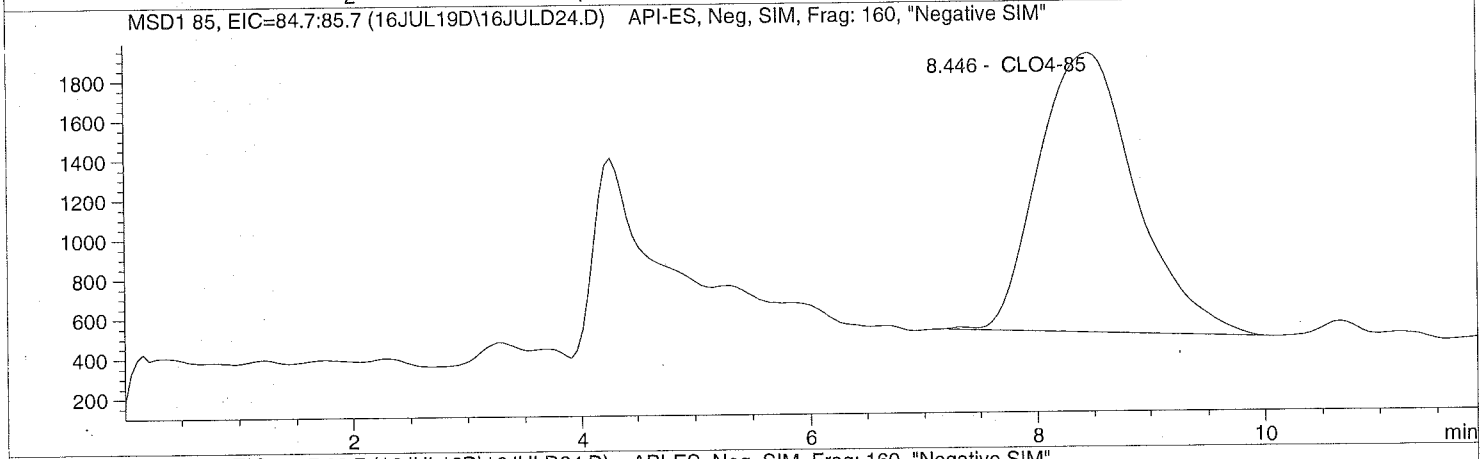
Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD24.D Sample Name: 1919059019

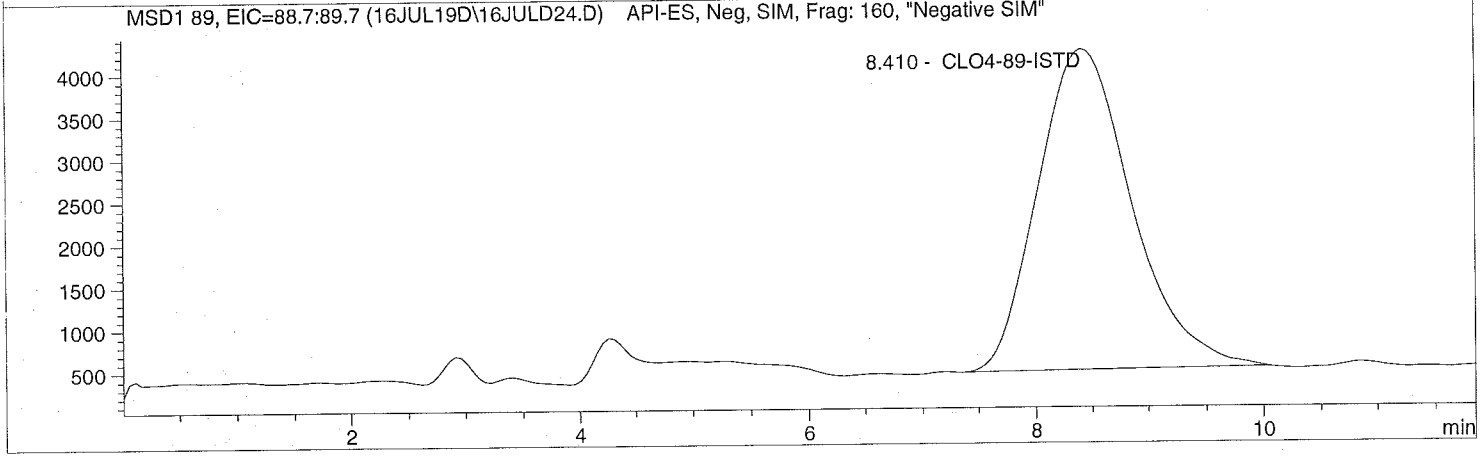
Injection Date:	7/16/2019 13:40:39	Seq Line:	24
Sample Name:	1919059019	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD24.D Sample Name: 1919059019

Injection Date:	7/16/2019 13:40:39	Seq Line:	24
Sample Name:	1919059019	Location:	Vial 93
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.385	PBA	249821.7	3.8217	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.446	PBA	83673.8	4.1503	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.410	BBA	215895.7	5.0000	CLO4-89-ISTD

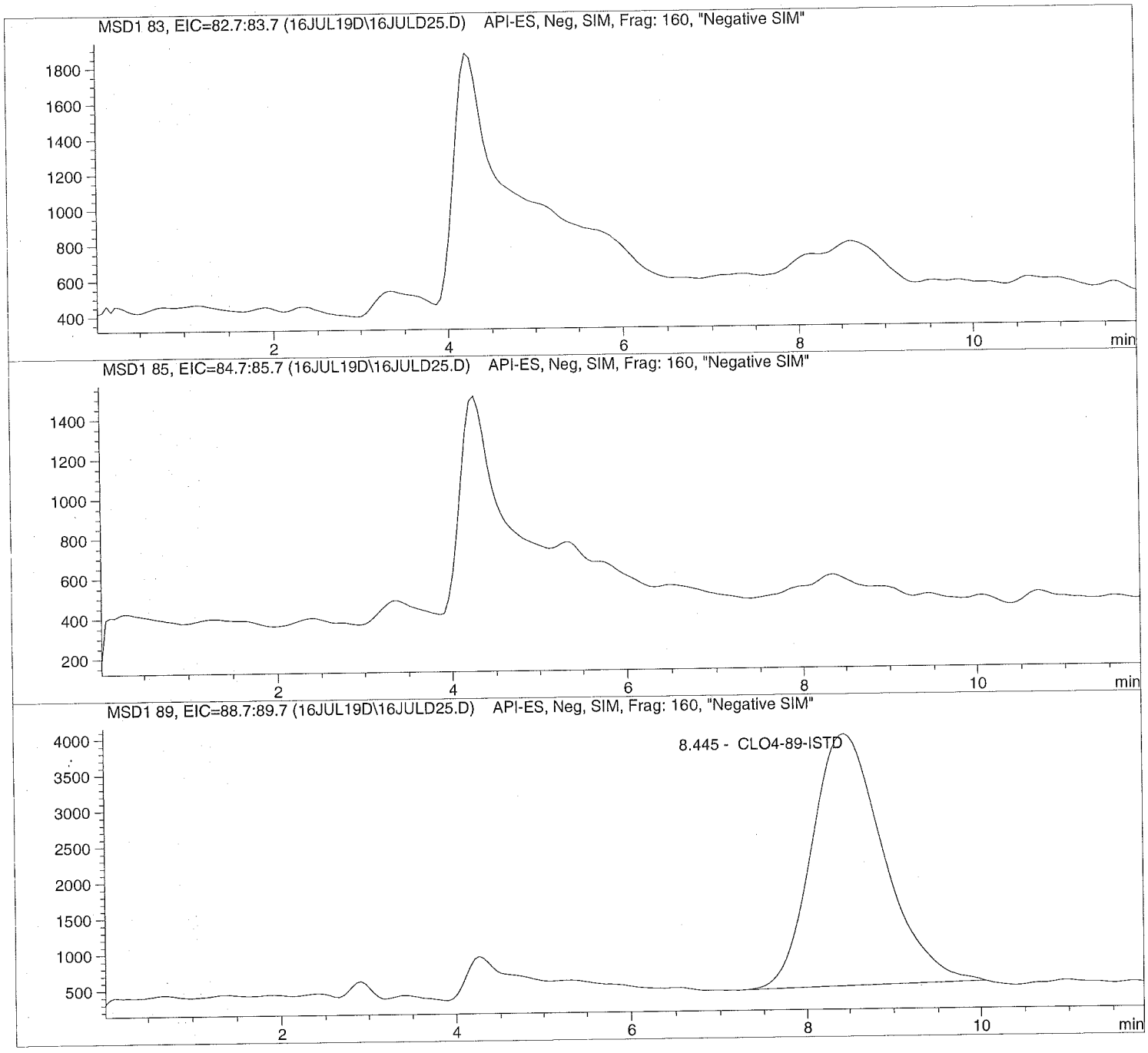
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD25.D Sample Name: 1919059020

Injection Date:	7/16/2019 13:54:29	Seq Line:	25
Sample Name:	1919059020	Location:	Vial 94
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD25.D Sample Name: 1919059020

Injection Date:	7/16/2019 13:54:29	Seq Line:	25
Sample Name:	1919059020	Location:	Vial 94
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.445	PBA	201956.3	5.0000	CLO4-89-ISTD

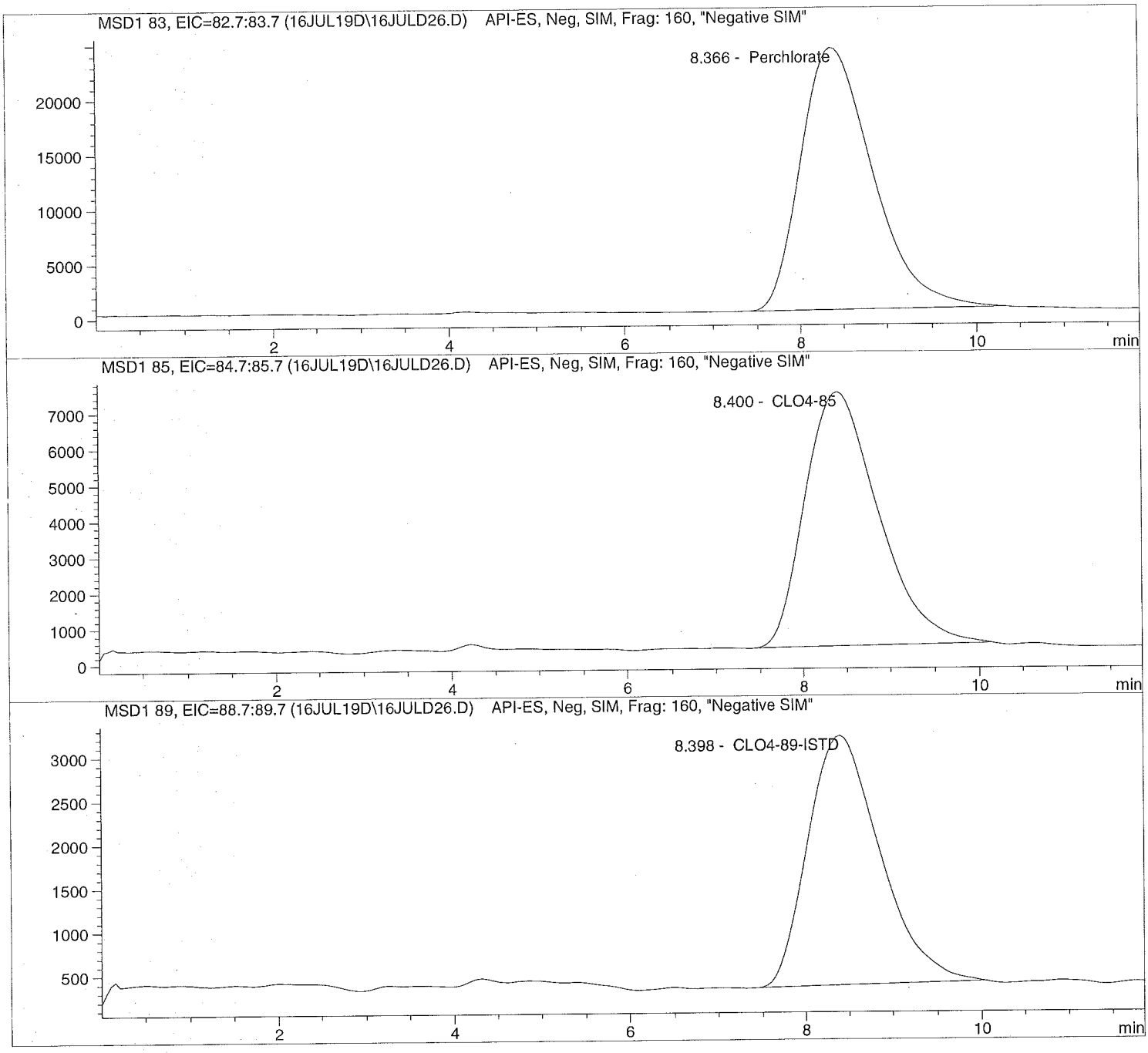
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD26.D Sample Name: 663784 CCV@25

Injection Date:	7/16/2019 14:08:18	Seq Line:	26
Sample Name:	663784 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD26.D Sample Name: 663784 CCV@25

Injection Date:	7/16/2019 14:08:18	Seq Line:	26
Sample Name:	663784 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.366	PBA	1371360.8	25.4241	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.400	PBA	411774.7	25.7063	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.398	PBA	163939.3	5.0000	CLO4-89-ISTD

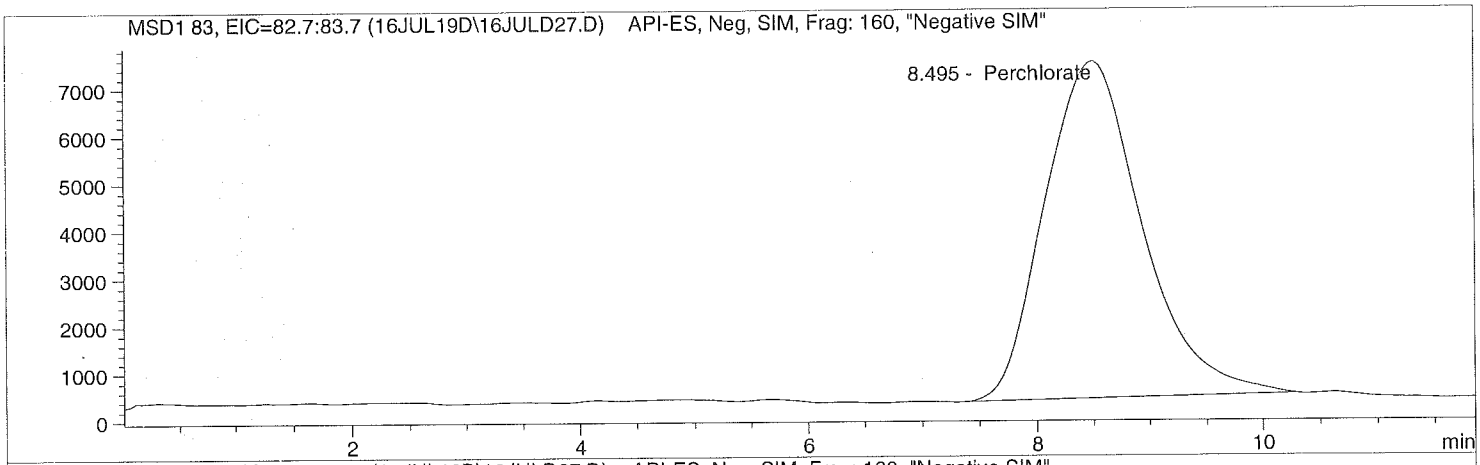
*** End of Report ***

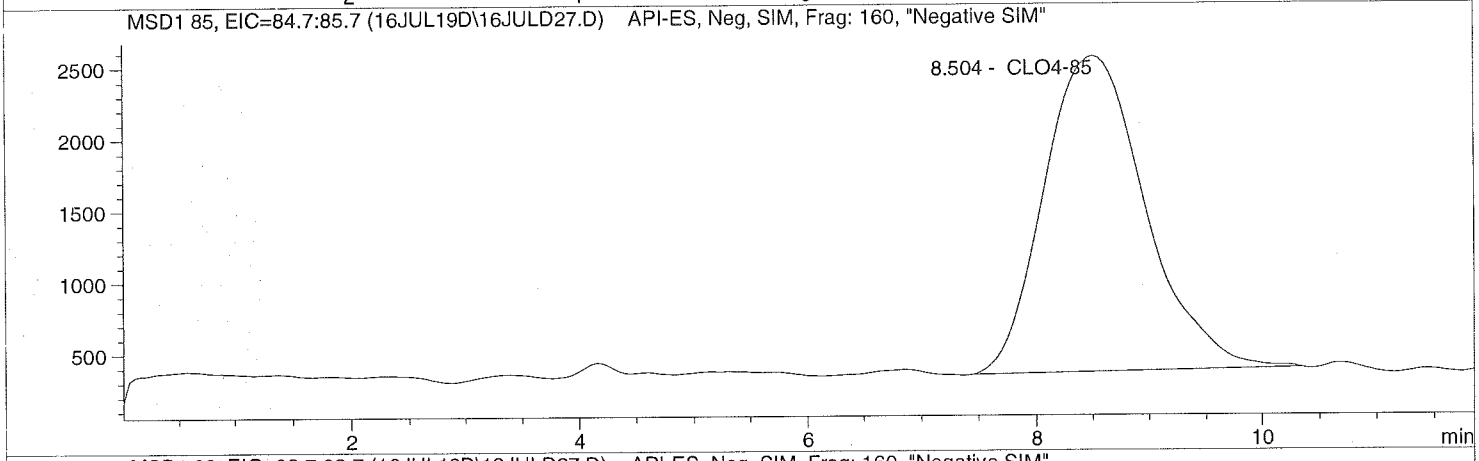
Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD27.D Sample Name: 1919059002 1K

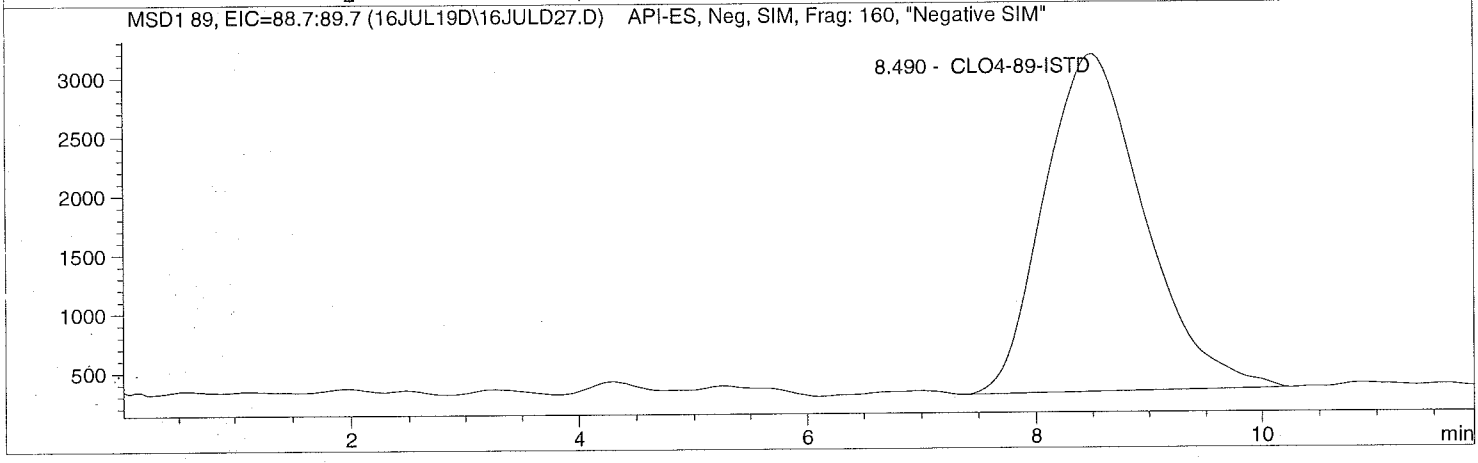
Injection Date:	7/16/2019 14:22:05	Seq Line:	27
Sample Name:	1919059002 1K	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD27.D Sample Name: 1919059002 1K

Injection Date:	7/16/2019 14:22:05	Seq Line:	27
Sample Name:	1919059002 1K	Location:	Vial 95
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1000.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.495	PBA	422100.4	7708.1563	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.504	PBA	136614.9	8266.4487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.490	PBA	175498.0	5000.0000	CLO4-89-ISTD

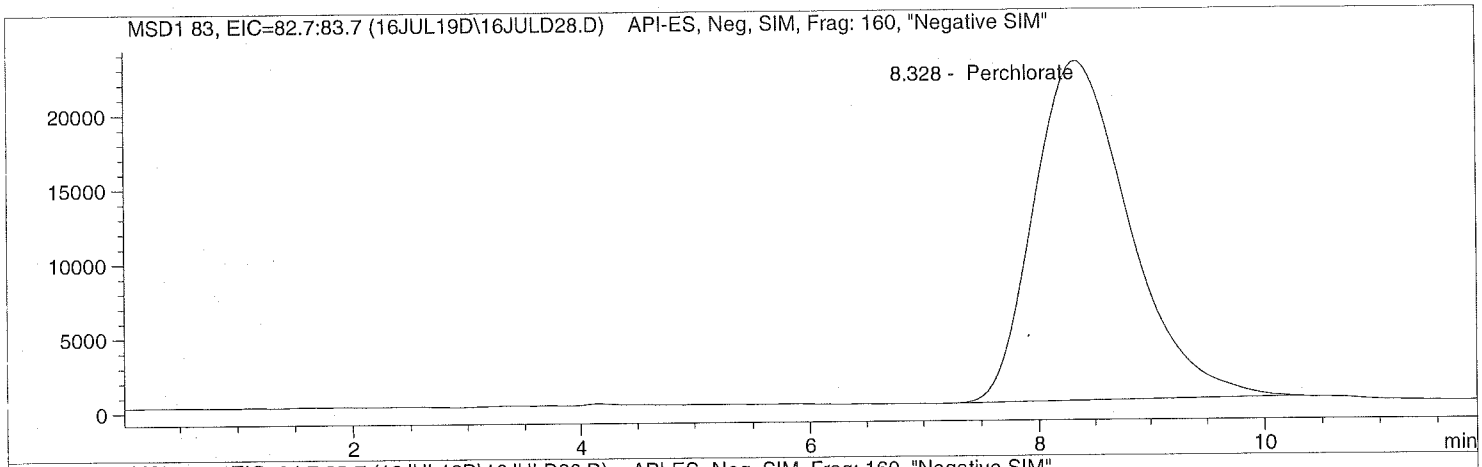
*** End of Report ***

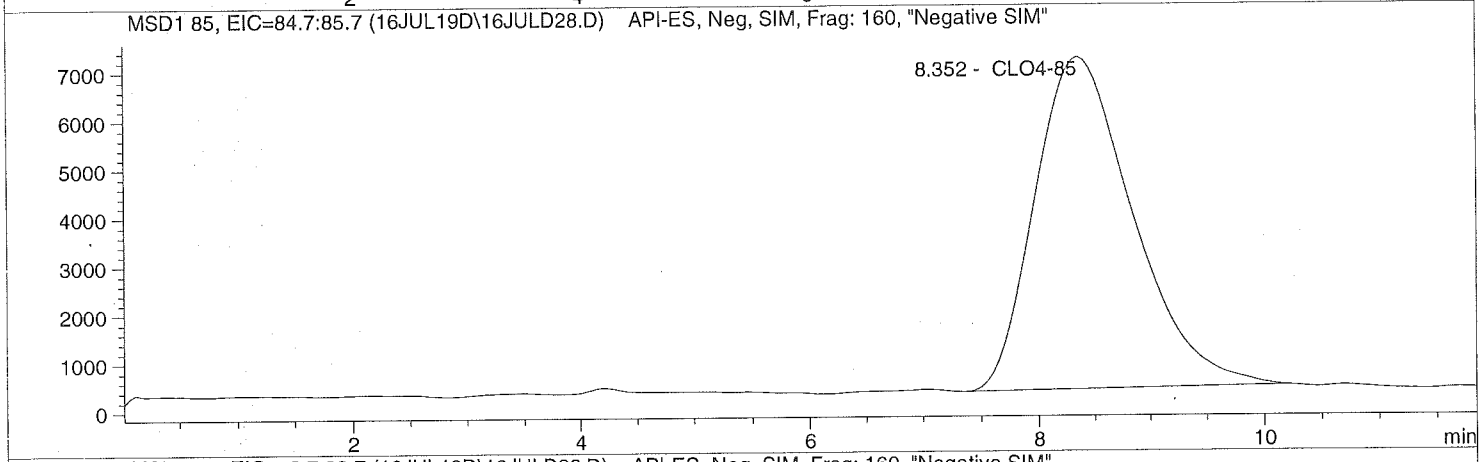
Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD28.D Sample Name: 663785 CCV@25

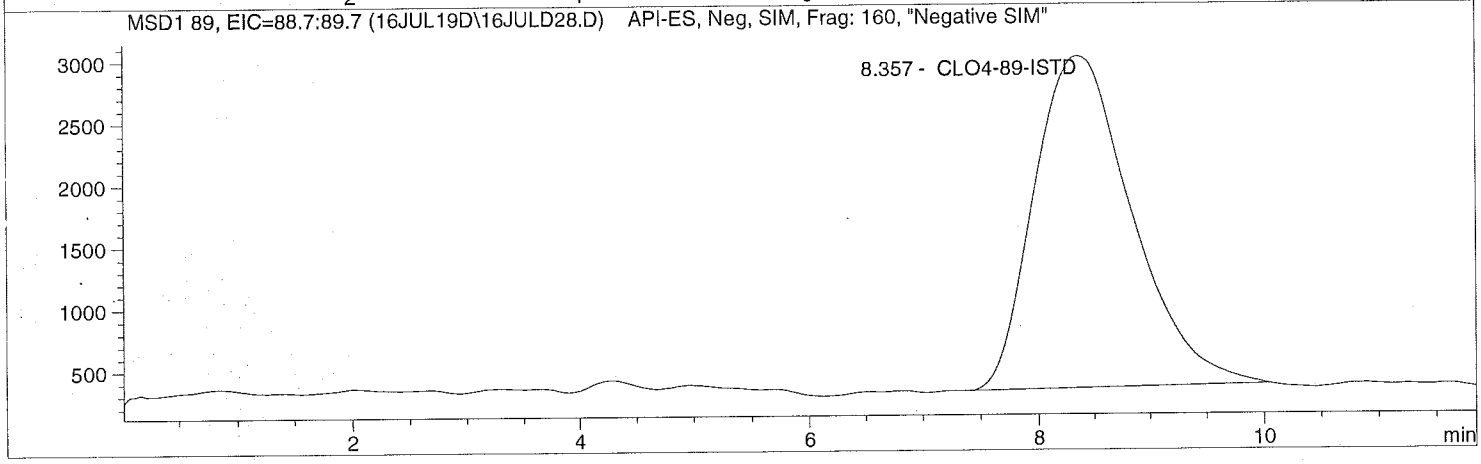
Injection Date:	7/16/2019 14:36:33	Seq Line:	28
Sample Name:	663785 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD28.D Sample Name: 663785 CCV@25

Injection Date:	7/16/2019 14:36:33	Seq Line:	28
Sample Name:	663785 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.328	PBA	1344125.5	25.2365	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.352	PBA	414368.9	26.1612	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.357	PBA	161949.8	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5		1	Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5		1	CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

Method C:\HPCHEM\1\METHODS\CLO4-DP2.M

RetTime [min]	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
	7	5.00000	2.21504e5	2.25729e-5			

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

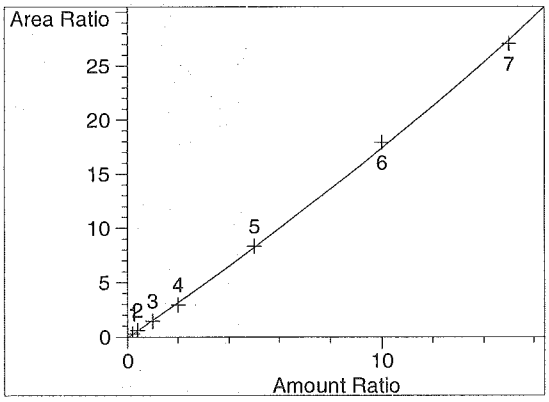
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

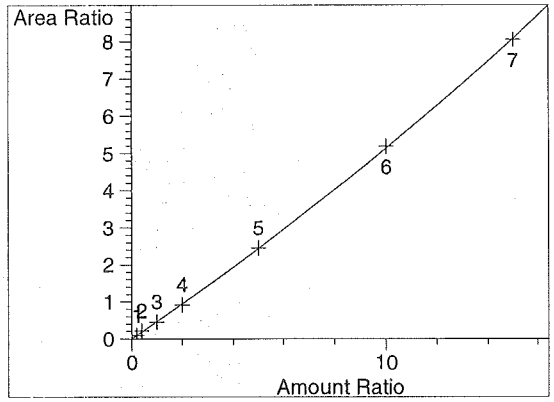
Peak Sum Table

No Entries in table

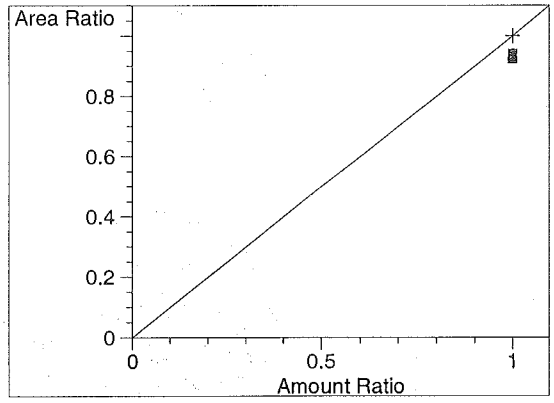
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Report: C:\HPCHEM\1\DATA\19MAR19I\19MAR19D.B

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

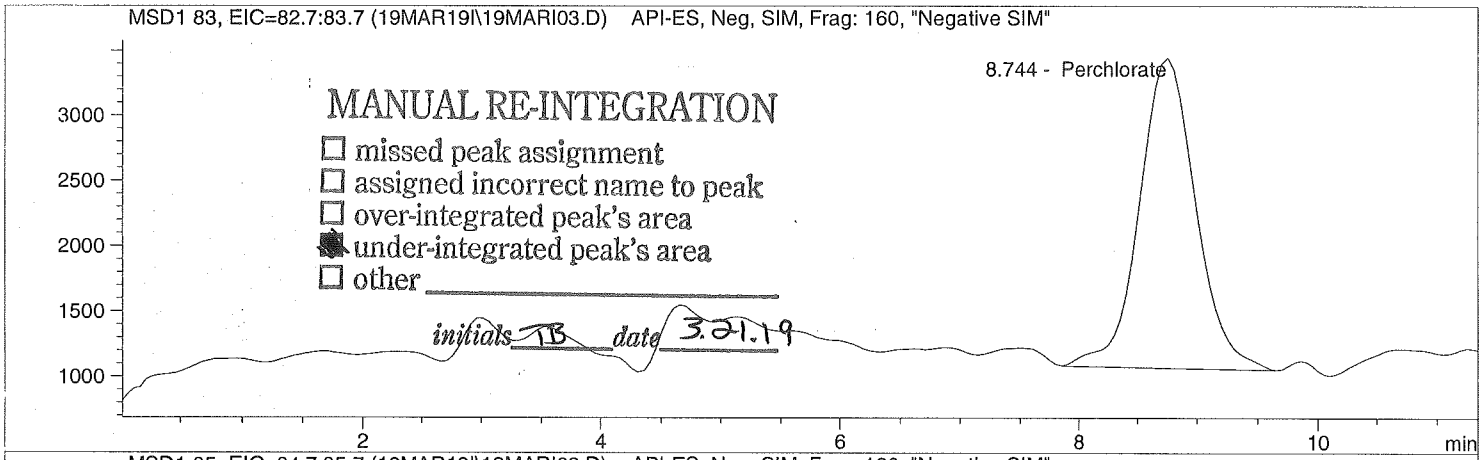
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

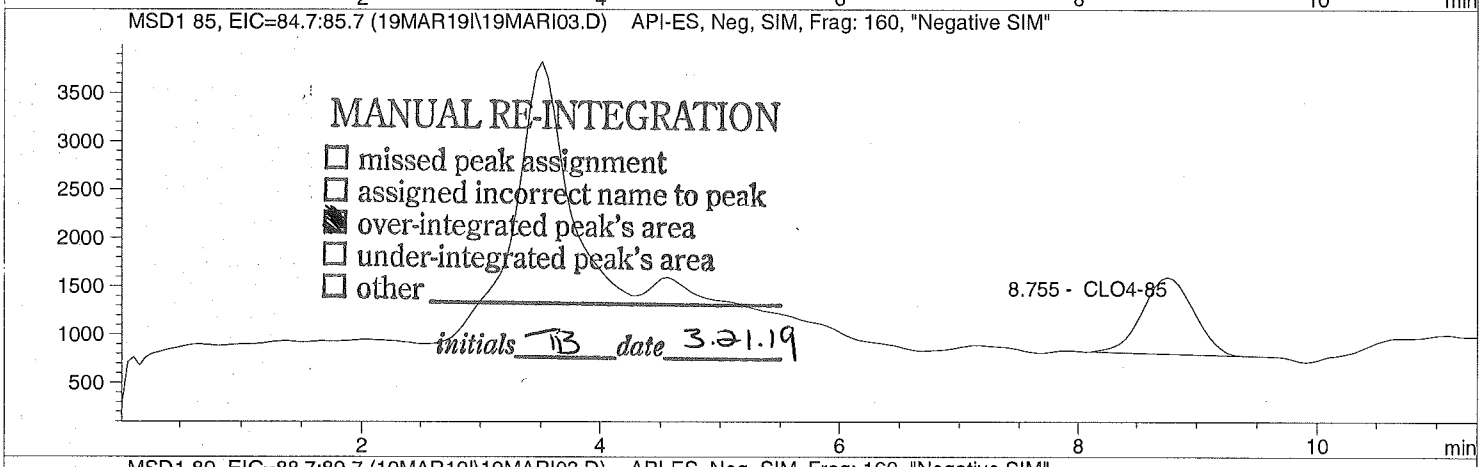
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

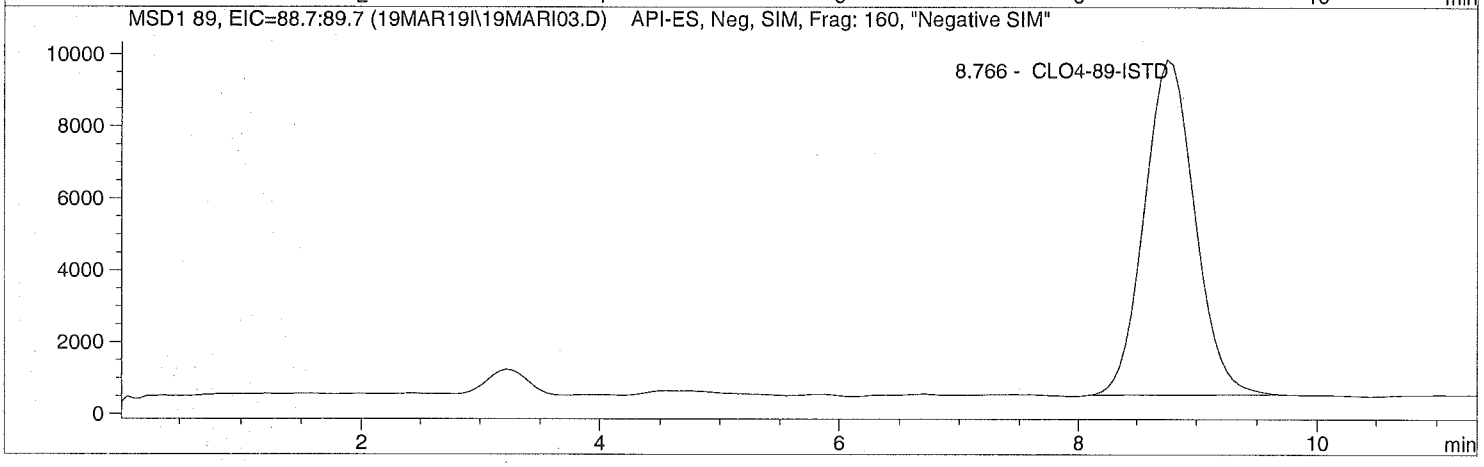
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

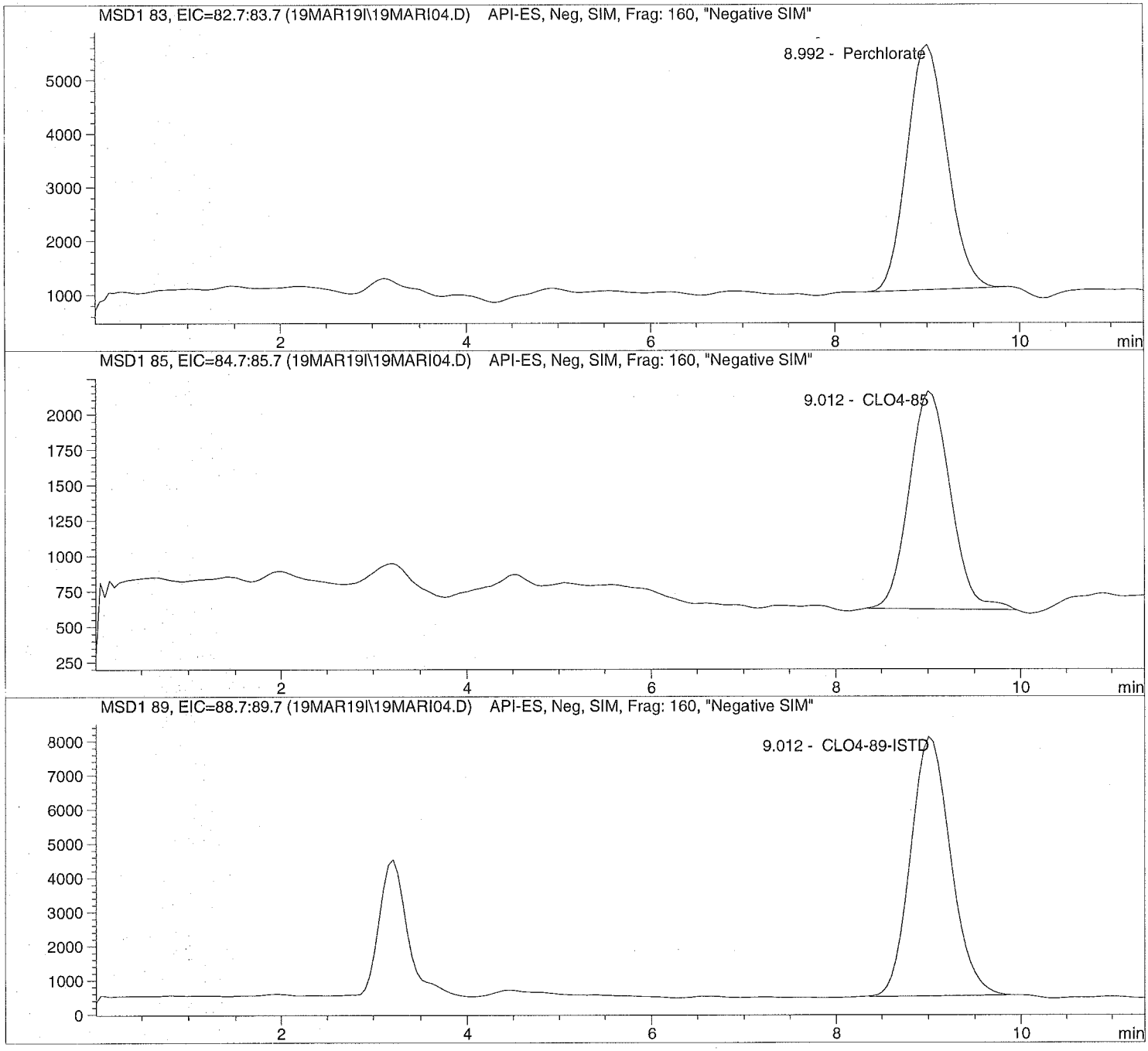
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

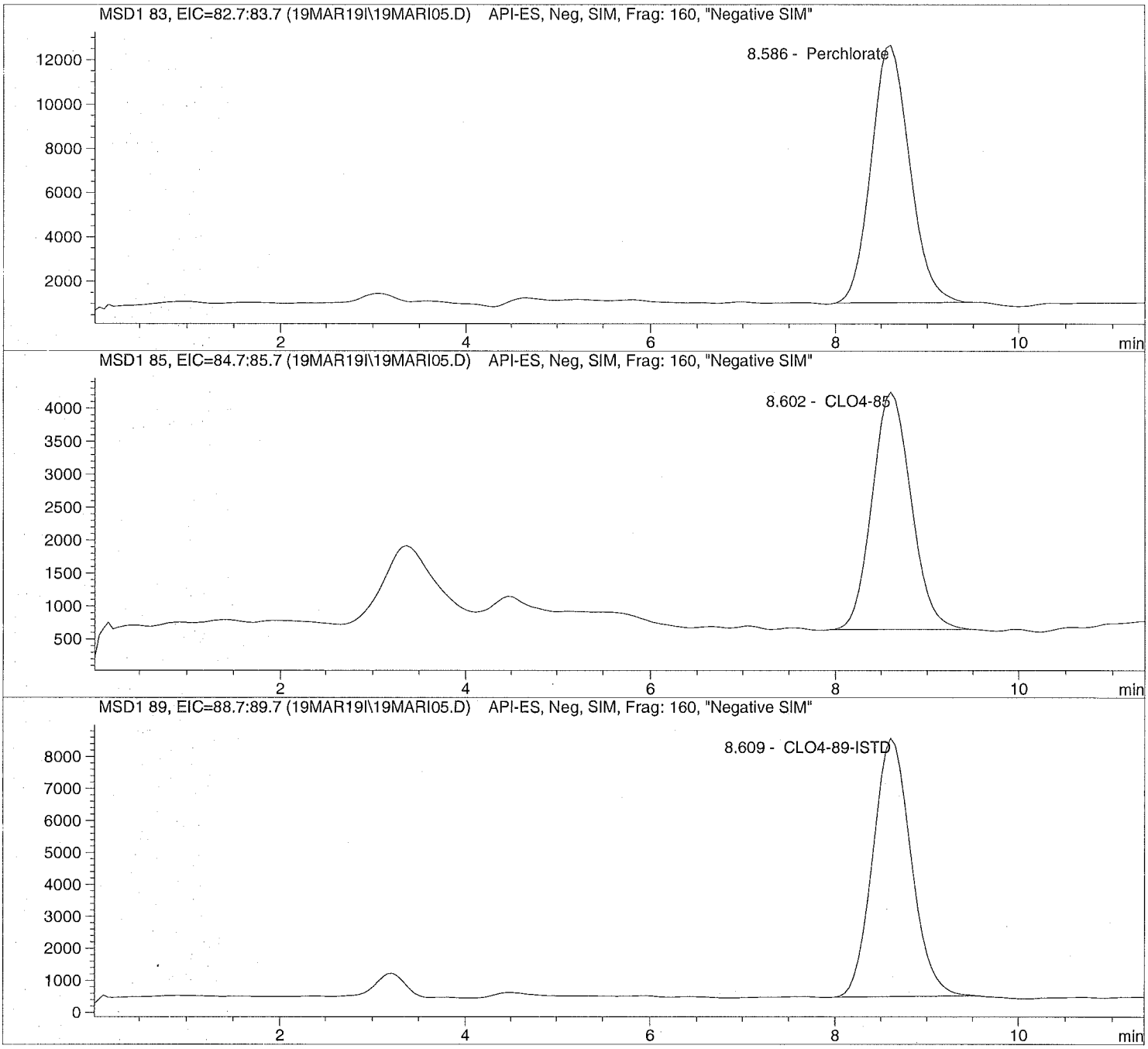
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

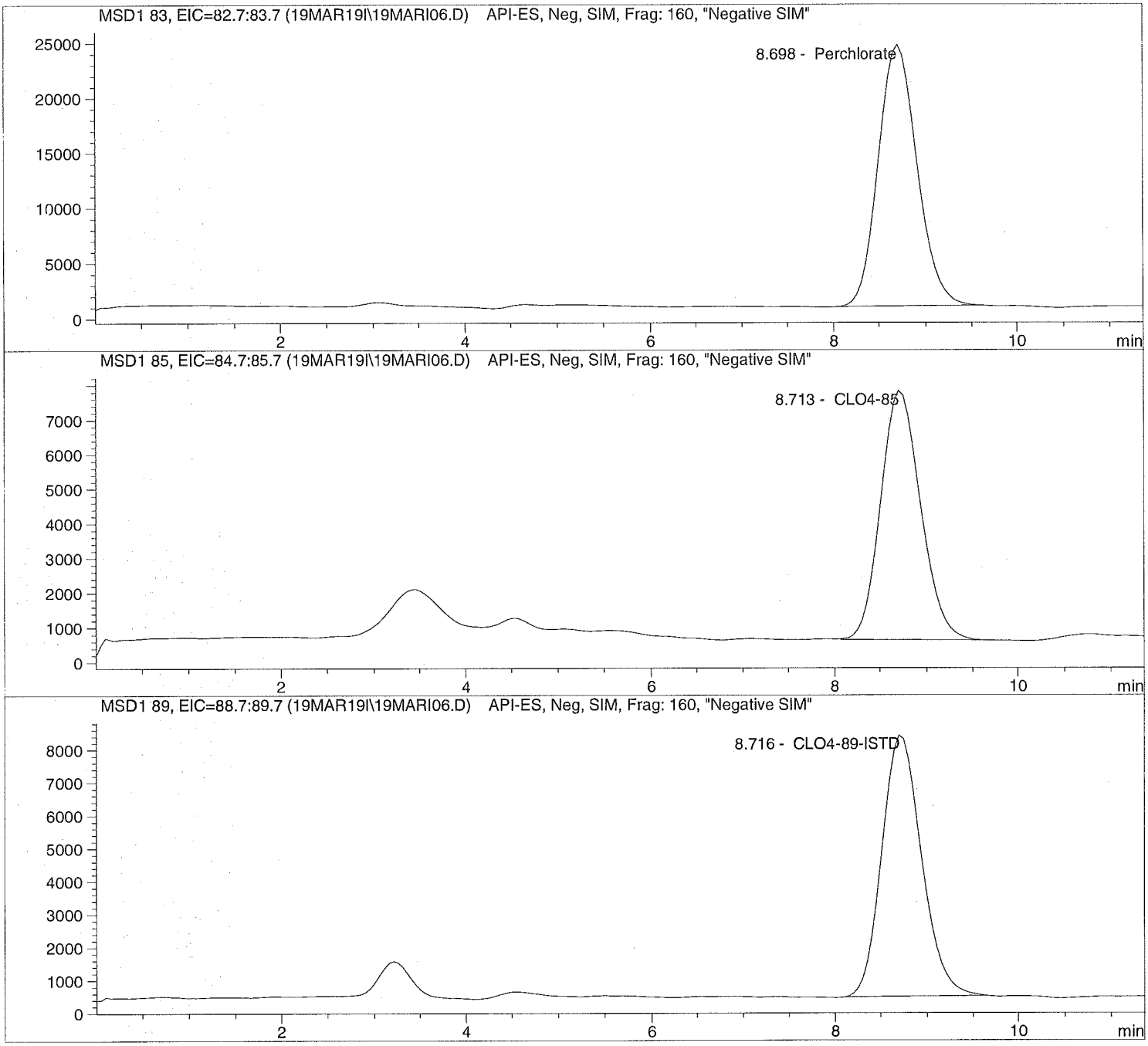
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

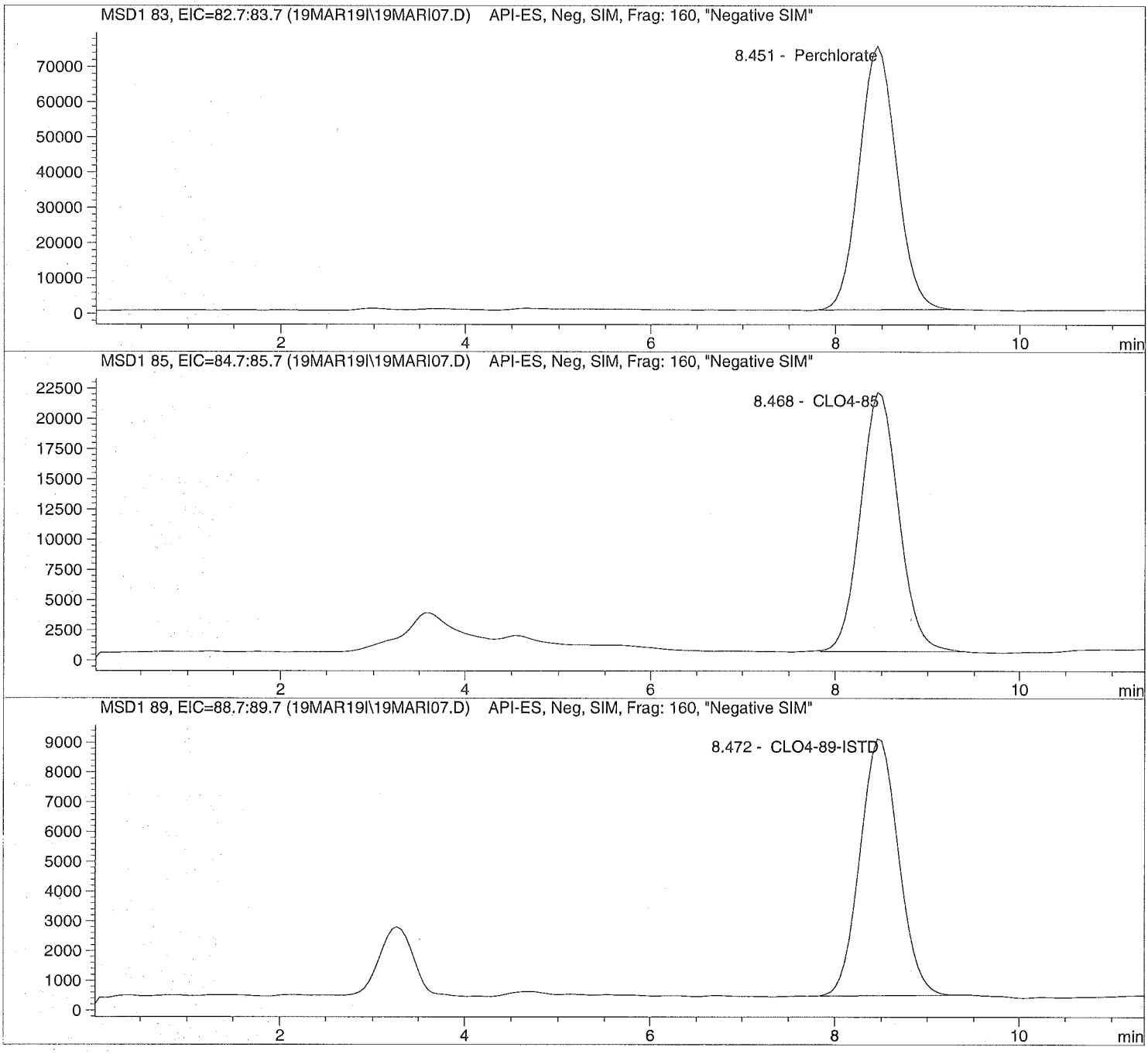
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

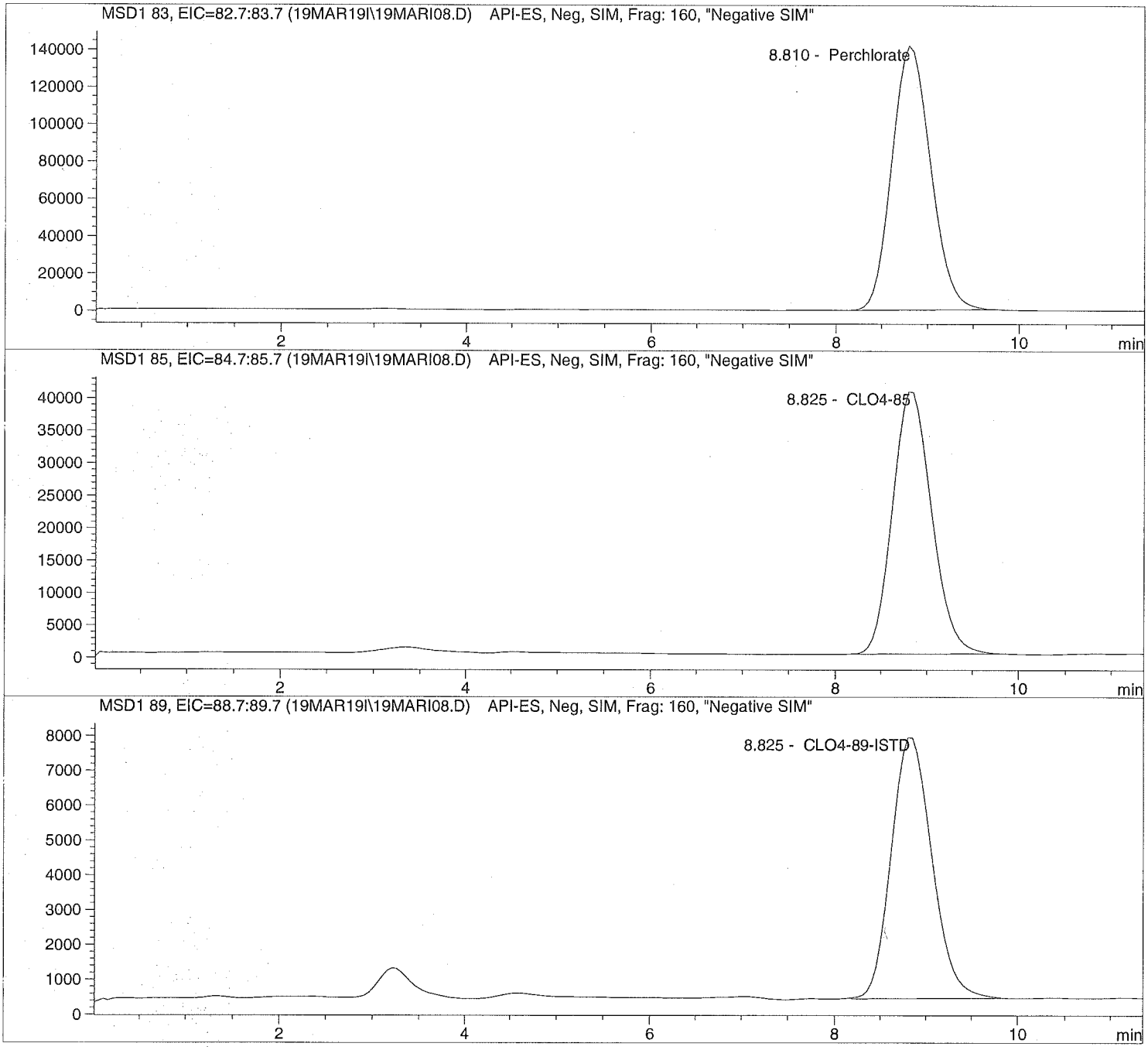
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

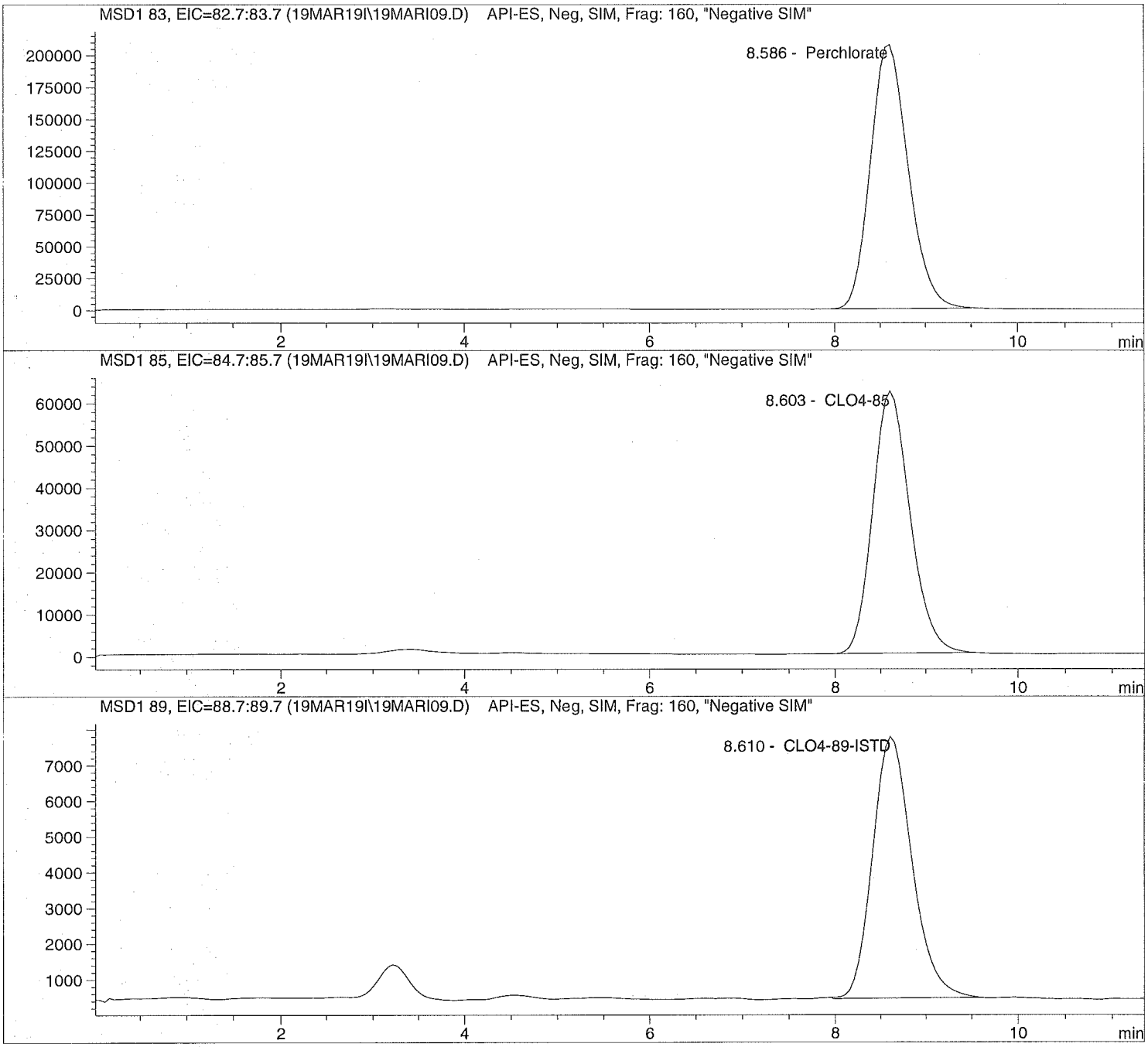
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

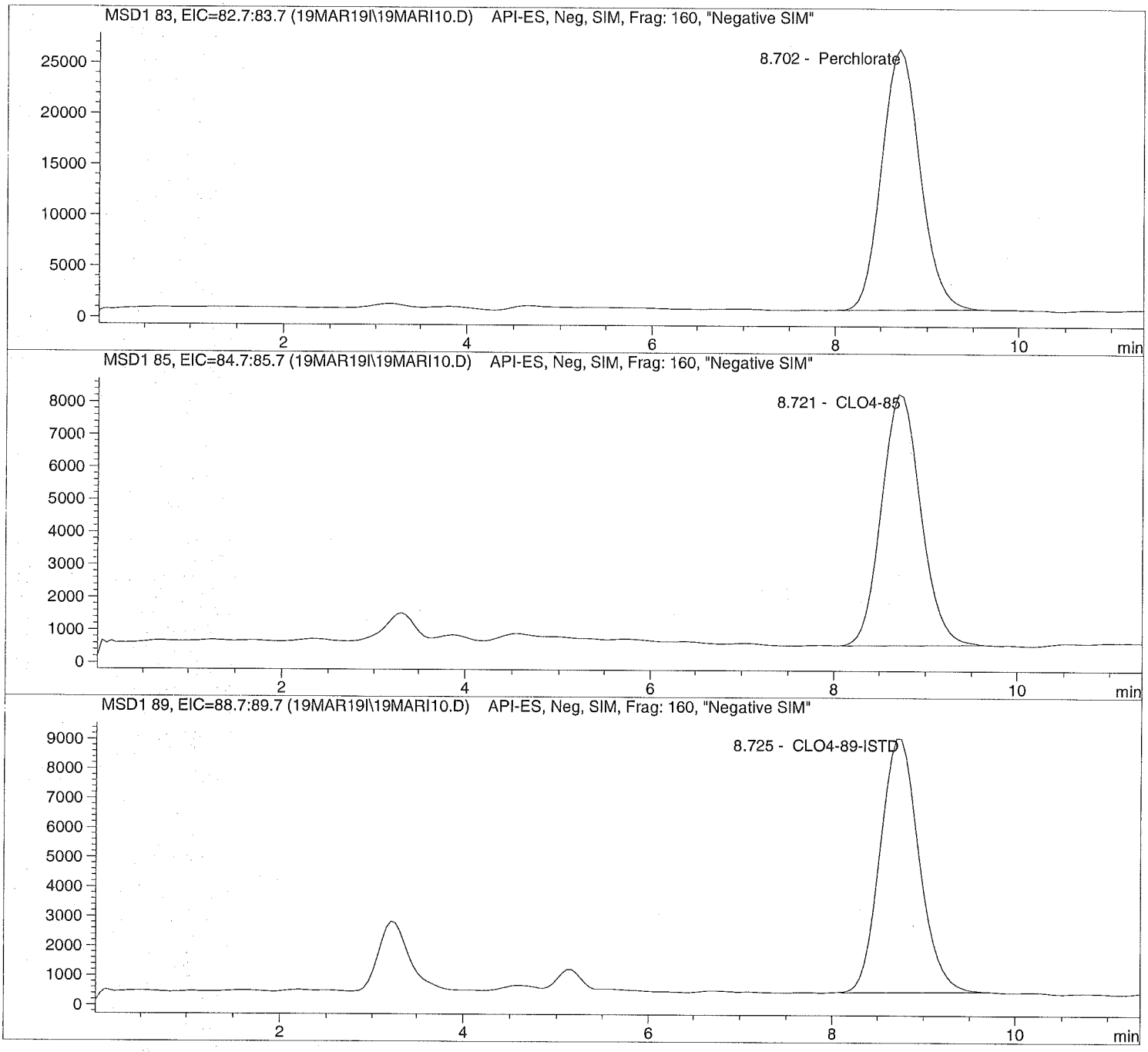
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L 00942658

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

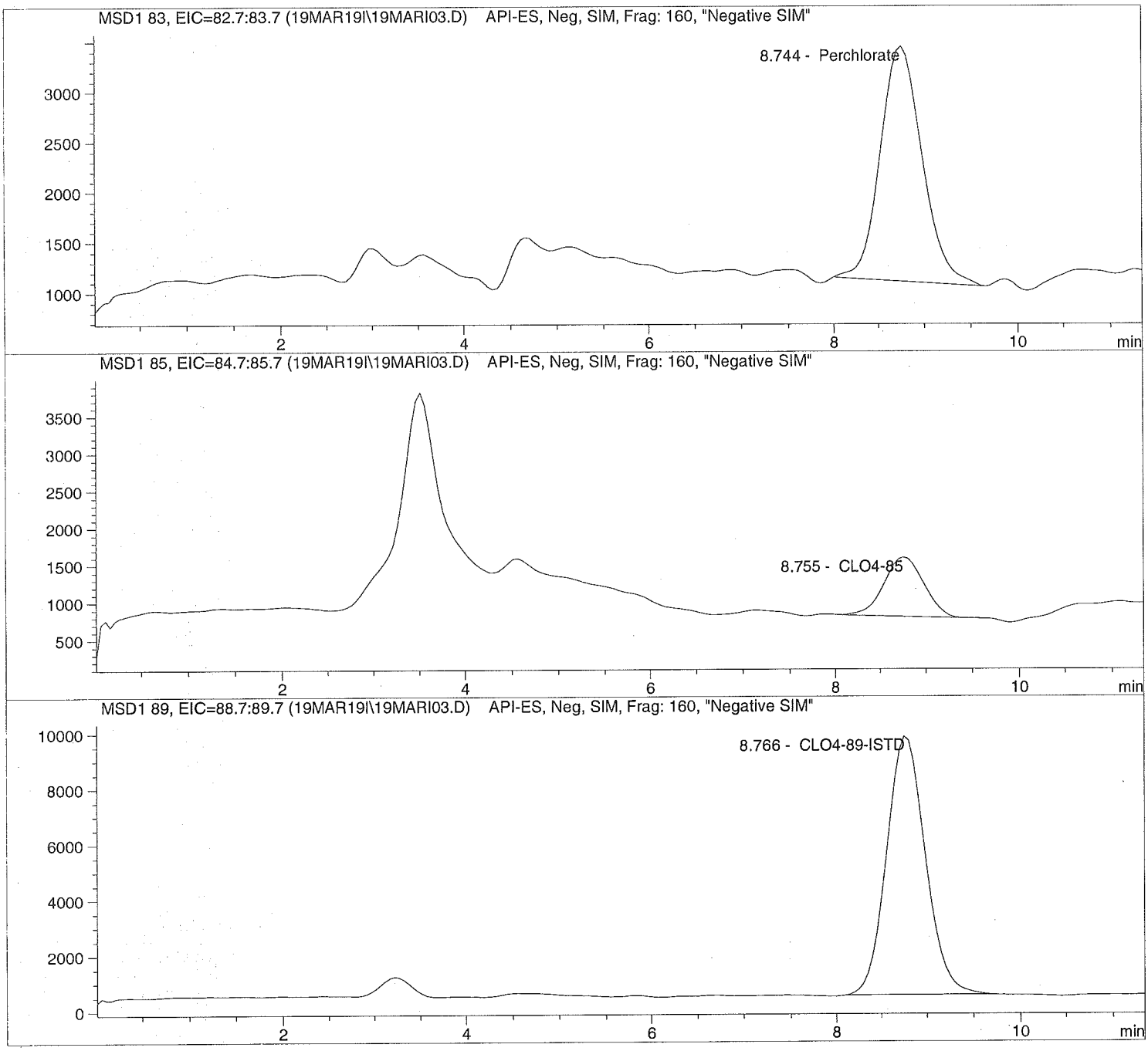
Unmodified

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

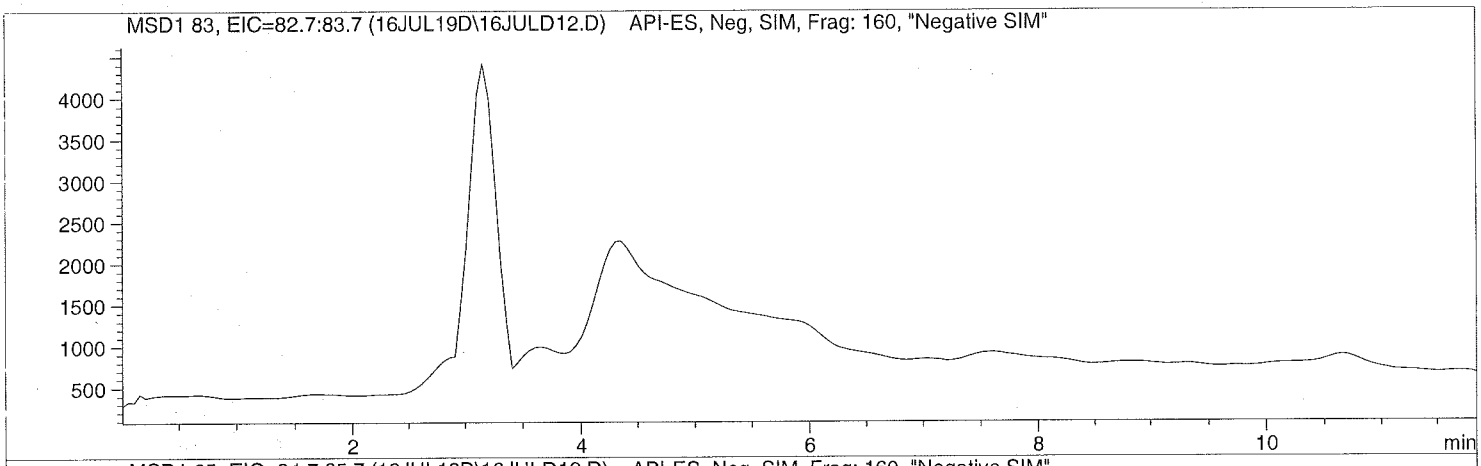
*** End of Report ***

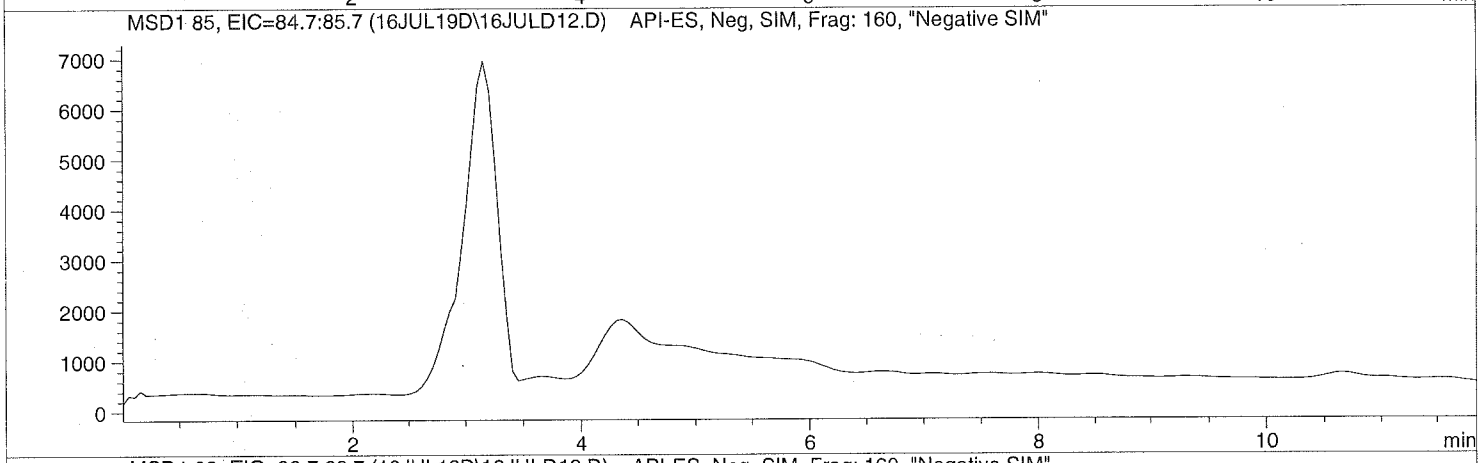
Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD12.D Sample Name: 1919059008

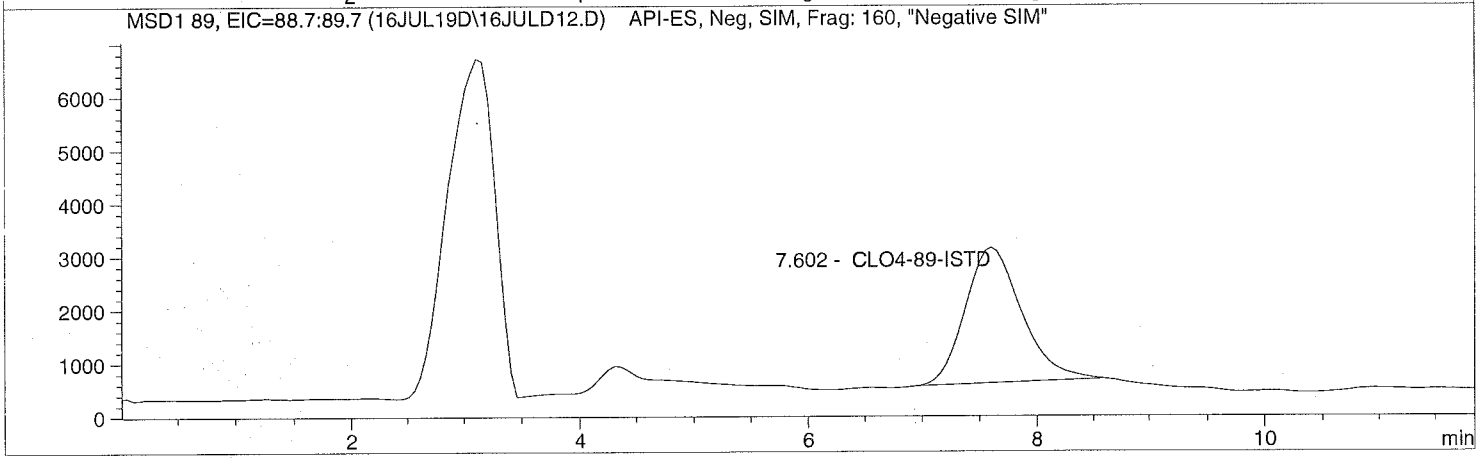
Injection Date:	7/16/2019 10:54:46	Seq Line:	12
Sample Name:	1919059008	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\16JUL19D\16JULD12.D Sample Name: 1919059008

Injection Date:	7/16/2019 10:54:46	Seq Line:	12
Sample Name:	1919059008	Location:	Vial 82
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.602	PBA	86892.1	5.0000	CLO4-89-ISTD

*** End of Report ***

10450 Stancliff Rd. Suite 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887

August 23, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Ste 129
Lakewood, CO 80228

Work Order: **HS19080486**

Laboratory Results for: **LHAAP 18 24**

Dear Marcia,

ALS Environmental received 3 sample(s) on Aug 09, 2019 for the analysis presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested. Results are expressed as "as received" unless otherwise noted.

QC sample results for this data met EPA or laboratory specifications except as noted in the Case Narrative or as noted with qualifiers in the QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained by ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

If you have any questions regarding this report, please feel free to call me.

Sincerely,

Generated By: JUMOKE.LAWAL
RJ Modashia
Project Manager

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Work Order: HS19080486

SAMPLE SUMMARY

Lab Samp ID	Client Sample ID	Matrix	TagNo	Collection Date	Date Received	Hold
HS19080486-01	18WW19_080819	Groundwater		08-Aug-2019 08:25	09-Aug-2019 08:45	☐
HS19080486-02	18WW20_080819	Groundwater		08-Aug-2019 09:15	09-Aug-2019 08:45	☐
HS19080486-03	Trip Blank	Water	C&G-062119-167	08-Aug-2019 00:00	09-Aug-2019 08:45	☐

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc. **CASE NARRATIVE**
Project: LHAAP 18 24
Work Order: HS19080486

Work Order Comments

• The analysis for Perchlorate was subcontracted to ALS Salt Lake City, UT. Final report attached.

GCMS Semivolatiles by Method SW8270SIM

Batch ID: 144050

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

GCMS Volatiles by Method SW8260

Batch ID: R344126

Sample ID: HS19080444-02MS

• MS and MSD are for an unrelated sample

Metals by Method SW6020

Batch ID: 144236

Sample ID: HS19080444-02MS

• MS and MSD are for an unrelated sample

Sample ID: HS19080444-02PDS

• PDS is for an unrelated sample

Metals by Method SW7470

Batch ID: 144044

• The test results meet requirements of the current NELAP standards, state requirements or programs where applicable.

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW19_080819
Collection Date: 08-Aug-2019 08:25

ANALYTICAL REPORT
WorkOrder:HS19080486
Lab ID:HS19080486-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:03
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	12-Aug-2019 14:03
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	12-Aug-2019 14:03
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:03
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	12-Aug-2019 14:03
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	12-Aug-2019 14:03
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	12-Aug-2019 14:03
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW19_080819
Collection Date: 08-Aug-2019 08:25

ANALYTICAL REPORT
WorkOrder:HS19080486
Lab ID:HS19080486-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	12-Aug-2019 14:03
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	12-Aug-2019 14:03
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	12-Aug-2019 14:03
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:03
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:03
Surr: 1,2-Dichloroethane-d4	*90.7*			**0**	*81-118*	*%REC*	*1*	*12-Aug-2019 14:03*
Surr: 4-Bromofluorobenzene	*102*			**0**	*85-114*	*%REC*	*1*	*12-Aug-2019 14:03*
Surr: Dibromofluoromethane	*93.7*			**0**	*80-119*	*%REC*	*1*	*12-Aug-2019 14:03*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*12-Aug-2019 14:03*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW19_080819
Collection Date: 08-Aug-2019 08:25

ANALYTICAL REPORT
WorkOrder:HS19080486
Lab ID:HS19080486-01
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 16-Aug-2019		Analyst: JHD
Aluminum	**0.327**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	21-Aug-2019 14:10
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	21-Aug-2019 14:10
Arsenic	**0.000655**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	21-Aug-2019 14:10
Barium	**0.119**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	21-Aug-2019 14:10
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	21-Aug-2019 14:10
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	21-Aug-2019 14:10
Calcium	**6.82**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	21-Aug-2019 14:10
Chromium	**0.0100**		**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	21-Aug-2019 14:10
Cobalt	**0.000430**	J	**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	21-Aug-2019 14:10
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	21-Aug-2019 14:10
Iron	**15.8**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	21-Aug-2019 14:10
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	21-Aug-2019 14:10
Magnesium	**3.17**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	21-Aug-2019 14:10
Manganese	**0.279**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	21-Aug-2019 14:10
Nickel	**0.00475**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	21-Aug-2019 14:10
Potassium	**2.04**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	21-Aug-2019 14:10
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	21-Aug-2019 14:10
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	21-Aug-2019 14:10
Sodium	**22.5**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	21-Aug-2019 14:10
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	21-Aug-2019 14:10
Vanadium	**0.00202**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	21-Aug-2019 14:10
Zinc	**0.0211**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	21-Aug-2019 14:10
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 12-Aug-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	12-Aug-2019 15:07
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	14-Aug-2019 16:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW20_080819
Collection Date: 08-Aug-2019 09:15

ANALYTICAL REPORT
WorkOrder:HS19080486
Lab ID:HS19080486-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:27
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	12-Aug-2019 14:27
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	12-Aug-2019 14:27
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:27
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	12-Aug-2019 14:27
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	12-Aug-2019 14:27
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	12-Aug-2019 14:27
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW20_080819
Collection Date: 08-Aug-2019 09:15

ANALYTICAL REPORT
WorkOrder:HS19080486
Lab ID:HS19080486-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C		**Method:SW8260**						Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	12-Aug-2019 14:27
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	12-Aug-2019 14:27
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	12-Aug-2019 14:27
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 14:27
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 14:27
Surr: 1,2-Dichloroethane-d4	*90.5*			**0**	*81-118*	*%REC*	*1*	*12-Aug-2019 14:27*
Surr: 4-Bromofluorobenzene	*103*			**0**	*85-114*	*%REC*	*1*	*12-Aug-2019 14:27*
Surr: Dibromofluoromethane	*92.9*			**0**	*80-119*	*%REC*	*1*	*12-Aug-2019 14:27*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*12-Aug-2019 14:27*
SEMIVOLATILES SIM		**Method:SW8270SIM**				Prep:SW3510 / 12-Aug-2019		Analyst: LG
1,4-Dioxane	**0.25**		**0.010**	**0.010**	**0.010**	**ug/L**	1	14-Aug-2019 12:04
Surr: 2-Fluorobiphenyl	*107*			**0**	*40-140*	*%REC*	*1*	*14-Aug-2019 12:04*
Surr: 4-Terphenyl-d14	*124*			**0**	*40-140*	*%REC*	*1*	*14-Aug-2019 12:04*
Surr: Nitrobenzene-d5	*116*			**0**	*40-140*	*%REC*	*1*	*14-Aug-2019 12:04*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: 18WW20_080819
Collection Date: 08-Aug-2019 09:15

ANALYTICAL REPORT
WorkOrder:HS19080486
Lab ID:HS19080486-02
Matrix:Groundwater

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
METALS BY ICPMS BY SW6020A		**Method:SW6020**				Prep:SW3010A / 16-Aug-2019		Analyst: JHD
Aluminum	**0.0246**		**0.00180**	**0.00500**	**0.0100**	**mg/L**	1	21-Aug-2019 14:13
Antimony	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	21-Aug-2019 14:13
Arsenic	0.000500	U	0.000400	0.000500	0.00500	mg/L	1	21-Aug-2019 14:13
Barium	**0.0929**		**0.00190**	**0.00250**	**0.00500**	**mg/L**	1	21-Aug-2019 14:13
Beryllium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	21-Aug-2019 14:13
Cadmium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	21-Aug-2019 14:13
Calcium	**2.93**		**0.0340**	**0.0500**	**0.500**	**mg/L**	1	21-Aug-2019 14:13
Chromium	**0.000595**	J	**0.000400**	**0.000500**	**0.00500**	**mg/L**	1	21-Aug-2019 14:13
Cobalt	**0.00504**		**0.000100**	**0.000500**	**0.00500**	**mg/L**	1	21-Aug-2019 14:13
Copper	0.00100	U	0.00100	0.00100	0.00500	mg/L	1	21-Aug-2019 14:13
Iron	**4.37**		**0.0120**	**0.0500**	**0.200**	**mg/L**	1	21-Aug-2019 14:13
Lead	0.00100	U	0.000600	0.00100	0.00500	mg/L	1	21-Aug-2019 14:13
Magnesium	**2.08**		**0.0100**	**0.0500**	**0.200**	**mg/L**	1	21-Aug-2019 14:13
Manganese	**0.220**		**0.000700**	**0.00100**	**0.00500**	**mg/L**	1	21-Aug-2019 14:13
Nickel	**0.00749**		**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	21-Aug-2019 14:13
Potassium	**1.33**		**0.0180**	**0.0500**	**0.200**	**mg/L**	1	21-Aug-2019 14:13
Selenium	0.00250	U	0.00110	0.00250	0.00500	mg/L	1	21-Aug-2019 14:13
Silver	0.000500	U	0.000200	0.000500	0.00500	mg/L	1	21-Aug-2019 14:13
Sodium	**26.2**		**0.0140**	**0.0500**	**0.200**	**mg/L**	1	21-Aug-2019 14:13
Thallium	0.000500	U	0.000200	0.000500	0.00200	mg/L	1	21-Aug-2019 14:13
Vanadium	**0.000822**	J	**0.000600**	**0.00100**	**0.00500**	**mg/L**	1	21-Aug-2019 14:13
Zinc	**0.0191**		**0.00200**	**0.00250**	**0.00500**	**mg/L**	1	21-Aug-2019 14:13
MERCURY BY SW7470A		**Method:SW7470**				Prep:SW7470 / 12-Aug-2019		Analyst: FO
Mercury	0.000100	U	0.0000300	0.000100	0.000200	mg/L	1	12-Aug-2019 15:19
SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)		**Method:NA**						Analyst: SUB
Subcontract Analysis	See Attached		0	0		NA	1	14-Aug-2019 16:04

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 08-Aug-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19080486
Lab ID:HS19080486-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
1,1,1,2-Tetrachloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,1,1-Trichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,1,2,2-Tetrachloroethane	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,1,2-Trichloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,1-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,1-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,1-Dichloropropene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,2,3-Trichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,2,3-Trichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,2,4-Trichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,2,4-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,2-Dibromo-3-chloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,2-Dibromoethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,2-Dichlorobenzene	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,2-Dichloroethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,2-Dichloropropane	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,3,5-Trimethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,3-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,3-Dichloropropane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
1,4-Dichlorobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 13:39
2,2-Dichloropropane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
2-Butanone	1.0	U	0.50	1.0	2.0	UG/L	1	12-Aug-2019 13:39
2-Chlorotoluene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
2-Hexanone	1.0	U	1.0	1.0	2.0	UG/L	1	12-Aug-2019 13:39
4-Chlorotoluene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 13:39
4-Isopropyltoluene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
4-Methyl-2-pentanone	1.0	U	0.70	1.0	2.0	UG/L	1	12-Aug-2019 13:39
Acetone	1.0	U	0.40	1.0	2.0	UG/L	1	12-Aug-2019 13:39
Benzene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Bromobenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Bromochloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Bromodichloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Bromoform	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Bromomethane	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Carbon disulfide	1.0	U	0.60	1.0	2.0	UG/L	1	12-Aug-2019 13:39
Carbon tetrachloride	0.50	U	0.50	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Chlorobenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Chloroethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Chloroform	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39

Note: See Qualifiers Page for a list of qualifiers and their explanation.

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
Sample ID: Trip Blank
Collection Date: 08-Aug-2019 00:00

ANALYTICAL REPORT
WorkOrder:HS19080486
Lab ID:HS19080486-03
Matrix:Water

ANALYSES	RESULT	QUAL	DL	LOD	LOQ	UNITS	DILUTION FACTOR	DATE ANALYZED
VOLATILES ORGANICS BY METHOD 8260C	**Method:SW8260**							Analyst: PC
Chloromethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
cis-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
cis-1,3-Dichloropropene	0.50	U	0.10	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Dibromochloromethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Dibromomethane	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Dichlorodifluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Ethylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Hexachlorobutadiene	1.0	U	1.0	1.0	1.0	UG/L	1	12-Aug-2019 13:39
Isopropylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
m,p-Xylene	1.0	U	0.50	1.0	2.0	UG/L	1	12-Aug-2019 13:39
Methylene chloride	1.0	U	0.40	1.0	2.0	UG/L	1	12-Aug-2019 13:39
n-Butylbenzene	0.50	U	0.40	0.50	1.0	UG/L	1	12-Aug-2019 13:39
n-Propylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Naphthalene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
o-Xylene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
sec-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Styrene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
tert-Butylbenzene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Tetrachloroethene	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Toluene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
trans-1,2-Dichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
trans-1,3-Dichloropropene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Trichloroethene	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Trichlorofluoromethane	0.50	U	0.30	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Vinyl chloride	0.50	U	0.20	0.50	1.0	UG/L	1	12-Aug-2019 13:39
Surr: 1,2-Dichloroethane-d4	*88.5*			**0**	*81-118*	*%REC*	*1*	*12-Aug-2019 13:39*
Surr: 4-Bromofluorobenzene	*98.7*			**0**	*85-114*	*%REC*	*1*	*12-Aug-2019 13:39*
Surr: Dibromofluoromethane	*91.6*			**0**	*80-119*	*%REC*	*1*	*12-Aug-2019 13:39*
Surr: Toluene-d8	*103*			**0**	*89-112*	*%REC*	*1*	*12-Aug-2019 13:39*

Note: See Qualifiers Page for a list of qualifiers and their explanation.

WEIGHT LOG

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

Batch ID: 144044 **Method:** MERCURY BY SW7470A **Prep:** HG_WPR

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19080486-01	1	10 (mL)	10 (mL)	1
HS19080486-02	1	10 (mL)	10 (mL)	1

Batch ID: 144050 **Method:** SEMIVOLATILES SIM **Prep:** 3510_B_SIM

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19080486-02	1	990	1 (mL)	0.00101

Batch ID: 144236 **Method:** METALS BY ICPMS BY SW6020A **Prep:** 3010A

SampID	Container	Sample Wt/Vol	Final Volume	Prep Factor
HS19080486-01	1	10	10 (mL)	1
HS19080486-02	1	10	10 (mL)	1

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

DATES REPORT

Sample ID	Client Samp ID	Collection Date	TCLP Date	Prep Date	Analysis Date	DF
Batch ID: 144044 (0)	**Test Name :** MERCURY BY SW7470A				**Matrix:** Groundwater	
HS19080486-01	18WW19_080819	08 Aug 2019 08:25		12 Aug 2019 10:00	12 Aug 2019 15:07	1
HS19080486-02	18WW20_080819	08 Aug 2019 09:15		12 Aug 2019 10:00	12 Aug 2019 15:19	1
Batch ID: 144050 (1)	**Test Name :** SEMIVOLATILES SIM				**Matrix:** Groundwater	
HS19080486-02	18WW20_080819	08 Aug 2019 09:15		12 Aug 2019 14:21	14 Aug 2019 12:04	1
Batch ID: 144236 (0)	**Test Name :** METALS BY ICPMS BY SW6020A				**Matrix:** Groundwater	
HS19080486-01	18WW19_080819	08 Aug 2019 08:25		16 Aug 2019 11:00	21 Aug 2019 14:10	1
HS19080486-02	18WW20_080819	08 Aug 2019 09:15		16 Aug 2019 11:00	21 Aug 2019 14:13	1
Batch ID: R344126 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Water	
HS19080486-03	Trip Blank	08 Aug 2019 00:00			12 Aug 2019 13:39	1
Batch ID: R344126 (0)	**Test Name :** VOLATILES ORGANICS BY METHOD 8260C				**Matrix:** Groundwater	
HS19080486-01	18WW19_080819	08 Aug 2019 08:25			12 Aug 2019 14:03	1
HS19080486-02	18WW20_080819	08 Aug 2019 09:15			12 Aug 2019 14:27	1
Batch ID: R344264 (0)	**Test Name :** SUBCONTRACT ANALYSIS - PERCHLORATE (EPA 6850)				**Matrix:** Groundwater	
HS19080486-01	18WW19_080819	08 Aug 2019 08:25			14 Aug 2019 16:04	1
HS19080486-02	18WW20_080819	08 Aug 2019 09:15			14 Aug 2019 16:04	1

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: 144044 (0) **Instrument: HG03** **Method: MERCURY BY SW7470A**

MBLK Sample ID: **MBLK-144044** Units: **mg/L** Analysis Date: **12-Aug-2019 15:03**
Client ID: Run ID: **HG03_344100** SeqNo: **5206050** PrepDate: **12-Aug-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.000100	0.000200								U

LCS Sample ID: **LCS-144044** Units: **mg/L** Analysis Date: **12-Aug-2019 15:05**
Client ID: Run ID: **HG03_344100** SeqNo: **5206051** PrepDate: **12-Aug-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00518	0.000200	0.005	0	104	82 - 119				

MS Sample ID: **HS19080486-01MS** Units: **mg/L** Analysis Date: **12-Aug-2019 15:08**
Client ID: **18WW19_080819** Run ID: **HG03_344100** SeqNo: **5206053** PrepDate: **12-Aug-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00524	0.000200	0.005	-0.00001000	105	82 - 119				

MSD Sample ID: **HS19080486-01MSD** Units: **mg/L** Analysis Date: **12-Aug-2019 15:10**
Client ID: **18WW19_080819** Run ID: **HG03_344100** SeqNo: **5206054** PrepDate: **12-Aug-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00517	0.000200	0.005	-0.00001000	104	82 - 119	0.005240	1.34	20	

The following samples were analyzed in this batch: HS19080486-01 HS19080486-02

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: 144236 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MBLK Sample ID: **MBLK-144236** Units: **mg/L** Analysis Date: **21-Aug-2019 12:39**
Client ID: Run ID: **ICPMS05_344606** SeqNo: **5219424** PrepDate: **16-Aug-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.004271	0.0100								J
Antimony	0.000500	0.00500								U
Arsenic	0.000500	0.00500								U
Barium	0.00250	0.00500								U
Beryllium	0.000500	0.00200								U
Cadmium	0.000500	0.00200								U
Calcium	0.0500	0.500								U
Chromium	0.000500	0.00500								U
Cobalt	0.000500	0.00500								U
Copper	0.00100	0.00500								U
Iron	0.0500	0.200								U
Lead	0.00100	0.00500								U
Magnesium	0.0500	0.200								U
Manganese	0.00100	0.00500								U
Nickel	0.00100	0.00500								U
Potassium	0.01915	0.200								J
Selenium	0.00250	0.00500								U
Silver	0.000500	0.00500								U
Sodium	0.0500	0.200								U
Thallium	0.000500	0.00200								U
Vanadium	0.00100	0.00500								U
Zinc	0.00250	0.00500								U

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: 144236 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

LCS Sample ID: **LCS-144236** Units: **mg/L** Analysis Date: **21-Aug-2019 12:41**
Client ID: Run ID: **ICPMS05_344606** SeqNo: **5219425** PrepDate: **16-Aug-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09959	0.0100	0.1	0	99.6	84 - 117				
Antimony	0.04719	0.00500	0.05	0	94.4	85 - 117				
Arsenic	0.04554	0.00500	0.05	0	91.1	84 - 116				
Barium	0.04667	0.00500	0.05	0	93.3	86 - 114				
Beryllium	0.04972	0.00200	0.05	0	99.4	83 - 121				
Cadmium	0.04705	0.00200	0.05	0	94.1	87 - 115				
Calcium	4.932	0.500	5	0	98.6	87 - 118				
Chromium	0.04713	0.00500	0.05	0	94.3	85 - 116				
Cobalt	0.04843	0.00500	0.05	0	96.9	86 - 115				
Copper	0.04761	0.00500	0.05	0	95.2	85 - 118				
Iron	4.888	0.200	5	0	97.8	87 - 118				
Lead	0.04668	0.00500	0.05	0	93.4	88 - 115				
Magnesium	4.769	0.200	5	0	95.4	83 - 118				
Manganese	0.04698	0.00500	0.05	0	94.0	87 - 115				
Nickel	0.04698	0.00500	0.05	0	94.0	85 - 117				
Potassium	4.715	0.200	5	0	94.3	87 - 115				
Selenium	0.04726	0.00500	0.05	0	94.5	80 - 120				
Silver	0.04905	0.00500	0.05	0	98.1	85 - 116				
Sodium	4.932	0.200	5	0	98.6	85 - 117				
Thallium	0.04473	0.00200	0.05	0	89.5	82 - 116				
Vanadium	0.04717	0.00500	0.05	0	94.3	86 - 115				
Zinc	0.04966	0.00500	0.05	0	99.3	83 - 119				

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: 144236 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MS Sample ID: **HS19080444-02MS** Units: **mg/L** Analysis Date: **21-Aug-2019 13:14**
Client ID: Run ID: **ICPMS05_344606** SeqNo: **5219411** PrepDate: **16-Aug-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1278	0.0100	0.1	0.03038	97.4	84 - 117				
Antimony	0.04736	0.00500	0.05	0.00014	94.4	85 - 117				
Arsenic	0.05733	0.00500	0.05	0.01029	94.1	84 - 116				
Barium	1.005	0.00500	0.05	0.9778	54.2	86 - 114				SO
Beryllium	0.05303	0.00200	0.05	0.000016	106	83 - 121				
Cadmium	0.04698	0.00200	0.05	-0.000022	94.0	87 - 115				
Calcium	72.23	0.500	5	68.25	79.5	87 - 118				SO
Chromium	0.04855	0.00500	0.05	0.001244	94.6	85 - 116				
Cobalt	0.04752	0.00500	0.05	0.000749	93.5	86 - 115				
Copper	0.04863	0.00500	0.05	0.00097	95.3	85 - 118				
Iron	5.031	0.200	5	0.1664	97.3	87 - 118				
Lead	0.04697	0.00500	0.05	0.000297	93.3	88 - 115				
Magnesium	29.14	0.200	5	24.51	92.5	83 - 118				O
Manganese	0.06099	0.00500	0.05	0.0136	94.8	87 - 115				
Nickel	0.04865	0.00500	0.05	0.001982	93.3	85 - 117				
Potassium	5.32	0.200	5	0.6411	93.6	87 - 115				
Selenium	0.04542	0.00500	0.05	-0.000066	91.0	80 - 120				
Silver	0.04799	0.00500	0.05	0.000091	95.8	85 - 116				
Sodium	367	0.200	5	364.9	42.5	85 - 117				SEO
Thallium	0.04572	0.00200	0.05	0.000008	91.4	82 - 116				
Vanadium	0.05297	0.00500	0.05	0.004203	97.5	86 - 115				
Zinc	0.06638	0.00500	0.05	0.01821	96.3	83 - 119				

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: 144236 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

MSD Sample ID: **HS19080444-02MSD** Units: **mg/L** Analysis Date: **21-Aug-2019 13:16**
Client ID: Run ID: **ICPMS05_344606** SeqNo: **5219412** PrepDate: **16-Aug-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.1306	0.0100	0.1	0.03038	100	84 - 117	0.1278	2.18	20	
Antimony	0.04818	0.00500	0.05	0.00014	96.1	85 - 117	0.04736	1.72	20	
Arsenic	0.05806	0.00500	0.05	0.01029	95.5	84 - 116	0.05733	1.26	20	
Barium	1.051	0.00500	0.05	0.9778	146	86 - 114	1.005	4.47	20	SO
Beryllium	0.05457	0.00200	0.05	0.000016	109	83 - 121	0.05303	2.86	20	
Cadmium	0.04698	0.00200	0.05	-0.000022	94.0	87 - 115	0.04698	0.00213	20	
Calcium	73.76	0.500	5	68.25	110	87 - 118	72.23	2.09	20	O
Chromium	0.0494	0.00500	0.05	0.001244	96.3	85 - 116	0.04855	1.74	20	
Cobalt	0.04877	0.00500	0.05	0.000749	96.0	86 - 115	0.04752	2.6	20	
Copper	0.04785	0.00500	0.05	0.00097	93.8	85 - 118	0.04863	1.6	20	
Iron	5.105	0.200	5	0.1664	98.8	87 - 118	5.031	1.47	20	
Lead	0.04753	0.00500	0.05	0.000297	94.5	88 - 115	0.04697	1.19	20	
Magnesium	29.34	0.200	5	24.51	96.5	83 - 118	29.14	0.696	20	O
Manganese	0.06142	0.00500	0.05	0.0136	95.6	87 - 115	0.06099	0.706	20	
Nickel	0.04657	0.00500	0.05	0.001982	89.2	85 - 117	0.04865	4.37	20	
Potassium	5.411	0.200	5	0.6411	95.4	87 - 115	5.32	1.7	20	
Selenium	0.04647	0.00500	0.05	-0.000066	93.1	80 - 120	0.04542	2.29	20	
Silver	0.04619	0.00500	0.05	0.000091	92.2	85 - 116	0.04799	3.83	20	
Sodium	370.6	0.200	5	364.9	115	85 - 117	367	0.983	20	EO
Thallium	0.04668	0.00200	0.05	0.000008	93.4	82 - 116	0.04572	2.09	20	
Vanadium	0.0534	0.00500	0.05	0.004203	98.4	86 - 115	0.05297	0.812	20	
Zinc	0.06671	0.00500	0.05	0.01821	97.0	83 - 119	0.06638	0.493	20	

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: 144236 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

PDS Sample ID: **HS19080444-02PDS** Units: **mg/L** Analysis Date: **21-Aug-2019 13:18**
Client ID: Run ID: **ICPMS05_344606** SeqNo: **5219413** PrepDate: **16-Aug-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.1132	0.00500	0.1	0.00014	113	80 - 120				
Arsenic	0.127	0.00500	0.1	0.01029	117	80 - 120				
Barium	1.13	0.00500	0.1	0.9778	152	80 - 120				SO
Beryllium	0.1191	0.00200	0.1	0.000016	119	80 - 120				
Cadmium	0.1127	0.00200	0.1	-0.000022	113	80 - 120				
Calcium	82.01	0.500	10	68.25	138	80 - 120				SO
Chromium	0.1196	0.00500	0.1	0.001244	118	80 - 120				
Cobalt	0.1172	0.00500	0.1	0.000749	116	80 - 120				
Copper	0.1157	0.00500	0.1	0.00097	115	80 - 120				
Iron	12.14	0.200	10	0.1664	120	80 - 120				
Lead	0.1158	0.00500	0.1	0.000297	115	80 - 120				
Manganese	0.1301	0.00500	0.1	0.0136	116	80 - 120				
Nickel	0.1155	0.00500	0.1	0.001982	114	80 - 120				
Selenium	0.1168	0.00500	0.1	-0.000066	117	80 - 120				
Silver	0.1004	0.00500	0.1	0.000091	100	80 - 120				
Thallium	0.118	0.00200	0.1	0.000008	118	80 - 120				
Vanadium	0.1231	0.00500	0.1	0.004203	119	80 - 120				
Zinc	0.1324	0.00500	0.1	0.01821	114	80 - 120				

PDS Sample ID: **HS19080444-02PDS** Units: **mg/L** Analysis Date: **23-Aug-2019 14:19**
Client ID: Run ID: **ICPMS05_344849** SeqNo: **5221849** PrepDate: **16-Aug-2019** DF: **10**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	464.9	2.00	100	352	113	80 - 120				

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: 144236 (0) **Instrument: ICPMS05** **Method: METALS BY ICPMS BY SW6020A**

SD Sample ID: **HS19080444-02SD** Units: **mg/L** Analysis Date: **21-Aug-2019 13:12**
Client ID: Run ID: **ICPMS05_344606** SeqNo: **5219410** PrepDate: **16-Aug-2019** DF: **5**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Aluminum	0.03597	0.0500					0.03038	0	10	J
Antimony	0.00250	0.0250					0.00014	0	10	U
Arsenic	0.01011	0.0250					0.01029	0	10	J
Barium	0.965	0.0250					0.9778	1.31	10	
Beryllium	0.00250	0.0100					0.000016	0	10	U
Cadmium	0.00250	0.0100					-0.000022	0	10	U
Calcium	66.25	2.50					68.25	2.93	10	
Chromium	0.00250	0.0250					0.001244	0	10	U
Cobalt	0.000643	0.0250					0.000749	0	10	J
Copper	0.00500	0.0250					0.00097	0	10	U
Iron	0.1666	1.00					0.1664	0	10	J
Lead	0.00500	0.0250					0.000297	0	10	U
Magnesium	23.71	1.00					24.51	3.26	10	
Manganese	0.01208	0.0250					0.0136	0	10	J
Nickel	0.00500	0.0250					0.001982	0	10	U
Potassium	0.6735	1.00					0.6411	0	10	J
Selenium	0.0125	0.0250					-0.000066	0	10	U
Silver	0.00250	0.0250					0.000091	0	10	U
Sodium	358.1	1.00					364.9	1.85	10	
Thallium	0.00250	0.0100					0.000008	0	10	U
Vanadium	0.008364	0.0250					0.004203	0	10	J
Zinc	0.01736	0.0250					0.01821	0	10	J

SD Sample ID: **HS19080444-02SD** Units: **mg/L** Analysis Date: **23-Aug-2019 14:16**
Client ID: Run ID: **ICPMS05_344849** SeqNo: **5221848** PrepDate: **16-Aug-2019** DF: **50**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%D	%D Limit	Qual
Sodium	343.6	10.0					352	2.4	10	

The following samples were analyzed in this batch: HS19080486-01 HS19080486-02

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: 144050 (1) **Instrument: SV-5** **Method: SEMIVOLATILES SIM**

MBLK Sample ID: **MBLK-144050** Units: **ug/L** Analysis Date: **14-Aug-2019 10:39**
Client ID: Run ID: **SV-5_344288** SeqNo: **5210366** PrepDate: **12-Aug-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.010	0.010								U
Surr: 2-Fluorobiphenyl	*0.06751*	*0*	*0.08*	*0*	*84.4*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.08197*	*0*	*0.08*	*0*	*102*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.08197*	*0*	*0.08*	*0*	*102*	*40 - 140*				

LCS Sample ID: **LCS1-144050** Units: **ug/L** Analysis Date: **14-Aug-2019 11:23**
Client ID: Run ID: **SV-5_344288** SeqNo: **5210367** PrepDate: **12-Aug-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.09839	0.010	0.08	0	123	40 - 140				
Surr: 2-Fluorobiphenyl	*0.07969*	*0*	*0.08*	*0*	*99.6*	*40 - 140*				
Surr: 4-Terphenyl-d14	*0.09862*	*0*	*0.08*	*0*	*123*	*40 - 140*				
Surr: Nitrobenzene-d5	*0.09595*	*0*	*0.08*	*0*	*120*	*40 - 140*				

LCSD Sample ID: **LCSD1-144050** Units: **ug/L** Analysis Date: **14-Aug-2019 11:43**
Client ID: Run ID: **SV-5_344288** SeqNo: **5210368** PrepDate: **12-Aug-2019** DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,4-Dioxane	0.09378	0.010	0.08	0	117	40 - 140	0.09839	4.79	20	
Surr: 2-Fluorobiphenyl	*0.07338*	*0*	*0.08*	*0*	*91.7*	*40 - 140*	*0.07969*	*8.24*	*20*	
Surr: 4-Terphenyl-d14	*0.105*	*0*	*0.08*	*0*	*131*	*40 - 140*	*0.09862*	*6.28*	*20*	
Surr: Nitrobenzene-d5	*0.08919*	*0*	*0.08*	*0*	*111*	*40 - 140*	*0.09595*	*7.31*	*20*	

The following samples were analyzed in this batch: HS19080486-02

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: R344126 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190812** Units: **UG/L** Analysis Date: **12-Aug-2019 12:26**
Client ID: Run ID: **VOA6_344126** SeqNo: **5206815** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	0.50	1.0								U
1,1,1-Trichloroethane	0.50	1.0								U
1,1,2,2-Tetrachloroethane	0.50	1.0								U
1,1,2-Trichloroethane	0.50	1.0								U
1,1-Dichloroethane	0.50	1.0								U
1,1-Dichloroethene	0.50	1.0								U
1,1-Dichloropropene	0.50	1.0								U
1,2,3-Trichlorobenzene	0.50	1.0								U
1,2,3-Trichloropropane	0.50	1.0								U
1,2,4-Trichlorobenzene	0.50	1.0								U
1,2,4-Trimethylbenzene	0.50	1.0								U
1,2-Dibromo-3-chloropropane	0.50	1.0								U
1,2-Dibromoethane	0.50	1.0								U
1,2-Dichlorobenzene	0.50	1.0								U
1,2-Dichloroethane	0.50	1.0								U
1,2-Dichloropropane	0.50	1.0								U
1,3,5-Trimethylbenzene	0.50	1.0								U
1,3-Dichlorobenzene	0.50	1.0								U
1,3-Dichloropropane	0.50	1.0								U
1,4-Dichlorobenzene	0.50	1.0								U
2,2-Dichloropropane	0.50	1.0								U
2-Butanone	1.0	2.0								U
2-Chlorotoluene	0.50	1.0								U
2-Hexanone	1.0	2.0								U
4-Chlorotoluene	0.50	1.0								U
4-Isopropyltoluene	0.50	1.0								U
4-Methyl-2-pentanone	1.0	2.0								U
Acetone	1.0	2.0								U
Benzene	0.50	1.0								U
Bromobenzene	0.50	1.0								U
Bromochloromethane	0.50	1.0								U
Bromodichloromethane	0.50	1.0								U
Bromoform	0.50	1.0								U
Bromomethane	0.50	1.0								U

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: R344126 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MBLK Sample ID: **VBLKW-190812** Units: **UG/L** Analysis Date: **12-Aug-2019 12:26**
Client ID: Run ID: **VOA6_344126** SeqNo: **5206815** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	1.0	2.0								U
Carbon tetrachloride	0.50	1.0								U
Chlorobenzene	0.50	1.0								U
Chloroethane	0.50	1.0								U
Chloroform	0.50	1.0								U
Chloromethane	0.50	1.0								U
cis-1,2-Dichloroethene	0.50	1.0								U
cis-1,3-Dichloropropene	0.50	1.0								U
Dibromochloromethane	0.50	1.0								U
Dibromomethane	0.50	1.0								U
Dichlorodifluoromethane	0.50	1.0								U
Ethylbenzene	0.50	1.0								U
Hexachlorobutadiene	1.0	1.0								U
Isopropylbenzene	0.50	1.0								U
m,p-Xylene	1.0	2.0								U
Methylene chloride	1.0	2.0								U
Naphthalene	0.50	1.0								U
n-Butylbenzene	0.50	1.0								U
n-Propylbenzene	0.50	1.0								U
o-Xylene	0.50	1.0								U
sec-Butylbenzene	0.50	1.0								U
Styrene	0.50	1.0								U
tert-Butylbenzene	0.50	1.0								U
Tetrachloroethene	0.50	1.0								U
Toluene	0.50	1.0								U
trans-1,2-Dichloroethene	0.50	1.0								U
trans-1,3-Dichloropropene	0.50	1.0								U
Trichloroethene	0.50	1.0								U
Trichlorofluoromethane	0.50	1.0								U
Vinyl chloride	0.50	1.0								U
Surr: 1,2-Dichloroethane-d4	*44.97*	*1.0*	*50*	*0*	*89.9*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*50.49*	*1.0*	*50*	*0*	*101*	*85 - 114*				
Surr: Dibromofluoromethane	*46.1*	*1.0*	*50*	*0*	*92.2*	*80 - 119*				
Surr: Toluene-d8	*51.42*	*1.0*	*50*	*0*	*103*	*89 - 112*				

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: R344126 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190812** Units: **UG/L** Analysis Date: **12-Aug-2019 11:38**
Client ID: Run ID: **VOA6_344126** SeqNo: **5206814** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.04	1.0	20	0	95.2	78 - 124				
1,1,1-Trichloroethane	18.66	1.0	20	0	93.3	74 - 131				
1,1,2,2-Tetrachloroethane	19.39	1.0	20	0	96.9	71 - 121				
1,1,2-Trichloroethane	18.86	1.0	20	0	94.3	80 - 119				
1,1-Dichloroethane	19.09	1.0	20	0	95.5	77 - 125				
1,1-Dichloroethene	18.97	1.0	20	0	94.9	71 - 131				
1,1-Dichloropropene	18.09	1.0	20	0	90.5	78 - 125				
1,2,3-Trichlorobenzene	21.2	1.0	20	0	106	69 - 129				
1,2,3-Trichloropropane	19.12	1.0	20	0	95.6	73 - 122				
1,2,4-Trichlorobenzene	20.07	1.0	20	0	100	69 - 130				
1,2,4-Trimethylbenzene	18.69	1.0	20	0	93.5	76 - 124				
1,2-Dibromo-3-chloropropane	18.39	1.0	20	0	91.9	62 - 128				
1,2-Dibromoethane	19.29	1.0	20	0	96.4	77 - 121				
1,2-Dichlorobenzene	19.51	1.0	20	0	97.5	80 - 119				
1,2-Dichloroethane	18.64	1.0	20	0	93.2	73 - 128				
1,2-Dichloropropane	20	1.0	20	0	100.0	78 - 122				
1,3,5-Trimethylbenzene	18.6	1.0	20	0	93.0	75 - 124				
1,3-Dichlorobenzene	18.38	1.0	20	0	91.9	80 - 119				
1,3-Dichloropropane	19.17	1.0	20	0	95.8	80 - 119				
1,4-Dichlorobenzene	19.37	1.0	20	0	96.8	79 - 118				
2,2-Dichloropropane	19.38	1.0	20	0	96.9	60 - 139				
2-Butanone	37.64	2.0	40	0	94.1	56 - 143				
2-Chlorotoluene	18.55	1.0	20	0	92.7	79 - 122				
2-Hexanone	38.67	2.0	40	0	96.7	57 - 139				
4-Chlorotoluene	18.37	1.0	20	0	91.8	78 - 122				
4-Isopropyltoluene	18.35	1.0	20	0	91.8	77 - 127				
4-Methyl-2-pentanone	36.6	2.0	40	0	91.5	67 - 130				
Acetone	39.41	2.0	40	0	98.5	39 - 160				
Benzene	19.19	1.0	20	0	96.0	79 - 120				
Bromobenzene	18.22	1.0	20	0	91.1	80 - 120				
Bromochloromethane	19.15	1.0	20	0	95.8	78 - 123				
Bromodichloromethane	19.01	1.0	20	0	95.0	79 - 125				
Bromoform	18.47	1.0	20	0	92.3	66 - 130				
Bromomethane	22.09	1.0	20	0	110	53 - 141				

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: R344126 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

LCS Sample ID: **VLCSW-190812** Units: **UG/L** Analysis Date: **12-Aug-2019 11:38**
Client ID: Run ID: **VOA6_344126** SeqNo: **5206814** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	39.03	2.0	40	0	97.6	64 - 133				
Carbon tetrachloride	17.53	1.0	20	0	87.6	72 - 136				
Chlorobenzene	18.85	1.0	20	0	94.2	82 - 118				
Chloroethane	21.29	1.0	20	0	106	60 - 138				
Chloroform	18.92	1.0	20	0	94.6	79 - 124				
Chloromethane	19.92	1.0	20	0	99.6	50 - 139				
cis-1,2-Dichloroethene	19.12	1.0	20	0	95.6	78 - 123				
cis-1,3-Dichloropropene	19.6	1.0	20	0	98.0	75 - 124				
Dibromochloromethane	18.95	1.0	20	0	94.7	74 - 126				
Dibromomethane	18.88	1.0	20	0	94.4	79 - 123				
Dichlorodifluoromethane	17.19	1.0	20	0	85.9	32 - 152				
Ethylbenzene	18.52	1.0	20	0	92.6	79 - 121				
Hexachlorobutadiene	22.48	1.0	20	0	112	66 - 134				
Isopropylbenzene	18.27	1.0	20	0	91.4	72 - 131				
m,p-Xylene	37.65	2.0	40	0	94.1	80 - 121				
Methylene chloride	19.94	2.0	20	0	99.7	74 - 124				
Naphthalene	19.17	1.0	20	0	95.8	61 - 128				
n-Butylbenzene	19.19	1.0	20	0	95.9	75 - 128				
n-Propylbenzene	18.19	1.0	20	0	91.0	76 - 126				
o-Xylene	18.81	1.0	20	0	94.0	78 - 122				
sec-Butylbenzene	18.24	1.0	20	0	91.2	77 - 126				
Styrene	19.4	1.0	20	0	97.0	78 - 123				
tert-Butylbenzene	18.14	1.0	20	0	90.7	78 - 124				
Tetrachloroethene	17.85	1.0	20	0	89.2	74 - 129				
Toluene	18.96	1.0	20	0	94.8	80 - 121				
trans-1,2-Dichloroethene	18.98	1.0	20	0	94.9	75 - 124				
trans-1,3-Dichloropropene	19.5	1.0	20	0	97.5	73 - 127				
Trichloroethene	18.81	1.0	20	0	94.0	79 - 123				
Trichlorofluoromethane	18.41	1.0	20	0	92.1	65 - 141				
Vinyl chloride	19.24	1.0	20	0	96.2	58 - 137				
Surr: 1,2-Dichloroethane-d4	*50.82*	*1.0*	*50*	*0*	*102*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*51.45*	*1.0*	*50*	*0*	*103*	*85 - 114*				
Surr: Dibromofluoromethane	*50.86*	*1.0*	*50*	*0*	*102*	*80 - 119*				
Surr: Toluene-d8	*47.64*	*1.0*	*50*	*0*	*95.3*	*89 - 112*				

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: R344126 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19080444-02MS** Units: **UG/L** Analysis Date: **12-Aug-2019 17:15**
Client ID: Run ID: **VOA6_344126** SeqNo: **5206825** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	18.24	1.0	20	0	91.2	78 - 124				
1,1,1-Trichloroethane	17.39	1.0	20	0	86.9	74 - 131				
1,1,2,2-Tetrachloroethane	19.33	1.0	20	0	96.7	71 - 121				
1,1,2-Trichloroethane	18.43	1.0	20	0	92.1	80 - 119				
1,1-Dichloroethane	16.73	1.0	20	0	83.6	77 - 125				
1,1-Dichloroethene	16.99	1.0	20	0	85.0	71 - 131				
1,1-Dichloropropene	17.79	1.0	20	0	89.0	78 - 125				
1,2,3-Trichlorobenzene	20.77	1.0	20	0	104	69 - 129				
1,2,3-Trichloropropane	18.82	1.0	20	0	94.1	73 - 122				
1,2,4-Trichlorobenzene	20.14	1.0	20	0	101	69 - 130				
1,2,4-Trimethylbenzene	19.22	1.0	20	0	96.1	76 - 124				
1,2-Dibromo-3-chloropropane	18.52	1.0	20	0	92.6	62 - 128				
1,2-Dibromoethane	18.1	1.0	20	0	90.5	77 - 121				
1,2-Dichlorobenzene	19	1.0	20	0	95.0	80 - 119				
1,2-Dichloroethane	16.95	1.0	20	0	84.8	73 - 128				
1,2-Dichloropropane	17.81	1.0	20	0	89.1	78 - 122				
1,3,5-Trimethylbenzene	19.34	1.0	20	0	96.7	75 - 124				
1,3-Dichlorobenzene	18.11	1.0	20	0	90.5	80 - 119				
1,3-Dichloropropane	17.91	1.0	20	0	89.5	80 - 119				
1,4-Dichlorobenzene	18.94	1.0	20	0	94.7	79 - 118				
2,2-Dichloropropane	16.24	1.0	20	0	81.2	60 - 139				
2-Butanone	44.43	2.0	40	0	111	56 - 143				
2-Chlorotoluene	18.6	1.0	20	0	93.0	79 - 122				
2-Hexanone	57.92	2.0	40	0	145	57 - 139				S
4-Chlorotoluene	18.43	1.0	20	0	92.2	78 - 122				
4-Isopropyltoluene	19.75	1.0	20	0	98.7	77 - 127				
4-Methyl-2-pentanone	55.9	2.0	40	0	140	67 - 130				S
Acetone	34.26	2.0	40	0	85.7	39 - 160				
Benzene	19.89	1.0	20	1.975	89.6	79 - 120				
Bromobenzene	18.01	1.0	20	0	90.1	80 - 120				
Bromochloromethane	15.88	1.0	20	0	79.4	78 - 123				
Bromodichloromethane	17.45	1.0	20	0	87.2	79 - 125				
Bromoform	17.62	1.0	20	0	88.1	66 - 130				
Bromomethane	12.43	1.0	20	0	62.2	53 - 141				

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: R344126 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MS Sample ID: **HS19080444-02MS** Units: **UG/L** Analysis Date: **12-Aug-2019 17:15**
Client ID: Run ID: **VOA6_344126** SeqNo: **5206825** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Carbon disulfide	49.83	2.0	40	0	125	64 - 133				
Carbon tetrachloride	17.74	1.0	20	0	88.7	72 - 136				
Chlorobenzene	18.33	1.0	20	0	91.6	82 - 118				
Chloroethane	16.83	1.0	20	0	84.1	60 - 138				
Chloroform	16.54	1.0	20	0	82.7	79 - 124				
Chloromethane	11.67	1.0	20	0	58.4	50 - 139				
cis-1,2-Dichloroethene	16.59	1.0	20	0	83.0	78 - 123				
cis-1,3-Dichloropropene	17.38	1.0	20	0	86.9	75 - 124				
Dibromochloromethane	18.02	1.0	20	0	90.1	74 - 126				
Dibromomethane	17.19	1.0	20	0	85.9	79 - 123				
Dichlorodifluoromethane	8.432	1.0	20	0	42.2	32 - 152				
Ethylbenzene	19.22	1.0	20	0	96.1	79 - 121				
Hexachlorobutadiene	20.65	1.0	20	0	103	66 - 134				
Isopropylbenzene	71.57	1.0	20	50.38	106	72 - 131				
m,p-Xylene	37.93	2.0	40	0	94.8	80 - 121				
Methylene chloride	17.3	2.0	20	0	86.5	74 - 124				
Naphthalene	156.4	1.0	20	122.9	167	61 - 128				SO
n-Butylbenzene	20.37	1.0	20	0	102	75 - 128				
n-Propylbenzene	33.57	1.0	20	12.96	103	76 - 126				
o-Xylene	18.91	1.0	20	0	94.6	78 - 122				
sec-Butylbenzene	31.64	1.0	20	11.43	101	77 - 126				
Styrene	18.69	1.0	20	0	93.5	78 - 123				
tert-Butylbenzene	30.98	1.0	20	11.82	95.8	78 - 124				
Tetrachloroethene	19.06	1.0	20	0	95.3	74 - 129				
Toluene	18.92	1.0	20	0	94.6	80 - 121				
trans-1,2-Dichloroethene	16.97	1.0	20	0	84.8	75 - 124				
trans-1,3-Dichloropropene	17.09	1.0	20	0	85.4	73 - 127				
Trichloroethene	17.88	1.0	20	0	89.4	79 - 123				
Trichlorofluoromethane	16.49	1.0	20	0	82.4	65 - 141				
Vinyl chloride	14.53	1.0	20	0	72.6	58 - 137				
Surr: 1,2-Dichloroethane-d4	*46.77*	*1.0*	*50*	*0*	*93.5*	*81 - 118*				
Surr: 4-Bromofluorobenzene	*52.77*	*1.0*	*50*	*0*	*106*	*85 - 114*				
Surr: Dibromofluoromethane	*46.71*	*1.0*	*50*	*0*	*93.4*	*80 - 119*				
Surr: Toluene-d8	*49.81*	*1.0*	*50*	*0*	*99.6*	*89 - 112*				

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: R344126 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19080444-02MSD** Units: **UG/L** Analysis Date: **12-Aug-2019 17:39**
Client ID: Run ID: **VOA6_344126** SeqNo: **5206826** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
1,1,1,2-Tetrachloroethane	19.18	1.0	20	0	95.9	78 - 124	18.24	5.05	20	
1,1,1-Trichloroethane	17.38	1.0	20	0	86.9	74 - 131	17.39	0.0182	20	
1,1,2,2-Tetrachloroethane	20.91	1.0	20	0	105	71 - 121	19.33	7.85	20	
1,1,2-Trichloroethane	19.52	1.0	20	0	97.6	80 - 119	18.43	5.76	20	
1,1-Dichloroethane	16.92	1.0	20	0	84.6	77 - 125	16.73	1.15	20	
1,1-Dichloroethene	16.75	1.0	20	0	83.7	71 - 131	16.99	1.45	20	
1,1-Dichloropropene	18.14	1.0	20	0	90.7	78 - 125	17.79	1.92	20	
1,2,3-Trichlorobenzene	22.17	1.0	20	0	111	69 - 129	20.77	6.52	20	
1,2,3-Trichloropropane	20.11	1.0	20	0	101	73 - 122	18.82	6.64	20	
1,2,4-Trichlorobenzene	20.9	1.0	20	0	104	69 - 130	20.14	3.68	20	
1,2,4-Trimethylbenzene	19.89	1.0	20	0	99.4	76 - 124	19.22	3.44	20	
1,2-Dibromo-3-chloropropane	20.7	1.0	20	0	103	62 - 128	18.52	11.1	20	
1,2-Dibromoethane	19.13	1.0	20	0	95.6	77 - 121	18.1	5.51	20	
1,2-Dichlorobenzene	19.74	1.0	20	0	98.7	80 - 119	19	3.8	20	
1,2-Dichloroethane	17.33	1.0	20	0	86.6	73 - 128	16.95	2.17	20	
1,2-Dichloropropane	18.86	1.0	20	0	94.3	78 - 122	17.81	5.69	20	
1,3,5-Trimethylbenzene	20.11	1.0	20	0	101	75 - 124	19.34	3.9	20	
1,3-Dichlorobenzene	18.91	1.0	20	0	94.6	80 - 119	18.11	4.36	20	
1,3-Dichloropropane	19.21	1.0	20	0	96.0	80 - 119	17.91	6.99	20	
1,4-Dichlorobenzene	19.93	1.0	20	0	99.6	79 - 118	18.94	5.08	20	
2,2-Dichloropropane	15.93	1.0	20	0	79.7	60 - 139	16.24	1.9	20	
2-Butanone	47.26	2.0	40	0	118	56 - 143	44.43	6.18	20	
2-Chlorotoluene	19.37	1.0	20	0	96.9	79 - 122	18.6	4.05	20	
2-Hexanone	62.31	2.0	40	0	156	57 - 139	57.92	7.29	20	S
4-Chlorotoluene	19.16	1.0	20	0	95.8	78 - 122	18.43	3.87	20	
4-Isopropyltoluene	20.39	1.0	20	0	102	77 - 127	19.75	3.21	20	
4-Methyl-2-pentanone	59.73	2.0	40	0	149	67 - 130	55.9	6.63	20	S
Acetone	36.85	2.0	40	0	92.1	39 - 160	34.26	7.28	20	
Benzene	20.64	1.0	20	1.975	93.3	79 - 120	19.89	3.66	20	
Bromobenzene	18.7	1.0	20	0	93.5	80 - 120	18.01	3.77	20	
Bromochloromethane	16.31	1.0	20	0	81.6	78 - 123	15.88	2.72	20	
Bromodichloromethane	18.2	1.0	20	0	91.0	79 - 125	17.45	4.22	20	
Bromoform	19	1.0	20	0	95.0	66 - 130	17.62	7.54	20	
Bromomethane	11.45	1.0	20	0	57.2	53 - 141	12.43	8.27	20	

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: HS19080486

QC BATCH REPORT

Batch ID: R344126 (0) **Instrument: VOA6** **Method: VOLATILES ORGANICS BY METHOD 8260C**

MSD Sample ID: **HS19080444-02MSD** Units: **UG/L** Analysis Date: **12-Aug-2019 17:39**
Client ID: Run ID: **VOA6_344126** SeqNo: **5206826** PrepDate: DF: **1**

Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD	RPD Limit	Qual
Carbon disulfide	49.52	2.0	40	0	124	64 - 133	49.83	0.607	20	
Carbon tetrachloride	18.06	1.0	20	0	90.3	72 - 136	17.74	1.8	20	
Chlorobenzene	18.9	1.0	20	0	94.5	82 - 118	18.33	3.06	20	
Chloroethane	16.01	1.0	20	0	80.0	60 - 138	16.83	4.98	20	
Chloroform	16.99	1.0	20	0	85.0	79 - 124	16.54	2.68	20	
Chloromethane	11.25	1.0	20	0	56.3	50 - 139	11.67	3.66	20	
cis-1,2-Dichloroethene	17.09	1.0	20	0	85.4	78 - 123	16.59	2.93	20	
cis-1,3-Dichloropropene	18.45	1.0	20	0	92.3	75 - 124	17.38	5.97	20	
Dibromochloromethane	19.08	1.0	20	0	95.4	74 - 126	18.02	5.69	20	
Dibromomethane	18.11	1.0	20	0	90.5	79 - 123	17.19	5.19	20	
Dichlorodifluoromethane	8.143	1.0	20	0	40.7	32 - 152	8.432	3.48	20	
Ethylbenzene	19.8	1.0	20	0	99.0	79 - 121	19.22	3.02	20	
Hexachlorobutadiene	21.93	1.0	20	0	110	66 - 134	20.65	6.03	20	
Isopropylbenzene	73.21	1.0	20	50.38	114	72 - 131	71.57	2.27	20	
m,p-Xylene	39.38	2.0	40	0	98.4	80 - 121	37.93	3.74	20	
Methylene chloride	17.55	2.0	20	0	87.8	74 - 124	17.3	1.47	20	
Naphthalene	169.4	1.0	20	122.9	233	61 - 128	156.4	8	20	SO
n-Butylbenzene	21.02	1.0	20	0	105	75 - 128	20.37	3.16	20	
n-Propylbenzene	34.73	1.0	20	12.96	109	76 - 126	33.57	3.4	20	
o-Xylene	19.85	1.0	20	0	99.2	78 - 122	18.91	4.82	20	
sec-Butylbenzene	32.71	1.0	20	11.43	106	77 - 126	31.64	3.32	20	
Styrene	19.68	1.0	20	0	98.4	78 - 123	18.69	5.15	20	
tert-Butylbenzene	32.37	1.0	20	11.82	103	78 - 124	30.98	4.39	20	
Tetrachloroethene	19.42	1.0	20	0	97.1	74 - 129	19.06	1.86	20	
Toluene	19.61	1.0	20	0	98.1	80 - 121	18.92	3.59	20	
trans-1,2-Dichloroethene	16.88	1.0	20	0	84.4	75 - 124	16.97	0.536	20	
trans-1,3-Dichloropropene	17.63	1.0	20	0	88.2	73 - 127	17.09	3.14	20	
Trichloroethene	18.33	1.0	20	0	91.6	79 - 123	17.88	2.47	20	
Trichlorofluoromethane	16.24	1.0	20	0	81.2	65 - 141	16.49	1.5	20	
Vinyl chloride	14.37	1.0	20	0	71.9	58 - 137	14.53	1.05	20	
Surr: 1,2-Dichloroethane-d4	*44.97*	*1.0*	*50*	*0*	*89.9*	*81 - 118*	*46.77*	*3.92*	*20*	
Surr: 4-Bromofluorobenzene	*52.86*	*1.0*	*50*	*0*	*106*	*85 - 114*	*52.77*	*0.171*	*20*	
Surr: Dibromofluoromethane	*46.88*	*1.0*	*50*	*0*	*93.8*	*80 - 119*	*46.71*	*0.376*	*20*	
Surr: Toluene-d8	*50.85*	*1.0*	*50*	*0*	*102*	*89 - 112*	*49.81*	*2.07*	*20*	

ALS Houston, US Date: 23-Aug-19

Client:	Bhate Environmental Associates, Inc.
Project:	LHAAP 18 24
WorkOrder:	HS19080486

QC BATCH REPORT

Batch ID:	**R344126 (0)**	**Instrument:**	**VOA6**	**Method:**	**VOLATILES ORGANICS BY METHOD 8260C**

The following samples were analyzed in this batch:	HS19080486-01	HS19080486-02	HS19080486-03

ALS Houston, US Date: 23-Aug-19

Client: Bhate Environmental Associates, Inc.
Project: LHAAP 18 24
WorkOrder: **HS19080486**

QUALIFIERS, ACRONYMS, UNITS

Qualifier	Description
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte detected below quantitation limit
M	Manually integrated, see raw data for justification
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL/SDL

Acronym	Description
DCS	Detectability Check Study
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
MBLK	Method Blank
MDL	Method Detection Limit
MQL	Method Quantitation Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PDS	Post Digestion Spike
PQL	Practical Quantitaion Limit
SD	Serial Dilution
SDL	Sample Detection Limit
TRRP	Texas Risk Reduction Program

Unit Reported	Description
mg/L	Milligrams per Liter

CERTIFICATIONS,ACCREDITATIONS & LICENSES

Agency	Number	Expire Date
Arkansas	19-028-0	27-Mar-2020
California	2919, 2019-2020	30-Apr-2020
Dept of Defense	ANAB L2231	20-Dec-2021
Kansas	E-10352 2019-2020	31-Jul-2020
Kentucky	123043, 2019-2020	30-Apr-2020
Louisiana	03087, 2019-2020	30-Jun-2020
Maryland	343, 2019-2020	30-Jun-2020
North Carolina	624-2019	31-Dec-2019
Oklahoma	2018-156	31-Aug-2019
Texas	TX104704231-19-23	30-Apr-2020

ALS Houston, US Date: 23-Aug-19

Sample Receipt Checklist

Client Name: Bhate Environmental
Work Order: HS19080486
Date/Time Received: **09-Aug-2019 08:45**
Received by: **JRM**

Checklist completed by: *Paresh M. Giga* eSignature 9-Aug-2019 Date
Reviewed by: *RJ Modashia* eSignature 9-Aug-2019 Date

Matrices: **GW/Water**
Carrier name: **FedEx**

Shipping container/cooler in good condition?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on shipping container/cooler?	Yes ☑	No ☐	Not Present ☐
Custody seals intact on sample bottles?	Yes ☐	No ☐	Not Present ☑
VOA/TX1005/TX1006 Solids in hermetically sealed vials?	Yes ☐	No ☐	Not Present ☑
Chain of custody present?	Yes ☑	No ☐	1 Page(s)
Chain of custody signed when relinquished and received?	Yes ☑	No ☐	COC IDs:None
Samplers name present on COC?	Yes ☐	No ☑	
Chain of custody agrees with sample labels?	Yes ☑	No ☐	
Samples in proper container/bottle?	Yes ☑	No ☐	
Sample containers intact?	Yes ☑	No ☐	
Sufficient sample volume for indicated test?	Yes ☑	No ☐	
All samples received within holding time?	Yes ☑	No ☐	
Container/Temp Blank temperature in compliance?	Yes ☑	No ☐	
Temperature(s)/Thermometer(s):	1.8c U/c	IR25	
Cooler(s)/Kit(s):	43662		
Date/Time sample(s) sent to storage:	8/9/19 16:35		
Water - VOA vials have zero headspace?	Yes ☑	No ☐	No VOA vials submitted ☐
Water - pH acceptable upon receipt?	Yes ☑	No ☐	N/A ☐
pH adjusted?	Yes ☐	No ☑	N/A ☐
pH adjusted by:			

Login Notes:

Client Contacted: Date Contacted: Person Contacted:

Contacted By: Regarding:

Comments:

Corrective Action:

bhate ENVIRONMENTAL ASSOCIATES, INC.

1608 13th Avenue South, Suite 300
Birmingham Alabama 35205
Tel: 205-918-4000
Fax: 205-918-4050

Page: _____ of _____

Project/Phase No: NWO1312.0150

COC Number(1): _____

LIMS Number: _____

Chain of Custody and Analytical Request

Facility/Base I.D.: LHAAP

Project/Site Name: LHAAP / Site 18/24

Client Name:

Collected by: Scott Beasinger

Field Sample ID (30 Characters Max)	ERPIMS LOCID (15 Characters Max)	Date Collected (dd-mmm-yyyy)	Time Collected (Military) (hhmm)	Sample Depth (beginning - ending)	SA Code (2)	Sample Number (2)	Sample Matrix (4)	Number of containers	VOC	PERCHLORATE	TOTAL MM METALS	1,4-DIOXANE						Ambient Blank Lot Control Number	Equipment Blank Lot Control Number	Trip Blank Lot Control Number	Cooler ID
18MW19-080819		08 AUG 2019	0825	-	N		WG	5	X	X	X										
18MW20-080819		08AUG 2019	0915	-	N		WG	6	X	X	X	X									
TRIP BLANK		08AUG 2019		-	TB		W	2	X												
				-																	
				-																	
				-																	
				-																	
				-																	
				-																	
				-																	

Sample Analysis Requested (5) | Quality Assurance Samples (6)

HS19080486
Bhate Environmental Associates, Inc.
LHAAP 18 24

COMMENTS: _____

Custody Transfers Prior to Receipt by Laboratory

	Relinquished By (Signed)	Date	Time	Received by (signed)	Date	Time
1.	Scott Beasinger	8/9/19	1400	J. MARCHAN	8/9/19	08:45
2.						
3.						

Sample Delivery Details / Laboratory Receipt

Delivered Directly to Lab: _____ Shipped No.:

_____ Method of Shipment: _____

_____ Fed Ex _____ Airbill Number:

_____ Analytical Lab: ALS 10450 Stancliff Rd. Suite 210 Houston, TX 77099 (281) 530-5656

ATTN: SONIA WEST Lab Recipient: Delivery Date/Time:

1.) Chain of Custody Number = date collected + custody number (e.g. 09-02-1999-01)

2.) Sample Type (SA) Codes: N = Normal Sample, TB = Trip Blank (-c) Sample, FD = Field Duplicate (-a) Samples, FR = Field Replicate (-b) Samples, EB = Equipment Blank (-d) Samples, MS = Matrix Spike, SD = Matrix Spike Duplicate, AB = Ambient Blank (-e)

3.) Sample Number: Unique sample number collected from a particular location per day. (e.g. Groundwater sample collected from MW-1 on 10/10/99 = 01, if sampled again on 10/10/99 = 02, etc.)

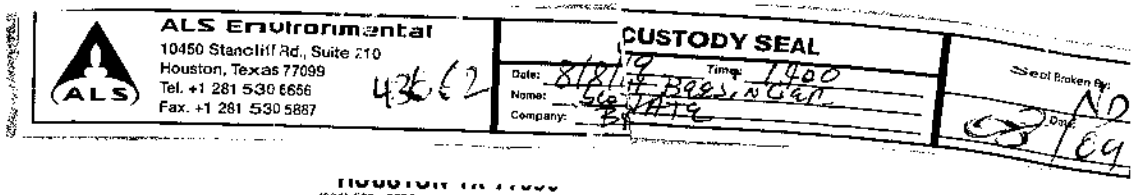
4.) Matrix Codes: GS = Soil Gas, WG = Groundwater, WS = Surface Water, SO = Soil, SE = Sediment, SL = Sludge, SS = Surface Soil Samples, WQ = Aqueous Blank Samples (trip, equipment, ambient, etc), SQ = Soil Blanks

5.) Sample Analysis Requested: Analytical method requested and number of containers provided for each.

6.) Quality assurance samples are assigned by date (ddmmyy) and the sample number associated with the sample (01, 02, etc) (e.g. Equipment blank collected in association with MW-1 on 10/10/99 will be designated 10109901 in the Equipment Blank Lot Control

Cooler 93662
Temp 1.8
1125
CF 0.0

00942698



ALS Environmental
10450 Stancliff Rd., Suite 210
Houston, Texas 77099
Tel. +1 281 530 5656
Fax. +1 281 530 5887

43662

CUSTODY SEAL
Date: 8/8/09 Time: 1400
Name: [illegible]
Company: [illegible]
Seal Broken By: ND
Date: 8/9/09

(281) 630-5656
REF: LHAAP/18/24 & SURFACE WATER - RJ
RMA:

43662
8/8/09 ND

FedEx Express

TRK# 4809 7834 3148

RETURNS MON-SAT

FedEx
TRK# 4809 7834 3148

FRI - 09 AUG 10:30A
PRIORITY OVERNIGHT

77099

Case Narrative

Method: 6850
Analysis: Perchlorate
Analysis SOP: LC-MS-CLO4
ALS WO ID(s): 1922027; 1922715; 1923027

Client: ALS Laboratories (Houston, TX)
Matrix: Water
ELMS Batch (HBN): 2281 (245600)

General Set Information: There were four field samples in these Work Orders. The samples were analyzed for perchlorate.

Method Summary: Each sample was prepared as noted below and analyzed using an Agilent 1100 LC/MSD system in select ion monitoring (SIM) mode at m/z 83 and 85, which corresponds to the loss of one oxygen atom from the perchlorate molecule. ChemStation software was used for instrument control and data analysis. The ion ratio of m/z 83 to 85 was used to positively identify the response peak as perchlorate. Quantitation was performed using the m/z 83 peak area. An internal standard (ISTD) of ^{18}O labeled perchlorate was added to each sample to establish the perchlorate peak retention time and used in quantitation.

Sample Preparation: A 10.0mL aliquot of each sample was transferred into a 15-mL centrifuge tube. 50µL of an ^{18}O labeled perchlorate solution was added to each sample as an internal standard. The samples were then capped, vortexed, and filtered into autosampler vial using Phenex PES membrane 0.45µm Syringe filters.

Holding Times: Holding times were met for all analyses.

Dilutions: NA

Method QC data: The method blank (LMB 668347) was less than 1/2 the CRDL. The recovery for the LCS (668348) was within acceptable parameters.

MS/MSD Analysis: MS/MSD was performed on samples 1922027001 (Client ID: LH18/24-SP650_073019_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. The spike target was 4.µg/L. The MS/MSD percent recoveries and relative percent difference (RPD) were within the performance limits.

Instrument QC: Instrument initial and continuing calibrations were performed in accordance with published procedures.

NC/CAR(s): NA

Sample Calculation: Samples were reported in µg/L. Results were calculated in µg/L by the equation (A)x(B),

where: A = Analyte concentration from the standard curve (µg/L)
B = Dilution performed at time of analysis

Miscellaneous Comments: These samples were analyzed in accordance with the requirements found in the DOD QSM Version 5.1.1. The Reporting Limit Verification Standard (RLVS – 668345) is reported from the analysis of the Laboratory Control Sample (LCS – 668348) at a level of 4.0µg/L. Due to limitations of the Chemstation Software, some of the chromatographic peaks may require manual integrations. A manual integration was performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 14AUGD05-08.

Thomas Bosch August 14, 2019
Analyst Date

ANALYTICAL REPORT

Report Date: August 14, 2019

RJ Modashia
ALS Environmental (Houston)
10450 Stancliff Road
Suite 210
Houston, TX 77099

Phone: 281 530-5656

E-mail: RJ.Modashia@ALSGlobal.com

Workorder: **34-1923027**
Project ID: HS19080486
Purchase Order: HS19080486
Project Manager Kevin W. Griffiths

Client Sample ID	Lab ID	Collect Date	Receive Date	Sampling Site
18WW19_080819	1923027001	08/08/19	08/13/19	
18WW20_080819	1923027002	08/08/19	08/13/19	

ANALYTICAL REPORT

Workorder: 34-1923027
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

Analytical Results

Sample ID: **18WW19_080819** | Sampling Site: NA | Collected: 08/08/2019
Lab ID: 1923027001 | Media: 125 mL Nalgene | Received: 08/13/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2281 (HBN: 245600) | **Percent Solid:** NA
Analyzed: 08/14/2019 10:22 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Sample ID: **18WW20_080819** | Sampling Site: NA | Collected: 08/08/2019
Lab ID: 1923027002 | Media: 125 mL Nalgene | Received: 08/13/2019
Matrix: Water | Sampling Parameter: NA

Analysis Method - EPA 6850, DoD QSM

Preparation: Not Applicable
Analysis: EPA 6850, DoD QSM Water | **Instrument ID:** LCMS04
Batch: ELMS/2281 (HBN: 245600) | **Percent Solid:** NA
Analyzed: 08/14/2019 10:36 | **Report Basis:** Wet

Analyte	Result (ug/L)	DL (ug/L)	LOD (ug/L)	LOQ (ug/L)	Dilution	Qual
Perchlorate	ND	1.0	2.0	4.0	1	U

Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Method	Analyst	Peer Review
EPA 6850, DoD QSM	/S/ Thomas Bosch 08/14/2019 12:01	/S/ Stephen Brose 08/14/2019 14:07

Laboratory Contact Information

ALS Environmental
960 W Levoy Drive
Salt Lake City, Utah 84123

Phone: (801) 266-7700
Email: alslt.lab@ALSGlobal.com
Web: www.alsslc.com

ANALYTICAL REPORT

Workorder: 34-1923027
Client: ALS Environmental (Houston)
Project Manager: Kevin W. Griffiths

General Lab Comments

The results provided in this report relate only to the items tested.
Samples were received in acceptable condition unless otherwise noted.
Samples have not been blank corrected unless otherwise noted.
This test report shall not be reproduced, except in full, without written approval of ALS.

ALS provides professional analytical services for all samples submitted. ALS is not in a position to interpret the data and assumes no responsibility for the quality of the samples submitted.

All quality control samples processed with the samples in this report yielded acceptable results unless otherwise noted.

ALS is accredited for specific fields of testing (scopes) in the following testing sectors. The quality system implemented at ALS conforms to accreditation requirements and is applied to all analytical testing performed by ALS. The following table lists testing sector, accreditation body, accreditation number and website. Please contact these accrediting bodies or your ALS project manager for the current scope of accreditation that applies to your analytical testing.

Testing Sector	Accreditation Body (Standard)	Certificate Number	Website
Environmental	PJLA (DoD ELAP)	L17-506	http://www.pjlabs.com
	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com
	Utah (TNI)	UT00953	http://lams.nelac-institute.org/search
	Nevada (TNI)	UT00953201-1	https://ndep.nv.gov/water/lab-certification
	Iowa (TNI)	IA# 376	http://www.shl.uiowa.edu/labcert/idnr/
	Kansas	E-10416	http://www.kdheks.gov/envlab/disclaimer.html
	Oklahoma (TNI)	IJ# 9980	http://www.deq.state.ok.us/CSDnew/labcert.htm
	Texas (TNI)	T104704456-18-9	https://www.tceq.texas.gov/assets/public/compliance/compliance_support/qa/txnelap_lab_list.pdf
Industrial Hygiene	AIHA (ISO 17025 & AIHA IHLAP)	101574	http://www.aihaaccreditedlabs.org
	DOECAP-AP	L18-606	http://www.pjlabs.com
	Washington	C596	https://ecology.wa.gov/Regulations-Permits/Permits-certifications/Laboratory-Accreditation
Dietary Supplements	PJLA (ISO 17025)	L17-507-R1	http://www.pjlabs.com

Result Symbol Definitions

MDL = Method Detection Limit, a statistical estimate of method/media/instrument sensitivity.
RL = Reporting Limit, a verified value of method/media/instrument sensitivity.
CRDL = Contract Required Detection Limit
Reg. Limit = Regulatory Limit.
ND = Not Detected, testing result not detected above the MDL or RL.
< Means this testing result is less than the numerical value.
** No result could be reported, see sample comments for details.

Qualifier Symbol Definitions

U = Qualifier indicates that the analyte was not detected above the MDL.
J = Qualifier Indicates that the analyte value is between the MDL and the RL. It is also used to indicate an estimated value for tentatively identified compounds in mass spectrometry where a 1:1 response is assumed.
B = Qualifier indicates that the analyte was detected in the blank.
E = Qualifier indicates that the analyte result exceeds calibration range.
P = Qualifier indicates that the RPD between the two columns is greater than 40%.

Quality Control Sample Batch Report

Analysis Information

Workorder: 1923027

Limits:	Client SOW/Contract Specified	**Preparation:**	NA	**Analysis:**	EPA 6850, DoD QSM
Basis:	DoD QSM	**Batch:**	NA	**Batch:**	ELMS/2281 (HBN: 245600)
		Prepared By:	NA	**Analyzed By:**	Thomas Bosch

Blank

LMB: 668347
Analyzed: 08/14/2019 09:11
Units: ug/L

Analyte	Result	MDL	RL
Perchlorate	ND	1	2.00

Laboratory Control Sample

LCS: 668348
Analyzed: 08/14/2019 08:43
Dilution: 1
Units: ug/L

Analyte	Result	Target	% Rec	QC Limits	
Perchlorate	4.00	4.00	100	78.8	123.8

Matrix Spike - Matrix Spike Duplicate

Sample: 1922027001	**MS:** 668349	**MSD:** 668350
Analyzed: 08/14/2019 09:25	**Analyzed:** 08/14/2019 09:39	**Analyzed:** 08/14/2019 09:54
Dilution: 1	**Dilution:** 1	**Dilution:** 1
Units: ug/L	**Units:** ug/L	**Units:** ug/L

Analyte	Result	Result	Target	% Rec	QC Limits		Result	% Rec	RPD	QC Limits	
Perchlorate	ND	3.69	4	92.2	78.8	123.8	3.63	90.7	1.61	0.0	20.0

QC Report Authorization (/S/ is an electronic signature that complies with 21 CFR Part 11)

Analyst	Peer Review
/S/ Thomas Bosch	/S/ Stephen Brose
08/14/2019 12:06	08/14/2019 14:07

Symbols and Definitions

- * - Analyte above reporting limit or outside of control limits
- ▲ - Sample result is greater than 4 times the spike added
- ◆ - Sample and Matrix Duplicate less than 5 times the reporting limit
- ● - Result is above the calibration range
- # - The Matrix Spike, Matrix Spike duplicate or Matrix Duplicate is reported for your information only. The sample matrix may be inappropriate for the method selected.

RPD - Relative % Difference (Spike / Spike Duplicate)
ND - Not Detected (U - Qualifier also flags analyte as not detected)
NA - Not Applicable
QC results are not adjusted for moisture correction, where applicable

10450 Stancliff Rd, Ste 210
Houston, TX 77099
T: +1 281 530 5656
F: +1 281 530 5887
www.alsglobal.com

Subcontract Chain of Custody

18698/# 2

SAMPLING STATE: **Texas**

COC ID: **11956**

SUBCONTRACT TO:

1923027

ALS Laboratory Group
960 LeVoy Dr
Salt Lake City, UT 84123

Phone: +1 801 266 7700

CUSTOMER INFORMATION:

Company:	ALS Houston
Contact:	RJ Modashia
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Email:	RJ.Modashia@alsglobal.com
Alternate Contact:	
Email:	

INVOICE INFORMATION:

Company:	ALS Houston
Contact:	Accounts Payable
Address:	10450 Stancliff Rd, Ste 210
Phone:	+1 281 530 5656
Reference:	HS19080486
TSR:	Danielle Winnings

	LAB SAMPLE ID	CLIENT SAMPLE ID	MATRIX	COLLECT DATE
	ANALYSIS REQUESTED			DUE DATE
1.	**HS19080486-01**	**18WW19_080819**	**Groundwater**	**08 Aug 2019 08:25**
	SUB_Perch-6850			23 Aug 2019
2.	**HS19080486-02**	**18WW20_080819**	**Groundwater**	**08 Aug 2019 09:15**
	SUB_Perch-6850			23 Aug 2019

Comments: Please analyze for the analysis listed above.
Send report to the emails shown above.

QC Level: DOD IV (DoD Data Package)

Relinquished By: _____ Date/Time: 8/12/19 18:00

Received By: _____ Date/Time: 8/13/19 09:07

Cooler ID(s): _____ Temperature(s): _____

ALS-Salt Lake City-Related Information Report (CRIR)

Cooler or Container Information Checklist (Fill In or Circle)

1923027

Client Name: ALS Houston

Project/Task/Site:

Date/Time of Receipt: 8/13/19 09:07

Number of Coolers Received: 1

Condition of Coolers:	(Acceptable)/Unacceptable	Temperature Control:	(Present)/Not Included
Cooler Custody Seals:	(Present)/Absent/NA		
	(Intact)/Broken/NA	Location Temp Taken:	(Control)/Between Samples
Container Custody Seals:	Present/(Absent)/NA		
	Intact/Broken/(NA)	Are all temperatures within project specific guidelines?	(Yes)/No/NA
Ice Present:	(Yes)/No/NA		
	(Frozen)/Melted/NA	VOA Headspace Present?	Yes/No/(NA)

pH Check Performed:							
	Metals	Yes/No/NA	Total Phenolics	Yes/No/NA	NO3/NO2	Yes/No/NA
	Cyanide	Yes/No/NA	TPH – 418.1	Yes/No/NA	Oil & Grease	Yes/No/NA
	Sulfide	Yes/No/NA	COD	Yes/No/NA	Total Phosphorous	Yes/No/NA
	Ammonia	Yes/No/NA	TKN	Yes/No/NA	Gross A.B, Gamma Spec	Yes/No/NA

Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.	Cooler Received	DCL Cooler No.	Temp.
1	C19 9827	3 °C	4	C19	°C	7	C19	°C
2	C19	°C	5	C19	°C	8	C19	°C
3	C19	°C	6	C19	°C	9	C19	°C

Taken By: Jaylynn Johnson (Signature) Jaylynn Johnson (Printed Name) 8/13/19 (Date)

Client-Related Information

☐ Missing Cooler	☐ Missing Samples/Bottles	☐ Incorrect Preservation	☐ Insufficient Sample Volume
☐ Cooler Conditions	☐ Broken/Leaking Samples	☐ pH Criteria Not Met	☐ Chain of Custody Problems
☐ Missing Paperwork	☐ Incorrect Bottle Type	☐ Residual Chlorine Present	☐ Other:
☐ Missing/Incorrect Bottle Labels	☐ Cooler Temperatures Out of Range	☐ Head Space in Bottles	

Briefly Describe the Problem and the Action Taken:

Client Notified? Yes ☐ No ☐

Response Required Within 24 Hours

Project Management

Project Manager Comments:

ALS Project Manager: _____ (Printed Name) Returned to Sample Receipt by: _____ (Signature) Date: _____

CRIR.doc

Revised 01/01/2018

Must Deliver Next Business Day
Time and Temperature Sensitive!

ORIGIN ID:SGRA (281) 530-5656
CLIENT SERVICES
ALS LABORATORY GROUP
10450 STANCLIFF ROAD
SUITE 210
HOUSTON, TX 77099
UNITED STATES US

SHIP DATE: 12AUG19
ACTWGT: 13.75 LB
CAD: 300130/CAFE3211
DIMS: 14x11x10 IN

BILL THIRD PARTY

TO SAMPLE RECEIVING
ALS ENVIRONMENTAL
960 W. LEVOY DRIVE

SALT LAKE CITY UT 84123
(801) 266-7700
REF: HS19080486 - RJ

FedEx Express

J18711806050Uv

THU 0201 4809 7836 6907

TUE - 13 AUG 10:30A
PRIORITY OVERNIGHT

AX BTFA

84123
UT-US SLC

RT 907 ST 9 5 10:30 A 6907 08.13

5510

Scan By:

ALS Environmental

CHAIN-OF-CUSTODY

Project / Job / Task: HS19080486	Split:	Workorder ID: 1923027	Level: ENV_LVL4	Requested Analysis
Client: ALS Environmental (Houston)		Account: 8101	Type: 125Poly	
Comments:			Preservatives: COOL	

Item	Collect Date/Time	Sample ID	Lab ID	QC	Matrix	Containers ID(s)	Containers Count	EPA 6850, DoD QSM
1	08/08/2019 08:25	18WW19_080819	1923027001		Water	A	1	A
2	08/08/2019 09:15	18WW20_080819	1923027002		Water	A	1	A
3								
4								
5								
6								
7								
8								
9								
10								

ORIGINAL FIELD SAMPLE CHAIN-OF-CUSTODY

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location
Warath, Julie	08/13/2019 09:07	ALS Sample Receiving	Sample Login
[signature] R.33.1	8/13/19 1400 8-14-19/08:20	60B T. Boak	Storage CLO4 ANALYSIS

SAMPLE PREPARATION / ANALYSIS CHAIN-OF-CUSTODY

Sample Prep / Analysis for: _____ Lab Notebook No.: _____

Prepared / Analyzed by: _____ Date / Time: _____

Relinquished By: (Signature)	Date / Time	Received By: (Signature)	Reason for Transfer / Storage Location

00942709

Batch Worklist

Batch: ELMS/ 2281 **Created:** 8/14/2019 07:41 **Instrument:** LCMS04 **HBN:** 245600
Rule: EPA 6850, DoD QSM Water **Analyst:** T. Bosch **Status:** WP

Workorder: 1922027 [ENV_LVL4]
Workorder: 1922715 [ENV_LVL4]
Workorder: 1923027 [ENV_LVL4]

Pos	Lab ID	Sample ID	Prep Initial	Prep Final	Dust Weight	Type	Mx	Container	Procedure	Mgr	Expire Date	Due Date	Run Date
1	668344	CCV for HBN 245600 [ELMS/2281]				CCV	3		E685041C3Q	5311		8/14/2019	8/14/2019
2	668348	LCS for HBN 245600 [ELMS/2281]				LCS	3		E6850Q413Q	5311		8/14/2019	8/14/2019
3	668346	ICS for HBN 245600 [ELMS/2281]				ICS	3		E6850..D3Q	5311		8/14/2019	8/14/2019
4	668347	LMB for HBN 245600 [ELMS/2281]				LMB	3		E6850Q413Q	5311		8/14/2019	8/14/2019
5	1922027001	LH18/24-SP650_073019_BIX				SAMPLE	3	1922027001-A	E6850Q41.3	5480	8/27/2019	8/14/2019	8/14/2019
6	668349	LH18/24-SP650...(1922027001MS)				MS	3		E6850Q413Q	5311		8/14/2019	8/14/2019
7	668350	LH18/24-SP65...(1922027001MSD)				MSD	3		E6850Q413Q	5311		8/14/2019	8/14/2019
8	1922715001	LH18/24-SP650_080619_BIX				SAMPLE	3	1922715001-A	E6850Q41.3	5480	9/3/2019	8/22/2019	8/14/2019
9	1923027001	18WW19_080819				SAMPLE	3	1923027001-A	E6850Q41.3	5480	9/5/2019	8/26/2019	8/14/2019
10	1923027002	18WW20_080819				SAMPLE	3	1923027002-A	E6850Q41.3	5480	9/5/2019	8/26/2019	8/14/2019
11	668345	RLVS for HBN 245600 [ELMS/2281				RLVS	3		E685041C3Q	5311		8/14/2019	8/14/2019
12	668351	CCV for HBN 245600 [ELMS/2281]				CCV	3		E685041C3Q	5311		8/14/2019	8/14/2019

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Analytical Documentation

Analyst Write-up

ALS Work Order #'s & Sample #( )'s: 1922027 (001); 1922715 (001); 1923027 (001)
ELMS Batch/HBN ID: 2281 (245600)
Prep Date: 08/13/2019 Analysis Date: 08/14/2019 Analyst: T. Bosch
Analyte: **Perchlorate** Matrix: **Water** Method: **6850**
Sequence: \\HPCHEM\1\SEQUENCE\CLO4\2019\AUG\14AUG19D.s
Reported DL: **1.0µg/L** Reported LOD: **2.0µg/L** Reported LOQ: **4.0µg/L**

SAMPLE PREPARATION/ANALYSIS:

Water: Samples were prepared by Thomas Bosch. 10.0mL of each sample was pipetted into a 15-mL centrifuge tube, and 50µL of an oxygen-18 labeled perchlorate solution was added as an internal standard. The samples were capped, vortexed, and filtered with Phenex PES membrane 0.45µm Syringe filters prior to analysis.

REAGENTS: Eluent A1: 95% ASTM Type II water (ALS)/ 5% ACN (B&J Lot AH015-4)/0.1% glacial acetic acid (JT-Baker Lot 04802).
Eluent B1: 95% ACN (B&J Lot AH015-4)/ 5% ASTM Type II water (ALS)/0.1% glacial acetic acid (JT-Baker Lot 04802).

STANDARDS: Internal Standard Spiking Solution Horizon# 43730. Dilutions of Working Standard Solution ID 43702 used for CCV's, LODV's, RLVS and IPC.

CALIBRATION CURVE: Used curve from 03/19/2019, sequence 19MAR19D.s Offline Quantitation Method: CLO4-DP2.M

INSTRUMENT CONDITIONS: Samples were analyzed with an Agilent 1100 LC/MSD system, in negative SIM mode, monitoring m/z 83, 85, and 89.
Instrument ID: LCMS04 Online Acquisition Method: CLO4-AQN.M Fragmentor: 160 Output Gain: 10 Injection Volume: 50µL
Column: KP-RPPX C8 separator, 250mm Mobile Phase: 70% Eluent A1; 30% Eluent B1

FLOW GRADIENT:

Time (min.)	Flow (mL/min)
0	0.65
5.8	0.65
5.9	0.25
10.3	0.25
10.5	0.65
12.0	0.65

QC DATA: 4.0µL of QC Solution Horizon ID 47516 was used for LCS 668348; Target = 4.0µg/L. ASTM type II water was used for LMB 668347.

MS/MSD: The Matrix Spike and duplicate (MS/MSD) were performed on sample 1922027001 (Client ID: LH18/24-SP650_073019_BIX). 4.0µl of Working Standard Solution Horizon ID 43701 was added to 10.0mL of sample preparation. Spike target = 4.0µg/L.

COMMENTS:

1) Results reported in µg/L.
2) All QC, Blank, CCV, and MS/MSD results were within method parameters.
3) Sample data can be viewed at two directories within the ALS system: \\ALSLTWS013\LCMS\LCMS04\2019\AUG\HBN# or through NuGenesis\Tree\PrintData\LCMS\DefaultView.
4) Notebook: \\alsltws013\ORGANIC\BOSCH\LCMS\Perchlorates\Waters\2019\245600-DoD-ALS-Hstn LCMS4 or through \\ALSLTWS013\DATAREVIEW\HBN#
5) The Reporting Limit Verification Standard (RLVS – 668345) is reported from the analysis of the Laboratory Control Sample (LCS – 668348) at a level of 4.0µg/L.
6) Due to limitations of the Chemstation Software, some of the chromatographic peaks require manual integration. Manual Integrations were performed for one of the Initial Calibration analyses (datafile: 19MARI03) along with datafiles 14AUGD05-08.

5.5 Chromatography (GC, HPLC and LC/MS) Technical Review

Note: It is the peer reviewer's responsibility to ensure that appropriate criteria are used as defined in the HORIZON PROFILE. The evaluation criteria are prioritized as per Section 2.2 of this SOP. These items must be checked for all projects. The following checklist will be completed by both the analyst and the peer reviewer and scanned into the HBN folder with the raw data.

Chromatography (GC, HPLC, LC/MS) Technical Review Criteria Batch(es)/SDG: ELMS: 2281 HBN: 245600 Sample Set IDs if Applicable: 1922027/1922715/1923027	Analyst Initials	Reviewer Initials
Calibration standards analyzed and meets criteria	TB	SB
Standards traceability checked and meets criteria	TB	SB
Standard curve coefficients evaluated and meet criteria	TB	SB
ICVs analyzed and meet acceptance criteria	TB	SB
CCVs analyzed and meet acceptance criteria	TB	SB
Method Blanks analyzed and meet acceptance criteria	TB	SB
Retention Time Windows checked	TB	SB
For method 8081A, Endrin/DDT Breakdown is checked for compliance	—	—
Surrogate recoveries checked and appropriately addressed	—	—
Method Preparation Blanks analyzed and meet acceptance criteria	TB	SB
MSs, MSDs, and/or MDs analyzed and calculations checked; applicable flags applied on QC reports; LCSs analyzed and meet acceptance criteria when performed	TB	SB
RLVS analyzed	TB	SB
Preparation and analysis hold times met	TB	SB
Preparation deviations and re-preparations noted when performed	TB	SB
Analysis deviations and re-analyses noted when performed	TB	SB
Sample dilution factors noted on reports	TB	SB
Electronic records in HBN transcription accuracy and completeness checked	TB	SB
Preparation and analysis calculations checked	TB	SB
NCRs are completed as necessary NC/CAR#	—	—
Report forms are complete and accurate	TB	SB
Manual integrations checked	TB	SB

STANDARD REPORT

Working Standard - CLO4 WRK

CLO4 WRK — Description - 6850 WKG Std 100.ug/L

Standard: 43702
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 WRK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	0.1 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43701	CLO4 INT	6850 Intermdt AccStd 10.ug/mL	CLO4 INT	0.1 mL	09/18/2019

STANDARD REPORT

Constituent

Stock Standard - CLO4 STOCK

CLO4 STOCK — Description - 6850 Stock AccStd 1,000ug/mL

Standard: 43659
MFG: AccuStandard
MFG Lot: 218065075
Part ID: IC-PER-10X-1

Created By: Thomas Bosch
Create Date: 09/17/2018 09:09AM

Amount: 100 mL
Expires: 07/25/2020
Usable: No
Lab Lot: CLO4 STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O		Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025
MFG Lot: Not Provided		Usable: Yes
Part ID: Not Provided		Lab Lot: LAB 109

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

STANDARD REPORT

Constituent

Working Standard - CLO4 INT

CLO4 INT — Description - 6850 Intermdt AccStd 10.ug/mL

Standard: 43701
MFG: ALS/SLC
MFG Lot: TNB: 09/18/2018
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 09/18/2018 02:09PM

Amount: 10 mL
Expires: 09/18/2019
Usable: Yes
Lab Lot: CLO4 INT

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
43659	CLO4 STOCK	6850 Stock AccStd 1,000ug/mL	CLO4 STOCK	0.1 mL	07/25/2020

STANDARD REPORT

Working Standard - CLO4 QC WRK

CLO4 QC WRK — **Description - 6850 QC WKG STD 100ug/L**

Standard: 47516
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC WRK 100.ug/L

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	100 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
47515	CLO4 QC INT	6850 QC Intrmdt Std-QC 10ug/mL	CLO4 QC INT 10.ug/mL	0.1 mL	03/31/2020

STANDARD REPORT

Constituent

Solvent Standard - ASTM H2O

ASTM H2O			Description - ASTM Type II Water
Standard: 109	Created By: ALS Support (Lims)	Amount: 1000 L	
MFG: DCL In House	Create Date: 10/06/2005 09:10AM	Expires: 11/07/2025	
MFG Lot: Not Provided		Usable: Yes	
Part ID: Not Provided		Lab Lot: LAB 109	

Pos.	Analyte	Name	Concentration
Solvent - Analyte(s) not applicable			

ALS

STANDARD REPORT

Constituent

Stock Standard - CLO4 QCSTOCK

CLO4 QCSTOCK — **Description - 6850 QC Stock STD 1,000ug/mL**

Standard: 36748
MFG: Ultra Scientific
MFG Lot: CP-0860
Part ID: ICC-013

Created By: Thomas Bosch
Create Date: 05/11/2017 01:05PM

Amount: 100 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC STOCK

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	1000 ug/mL

STANDARD REPORT

Constituent

Working Standard - CLO4 QC INT

CLO4 QC INT — Description - 6850 QC Intrmdt Std-QC 10ug/mL

Standard: 47515
MFG: ALS/SLC
MFG Lot: TNB: 05/06/2019
Pipette ID: Not Provided

Created By: Thomas Bosch
Create Date: 05/06/2019 03:05PM

Amount: 10 mL
Expires: 03/31/2020
Usable: Yes
Lab Lot: CLO4 QC INT 10.ug/mL

Pos.	Analyte	Name	Concentration
1	14797-73-0	Perchlorate	10 ug/mL

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
109	ASTM H2O	ASTM Type II Water	LAB 109	9.9 mL	11/07/2025
36748	CLO4 QCSTOCK	6850 QC Stock STD 1,000ug/mL	CLO4 QC STOCK	0.1 mL	03/31/2020

STANDARD REPORT

Working Standard - CLO4ISTDWRK

CLO4ISTDWRK — Description - Perchlorate ISTD Wrk 1,000ug/L

Standard: 43730	**Created By:** Thomas Bosch	**Amount:** 25 mL
MFG: ALS/SLC	**Create Date:** 09/20/2018 09:09AM	**Expires:** 09/20/2019
MFG Lot: TNB: 05/09/2018	**Verified By:** Thomas Bosch	**Usable:** Yes
Pipette ID: Not Provided	**Verify Date:**	**Lab Lot:** CLO4ISTDWRK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	1000 ug/L
2	14797-73-0-89	Perchlorate 89	1000 ug/L

Composition

Standard	Standard ID	Description	Lab Lot ID	Volume	Expires
43729	CLO4ISTDSTK	Perchlorate ISTD Stock	CLO4ISTDSTK	0.25 mL	04/28/2026

STANDARD REPORT

Constituent

Stock Standard - CLO4ISTDSTK

CLO4ISTDSTK — Description - Perchlorate ISTD Stock

Standard: 43729
MFG: Cambridge Isotope
MFG Lot: SDFF-012A
Part ID: OLM-7310-S

Created By: Thomas Bosch
Create Date: 09/20/2018 09:09AM
Verified By: Thomas Bosch
Verify Date:

Amount: 1 mL
Expires: 04/28/2026
Usable: Yes
Lab Lot: CLO4ISTDSTK

Pos.	Analyte	Name	Concentration
1	14797-73-0-8385	Perchlorate 83:85 Ratio	100 ug/mL
2	14797-73-0-89	Perchlorate 89	100 ug/mL

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Product Name: Perchlorate IC Standard

Description:
This Reference Material (RM) was gravimetrically prepared in accordance with ISO Guide 34 and under ULTRA Scientific's ISO 9001 registered quality system. The neat materials used for this product have been verified by ULTRA's ISO 17025 laboratory and under ULTRA's ISO Guide 34 accreditation. The analyte concentrations were verified by ULTRA's ISO 17025 accredited laboratory. For each analyte, the true value, with its uncertainty value calculated at the 95% confidence level, is reported below.

Analyte	Starting Material	Lot Number	Purity (%)	Calculated Value	True Value	Traceability & Method
perchlorate	potassium perchlorate	RM07987	100	1001 ± 5 µg/mL	976 ± 6 µg/mL	NIST SRM 3141A; ICP-OES

Solvent: water (low TOC, < 50 ppb)

Storage: Store at Room Temperature (15° to 30°C).

Traceability:
Traceability has been established through an unbroken chain of comparisons, each having stated uncertainties. Comparisons are based on appropriate physical or chemical measurements, including gravimetric or volumetric dilution, where the mass or volume of a solution before and after dilution is measured. The balances used for these measurements are calibrated with weights traceable to NIST in compliance with ANSI/NCSL Z-540-1, ISO 9001, ISO 17025, and ISO Guide 34. Calibrated Class A glassware is used for volumetric measurements. Thermometers are calibrated against a NIST traceable thermometer in accordance with NIST Special Publication 819.

Estimation of Uncertainties:
The true value is reported, with its uncertainty value calculated at the 95% confidence level.

Homogeneity:
This RM was formulated and unitized according to an in-house procedure and is guaranteed to be homogeneous. There is no minimum sub-sample size required.

Intended Use:
This RM is intended for the preparation of working reference samples for use in routine laboratory analyses, calibration of instruments, validation of analytical methods, assessments of measurement methods and continuing calibration verification.

Instructions for Use:
Sample aliquots for analysis should be withdrawn at 20°C to 25°C immediately after opening and should be processed without delay for the true value to be valid within the stated uncertainties. Do not pipet from the bottle. Do not return any material removed for pipetting to the bottle. Tightly cap the bottle after removing any material and store according to the instructions noted above.

Hazards:
Refer to the Safety Data Sheet for information regarding this RM.

Expiration of Certification:
The certification of this RM is valid, within the measurement uncertainty specified, until the expiration date specified above, provided the RM is handled and stored in accordance with the instructions given in this certificate. This certification is nullified if the RM is damaged, contaminated, or otherwise modified.

ANAB ACCREDITED REFERENCE MATERIAL PRODUCER
ANAB ACCREDITED TESTING LABORATORY

ULTRA SCIENTIFIC
Analytical Solutions

Certificate of Analysis

ISO Guide 34 Reference Material

Product Number: ICC-013
Lot Number: CP-0860

Lot Issue Date: 29-Feb 2016
Expiration Date: 31-Mar 2020

Maintenance of Certification:
The real-time, long term stability of the RM may be monitored over the lifetime of the certification. If substantive changes occur that affect the certification before the expiration of this certificate, ULTRA Scientific will notify the purchaser.

Peter A. King, Ph.D.
VP, Technical Operations

Daniel J. Lamendola
Director of QA/RA

125 Market Street
New Haven, CT 06513
USA

AccuStandard®

Tel (203)786-5290
Fax (203)786-5287
www.AccuStandard.com

CERTIFICATE OF ANALYSIS

S 43659

AccuTrace™ Reference Standard

Catalog No: IC-PER-10X-1
Description: Perchlorate Standard
Element: Perchlorate (ClO_4)
SRM: Ind. Std.
Lot: 218065075
Matrix: Water
Hazards: *Refer to SDS for complete safety information*

Date Certified: Jun 25, 2018
Expiration: Jul 25, 2020
Sample Size: 100 mL
Components: 1
Storage Condition: Ambient (>5 °C)
Included on ISO/IEC 17025 Scope of Accreditation: Yes
Included on ISO 17034 Scope of Accreditation: Yes

Signal Word: None

Component		SRM #	Prepared Concentration (µg/mL)
ClO_4	Perchlorate	Ind. Std.	1000

The gravimetric uncertainty for this product is ±0.24%.
The final solution was checked against an independent standard to verify its concentration.
We use the highest purity raw materials available to minimize impurity levels in the final solution. Typically 99.999%+ pure starting materials are used as well as ASTM Type I 18 megohm deionized water.
All solutions are filtered through a 0.2 µm filter prior to being bottled.
All glassware used in preparation is Class A and calibrated regularly.
All weights are traceable through N.I.S.T. Test No. 822-275872-11
All bottles are triple rinsed with deionized water prior to use.
Shake bottle prior to use and do not pipette directly out of the bottle. Use only cleaned Class A volumetric glassware.
We certify the accuracy of this standard to be ±0.5% of the stated value until its expiration date provided it is kept tightly capped and stored under the conditions stated above.

Certified By: Meigan O'Leary
Meigan O'Leary, Inorganic QC Manager

For use in routine laboratory analysis.

AccuStandard is accredited to ISO 17034, ISO/IEC 17025 and certified to ISO 9001:2015

AccuStandard

Cambridge Isotope Laboratories, Inc.

Certificate of Analysis

Quality Standards:
ISO Guide 34 • ISO/IEC 17025 • ISO 13485 • cGMP

23118

Product Name: (Isotopic Label & Enrichment Specification)	PERCHLORIC ACID, SODIUM SALT (18O4, 90%+) 100 UG/ML IN WATER
Lot Number:	SDDG-013
Catalog Number:	OLM-7310-S

Product Information

Chemical Purity Specification:	≥98%
Labeled CAS Number:	NA
Unlabeled CAS Number:	7601-89-0
MW*:	130.4
Chemical Formula:	NaCl*O4
Storage:	Store at room temperature away from light and moisture.
Stability:	See storage and expiration date.

Certification

Cambridge Isotope Laboratories, Inc. guarantees that this material meets or exceeds the specifications stated. Absolute identity as well as chemical and isotopic purities are assured by the use of unambiguous synthetic routes and multiple chemical analyses whenever possible. Results are representative of QC testing at time of release from Quality Control unless otherwise stated.

Volumetric measurements were made with Class A glassware. Gravimetry is traceable to the NIST through calibrated balances and certified, calibrated, standard weights. The calibrations are traceable to the NIST under Test No. 822/270236-04. The calibrations also meet specifications outlined in ISO 9001, ISO/IEC 17025, ANSI/NSCL Z540-1-1994, NCR Document 10CFR50 Appendix B, and applicable subdocuments.

This COA references the bulk catalog number before packaging. The COA also applies to the CIL finished good catalog number. Some possible packaging sizes and their corresponding suffix are -1.2, -1, -0.5, -10, or -0.1.

* *For isotopically labeled compounds, MW listed is for the fully enriched product.*

Approved by: T. J. Eckersley

Timothy J. Eckersley, Ph.D., Quality Assurance

Quality Control Tests and Results

QC Release Date	2/27/2014
Expiration Date	2/27/2024
Concentration Based on Gravimetry	102 µg/mL
Chemical Purity of Neat Material(s)	98%
LC/MS for Concentration	109.4 ± 2.8 µg/mL (k=2)

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#*	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
*	668344 CCV@25	Vial 71	1	Control	1	1.41705e6	7.940	23.98275
*	668348 QC@4.0	Vial 72	1	Control	2	2.54232e5	7.968	4.00063
*	668346 ICS@4.0	Vial 73	1	Control	3	1.69006e5	7.781	3.16133
*	668347 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1922027001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	668349 220271S	Vial 76	1	Sample	6	1.85325e5	7.618	3.68787
*	668350 220271D	Vial 77	1	Sample	7	1.87103e5	7.610	3.62903
*	1922715001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1923027001	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1923027002	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	668351 CCV@25	Vial 71	1	Control	11	1.38922e6	7.982	23.06424

#*	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
*	668344 CCV@25	Vial 71	1	Control	1	4.43367e5	7.960	25.20664
*	668348 QC@4.0	Vial 72	1	Control	2	8.12716e4	7.989	4.15621
*	668346 ICS@4.0	Vial 73	1	Control	3	6.47272e4	7.805	3.88663
*	668347 LMB	Vial 74	1	Control	4	0.00000	0.000	0.00000
*	1922027001	Vial 75	1	Sample	5	0.00000	0.000	0.00000
*	668349 220271S	Vial 76	1	Sample	6	6.51794e4	7.628	4.19725
*	668350 220271D	Vial 77	1	Sample	7	6.53175e4	7.615	4.09697
*	1922715001	Vial 78	1	Sample	8	0.00000	0.000	0.00000
*	1923027001	Vial 79	1	Sample	9	0.00000	0.000	0.00000
*	1923027002	Vial 80	1	Sample	10	0.00000	0.000	0.00000
*	668351 CCV@25	Vial 71	1	Control	11	4.40722e5	7.997	24.55800

#*	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
*	668344 CCV@25	Vial 71	1	Control	1	1.80205e5	7.960	5.00000
*	668348 QC@4.0	Vial 72	1	Control	2	2.09396e5	7.994	5.00000
*	668346 ICS@4.0	Vial 73	1	Control	3	1.78427e5	7.807	5.00000
*	668347 LMB	Vial 74	1	Control	4	2.39409e5	8.172	5.00000
*	1922027001	Vial 75	1	Sample	5	1.62744e5	7.641	5.00000
*	668349 220271S	Vial 76	1	Sample	6	1.66279e5	7.631	5.00000
*	668350 220271D	Vial 77	1	Sample	7	1.70743e5	7.634	5.00000
*	1922715001	Vial 78	1	Sample	8	1.55455e5	7.625	5.00000
*	1923027001	Vial 79	1	Sample	9	2.03712e5	7.859	5.00000
*	1923027002	Vial 80	1	Sample	10	2.10021e5	7.856	5.00000
*	668351 CCV@25	Vial 71	1	Control	11	1.84112e5	7.983	5.00000

*** End of Report ***

Sequence Table:

Method and Injection Info Part:

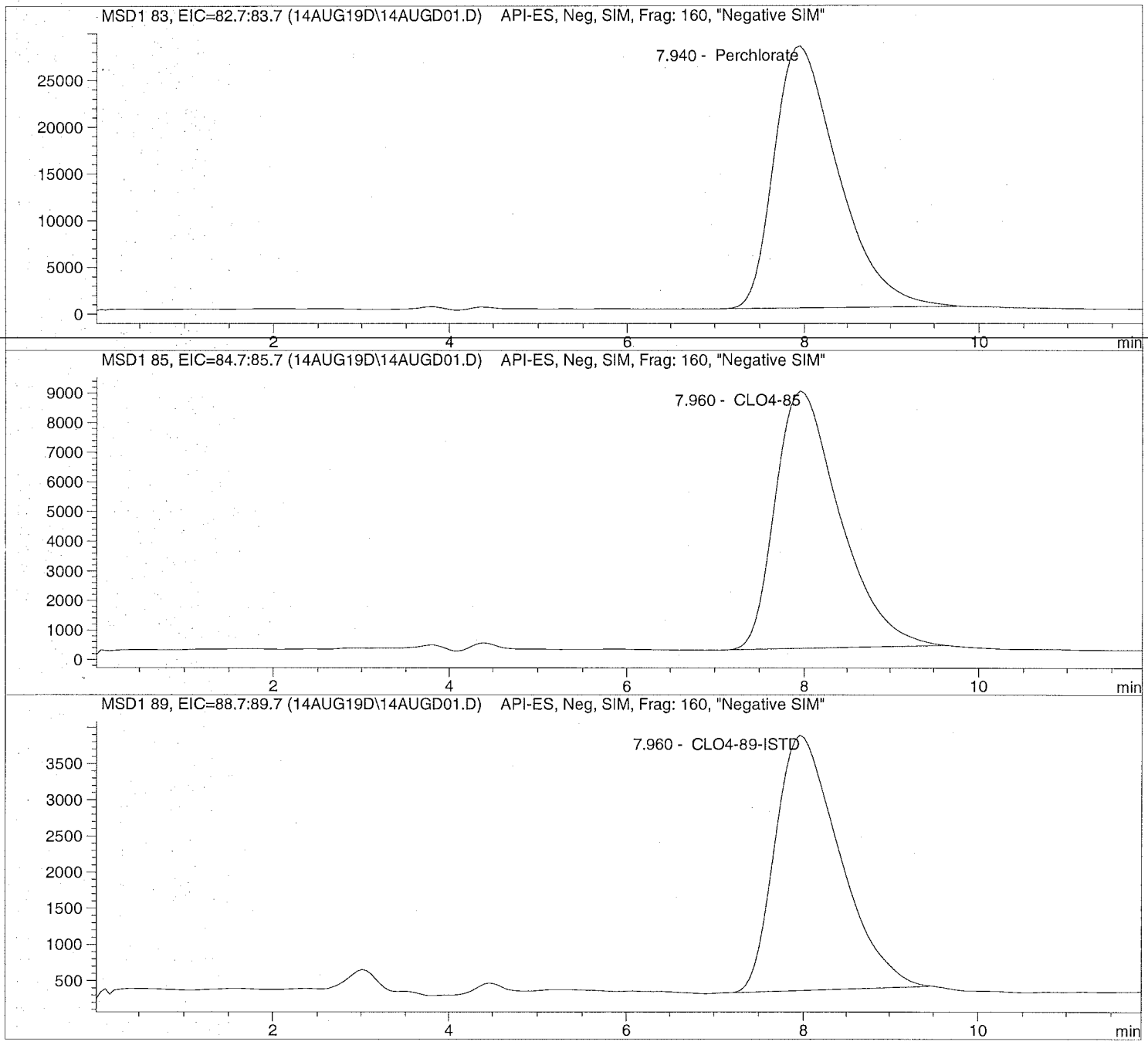
Line	Location	SampleName		Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	668344	CCV@25	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	668348	QC@4.0	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	668346	ICS@4.0	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	668347	LMB	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	1922027001		CLO4-AQN	1	Sample		
6	Vial 76	668349	220271S	CLO4-AQN	1	Sample		
7	Vial 77	668350	220271D	CLO4-AQN	1	Sample		
8	Vial 78	1922715001		CLO4-AQN	1	Sample		
9	Vial 79	1923027001		CLO4-AQN	1	Sample		
10	Vial 80	1923027002		CLO4-AQN	1	Sample		
11	Vial 71	668351	CCV@25	CLO4-AQN	1	Ctrl Samp		

Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD01.D Sample Name: 668344 CCV@25

Injection Date:	8/14/2019 08:28:02	Seq Line:	1
Sample Name:	668344 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD01.D Sample Name: 668344 CCV@25

Injection Date:	8/14/2019 08:28:02	Seq Line:	1
Sample Name:	668344 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.940	PBA	1417055.0	23.9827	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.960	PBA	443367.1	25.2066	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.960	PBA	180205.1	5.0000	CLO4-89-ISTD

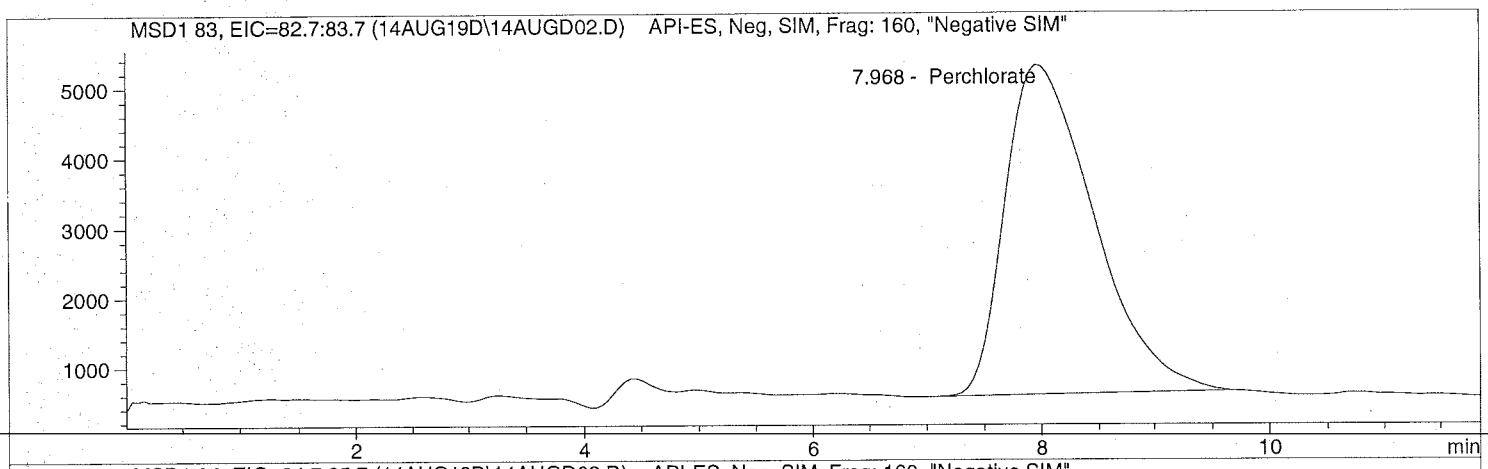
*** End of Report ***

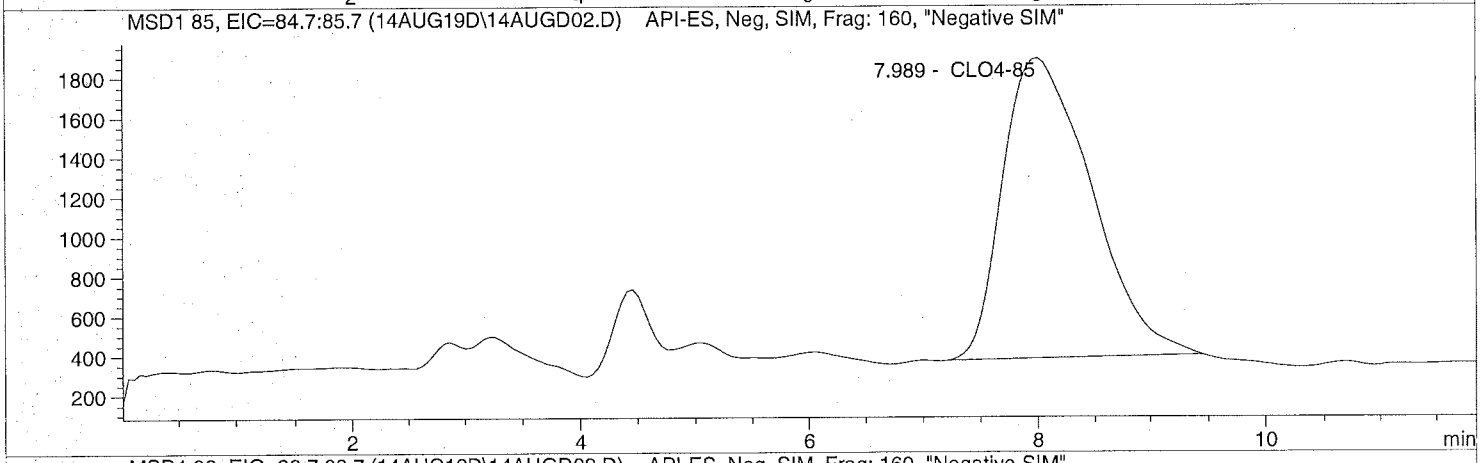
Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD02.D Sample Name: 668348 QC@4.0

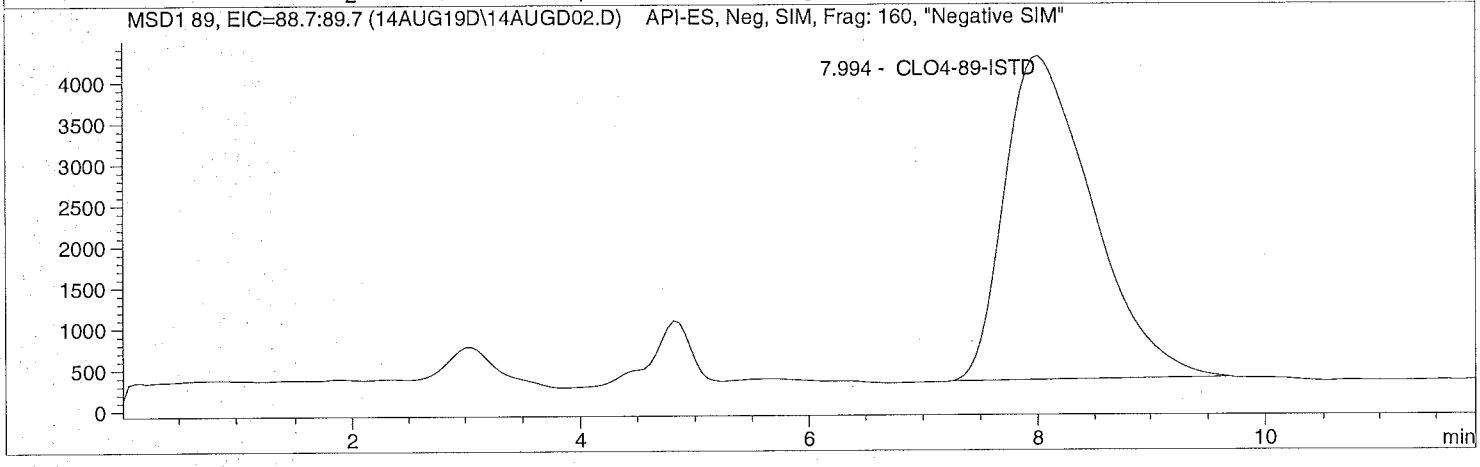
Injection Date:	8/14/2019 08:43:08	Seq Line:	2
Sample Name:	668348 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD02.D Sample Name: 668348 QC@4.0

Injection Date:	8/14/2019 08:43:08	Seq Line:	2
Sample Name:	668348 QC@4.0	Location:	Vial 72
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.968	PBA	254232.1	4.0006	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.989	PBA	81271.6	4.1562	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.994	PBA	209395.8	5.0000	CLO4-89-ISTD

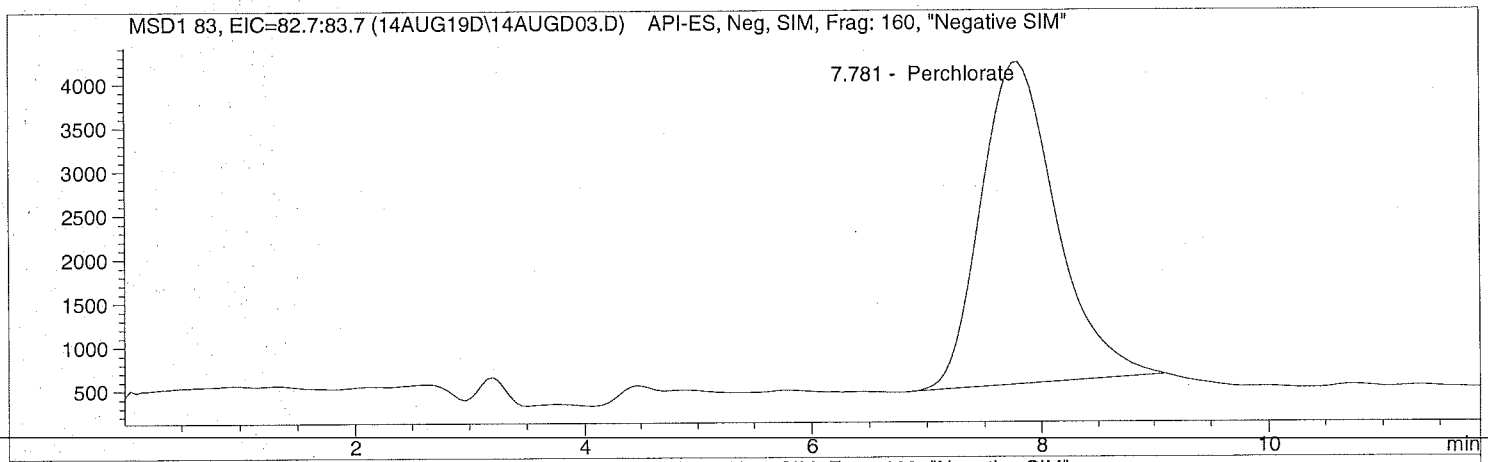
*** End of Report ***

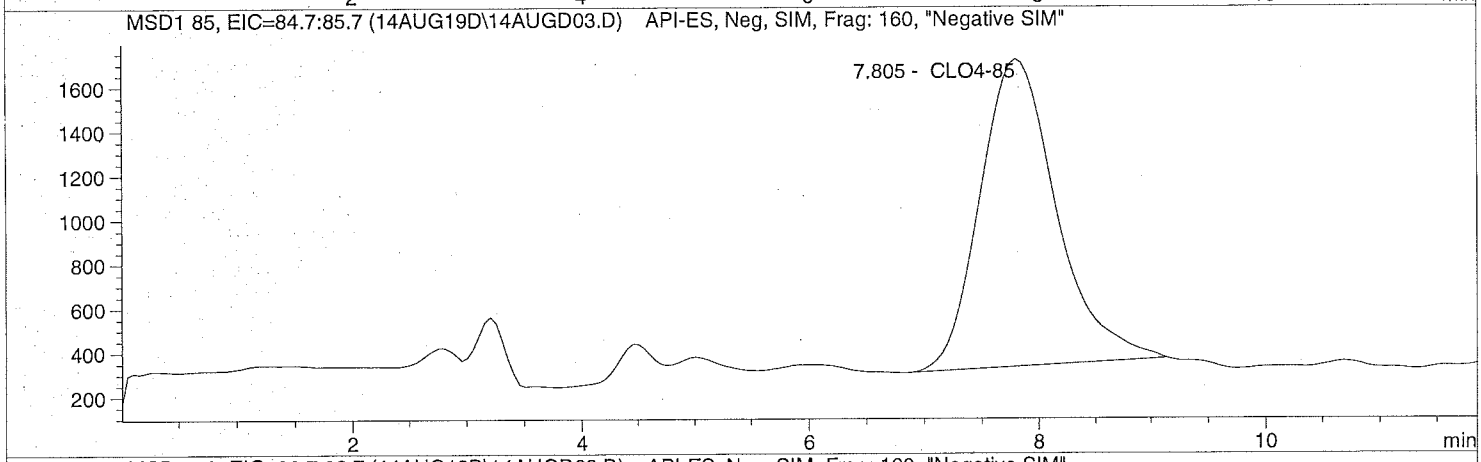
Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD03.D Sample Name: 668346 ICS@4.0

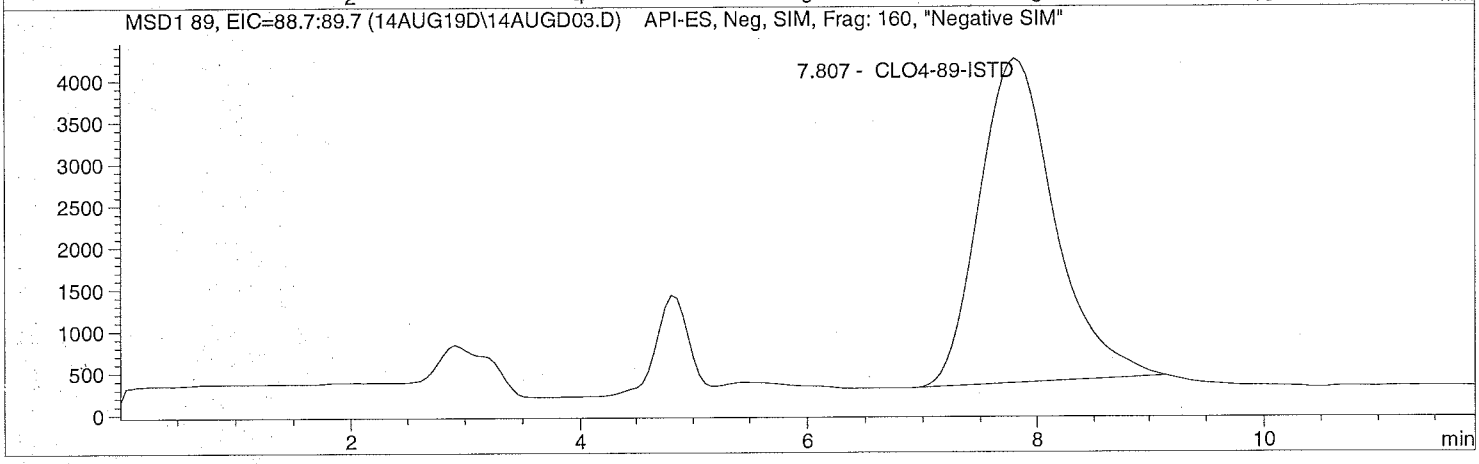
Injection Date:	8/14/2019 08:57:20	Seq Line:	3
Sample Name:	668346 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD03.D Sample Name: 668346 ICS@4.0

Injection Date:	8/14/2019 08:57:20	Seq Line:	3
Sample Name:	668346 ICS@4.0	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	4.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.781	PBA	169005.6	3.1613	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.805	PBA	64727.2	3.8866	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.807	PBA	178426.7	5.0000	CLO4-89-ISTD

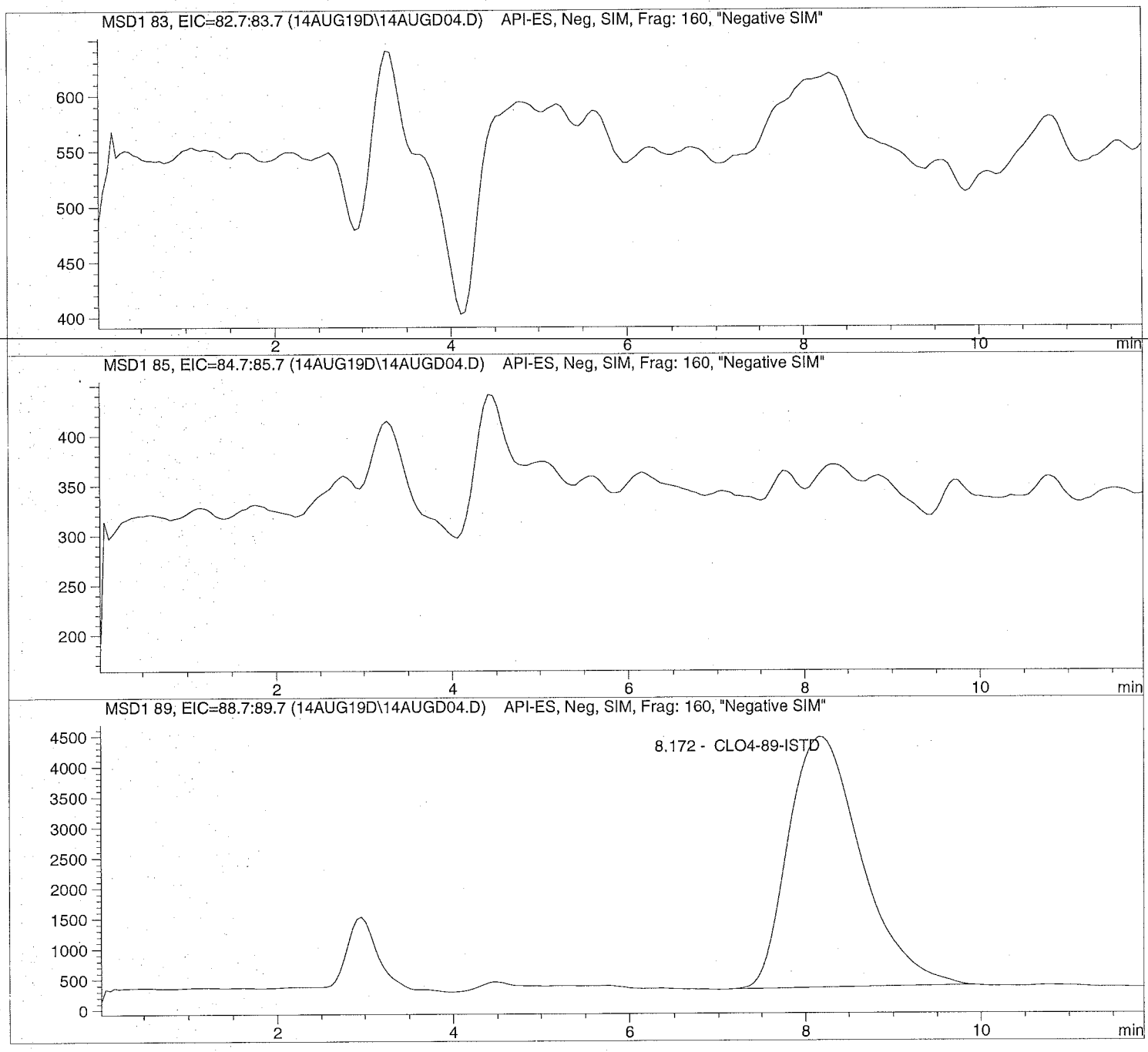
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD04.D Sample Name: 668347 LMB

Injection Date:	8/14/2019 09:11:36	Seq Line:	4
Sample Name:	668347 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD04.D Sample Name: 668347 LMB

Injection Date:	8/14/2019 09:11:36	Seq Line:	4
Sample Name:	668347 LMB	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.172	PBA	239408.7	5.0000	CLO4-89-ISTD

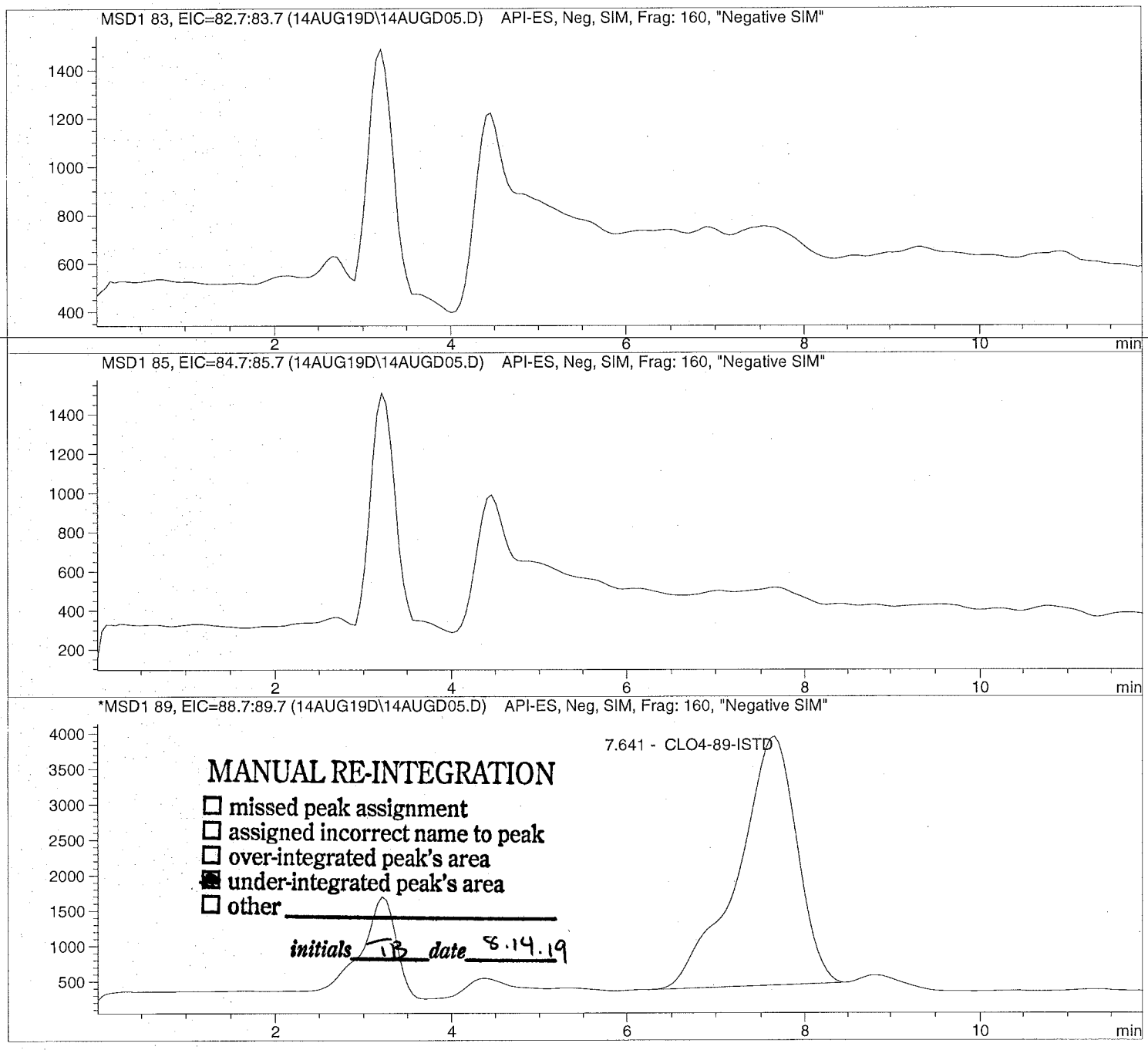
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD05.D Sample Name: 1922027001

Injection Date:	8/14/2019 09:25:46	Seq Line:	5
Sample Name:	1922027001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD05.D Sample Name: 1922027001

Injection Date:	8/14/2019 09:25:46	Seq Line:	5
Sample Name:	1922027001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.641	MM	162744.4	5.0000	CLO4-89-ISTD

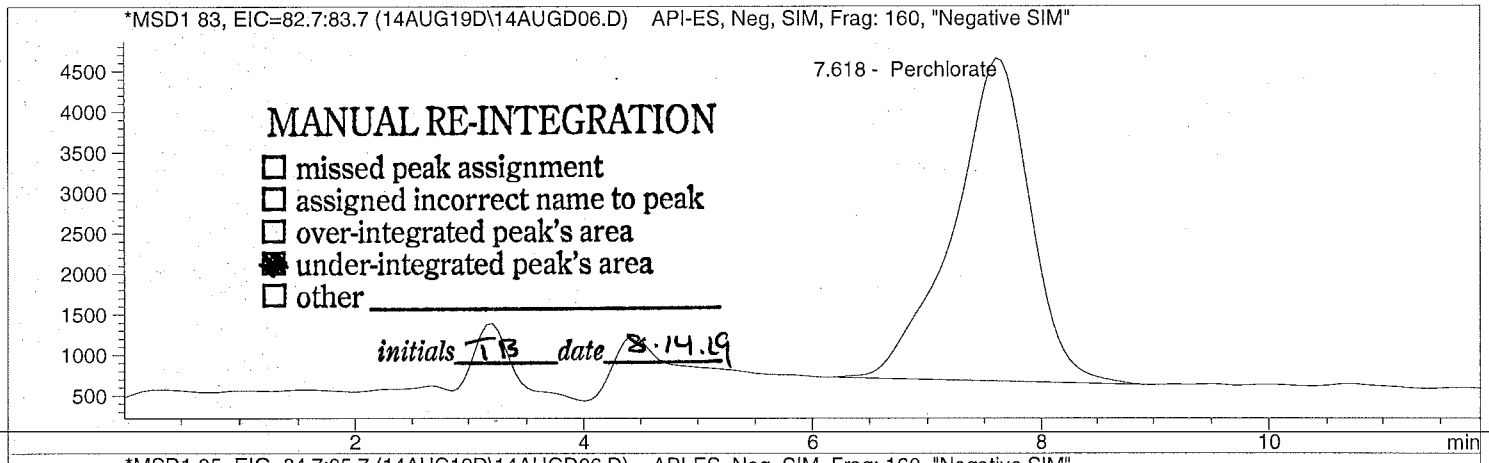
*** End of Report ***

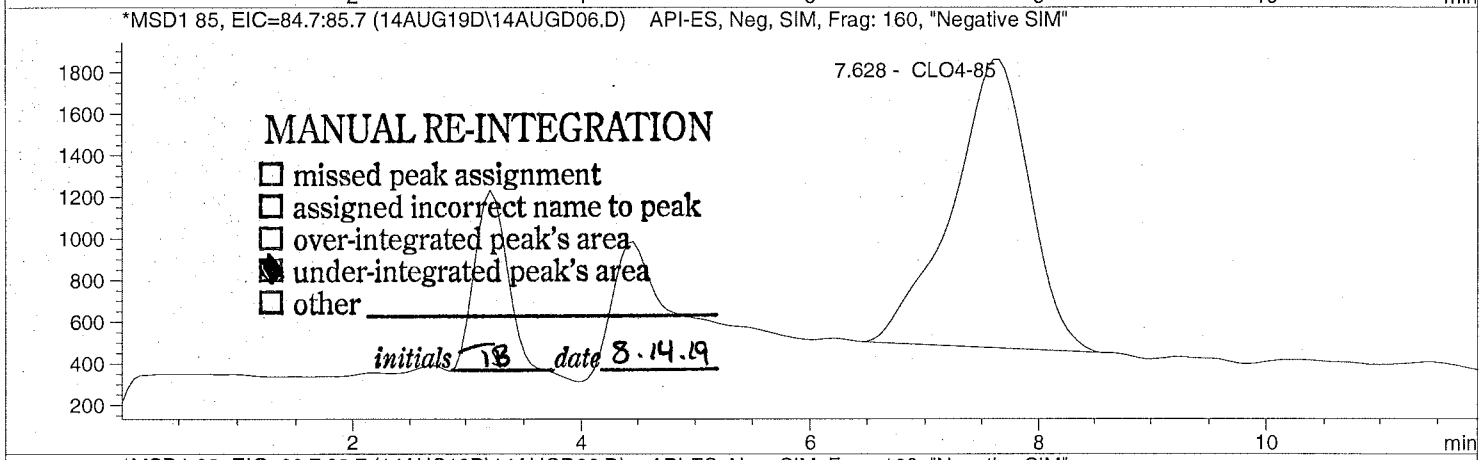
Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD06.D Sample Name: 668349 220271S

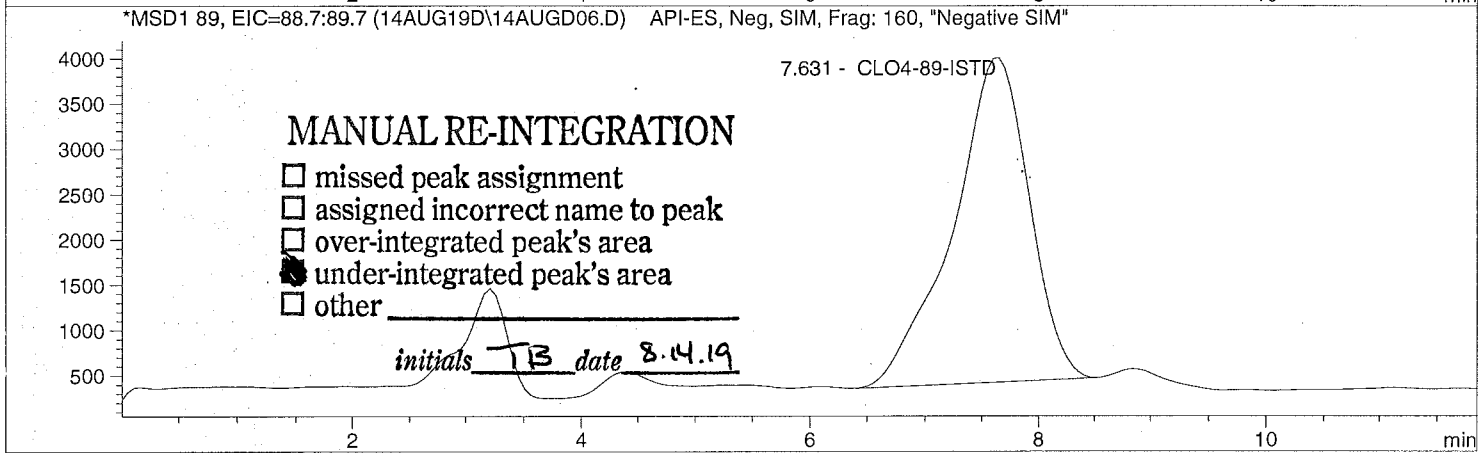
Injection Date:	8/14/2019 09:39:59	Seq Line:	6
Sample Name:	668349 220271S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD06.D Sample Name: 668349 220271S

Injection Date:	8/14/2019 09:39:59	Seq Line:	6
Sample Name:	668349 220271S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.618	MM	185324.7	3.6879	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.628	MM	65179.4	4.1973	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.631	MM	166279.3	5.0000	CLO4-89-ISTD

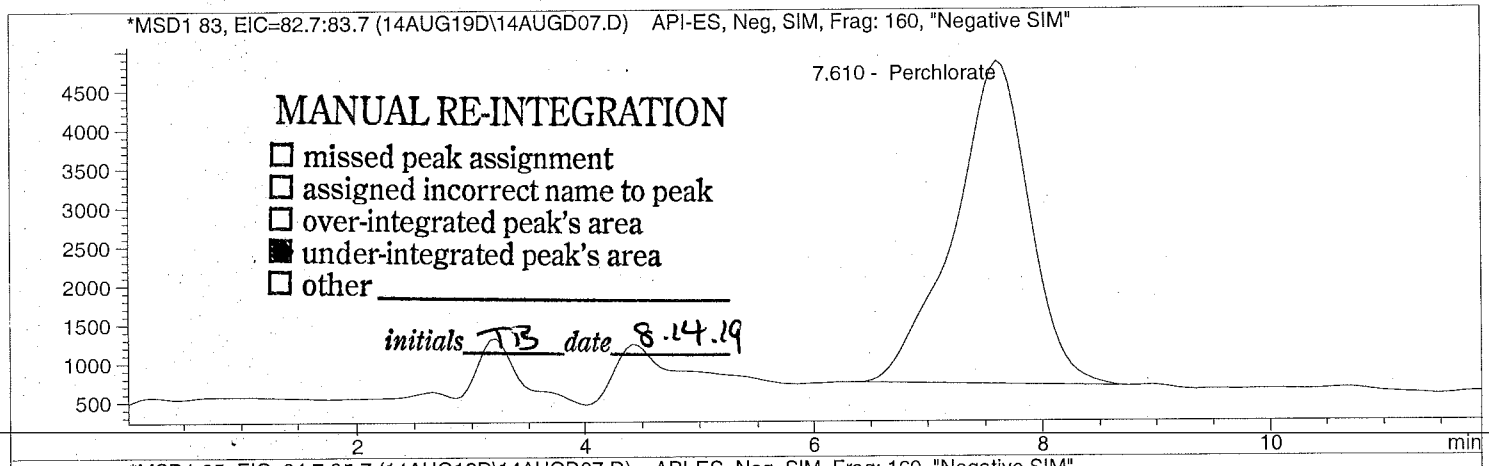
*** End of Report ***

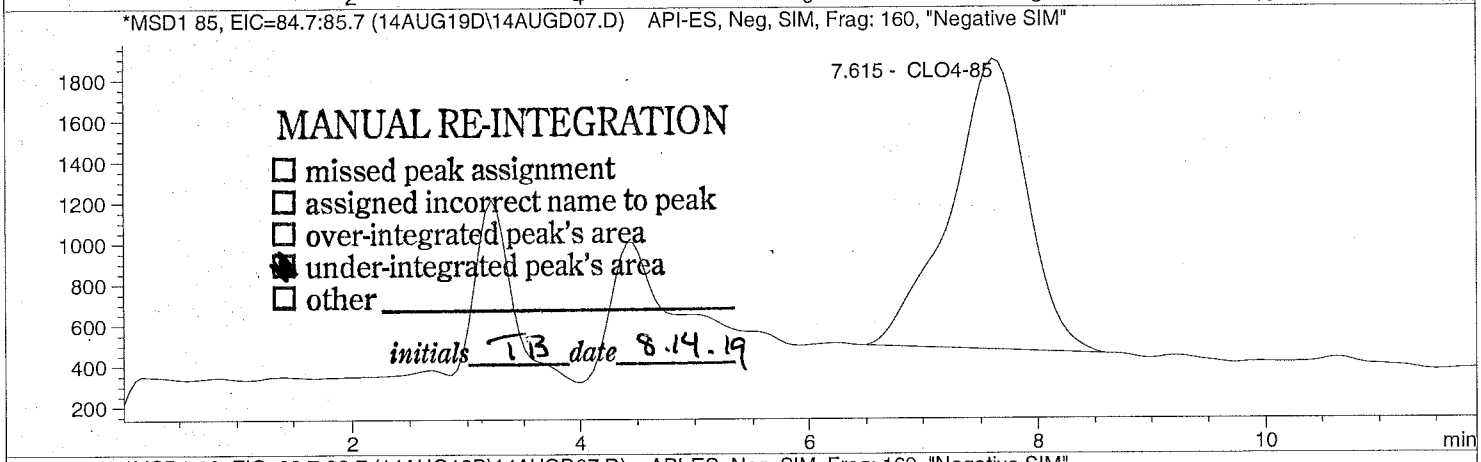
Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD07.D Sample Name: 668350 220271D

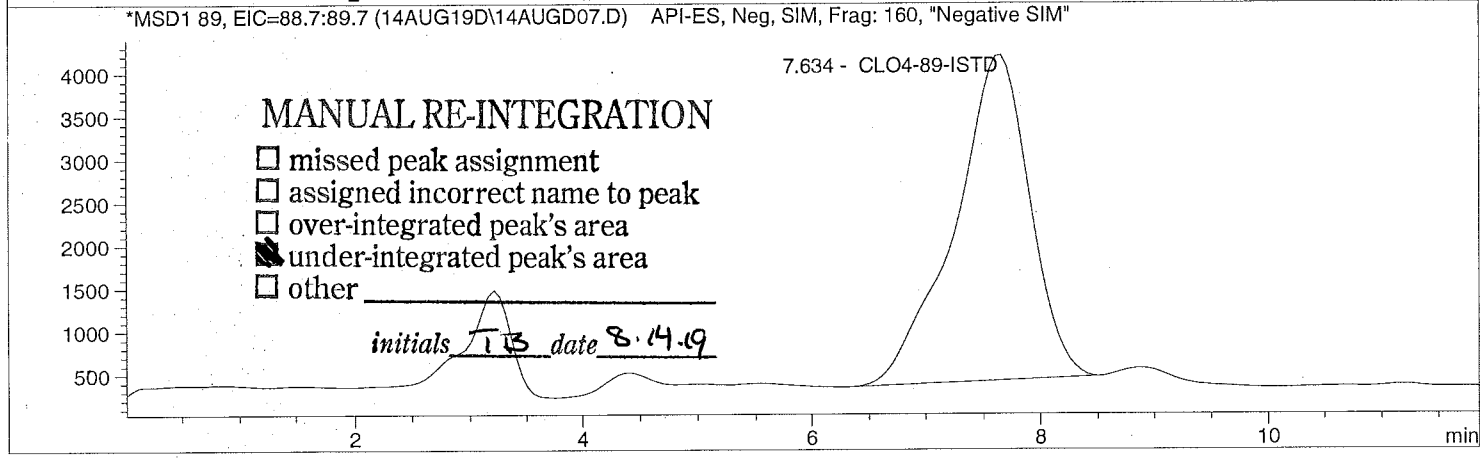
Injection Date:	8/14/2019 09:54:13	Seq Line:	7
Sample Name:	668350 220271D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD07.D Sample Name: 668350 220271D

Injection Date:	8/14/2019 09:54:13	Seq Line:	7
Sample Name:	668350 220271D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.610	MM	187102.7	3.6290	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.615	MM	65317.5	4.0970	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.634	MM	170742.6	5.0000	CLO4-89-ISTD

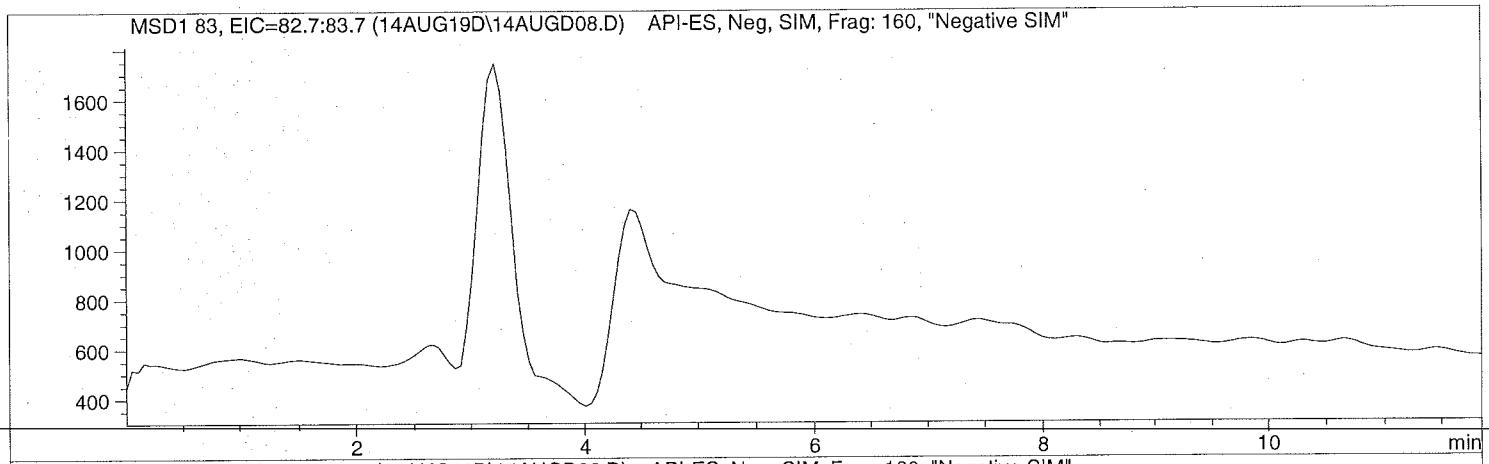
*** End of Report ***

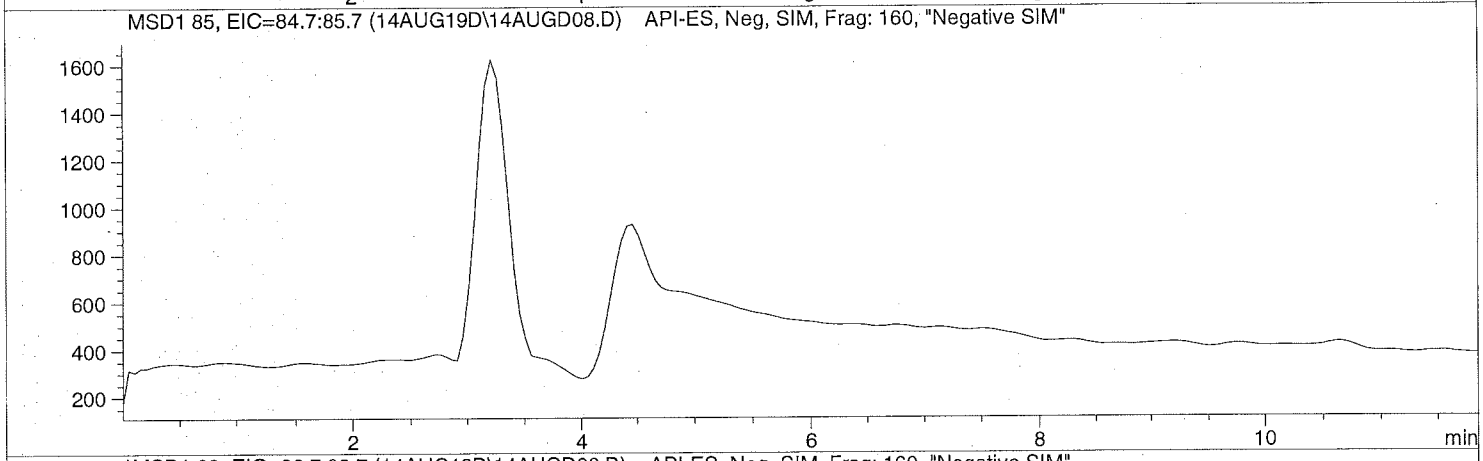
Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD08.D Sample Name: 1922715001

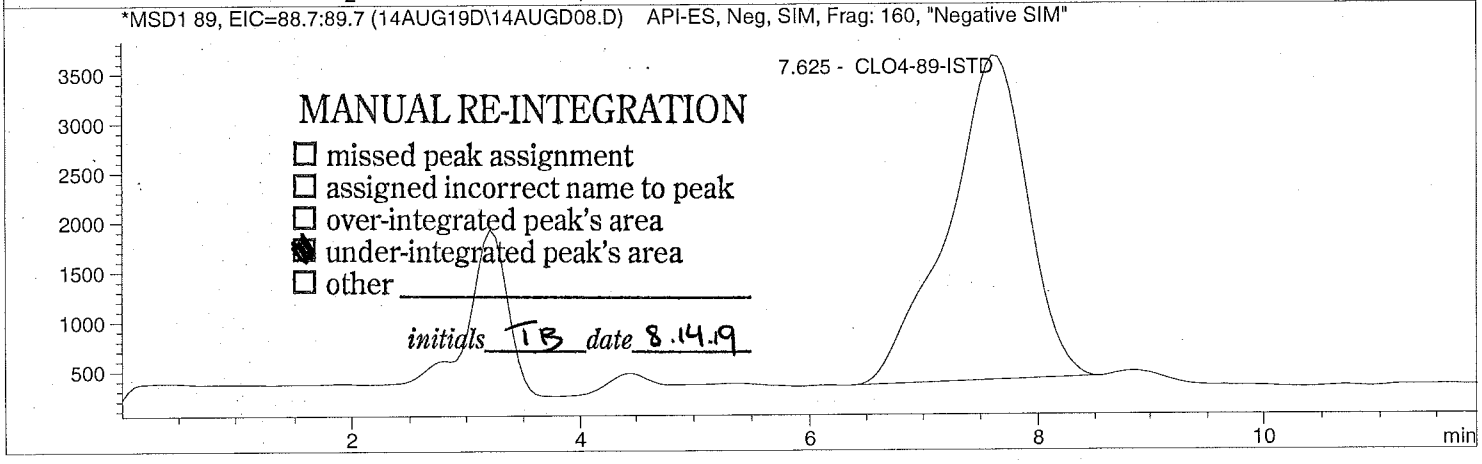
Injection Date:	8/14/2019 10:08:31	Seq Line:	8
Sample Name:	1922715001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







MANUAL RE-INTEGRATION

- ☐ missed peak assignment
- ☐ assigned incorrect name to peak
- ☐ over-integrated peak's area
- ☒ under-integrated peak's area
- ☐ other _____

initials TB *date* 8.14.19

Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD08.D Sample Name: 1922715001

Injection Date:	8/14/2019 10:08:31	Seq Line:	8
Sample Name:	1922715001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.625	MM	155455.2	5.0000	CLO4-89-ISTD

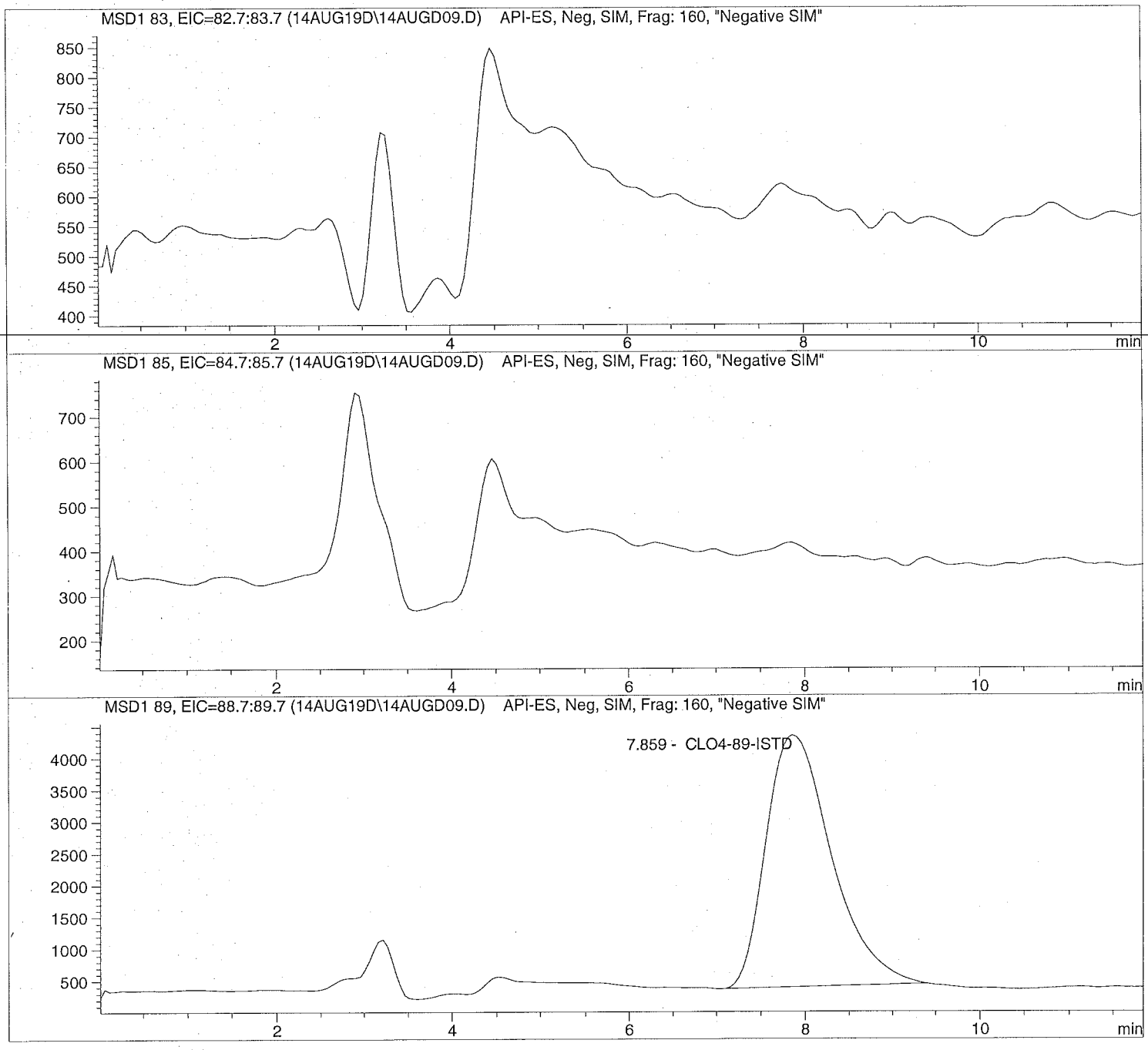
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD09.D Sample Name: 1923027001

Injection Date:	8/14/2019 10:22:43	Seq Line:	9
Sample Name:	1923027001	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD09.D Sample Name: 1923027001

Injection Date:	8/14/2019 10:22:43	Seq Line:	9
Sample Name:	1923027001	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.859	PBA	203712.1	5.0000	CLO4-89-ISTD

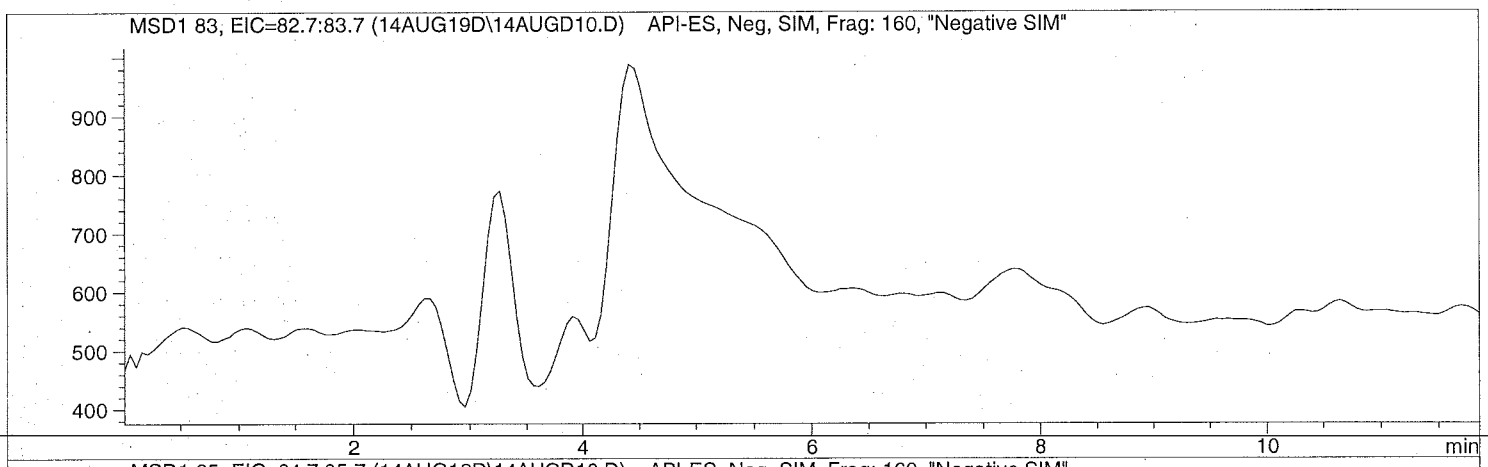
*** End of Report ***

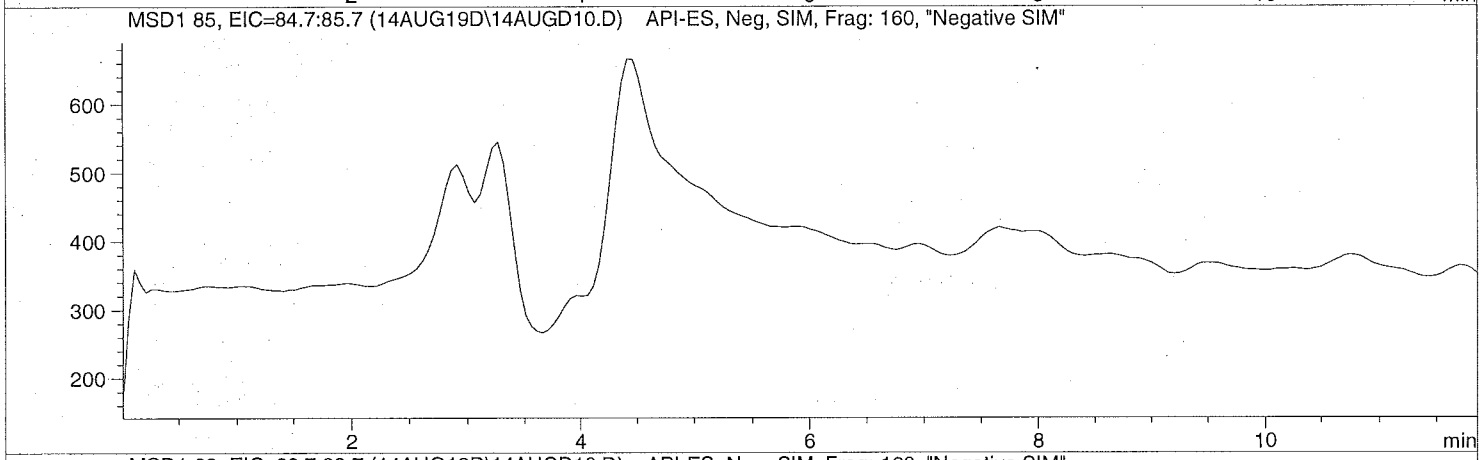
Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD10.D Sample Name: 1923027002

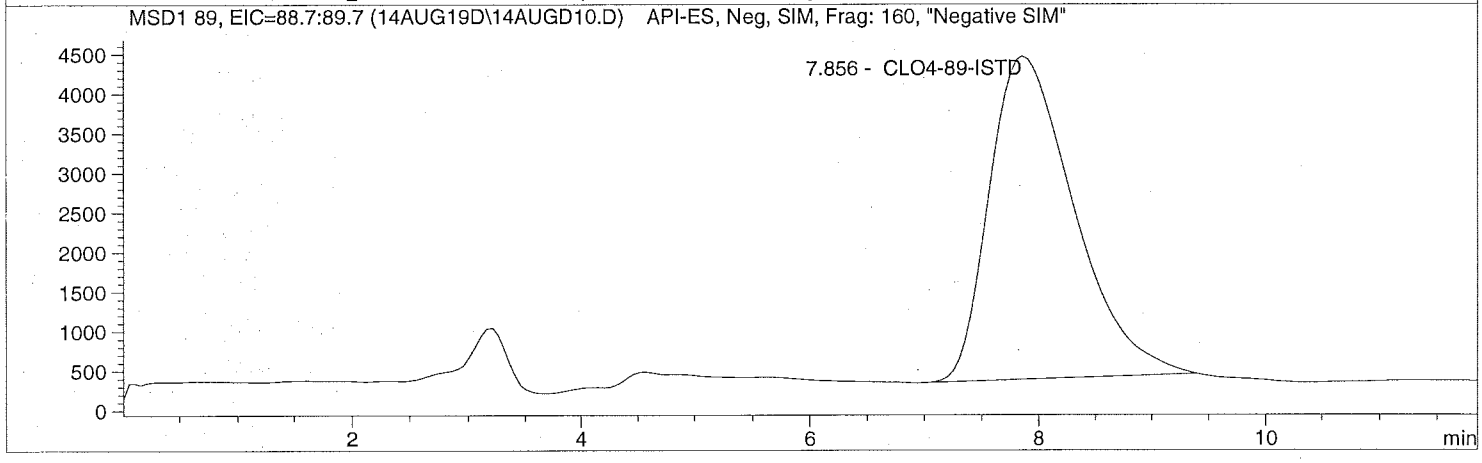
Injection Date:	8/14/2019 10:36:56	Seq Line:	10
Sample Name:	1923027002	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD10.D Sample Name: 1923027002

Injection Date:	8/14/2019 10:36:56	Seq Line:	10
Sample Name:	1923027002	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Fri, 12. Apr. 2019,07:52:58 am
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.856	PBA	210021.3	5.0000	CLO4-89-ISTD

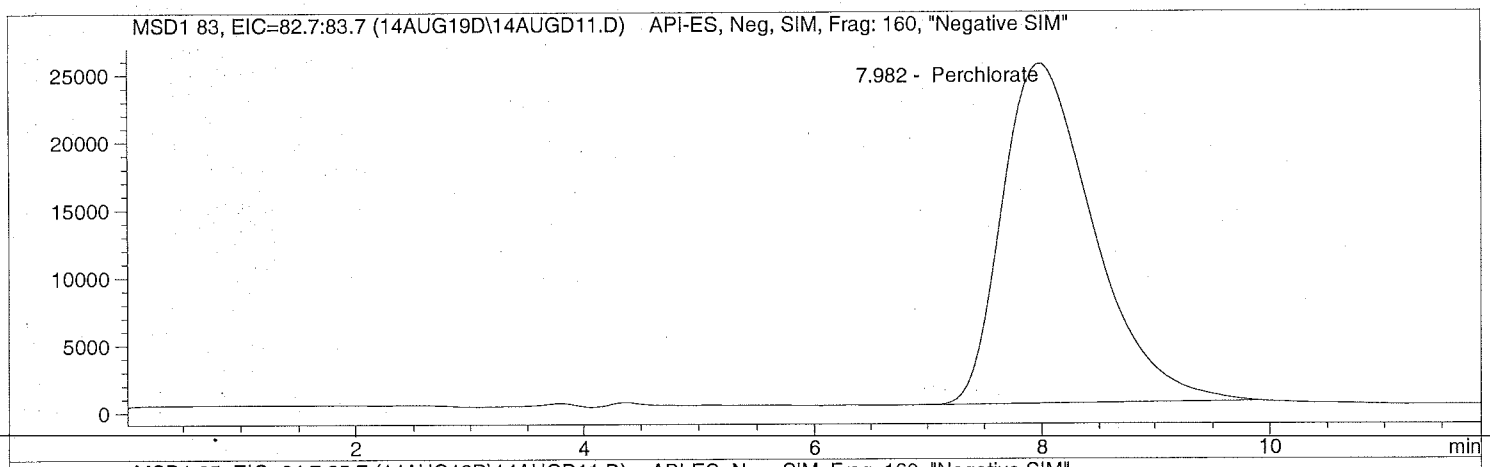
*** End of Report ***

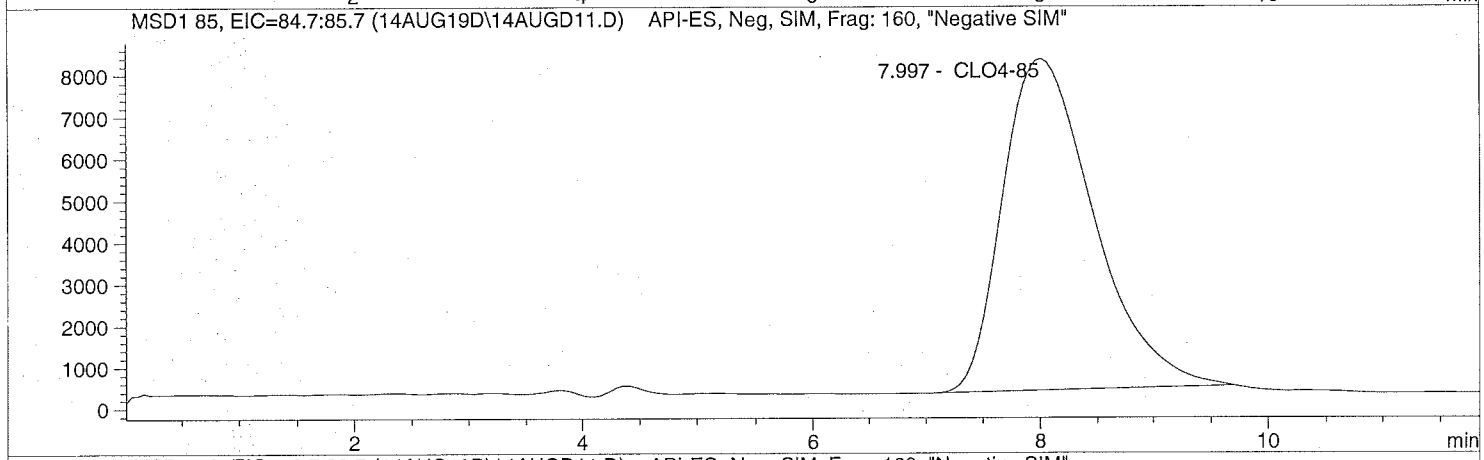
Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD11.D Sample Name: 668351 CCV@25

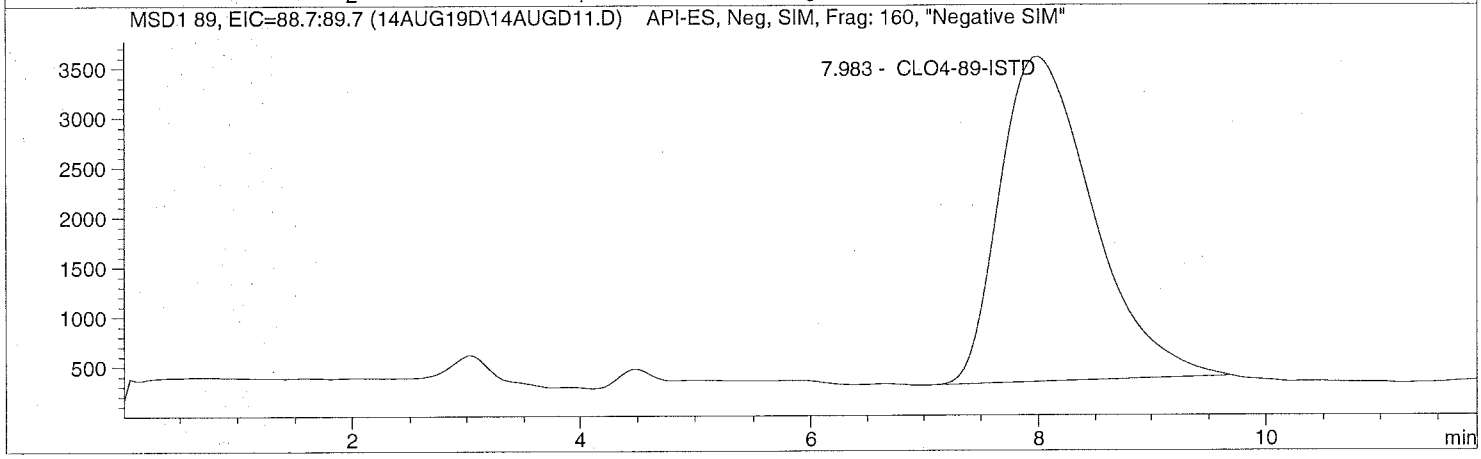
Injection Date:	8/14/2019 10:55:23	Seq Line:	11
Sample Name:	668351 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD11.D Sample Name: 668351 CCV@25

Injection Date:	8/14/2019 10:55:23	Seq Line:	11
Sample Name:	668351 CCV@25	Location:	Vial 71
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.982	PBA	1389218.6	23.0642	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.997	PBA	440722.5	24.5580	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.983	PBA	184111.7	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Initial Calibration

Calibration Table

Perchlorate

Calib. Data Modified : 3/19/2019 2:35:19 PM

Calculate : Internal Standard
Based on : Peak Area

Rel. Reference Window : 20.000 %
Abs. Reference Window : 0.000 min
Rel. Non-ref. Window : 20.000 %
Abs. Non-ref. Window : 0.000 min
Use Multiplier & Dilution Factor with ISTDs
Uncalibrated Peaks : not reported
Partial Calibration : No recalibration if peaks missing

Curve Type : Quadratic (some peaks differ, see below)
Origin : Ignored (some peaks differ, see below)
Weight : Linear (Amnt) (some peaks differ, see below)

Recalibration Settings:
Average Response : Average all calibrations
Average Retention Time: Floating Average New 75%

Calibration Report Options :
Printout of recalibrations within a sequence:
Calibration Table after Recalibration
Normal Report after Recalibration
If the sequence is done with bracketing:
Results of first cycle (ending previous bracket)

Default Sample ISTD Information (if not set in sample table):

ISTD #	ISTD Amount	Name
1	5.00000	CLO4-89-ISTD

Signal 1: MSD1 83, EIC=82.7:83.7
Signal 2: MSD1 85, EIC=84.7:85.7
Signal 3: MSD1 89, EIC=88.7:89.7

RetTime [min]	Sig	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name
8.744	1	1	1.00000	7.76074e4	1.28854e-5	1		Perchlorate
		2	2.00000	1.35273e5	1.47849e-5			
		3	5.00000	3.37764e5	1.48033e-5			
		4	10.00000	6.83454e5	1.46316e-5			
		5	25.00000	2.08433e6	1.19943e-5			
		6	50.00000	4.13334e6	1.20968e-5			
		7	75.00000	5.99313e6	1.25143e-5			
8.755	2	1	1.00000	2.36780e4	4.22333e-5	1		CLO4-85
		2	2.00000	4.69486e4	4.25998e-5			
		3	5.00000	1.06124e5	4.71147e-5			
		4	10.00000	2.13523e5	4.68335e-5			
		5	25.00000	6.14295e5	4.06971e-5			
		6	50.00000	1.19814e6	4.17315e-5			
		7	75.00000	1.78355e6	4.20509e-5			
8.766	3	1	5.00000	2.73208e5	1.83011e-5	+I1		CLO4-89-ISTD
		2	5.00000	2.24886e5	2.22335e-5			
		3	5.00000	2.33196e5	2.14412e-5			
		4	5.00000	2.34454e5	2.13262e-5			
		5	5.00000	2.50568e5	1.99547e-5			
		6	5.00000	2.30977e5	2.16472e-5			

RetTime [min]	Lvl	Amount	Area	Amt/Area	Ref	Grp	Name	Sig
	7	5.00000	2.21504e5	2.25729e-5				

More compound-specific settings:

Compound: Perchlorate
- Time Window : From 6.654 min To 12.544 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

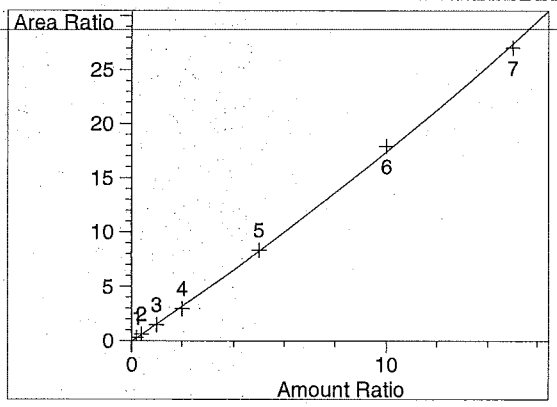
Compound: CLO4-85
- Time Window : From 6.650 min To 12.505 min
- Curve Type : Quadratic
- Origin : Ignored
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 0.5
  - Level 3 : 0.2
  - Level 4 : 0.1
  - Level 5 : 0.04
  - Level 6 : 0.02
  - Level 7 : 0.013333

Compound: CLO4-89-ISTD
- Time Window : From 6.659 min To 12.466 min
- Curve Type : Linear
- Origin : Included
- Calibration Level Weights:/
  - Level 1 : 1
  - Level 2 : 1
  - Level 3 : 1
  - Level 4 : 1
  - Level 5 : 1
  - Level 6 : 1
  - Level 7 : 1

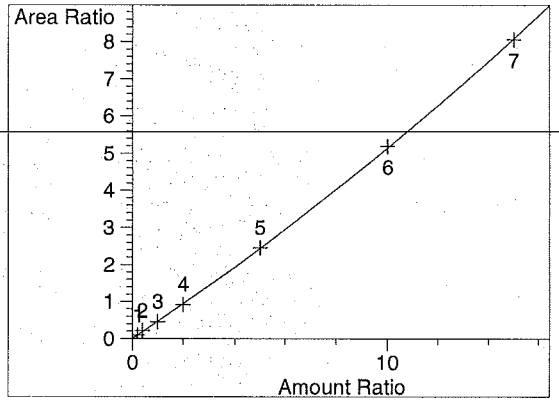
Peak Sum Table

No Entries in table

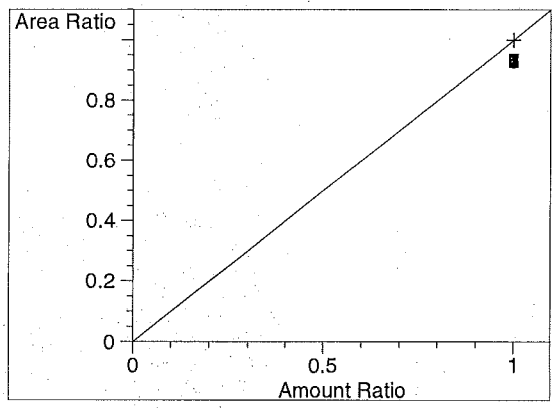
Calibration Curves



Perchlorate at exp. RT: 8.744
MSD1 83, EIC=82.7:83.7
Correlation: 0.99957
Residual Std. Dev.: 0.30744
Formula: $y = ax^2 + bx + c$
a: 1.76988e-2
b: 1.56480
c: -4.92430e-2
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-85 at exp. RT: 8.755
MSD1 85, EIC=84.7:85.7
Correlation: 0.99983
Residual Std. Dev.: 0.03473
Formula: $y = ax^2 + bx + c$
a: 5.13396e-3
b: 4.62055e-1
c: 4.97209e-4
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 0.5
Level 3 : 0.2
Level 4 : 0.1
Level 5 : 0.04
Level 6 : 0.02
Level 7 : 0.013333



CLO4-89-ISTD at exp. RT: 8.766
MSD1 89, EIC=88.7:89.7
Correlation: 1.00000
Residual Std. Dev.: 0.00000
Formula: $y = mx + b$
m: 1.00000
b: 0.00000
x: Amount Ratio
y: Area Ratio
Calibration Level Weights:
Level 1 : 1
Level 2 : 1
Level 3 : 1
Level 4 : 1
Level 5 : 1
Level 6 : 1
Level 7 : 1

Batch Review Method:
C:\HPCHEM\1\METHODS\CLO4-DP2.M

['#' ==> Run has not been reprocessed with Batch Review Method
'*' ==> Run has been saved with batch file]

#	Sample	Location	Inj	SampleType	Run	Perchlorate Area	Perchlorat RT	Perchlorate Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	7.76074e4	8.744	1.06245
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	1.35273e5	8.992	2.06969
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	3.37764e5	8.586	4.73474
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	6.83454e5	8.698	9.27727
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.08433e6	8.451	25.29036
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	4.13334e6	8.810	51.36844
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	5.99313e6	8.586	74.16754
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	7.34719e5	8.702	9.25940

#	Sample	Location	Inj	SampleType	Run	CLO4-85 Area	CLO4-85 RT	CLO4-85 Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.36780e4	8.755	9.30535e-1
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	4.69486e4	9.012	2.24255
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	1.06124e5	8.602	4.86656
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.13523e5	8.713	9.64312
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	6.14295e5	8.468	25.12159
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	1.19814e6	8.825	50.46721
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	1.78355e6	8.603	74.72019
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.27495e5	8.721	9.54024

#	Sample	Location	Inj	SampleType	Run	CLO4-89-ISTD Area	CLO4-89-IS RT	CLO4-89-ISTD Amount
#*	CLO4@ 1.0ug/L	Vial 73	1	Control	3	2.73208e5	8.766	5.00000
#*	CLO4@ 2.0ug/L	Vial 74	1	Control	4	2.24886e5	9.012	5.00000
#*	CLO4@ 5.0ug/L	Vial 75	1	Control	5	2.33196e5	8.609	5.00000
#*	CLO4@ 10.ug/L	Vial 76	1	Control	6	2.34454e5	8.716	5.00000
#*	CLO4@ 25.ug/L	Vial 77	1	Control	7	2.50568e5	8.472	5.00000
#*	CLO4@ 50.ug/L	Vial 78	1	Control	8	2.30977e5	8.825	5.00000
#*	CLO4@ 75.ug/L	Vial 79	1	Control	9	2.21504e5	8.610	5.00000
#*	ICAL Verf@10ug/L	Vial 80	1	Control	10	2.52544e5	8.725	5.00000

*** End of Report ***

Sequence: C:\HPCHEM\1\SEQUENCE\CLO4\2019\MAR\19MAR19I.S

Sequence Table:

Method and Injection Info Part:

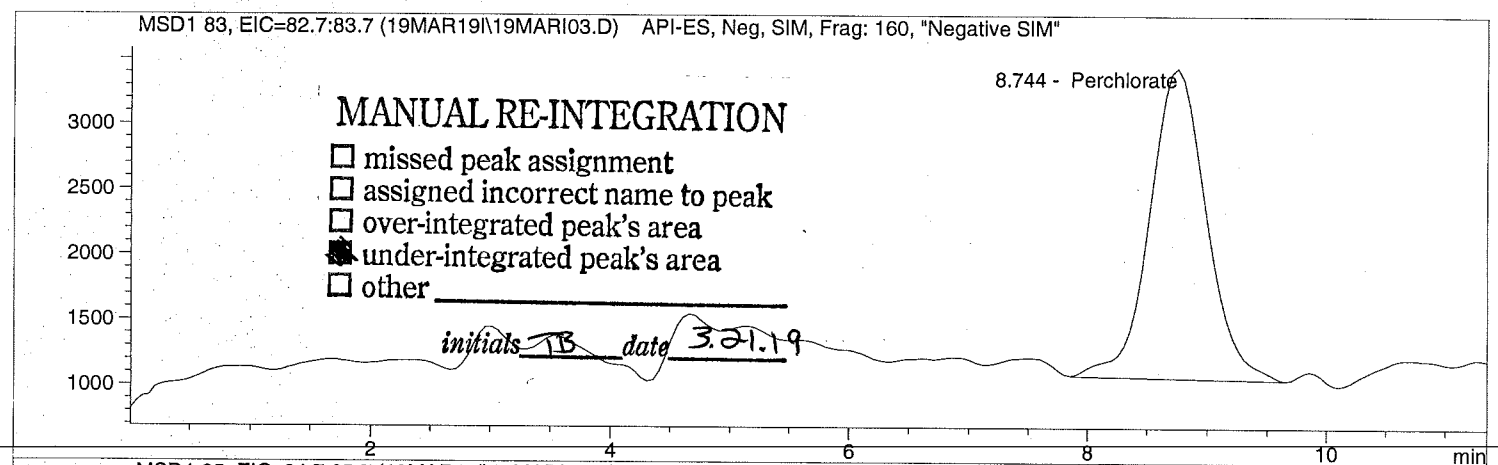
Line	Location	SampleName	Method	Inj	SampleType	InjVolume	DataFile
1	Vial 71	CLO4@ 0.2ug/L	CLO4-AQN	1	Ctrl Samp		
2	Vial 72	CLO4@ 0.5ug/L	CLO4-AQN	1	Ctrl Samp		
3	Vial 73	CLO4@ 1.0ug/L	CLO4-AQN	1	Ctrl Samp		
4	Vial 74	CLO4@ 2.0ug/L	CLO4-AQN	1	Ctrl Samp		
5	Vial 75	CLO4@ 5.0ug/L	CLO4-AQN	1	Ctrl Samp		
6	Vial 76	CLO4@ 10.ug/L	CLO4-AQN	1	Ctrl Samp		
7	Vial 77	CLO4@ 25.ug/L	CLO4-AQN	1	Ctrl Samp		
8	Vial 78	CLO4@ 50.ug/L	CLO4-AQN	1	Ctrl Samp		
9	Vial 79	CLO4@ 75.ug/L	CLO4-AQN	1	Ctrl Samp		
10	Vial 80	ICAL Verf@10ug/L	CLO4-AQN	1	Ctrl Samp		

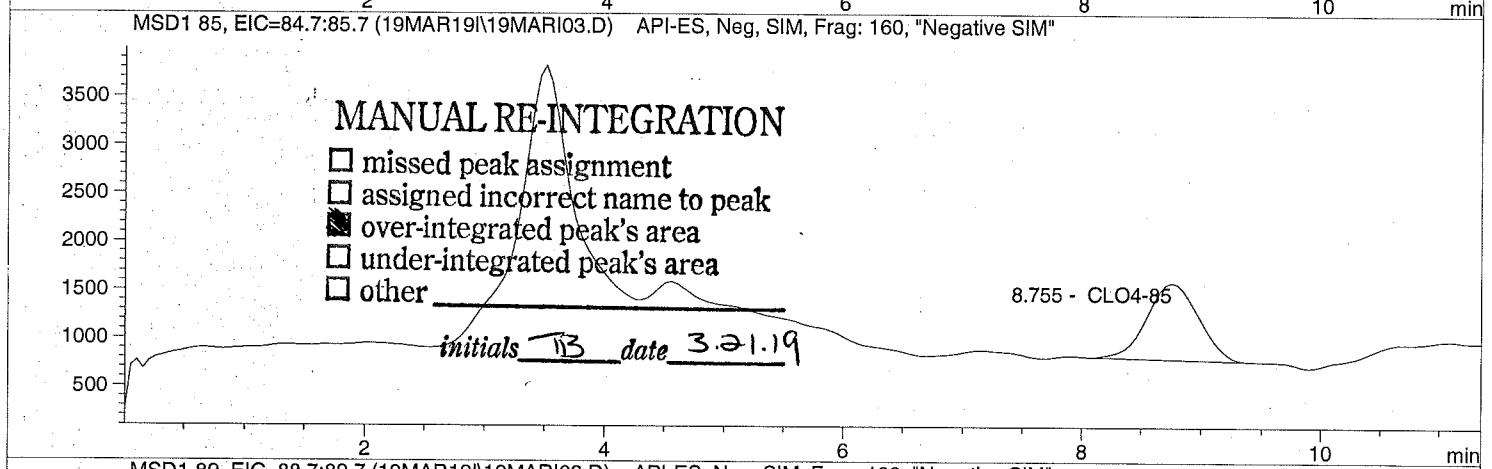
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

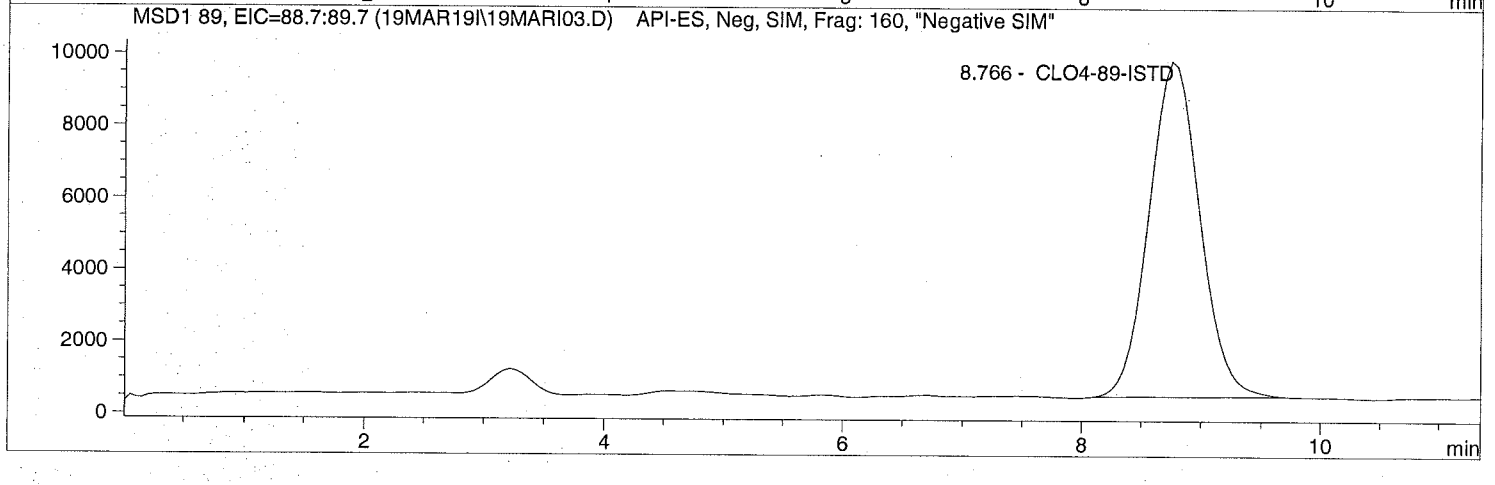
Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	MM	77607.4	1.0625	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	MM	23678.0	0.9305	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

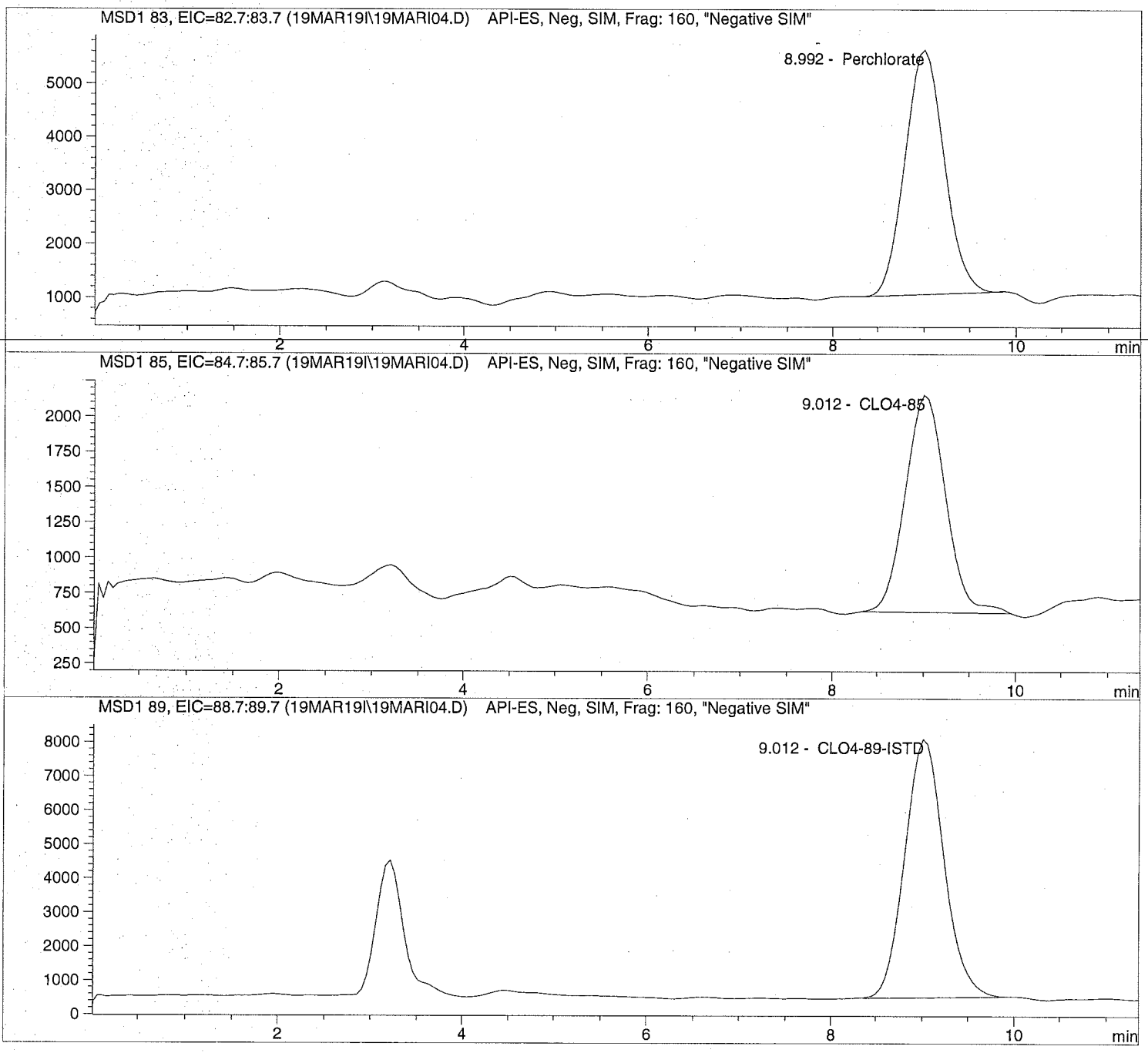
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI04.D Sample Name: CLO4@ 2.0ug/L

Injection Date:	3/19/2019 09:53:00	Seq Line:	4
Sample Name:	CLO4@ 2.0ug/L	Location:	Vial 74
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 2.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.992	BBA	135272.8	2.0697	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	46948.6	2.2425	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
9.012	BBA	224885.9	5.0000	CLO4-89-ISTD

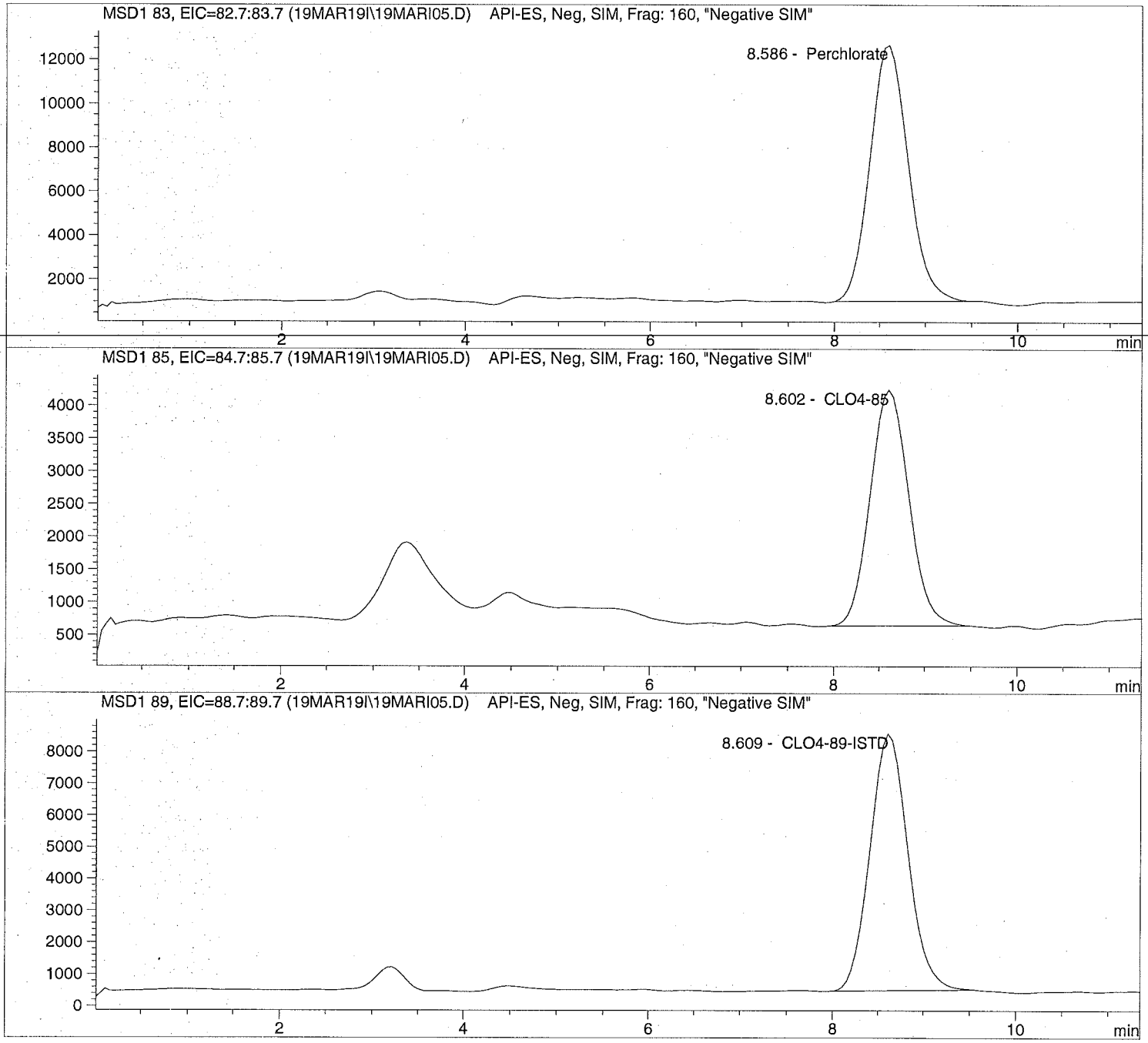
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI05.D Sample Name: CLO4@ 5.0ug/L

Injection Date:	3/19/2019 10:06:16	Seq Line:	5
Sample Name:	CLO4@ 5.0ug/L	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	5.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	337763.6	4.7347	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.602	PBA	106124.0	4.8666	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.609	PBA	233196.3	5.0000	CLO4-89-ISTD

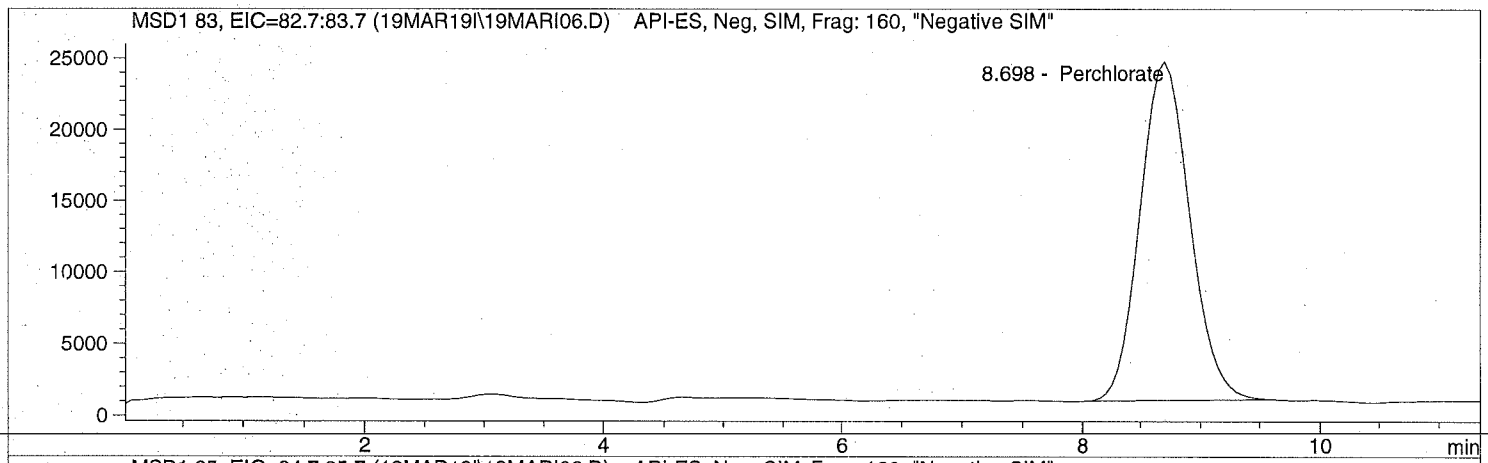
*** End of Report ***

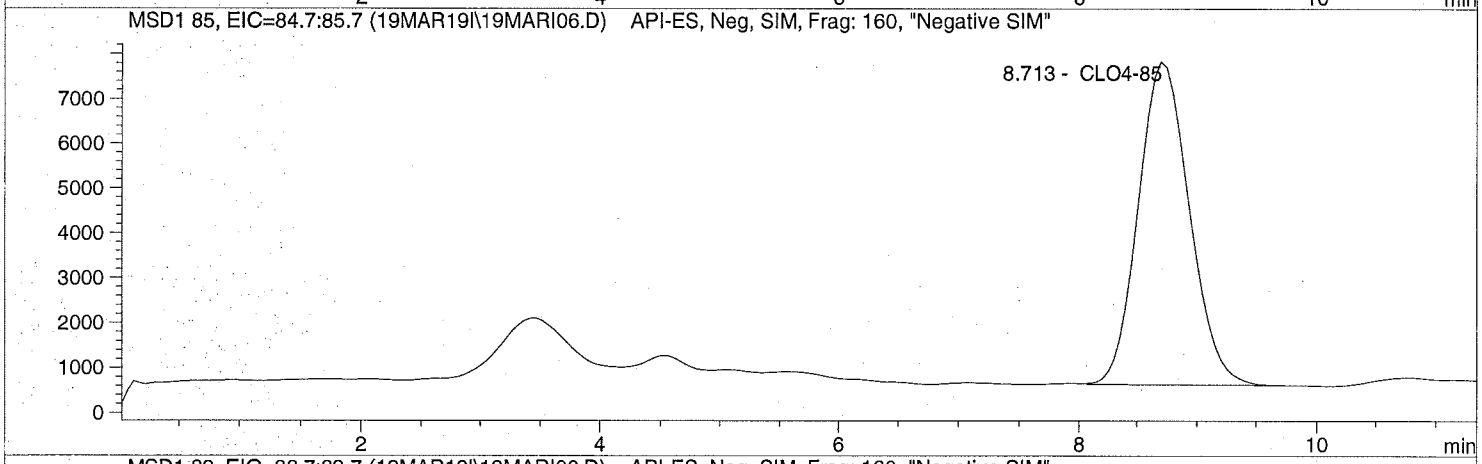
Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

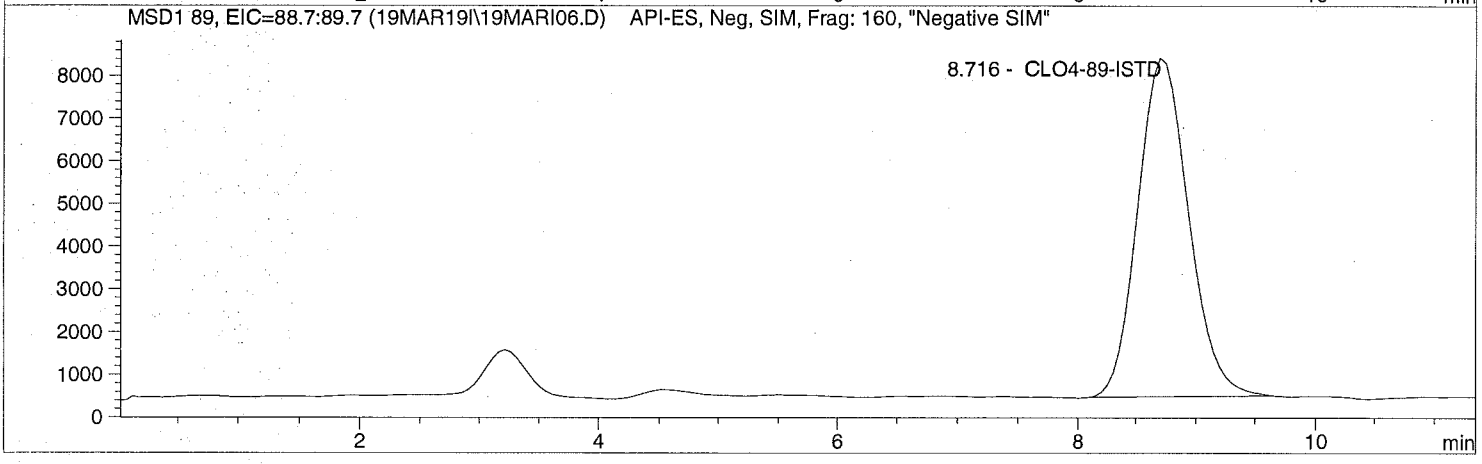
Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI06.D Sample Name: CLO4@ 10.ug/L

Injection Date:	3/19/2019 10:19:32	Seq Line:	6
Sample Name:	CLO4@ 10.ug/L	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.698	PBA	683454.4	9.2773	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.713	BBA	213522.6	9.6431	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.716	PBA	234453.6	5.0000	CLO4-89-ISTD

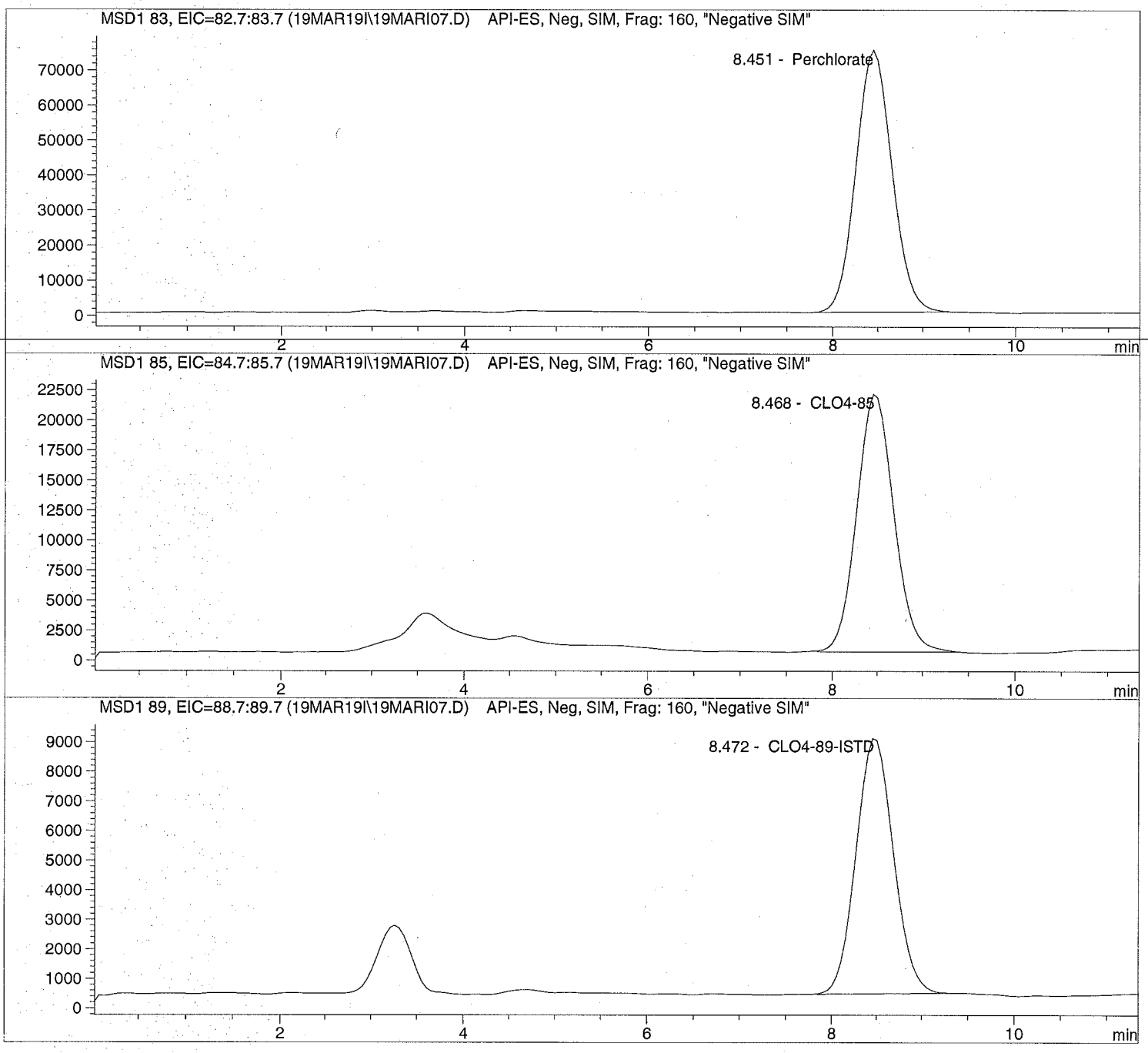
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI07.D Sample Name: CLO4@ 25.ug/L

Injection Date:	3/19/2019 10:32:49	Seq Line:	7
Sample Name:	CLO4@ 25.ug/L	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 25.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.451	PBA	2084327.4	25.2904	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.468	BBA	614294.8	25.1216	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.472	BBA	250568.0	5.0000	CLO4-89-ISTD

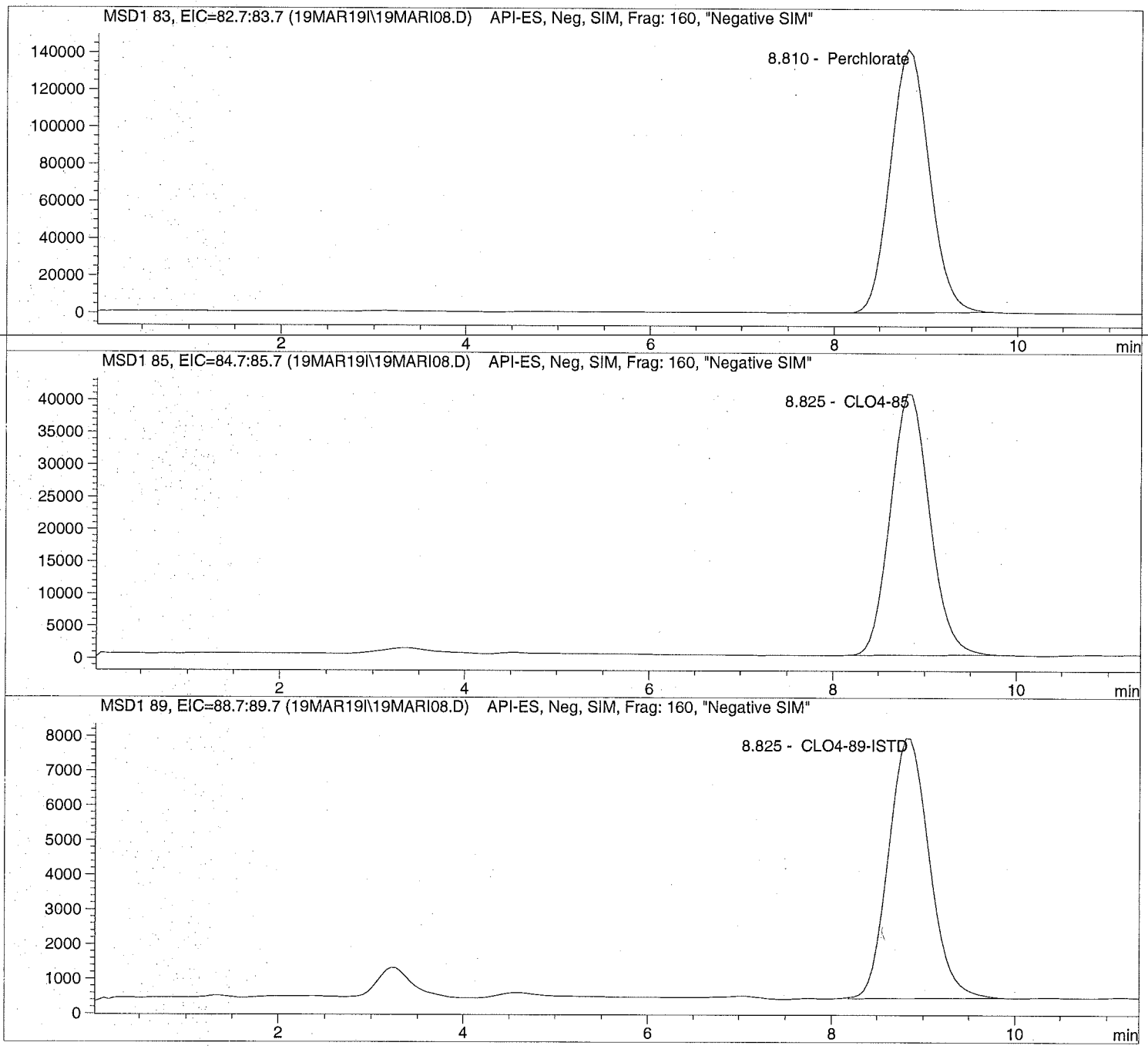
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI08.D Sample Name: CLO4@ 50.ug/L

Injection Date:	3/19/2019 10:46:05	Seq Line:	8
Sample Name:	CLO4@ 50.ug/L	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	50.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.810	PBA	4133340.5	51.3684	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	1198135.6	50.4672	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.825	BBA	230976.7	5.0000	CLO4-89-ISTD

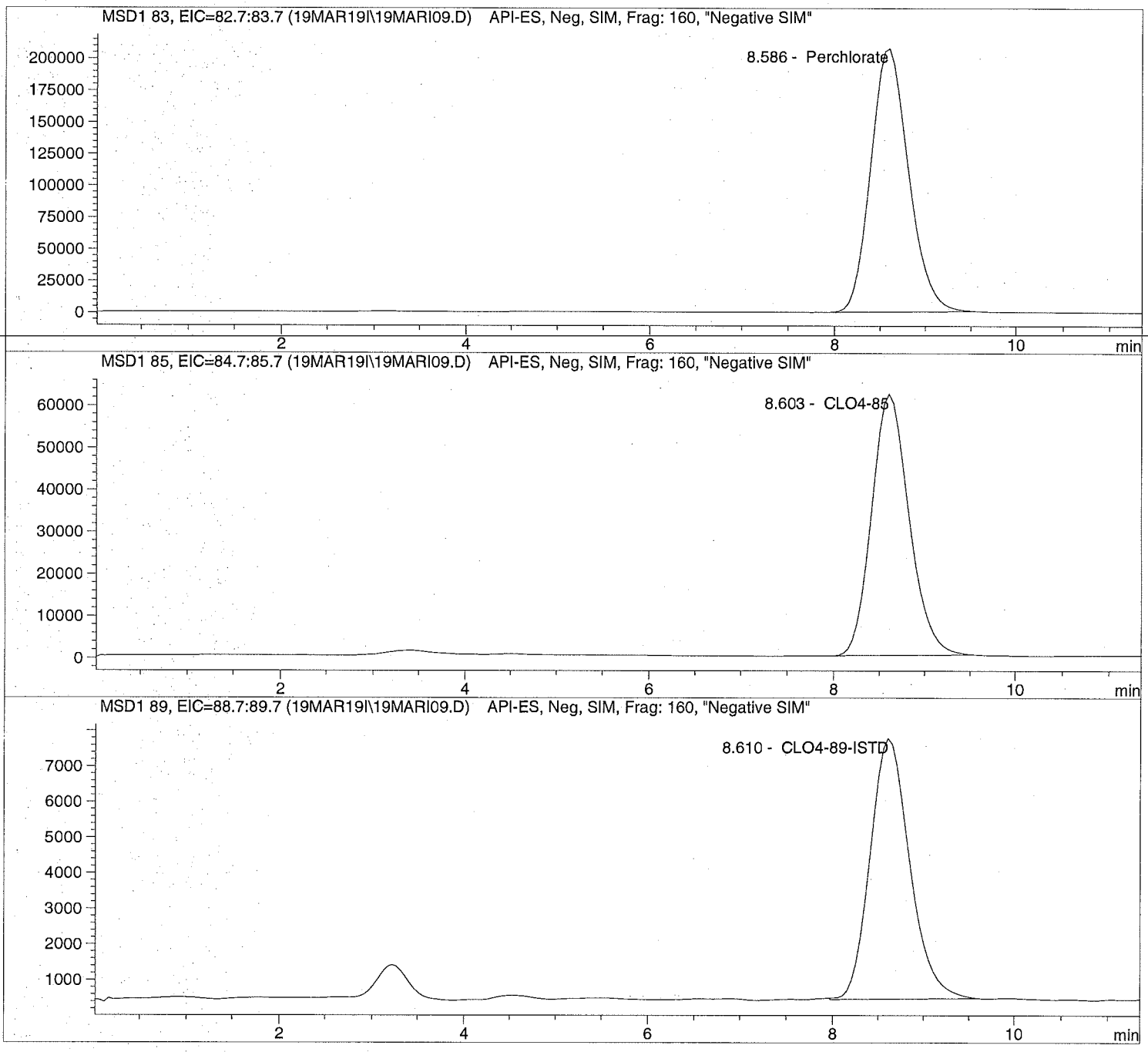
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI09.D Sample Name: CLO4@ 75.ug/L

Injection Date:	3/19/2019 10:59:22	Seq Line:	9
Sample Name:	CLO4@ 75.ug/L	Location:	Vial 79
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	75.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.586	PBA	5993128.0	74.1675	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.603	PBA	1783554.4	74.7202	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.610	BBA	221504.5	5.0000	CLO4-89-ISTD

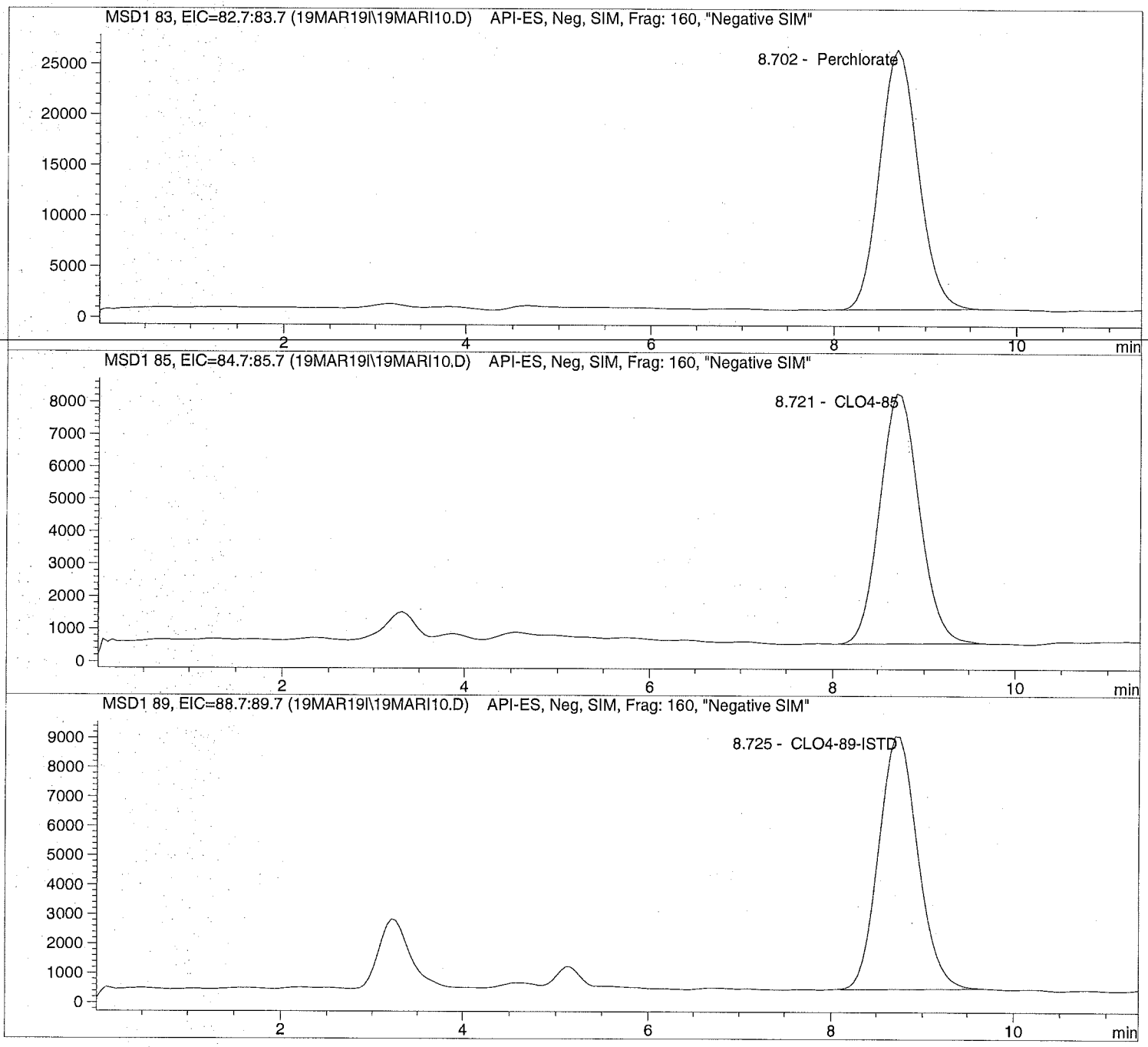
*** End of Report ***

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI10.D Sample Name: ICAL Verf@10ug/L

Injection Date:	3/19/2019 11:12:42	Seq Line:	10
Sample Name:	ICAL Verf@10ug/L	Location:	Vial 80
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:35:22

Perchlorate analysis

Sample Information

Sorted By: Signal
Calib. Data Modified: Tue, 19. Mar. 2019,02:35:19 pm
Multiplier: 1.000000
Dilution: 1.000000
Sample Amount: 10.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.702	PBA	734718.7	9.2594	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.721	PBA	227494.7	9.5402	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.725	BBA	252544.4	5.0000	CLO4-89-ISTD

*** End of Report ***

ALS Laboratory Group
ANALYTICAL CHEMISTRY & TESTING SERVICES

Environmental Division

Raw Data

Unmodified

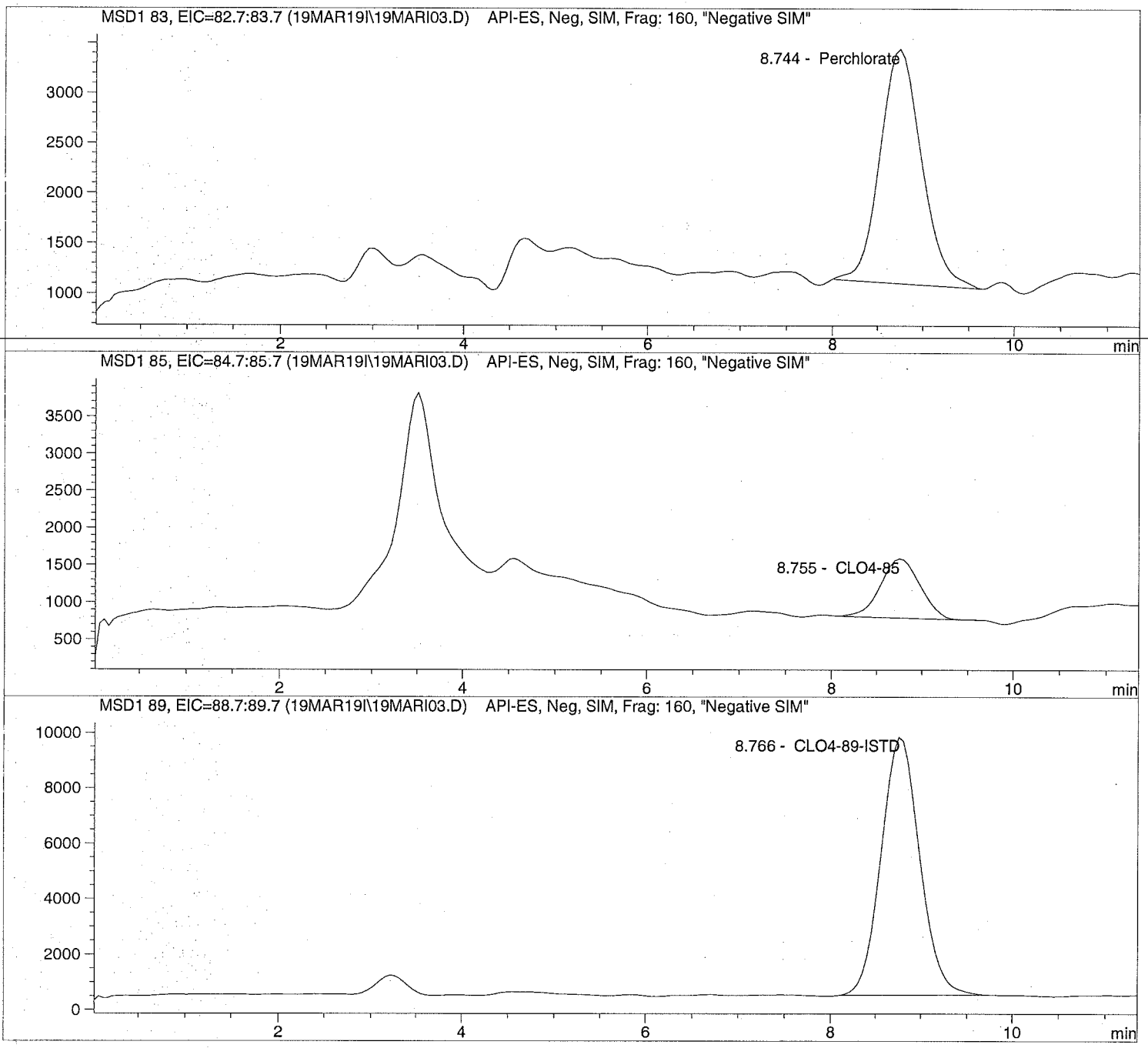
00942776

Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis



Data file: C:\HPCHEM\1\DATA\19MAR19I\19MARI03.D Sample Name: CLO4@ 1.0ug/L

Injection Date:	3/19/2019 09:39:40	Seq Line:	3
Sample Name:	CLO4@ 1.0ug/L	Location:	Vial 73
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	30 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 3/19/2019 14:38:25

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Tue, 19. Mar. 2019,02:35:19 pm
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	1.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.744	BBA	74166.3	1.0224	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.755	BBA	24138.1	0.9487	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
8.766	BBA	273207.6	5.0000	CLO4-89-ISTD

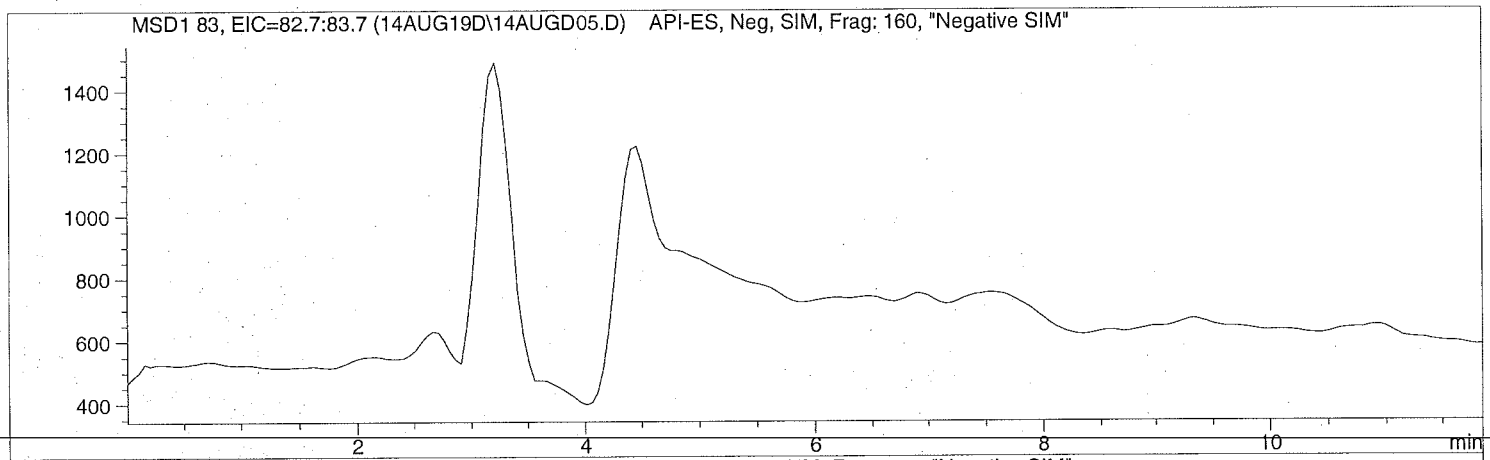
*** End of Report ***

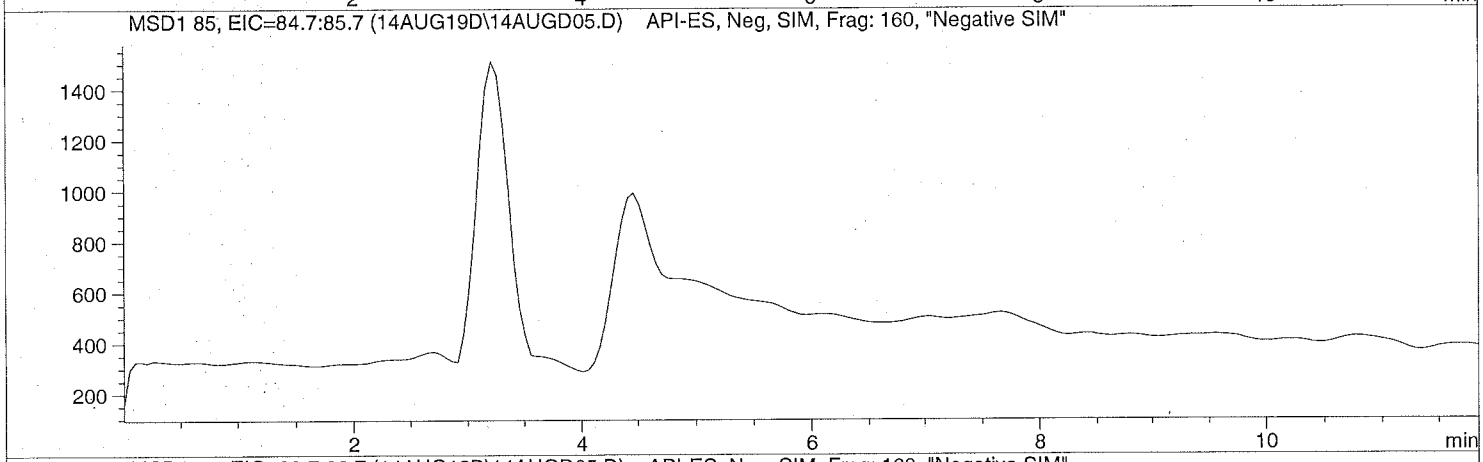
Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD05.D Sample Name: 1922027001

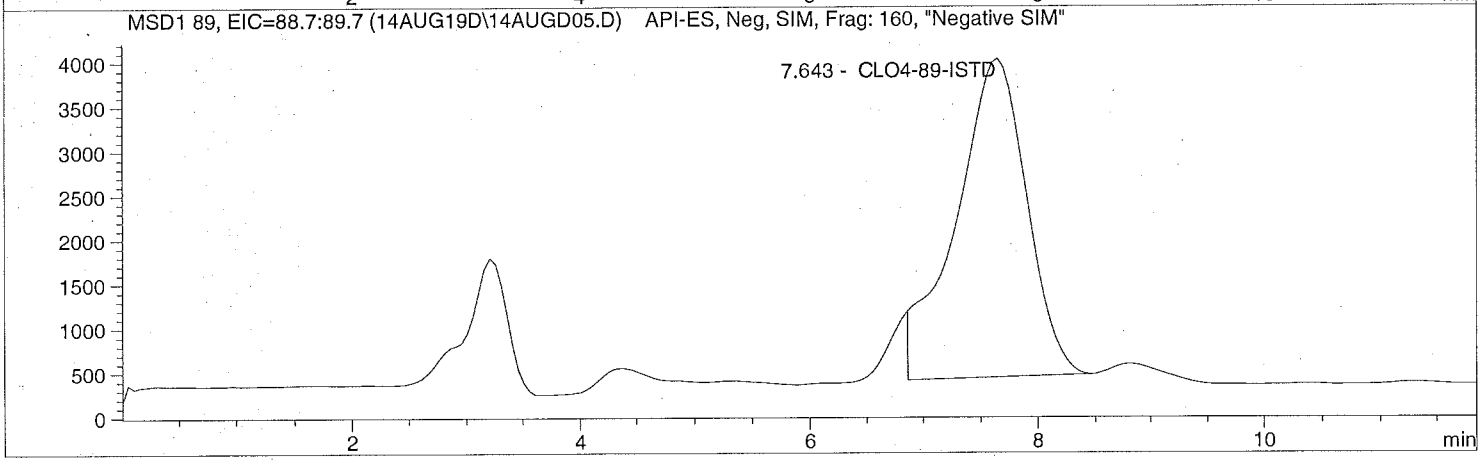
Injection Date:	8/14/2019 09:25:46	Seq Line:	5
Sample Name:	1922027001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD05.D Sample Name: 1922027001

Injection Date:	8/14/2019 09:25:46	Seq Line:	5
Sample Name:	1922027001	Location:	Vial 75
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.643	BBA	153964.0	5.0000	CLO4-89-ISTD

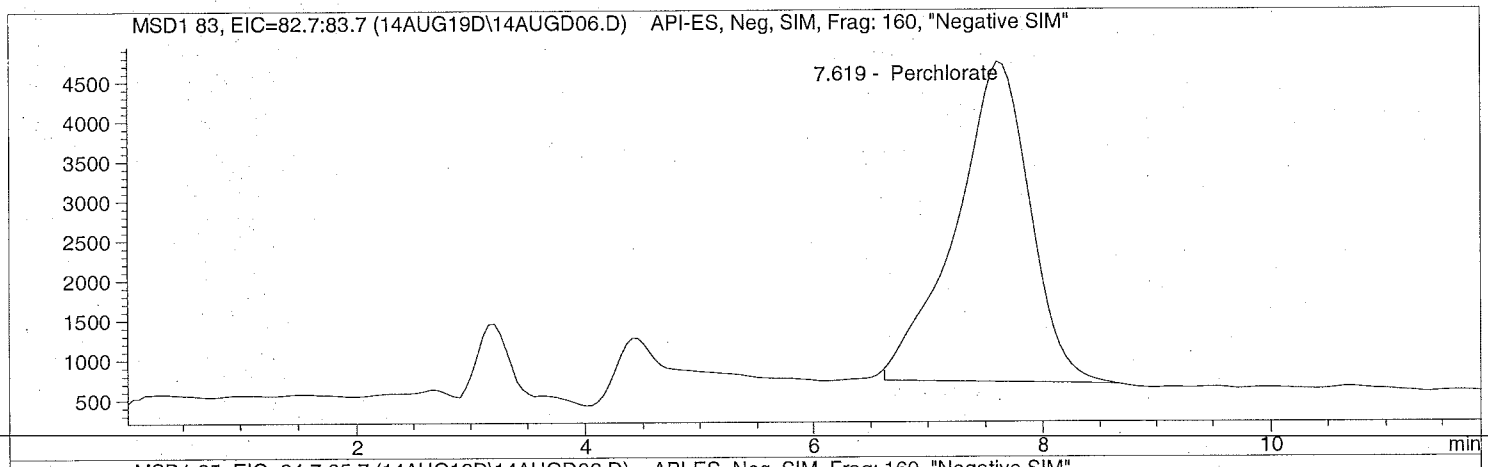
*** End of Report ***

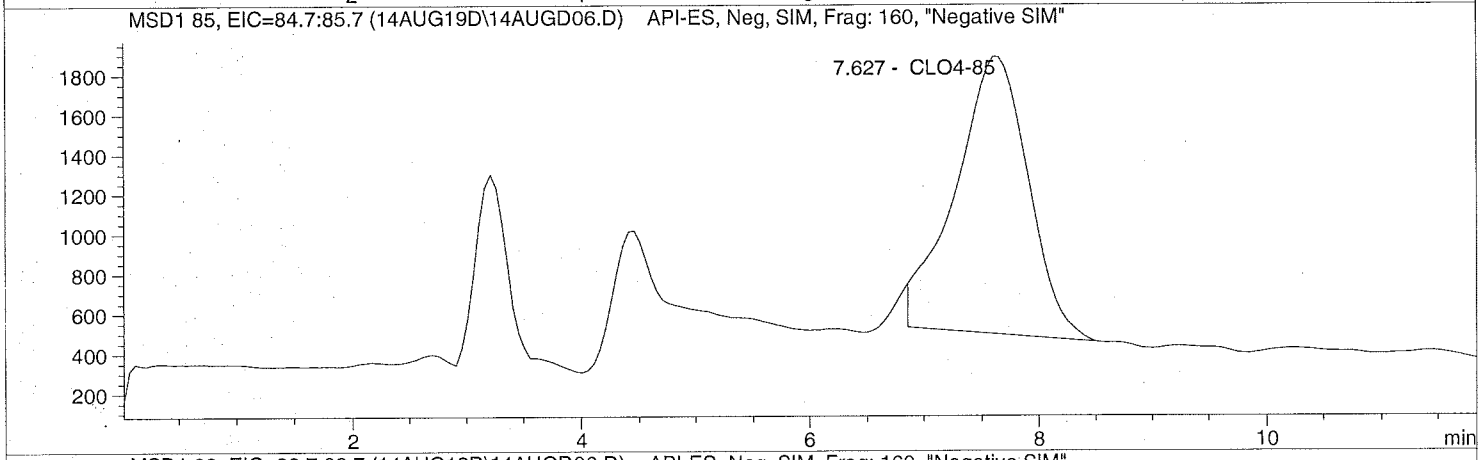
Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD06.D Sample Name: 668349 220271S

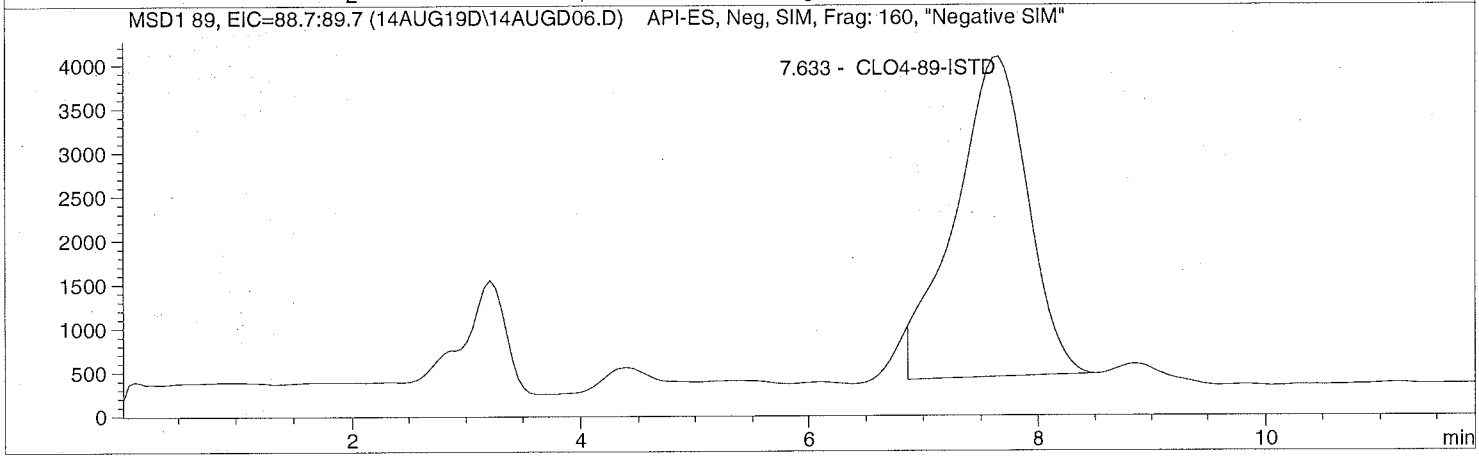
Injection Date:	8/14/2019 09:39:59	Seq Line:	6
Sample Name:	668349 220271S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD06.D Sample Name: 668349 220271S

Injection Date:	8/14/2019 09:39:59	Seq Line:	6
Sample Name:	668349 220271S	Location:	Vial 76
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.619	BBA	180213.1	3.7183	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.627	BBA	61346.3	4.0986	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.633	BBA	160298.6	5.0000	CLO4-89-ISTD

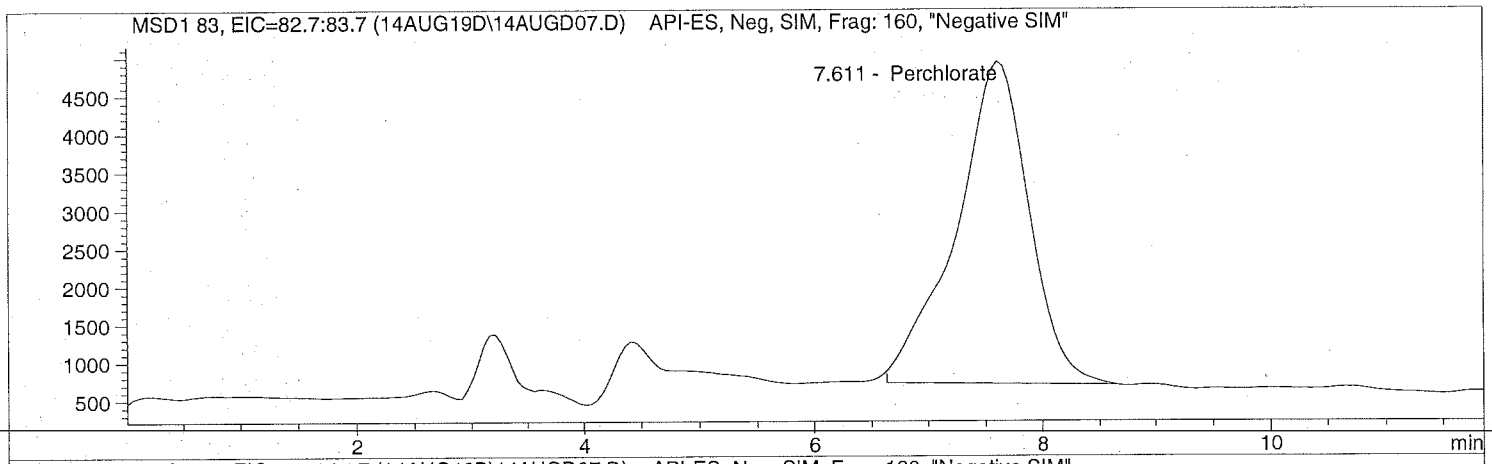
*** End of Report ***

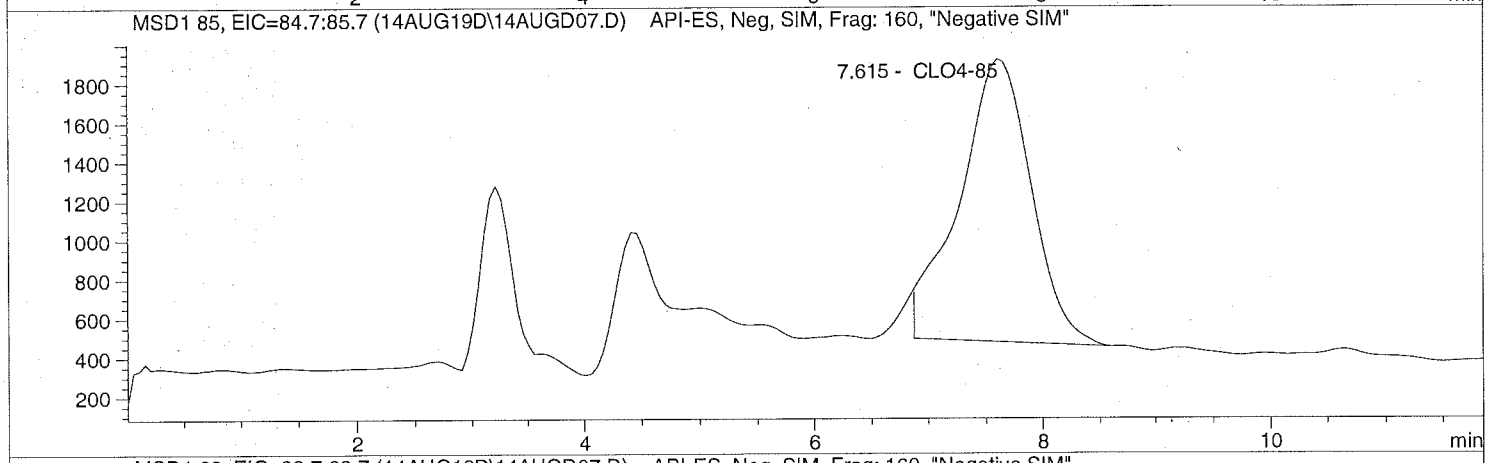
Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD07.D Sample Name: 668350 220271D

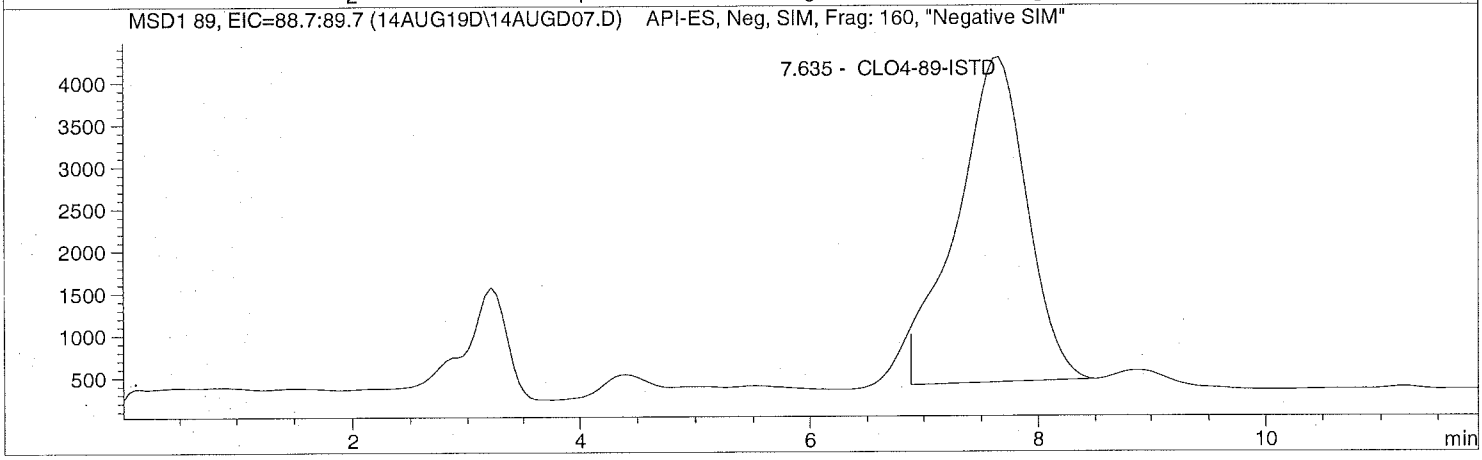
Injection Date:	8/14/2019 09:54:13	Seq Line:	7
Sample Name:	668350 220271D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Injection Date:	8/14/2019 09:54:13	Seq Line:	7
Sample Name:	668350 220271D	Location:	Vial 77
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.611	BBA	186832.0	3.7710	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.615	BBA	62944.2	4.1167	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.635	BBA	163743.1	5.0000	CLO4-89-ISTD

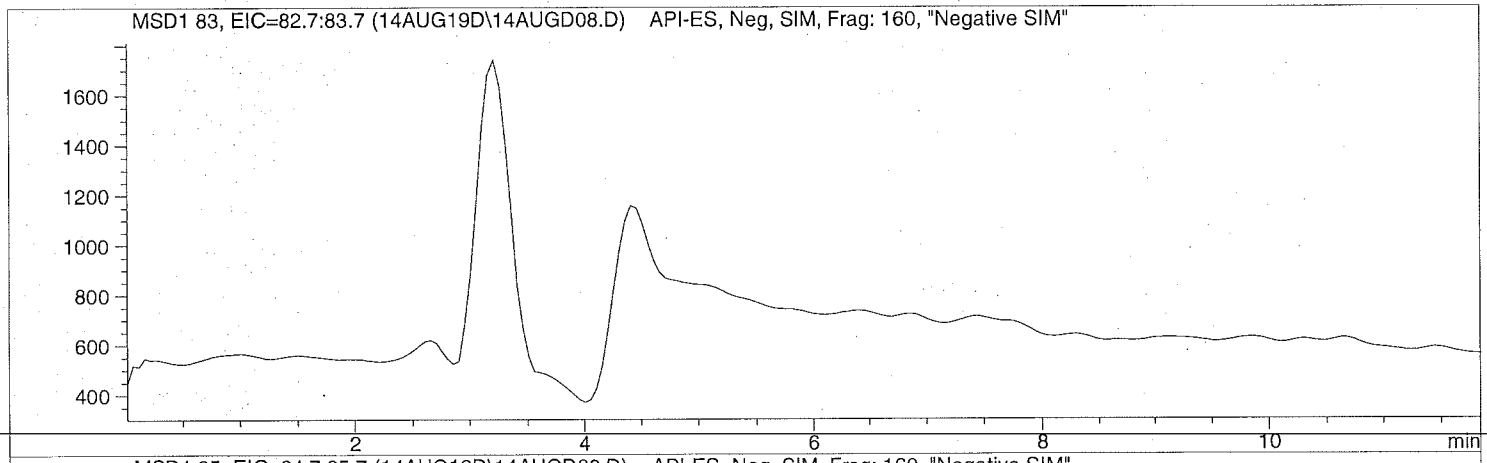
*** End of Report ***

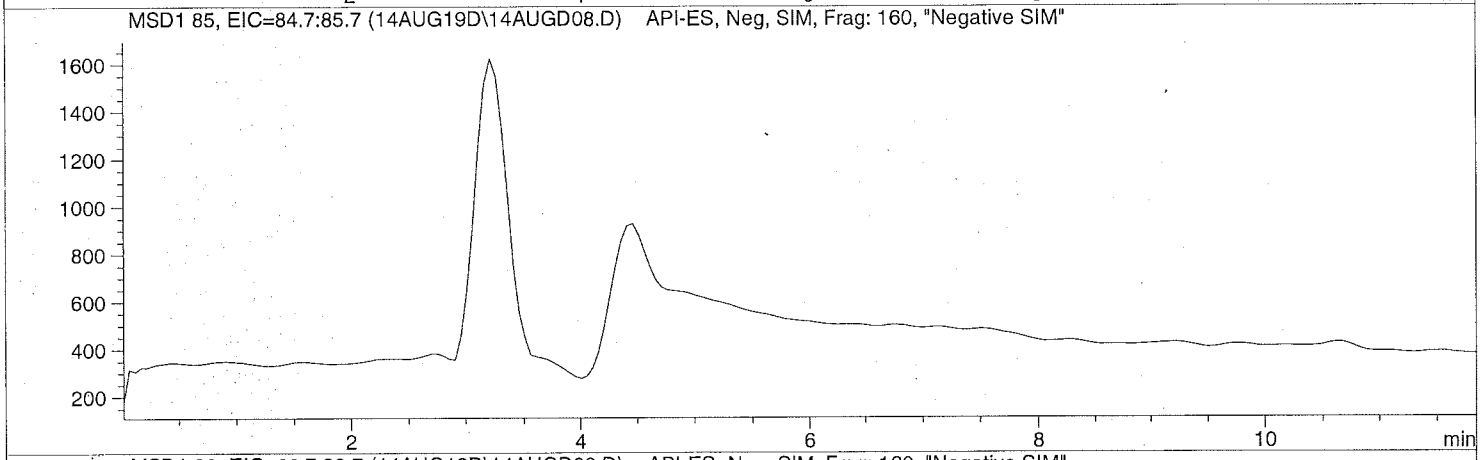
Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD08.D Sample Name: 1922715001

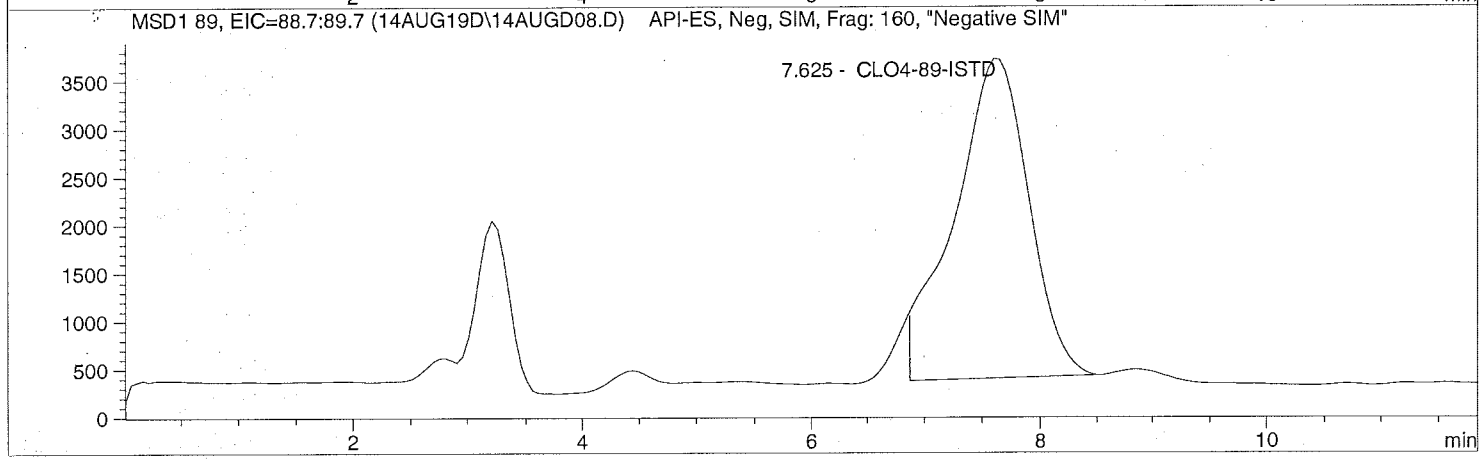
Injection Date:	8/14/2019 10:08:31	Seq Line:	8
Sample Name:	1922715001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis







Data file: C:\HPCHEM\1\DATA\14AUG19D\14AUGD08.D Sample Name: 1922715001

Injection Date:	8/14/2019 10:08:31	Seq Line:	8
Sample Name:	1922715001	Location:	Vial 78
Acq Operator:	TNB	Inj. No.:	1
		Inj. Vol.:	50 µl

Acq. Method: CLO4-AQN.M
Analysis Method: C:\HPCHEM\1\METHODS\CLO4-DP2.M
Last Changed: 4/12/2019 07:54:13

Perchlorate analysis

Sample Information

Sorted By:	Signal
Calib. Data Modified:	Fri, 12. Apr. 2019,07:52:58 am
Multiplier:	1.000000
Dilution:	1.000000
Sample Amount:	0.000

LCMS Results

Signal1: MSD1 83, EIC=82.7:83.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	Perchlorate

Signal2: MSD1 85, EIC=84.7:85.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
0.000		0.0	0.0000	CLO4-85

Signal3: MSD1 89, EIC=88.7:89.7

RT [min]	Type	Area	Amount [ug/sample]	Compound Name
7.625	BBA	148522.8	5.0000	CLO4-89-ISTD

*** End of Report ***

APPENDIX G
QUALITY CONTROL SUMMARY REPORT

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QUARTERLY CONTROL SUMMARY REPORT
2nd QUARTER (APRIL-JUNE) 2019
GROUNDWATER TREATMENT PLANT
LONGHORN ARMY AMMUNITION PLANT
KARNACK, TEXAS

November 2019

Prepared For:

Longhorn Army Ammunition Plant
Karnack, Texas

Under Contract To:

U.S. Army Corps of Engineers
Tulsa District
Tulsa, Oklahoma

Contract Number: W9128F-13-D-0012
Task Order Number: W912BV17F0150

Prepared By:

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Tables

Table 1: Field Sample Identification and Laboratory Packages
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1 INTRODUCTION

Bhate reviewed 41 data packages from ALS Environmental, Houston, Texas. Groundwater samples were collected from April 4, 2019, through June 12, 2019, at the Groundwater Treatment Plant (GWTP) and from June 13, 2019, through August 8, 2019, at Site LHAAP 18/24 at Longhorn Army Ammunition Plant (LHAAP), Karnack, Texas. Data were reviewed for conformance to the requirements of the following guidance documents: [U.S. Environmental Protection Agency] *USEPA Contract Laboratory Program* [CLP] *National Functional Guidelines for Superfund Organic Methods Data Review* (USEPA, January 2017); *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review* (USEPA, January 2017); and the *Final Basewide Uniform Federal Policy* [UFP] – *Quality Assurance Project Plan* [QAPP] *Longhorn Army Ammunition Plant* which is in Appendix C of the *Final Installation-Wide Work Plan for Longhorn Army Ammunition Plant Karnack, Texas* (Bhate, May 2018).

1.1 Intended Use of Data

The objective of sampling at the GWTP is to monitor effluent streams to confirm compliance with discharge limits.

Analyses performed include:

- SW6850 – Perchlorate
- E350.3/SM4500 NH3 – Nitrogen, Ammonia
- E365.3/SM4500 P – Orthophosphate
- E415.1/SM5310 – Total Organic Carbon
- SW8260C - Volatile Organic Compounds (VOCs)
- SW8270D Selected Ion Monitoring (SIM) - 1,4-Dioxane
- SW6020A/7470A – Metals
- SW9056A – Chloride (Cl) and Sulfate (SO_4)
- SW7196A – Hexavalent Chromium
- E410.4 – Chemical Oxygen Demand
- E1664A – Oil and Grease
- TO-15 – Volatiles in Air

Table 1 lists the sample identification numbers (IDs) and their associated laboratory package.

Table 2 lists qualified results with the qualification flag and reason code.

The following narrative is a brief synopsis of data that required qualification due to quality control discrepancies.

1.2 Preservation and Holding Times

Sample identification data were evaluated for agreement with the chain-of-custody (COC). All samples were received in appropriate containers, within the proper temperature range, in good condition, and within the required hold time.

1.3 Calibrations

All analytes reported must be present in the initial and continuing calibration. The calibrations must meet the acceptance criteria specified in Worksheet 24 (Analytical Instrument Calibration) of the QAPP. All results reported must be within the calibration range. Samples were diluted, if necessary, to bring analyte responses within the calibration range.

1.3.1 Continuing Calibration Verifications

The calibrations must meet the following criteria otherwise the compound is qualified J or UJ: The continuing calibration verification (CCV) criteria are 20 percent difference (%D) for VOCs and Semi-Volatile Organic Compounds (SVOCs) and 50% for closing CCVs. Metals and general chemistry - 10%D; perchlorate - 15%D; and volatiles in air - 30%D.

GWTP samples LH18/24-SP650_040419 and LH18/24-SP650_041019 reported carbon tetrachloride and tetrachloroethene outside calibration criteria. GWTP sample LH18/24-SP650_061219 reported acetone outside criteria. Packages HS19061164 and HS19061210 reported bromoform and 1,2-dibromo-3-chloropropane below control limits. Packages HS19061482, HS19061386, and HS19061486 reported bromoform; 1,2-dibromo-3-chloropropane; and 1,2,3-trichlorobenzene below control limits. Finally, sample ICT13A_071119 reported the CCV recovery of bromoform above control limits. The associated sample compounds were qualified as estimated non-detected, “UJ”.

1.4 Blanks

If the analyte result for an associated sample was less than 5X (10X for common laboratory contaminants) the analyte concentration in the blank, that result was qualified “UB” and considered an artifact of blank contamination. Where the sample result for the affected analyte was non-detect or greater than 5X the amount in the blank, no qualifier was applied.

1.4.1 Metals - SW6020

LHAAP 18/24 sample ICT2_062819 reported antimony and vanadium at a concentration < 5X the method blank concentration and samples ICT4_062819, ICT7_062819, ICT8_062819, ICT11_062819, ICT11_062819-a, ICT14B_062819, 18WW09_062719, 18WW25_062719, 125_062419, 126_062419, 18WW03_062419, 18WW03_062419-a, 18CPTMW10DW_062019, 18CPTMW19SW_062019, 18WW02_062019, 18CPTMW01DW_061919, MW6_061819, MW21_061819, 18WW14_061319, 18CPTMW12SW_061319, 18CPTMW12SW_061319-a, 18CPTMW12DW_061319, 18CPTMW22SW_061319, 18CPTMW22DW_061319, MW20_061319, MW22_062119, 18CPTMW03SW_062119, AWD3_062119, and MW1_061919 reported vanadium at a concentration < 5X the method blank concentration. Samples 18WW03_062419, 18WW03_062419-a, 18WW17_062419, 17WW08_062519, C03_062619, 18CPTMW18_062619, and 18WW18_062419 reported aluminum < 5X the method blank concentration. Sample 18CPTMW14_062519 reported antimony < 5X the blank concentration. Samples 18CPTMW10DW_062019, 18CPTMW01DW_061919, MW1_061919, MW6_061819, 18CPTMW22R_061319, MW20_061319, MW14_062019, MW14_062019-a, and

18WW02_062019 reported copper <5X the blank concentration. These metals were qualified "UB".

1.4.2 Volatiles - SW8260

Acetone was detected at a concentration < 10X the trip blank and/or method blank concentration in samples C04_062019, 18WW08_062719, 18WW25_062719, 18CPTMW24_062519, 18CPTMW10SW_062019, 18CPTMW10DW_062019, 18CPTMW19_062019, 18WW02_062019, 18WW06_062019, 18WW22_062019, 18CPTMW01DW_061919, 18CPTMW04_061919, 18CPTMW08SW_061819, MW5_061819, 109_061819, 18CPTMW12SW_061319, 18CPTMW12SW_061319-a, 18CPTMW12DW_061319, 18CPTMW23SW_061319, and 18CPTMW04SW_061919. This compound was qualified "UB".

1.5 Surrogates

Surrogates were evaluated using limits defined by each method in the project-specific QAPP Worksheet 28.

1.5.1 1,4-Dioxane - SW8270SIM

Surrogates 4-terphenyl-d14 and nitrobenzene-d5 were spiked with 2X the normal concentration by the lab and recovered above control limits for sample MW21_061819. The result for 1,4-dioxane was considered estimated and flagged "J".

1.5.2 Volatiles - SW8260

Surrogate 1,2-dichloroethane-d4 was recovered above control limits in sample MW14_062019-a. Toluene-d8 was recovered above limits in sample ICT13A_071119. The detected volatile compounds were considered estimated and flagged "J".

1.6 Laboratory Control Sample (LCS)/Laboratory Control Sample Duplicate (LCSD)

LCS/LCSD recoveries were evaluated using limits defined in the project-specific QAPP Worksheet 15.

1.6.1 Volatiles - SW8260

Chloroform reported the LCS recovery above control limits in packages HS19061279 and HS19061383. The associated samples that reported detections were qualified as estimated, "J".

1.7 Matrix Spike (MS)/Matrix Spike Duplicate Sample (MSD)

MS/MSD recoveries were evaluated using limits defined in Worksheet 15 of the project-specific QAPP. When sample results were greater than 4X the spike amount, control limits were not applicable and require no qualification. Furthermore, if a MS/MSD analyses was performed on a batched (unrelated) sample no qualification was made to the sample data. Otherwise, only the sample used for spiking requires qualification.

1.7.1 Volatiles - SW8260

The GWTP spike sample LH18/24-SP650_041719 reported 1,1-dichloroethane; benzene; chlorobenzene; chloroform; methylene chloride; styrene; and toluene below MS and/or MSD control limits. LHAAP 18/24 spike sample ICT14D_062819 reported methylene chloride below MS/MSD control limits. Sample C09_062619 reported the MS and/or MSD recoveries of 1,1-dichloroethane; bromobenzene; bromochloromethane; chlorobenzene; and chloroform below control limits. These compounds were qualified as estimated detect/non-detect, "J/UJ".

1.7.2 Anions - SW9056

The GWTP spike sample LH18/24-SP650_040419 reported chloride below MS recovery control limits and was qualified as estimated, "J".

1.7.3 Metals - SW6020

The GWTP spike samples LH18/24-SP650_060419 reported selenium below MS/MSD recovery limits. Aluminum failed the MSD recovery high in spiked sample ICT14D_062819. Manganese failed the MSD recovery low in spiked sample MW6_061819. Lastly, barium failed the MSD recovery high in the spiked sample ICT13A_071119. These metals were qualified as estimated, "J/UJ".

1.8 Internal Standards

If the percent recovery (%R) for an internal standard in a sample is not within the limit, the associated sample is qualified for those analytes associated with the internal standard(s) outside of the limit.

Internal standards were within acceptance criteria for the associated compounds.

1.9 Precision

Precision is the measure of variability of individual sample measurements. Evaluation of laboratory and/or field duplicates for precision was done using the relative percent difference (RPD). The RPD is defined as the difference between two duplicate samples divided by the mean and expressed as a percent. Field duplicate RPD limits were set at <30% for groundwater and air matrices. Laboratory duplicate RPD limits were set at <25% for air matrices.

1.9.1 Laboratory Duplicate

The laboratory duplicate results were within control limits.

1.9.2 Field Duplicate

The LHAAP 18/24 sample ICT12B_062819 and its duplicate reported benzene and carbon tetrachloride outside control limits. Sample ICT11_062819 and its duplicate were outside the RPD limit for acetone, aluminum, chromium, and vanadium. Sample 18WW03_062419 and its duplicate were outside RPD limits for chromium. Sample MW2_061919 and its duplicate were outside RPD limits for bromochloromethane and 1,4-dioxane. Sample 18CPTMW12SW_061319 and its duplicate were outside limits for 1,4-dioxane and vanadium. Samples

18CPTMW06_062119, MW14_062019, and their duplicates were outside control limits for 1,4-dioxane. Sample AWD4_062619 and its duplicate were outside RPD limits for multiple metals. Sample 18WW10_062519 and its duplicate were outside RPD limits for acetone. These compounds were qualified as estimated, "J", in both parent sample and associated duplicate.

2 DATA USABILITY SUMMARY

The data are usable for the intended purposes of the project (Table 3). The data quality objectives have been met for the project.

Table 1: Field Sample Identification and Laboratory Packages

Client Sample ID	Lab Package	SW6850	E350.3	E365.3	E415.1	SW8270D SIM	SW8260C	SW6020A	SW9056A	SW7196A	E410.4	1664A	TO-15
GWTP Samples													
LH18/24-SP650_040419/BIX	HS19040313	X	X	X	X								
LH18/24-SP650_040419	HS19040319						X		X				
LH18/24-SP650_041019/BIX	HS19040652	X				X	X	X		X			
LH18/24-SP140_041019	HS19040654	X						X		X			
LH18/24-SP650_041019/BIX	HS19040653	X	X	X	X								
LH18/24-SP650_041719/BIX	HS19041072	X	X	X	X								
LH18/24-SP650_041719	HS19041158						X		X				
LH18/24-SP650_050119/BIX	HS19050126	X	X	X	X								
LH18/24-SP650_050119	HS19050138						X		X				
LH18/24-SP140_050719	HS19050401	X						X		X			
LH18/24-SP650_050719/BIX	HS19050398	X				X	X	X		X			
LH18/24-SP650_050719/BIX	HS19050397	X	X	X	X								
LH18/24-SP650_051419/BIX	HS19050886	X	X	X	X								
LH18/24-SP650_051419	HS19050920						X		X				
LH18/24-SP650_052119/BIX	HS19051289	X	X	X	X								
LH18/24-SP650_052919	HS19051866						X		X				
LH18/24-SP650_052919/BIX	HS19051856	X	X	X	X								
LH18/24-SP650_052919/BIX	HS19051859	X				X	X	X	X		X	X	
LH18/24-SP140_052919	HS19051863	X				X	X	X	X		X	X	
LH18/24-SP650_060419/BIX	HS19060168	X				X	X	X		X			
LH18/24-SP140_060419	HS19060174	X						X		X			
LH18/24-SP650_060419/BIX	HS19060172	X	X	X	X								
LH18/24-SP650_061219/BIX	HS19060672	X	X	X	X								
LH18/24-SP650_061219	HS19060699						X		X				
Air Samples													
LH18/24-Air_052919_Stripper	P1903177												X
LH18/24-Air_052919_Stripper_a	P1903177												X
LH18/24-Air_052919_GWTP	P1903177												X
LH18/24-Air_0529_Downwind_South	P1903177												X
Site 18/24													
AWD1_062019	HS19061164					X							
AWD3_062119	HS19061210	X					X	X					
AWD4_062619	HS19061482	X				X	X	X					
AWD4_062619-a	HS19061482	X				X	X	X					
18CPTMW01DW_061919	HS19061083	X				X	X	X					
18CPTMW01SW_061919	HS19061083	X				X	X	X					
18CPTMW03SW_062119	HS19061210	X				X	X	X					
18CPTMW04_061919	HS19061083	X				X	X						
18CPTMW04SW_061919	HS19061083	X				X	X	X					
18CPTMW06_062119	HS19061210	X				X	X						

Client Sample ID	Lab Package	SW6850	E350.3	E365.3	E415.1	SW8270D SIM	SW8260C	SW6020A	SW9056A	SW7196A	E410.4	1664A	TO-15
18CPTMW06_062119-a	HS19061210	X				X	X						
18CPTMW07_062519	HS19061383	X				X	X						
18CPTMW08SW-061819	HS19060986	X				X	X						
18CPTMW08DW-061819	HS19060986	X				X							
18CPTMW10SW_062019	HS19061157	X				X	X						
18CPTMW10DW_062019	HS19061157	X					X	X					
18CPTMW12SW_061719	HS19060929	X				X	X	X					
18CPTMW12SW_061719-a	HS19060929	X				X	X	X					
18CPTMW12DW_061719	HS19060929	X				X	X	X					
18CPTMW14_062519	HS19061383	X				X	X	X					
18CPTMW15_062119	HS19061210	X				X	X						
18CPTMW16_062719	HS19061547	X				X							
18CPTMW18_062619	HS19061486	X				X	X	X					
18CPTMW19_062019	HS19061157	X				X	X						
18CPTMW19SW_062019	HS19061157	X				X	X	X					
18CPTMW22R_061319	HS19060835	X				X	X	X					
18CPTMW22SW_061319	HS19060835	X				X	X	X					
18CPTMW22DW_061319	HS19060835	X				X	X	X					
18CPTMW23-061719	HS19060929	X				X	X						
18CPTMW23SW-061719	HS19060929	X				X	X						
18CPTMW24_062519	HS19061383	X				X	X						
18CPTMW26SW_061319	HS19060835	X				X	X						
17WW08_062519	HS19061386	X					X	X					
18WW02_062019	HS19061157	X				X	X	X					
18WW03_062419	HS19061279	X				X	X	X					
18WW03_062419_a	HS19061279	X				X	X	X					
18WW06_062019	HS19061157	X				X	X						
18WW08_062719	HS19061547	X				X	X						
18WW09_062719	HS19061547	X				X		X					
18WW10_062519	HS19061386	X				X	X						
18WW10_062519-a	HS19061386	X				X	X						
18WW14_061719	HS19060929	X						X					
18WW16_062619	HS19061486	X					X	X					
18WW17_062419	HS19061279	X					X	X					
18WW18_062419	HS19061279	X				X	X	X					
18WW19_080819	HS19080486	X					X	X					
18WW20_080819	HS19080486	X				X	X	X					
18WW22_062019	HS19061157	X				X	X	X					
18WW24_062619	HS19061482	X					X	X					
18WW25_062719	HS19061547	X				X	X	X					
C01_062119	HS19061210	X					X						
C02_062519	HS19061386	X					X						
C03_062619	HS19061486	X				X	X	X					
C04_062019	HS19061157	X					X						
C06_062619	HS19061486	X					X	X					
C08_062119	HS19061210	X				X	X						
C09_062619	HS19061486	X					X	X					
MW1_061919	HS19061083	X					X	X					
MW2_061919	HS19061083	X				X	X						
MW2_061919_a	HS19061083	X				X	X						
MW3_062519	HS19061383	X					X	X					
MW5_061819	HS19060986	X				X	X						
MW6_061819	HS19060986	X					X	X					
MW7_061719	HS19060929	X				X	X						
MW8_062119	HS19061210	X				X	X						
MW9_062519	HS19061386	X				X	X	X					

Client Sample ID	Lab Package	SW6850	E350.3	E365.3	E415.1	SW8270D SIM	SW8260C	SW6020A	SW9056A	SW7196A	E410.4	1664A	TO-15
MW10_062519	HS19061386	X				X	X						
MW12_062019	HS19061164	X					X						
MW13_062519	HS19061386	X					X	X					
MW14_062019	HS19061164	X				X	X	X					
MW14_062019-a	HS19061164	X				X	X	X					
MW16_062619	HS19061482	X				X	X						
MW17_062519	HS19061386	X				X							
MW18_062619	HS19061486	X					X						
MW19_062619	HS19061482	X					X	X					
MW20_061319	HS19060835	X					X	X					
MW21-061819	HS19060986	X				X	X	X					
MW22_062119	HS19061210	X					X	X					
MW23_062419	HS19061279	X					X						
102_062419	HS19061279	X					X	X					
109_061819	HS19060986	X				X	X						
120_062019	HS19061164	X				X	X						
125_062419	HS19061279	X					X	X					
126_062419	HS19061279	X				X	X	X					
129_062419	HS19061279	X				X	X	X					
130_062519	HS19061386	X					X	X					
130_062519-a	HS19061386	X					X	X					
ICT2_062819	HS19070016	X					X	X					
ICT4_062819	HS19070016	X					X	X					
ICT7_062819	HS19070016	X					X	X					
ICT8_062819	HS19070016	X					X	X					
ICT11_062819	HS19070016	X					X	X					
ICT11_062819-a	HS19070016	X					X	X					
ICT12B_062819	HS19070016	X					X	X					
ICT12B_062819-a	HS19070016	X					X	X					
ICT12C_062819	HS19070016	X					X	X					
ICT12D_062819	HS19070016	X					X	X					
ICT12E_062819	HS19070016	X					X	X					
ICT13A_062819	HS19070622	X					X	X					
ICT13B_062819	HS19070016	X					X	X					
ICT13D_062819	HS19070016	X					X	X					
ICT13E_062819	HS19070016	X					X	X					
ICT13F_062819	HS19070016	X					X	X					
ICT14B_062819	HS19070016	X					X	X					
ICT14C_062819	HS19070016	X					X	X					
ICT14D_062819	HS19070016	X					X	X					

Notes:
MW – Monitoring Well
SM – Standard Method
SW-846 - Test Methods for Evaluating Solid Waste, Physical/Chemical Methods.
E – U.S. Environmental Protection Agency Method
HS – Houston
ICT – Interceptor Collection Trench

Table 2: Qualified Analytical Data

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Result and Qualifier+	Reason for Qualification
GWTP				
LH18/24-SP650_040419	HS19040319	Carbon Tetrachloride Tetrachloroethene Chloride	0.5 UJ 0.5 UJ 377 J	CCV CCV MS <
LH18/24-SP650_041019	HS19040652	Carbon Tetrachloride Tetrachloroethene	0.5 UJ 0.5 UJ	CCV CCV
LH18/24-SP650_041719	HS19041158	1,1-Dichloroethane Benzene Chlorobenzene Chloroform Methylene chloride Styrene Toluene	0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 0.5 UJ 37 J 1.8 J	MS/MSD < MSD < MSD < MS/MSD < MSD < MSD/MSD < MS/MSD <
LH18/24-SP650_060419	HS19060168	Selenium	0.00250 UJ	MS/MSD <
LH18/24-SP650_061219	HS19060699	Acetone	1.0 UJ	CCV
LHAAP 18/24				
ICT2_062819	HS19070016	Antimony Vanadium	0.000493 UB 0.00189 UB	MB MB
ICT4_062819	HS19070016	Vanadium	0.00174 UB	MB
ICT7_062819	HS19070016	Vanadium	0.00136 UB	MB
ICT8_062819	HS19070016	Vanadium	0.00195 UB	MB
ICT11_062819	HS19070016	Acetone Aluminum Chromium Vanadium	6.4 J 0.00846 J 0.142 J 0.00109 UB*	FD RPD FD RPD FD RPD MB/FD RPD
ICT11_062819-a	HS19070016	Acetone Aluminum Chromium Vanadium	3.6 J 0.0149 J 0.219 J 0.00243 UB*	FD RPD FD RPD FD RPD MB/FD RPD
ICT12B_062819	HS19070016	Benzene Carbon Tetrachloride	16 J 68 J	FD RPD FD RPD
ICT12B_062819-a	HS19070016	Benzene Carbon Tetrachloride	11 J 49 J	FD RPD FD RPD
ICT14B_062819	HS19070016	Vanadium	0.00184 UB	MB
ICT14D_062819	HS19070016	Methylene chloride Aluminum	11,000 J 0.0223 J	MS/MSD < MSD >
18WW08_062719	HS19061547	Acetone	2.1 UB	TB
18WW09_062719	HS19061547	Vanadium	0.00236 UB	MB
18WW25_062719	HS19061547	Acetone Vanadium	2.3 UB 0.000983 UB	TB MB
MW23_062419	HS19061279	Chloroform	20 J	LCS >
125_062419	HS19061279	Chloroform Vanadium	26 J 0.00142 UB	LCS > MB
126_062419	HS19061279	Vanadium	0.00257 UB	MB
129_062419	HS19061279	Chloroform	1.2 J	LCS >
18WW03_062419	HS19061279	Aluminum Chromium Vanadium	0.0156 UB 0.0540 J 0.00237 UB	MB FD RPD MB
18WW03_062419-a	HS19061279	Aluminum Chromium Vanadium	0.0175 UB 0.0356 J 0.00240 UB	MB FD RPD MB
18WW17_062419	HS19061279	Aluminum	0.0219 UB	MB
18WW18_062419	HS19061279	Aluminum	0.0389 UB	MB
18CPTMW14_062519	HS19061383	Chloroform Antimony	6.7 J 0.000513 UB	LCS > MB
18CPTMW24_062519	HS19061383	Acetone	5.1 UB	MB
18CPTMW10SW_062019	HS19061157	Acetone	5.4 UB	MB

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Result and Qualifier+	Reason for Qualification
18CPTMW10DW_062019	HS19061157	Acetone Copper Vanadium	3.3 UB 0.00188 UB 0.00163 UB	MB MB MB
18CPTMW19_062019	HS19061157	Acetone	4.8 UB	MB
18CPTMW19SW_062019	HS19061157	Vanadium	0.00184 UB	MB
18WW02_062019	HS19061157	Acetone Copper Vanadium	5.4 UB 0.00663 UB 0.00394 UB	MB MB MB
18WW06_062019	HS19061157	Acetone	3.0 UB	MB
18WW22_062019	HS19061157	Acetone	9.1 UB	MB
C04_062019	HS19061157	Acetone	4.8 UB	MB
18CPTMW01DW_061919	HS19061083	Acetone Copper Vanadium	5.1 UB 0.00332 UB 0.00102 UB	TB MB MB
18CPTMW04_061919	HS19061083	Acetone	4.6 UB	TB
18CPTMW04SW_061919	HS19061083	Acetone	5.0 UB	TB
MW1_061919	HS19061083	Copper Vanadium	0.00256 UB 0.00117 UB	MB MB
MW2_061919	HS19061083	Bromochloromethane 1,4-Dioxane	660 J 3.5 J	FD RPD FD RPD
MW2_061919-a	HS19061083	Bromochloromethane 1,4-Dioxane	460 J 6.2 J	FD RPD FD RPD
MW5_061819	HS19060986	Acetone	4.9 UB	TB
MW6_061819	HS19060986	Manganese Copper Vanadium	0.137 J 0.00520 UB 0.00378 UB	MSD < MB MB
18CPTMW08SW_061819	HS19060986	Acetone	2.7 UB	TB
MW21_061819	HS19060986	1,4-Dioxane Vanadium	1.2 J 0.00433 UB	Surr > MB
109_061819	HS19060986	Acetone	7.8 UB	TB
18CPTMW12SW_061319	HS19060929	Acetone Vanadium 1,4-Dioxane	2.9 UB 0.00102 UB* 0.073 J	TB MB/FD RPD FD RPD
18CPTMW12SW_061319-a	HS19060929	Acetone Vanadium 1,4-Dioxane	3.0 UB 0.00150 UB* 0.18 J	TB MB/FD RPD FD PRD
18CPTMW12DW_061319	HS19060929	Acetone Vanadium	3.2 UB 0.00169 UB	TB MB
18CPTMW23SW_061319	HS19060929	Acetone	2.7 UB	TB
18WW14_061319	HS19060929	Vanadium	0.00422 UB	MB
18CPTMW22R_061319	HS19060835	Copper	0.00172 UB	MB
18CPTMW22SW_061319	HS19060835	Vanadium	0.00200 UB	MB
18CPTMW22DW_061319	HS19060835	Vanadium	0.00216 UB	MB
MW20_061319	HS19060835	Copper Vanadium	0.00576 UB 0.00507 UB	MB MB
C01_062119	HS19061210	Bromoform 1,2-Dibromo-2-Chloropropane	0.50 UJ 0.50 UJ	CCV CCV
C08_062119	HS19061210	Bromoform 1,2-Dibromo-2-Chloropropane	0.50 UJ 0.50 UJ	CCV CCV
MW8_062119	HS19061210	Bromoform 1,2-Dibromo-2-Chloropropane	0.50 UJ 0.50 UJ	CCV CCV
MW22_062119	HS19061210	Vanadium Bromoform 1,2-Dibromo-2-Chloropropane	0.00257 UB 0.50 UJ 0.50 UJ	MB CCV CCV
18CPTMW03SW_062119	HS19061210	Vanadium Bromoform 1,2-Dibromo-2-Chloropropane	0.00183 UB 0.50 UJ 0.50 UJ	MB CCV CCV
18CPTMW06_062119	HS19061210	1,4-Dioxane Bromoform 1,2-Dibromo-2-Chloropropane	0.46 J 0.50 UJ 0.50 UJ	FD RPD CCV CCV

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Result and Qualifier+	Reason for Qualification
18CPTMW06_062119-a	HS19061210	1,4-Dioxane	0.052 J	FD RPD
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
18CPTMW15_062119	HS19061210	Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
AWD3_062119	HS19061210	Vanadium	0.00191 UB	MB
		Bromoform	5.0 UJ	CCV
		1,2-Dibromo-2-Chloropropane	5.0 UJ	CCV
MW12_062019	HS19061164	Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
MW14_062019	HS19061164	Copper	0.00394 UB	MB
		1,4-Dioxane	280 J	FD RPD
		Bromoform	10 UJ	CCV
		1,2-Dibromo-2-Chloropropane	10 UJ	CCV
MW14_062019-a	HS19061164	1,1-Dichloroethene	140 J	Surr >
		1,2-Dichloroethane	110 J	Surr >
		Chloroform	25 J	Surr >
		cis-1,2-Dichloroethene	2,000 J	Surr >
		Copper	0.00362 UB	MB
		1,4-Dioxane	390 J	FD RPD
		Bromoform	10 UJ	CCV
		1,2-Dibromo-2-Chloropropane	10 UJ	CCV
120_062019	HS19061164	Bromoform	10 UJ	CCV
		1,2-Dibromo-2-Chloropropane	10 UJ	CCV
AWD4_062619	HS19061482	Aluminum	20.1 J	FD RPD
		Arsenic	0.00257 J	FD RPD
		Beryllium	0.000982 J	FD RPD
		Chromium	0.387 J	FD RPD
		Cobalt	0.0121 J	FD RPD
		Copper	0.0215 J	FD RPD
		Iron	22.3 J	FD RPD
		Lead	0.00842 J	FD RPD
		Potassium	1.29 J	FD RPD
		Vanadium	0.0366 J	FD RPD
		Zinc	0.0883 J	FD RPD
		1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
AWD4_062619-a	HS19061482	Aluminum	9.41 J	FD RPD
		Arsenic	0.00158 J	FD RPD
		Beryllium	0.000691 J	FD RPD
		Chromium	0.193 J	FD RPD
		Cobalt	0.00828 J	FD RPD
		Copper	0.0140 J	FD RPD
		Iron	11 J	FD RPD
		Lead	0.00448 J	FD RPD
		Potassium	0.827 J	FD RPD
		Vanadium	0.0207 J	FD RPD
		Zinc	0.0588 J	FD RPD
		1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
18WW24_062619	HS19061482	1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
MW16_062619	HS19061482	1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
MW19_062619	HS19061482	1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Result and Qualifier+	Reason for Qualification
17WW08_062519	HS19061386	Aluminum	0.0212 UB	MB
18WW10_062519	HS19061386	Acetone	3.9 J	FD RPD
		1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
18WW10_062519-a	HS19061386	Acetone	2.0 J	FD RPD
		1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
130_062519-a	HS19061386	1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
MW9_062519	HS19061386	1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
MW10_062519	HS19061386	1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
MW13_062519	HS19061386	1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
C02_062519	HS19061386	1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
C03_062619	HS19061486	Aluminum	0.00694 UB	MB
C06_062619	HS19061486	1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
C09_062619	HS19061486	1,1-Dichloroethane	0.50 UJ	MS/MSD <
		Bromobenzene	0.50 UJ	MS/MSD <
		Bromochloromethane	0.50 UJ	MS/MSD <
		Chlorobenzene	0.50 UJ	MS <
		Chloroform	0.50 UJ	MSD <
		1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
18CPTMW18_062619	HS19061486	Aluminum	0.0122 UB	MB
		1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
18WW16_062619	HS19061486	1,2,3-Trichlorobenzene	0.50 UJ	CCV
		Bromoform	0.50 UJ	CCV
		1,2-Dibromo-2-Chloropropane	0.50 UJ	CCV
ICT13A_071119	HS19070622	1,1-Dichloroethane	1.3 J	Surr >
		1,1-Dichloroethene	5.5 J	Surr >
		1,2-Dichloroethane	18 J	Surr >
		cis-1,2-Dichloroethene	86 J	Surr >
		Tetrachloroethene	2.2 J	Surr >
		trans-1,2-Dichloroethene	1.1 J	Surr >
		Vinyl chloride	6.4 J	Surr >
		Bromoform	0.05 UJ	CCV
		Barium	0.0656 J	MSD >

Client Sample ID Laboratory	Laboratory Package	Analyte Name	Result and Qualifier+	Reason for Qualification

Notes:
J – Estimated: The analyte was positively identified, the quantitation is an estimation due to discrepancies in meeting certain analyte-specific quality control criteria.
UJ – Estimated not detected; The analyte was not detected but considered estimated due to discrepancies in meeting quality control criteria and reported to the limit of detection.
UB – considered an artifact of blank contamination
FD RPD – Field Duplicate Relative Percent Difference outside control limits
MB – Method Blank contamination; TB – trip blank contamination
CCV – Continuing calibration verification percent recovery outside control limits
MS/MSD <>– Matrix spike/Matrix spike duplicate below/above control limits; LCS > - laboratory control sample above control limits
Surr > - surrogate recover above control limits
*- UB flag supersedes all others
+ - Volatiles/semi-volatiles in micrograms per liter (μg/L); metals and general chemistry in milligrams per liter (mg/L)

Table 3: Completeness by Method

Method	No. of Rejected Results	% Completeness
SW6850	0	100
E350.1	0	100
E365.2	0	100
E415.1	0	100
SW8270D	0	100
SW8260B	0	100
SW6020A	0	100
SW9056	0	100
SW7196A	0	100
E410.4	0	100
E1664	0	100
TO-15	0	100

APPENDIX H
AIR MONITORING ANALYTICAL LABORATORY REPORT
(PROVIDED ON CD ONLY)

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LABORATORY REPORT

June 25, 2019

Marcia Olive
Bhate Environmental Associates, Inc.
445 Union Blvd Suite 129
Lakewood, CO 80228

RE: LHAAP-GWTP / NW01312.0150

Dear Marcia:

Enclosed are the results of the samples submitted to our laboratory on June 4, 2019. For your reference, these analyses have been assigned our service request number P1903177.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at www.alsglobal.com. Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

ALS | Environmental

By Sue Anderson at 3:20 pm, Jun 25, 2019

Sue Anderson
Project Manager

2655 Park Center Dr., Suite A
Simi Valley, CA 93065
T: +1 805 526 7161
www.alsglobal.com

Client: Bhate Environmental Associates, Inc. Service Request No: P1903177
Project: LHAAP-GWTP / NW01312.0150

CASE NARRATIVE

The samples were received intact under chain of custody on June 4, 2019 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

Volatile Organic Compound Analysis

The samples were analyzed for volatile organic compounds in accordance with EPA Method TO-15 from the Compendium of Methods for the Determination of Toxic Organic Compounds in Ambient Air, Second Edition (EPA/625/R-96/010b), January, 1999. This procedure is described in laboratory SOP VOA-TO15. The analytical system was comprised of a gas chromatograph / mass spectrometer (GC/MS) interfaced to a whole-air preconcentrator. This method is included on the laboratory's NELAP and DoD-ELAP scope of accreditation. Any analytes flagged with an X are not included on the NELAP or DoD-ELAP accreditation.

The containers were cleaned, prior to sampling, down to the method reporting limit (MRL) reported for this project. For projects requiring DoD QSM 5.1 compliance canisters were cleaned to <1/2 the MRL. Please note, projects which require reporting below the MRL could have results between the MRL and method detection limit (MDL) that are biased high.

The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.

Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.

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Simi Valley, CA 93065
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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	http://dec.alaska.gov/eh/lab.aspx	17-019
Arizona DHS	http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home	AZ0694
Florida DOH (NELAP)	http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html	E871020
Louisiana DEQ (NELAP)	http://www.deq.louisiana.gov/page/la-lab-accreditation	05071
Maine DHHS	http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml	2018027
Minnesota DOH (NELAP)	http://www.health.state.mn.us/accreditation	1521096
New Jersey DEP (NELAP)	http://www.nj.gov/dep/enforcement/oqa.html	CA009
New York DOH (NELAP)	http://www.wadsworth.org/labcert/elap/elap.html	11221
Oregon PHD (NELAP)	http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx	4068-006
Pennsylvania DEP	http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx	68-03307 (Registration)
PJLA (DoD ELAP)	http://www.pjlabs.com/search-accredited-labs	65818 (Testing)
Texas CEQ (NELAP)	http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html	T104704413-18-9
Utah DOH (NELAP)	http://health.utah.gov/lab/lab_cert_env	CA016272018-9
Washington DOE	http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html	C946

Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at www.alsglobal.com, or at the accreditation body's website.

Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.

ALS ENVIRONMENTAL

DETAIL SUMMARY REPORT

Client: Bhate Environmental Associates, Inc. Service Request: P1903177
Project ID: LHAAP-GWTP / NW01312.0150

Date Received: 6/4/2019
Time Received: 09:10

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pfl (psig)	TO-15 - VOC Cans
LH18/24-Air_052919_Stripper	P1903177-001	Air	5/29/2019	14:00	AS01320	-0.09	3.55	X
LH18/24-Air_052919_Stripper_a	P1903177-002	Air	5/29/2019	14:00	AS00732	-0.10	3.62	X
LH18/24-Air_052919_GWTP	P1903177-003	Air	5/29/2019	14:15	AC02346	-2.16	3.68	X
LH18/24-Air_0529_Downwind_South	P1903177-004	Air	5/30/2019	07:00	AC02318	0.12	3.52	X

Air - Chain of Custody Record & Analytical Service Request

Page 1 of 1

2655 Park Center Drive, Suite A
Simi Valley, California 93065
Phone (805) 526-7161
Fax (805) 526-7270

Requested Turnaround Time in Business Days (Surcharges) please circle
1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard

ALS Project No. R1903177

Company Name & Address (Reporting Information)
BHATE ENVIRONMENTAL
445 UNION BLVD. STE 129
LAKEWOOD, CO. 80228

Project Name: LHAAP - GWTP

Project Number: NW01312.0150

Project Manager: Kim Nemmers

P.O. # / Billing Information

Phone: 720-463-3905

Fax:

Email Address for Result Reporting: molive@bhate.com

Sampler (Print & Sign): Scott Beesinger Scott Beesinger

ALS Contact:

Client Sample ID	Laboratory ID Number	Date Collected	Time Collected	Canister ID (Bar code # - AC, SC, etc.)	Flow Controller ID (Bar code # - FC #)	Canister Start Pressure "Hg	Canister End Pressure "Hg/psig	Sample Volume	Analysis Method: TO-15		Comments e.g. Actual Preservative or specific instructions
LH18/24-Air-052919_Stripper		5/29/19	1400	AS01320		-30	0	6L	✓		
LH18/24-Air_052919_Stripper_dup		5/29/19	1400	AS00732		-28	0	6L	✓		
LH18/24-Air-052919_GWTP		5/29/19	1415	AC02346	SFC00182	-27	-5	6L	✓		
LH18/24-Air_0529_Downwind_South		5/30/19	0700	AC02318	SFC00157	-25	0	6L	✓		

Report Tier Levels - please select

Tier I - Results (Default if not specified) _____
Tier II (Results + QC Summaries) X
Tier III (Results + QC & Calibration Summaries) _____
Tier IV (Data Validation Package) 10% Surcharge _____

EDD required Yes / No
Type: _____ Units: _____

Chain of Custody Seal: (Circle)
INTACT BROKEN ABSENT

Project Requirements (MRLs, QAPP)

Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
Scott Beesinger	5/30/19	07:15			
Relinquished by: (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
				6/1/19	0910

Cooler / Blank Temperature ____°C

009 of 069

009428808

ALS Environmental
Sample Acceptance Check Form

Client: Bhate Environmental Associates, Inc. Work order: P1903177

Project: LHAAP-GWTP / NW01312.0150

Sample(s) received on: 6/4/19 Date opened: 6/4/19 by: HAYDEN.AKERS

Note: This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

		Yes	No	N/A
1	Were **sample containers** properly marked with client sample ID?	☒	☐	☐
2	Did **sample containers** arrive in good condition?	☒	☐	☐
3	Were **chain-of-custody** papers used and filled out?	☒	☐	☐
4	Did **sample container labels** and/or tags agree with custody papers?	☒	☐	☐
5	Was **sample volume** received adequate for analysis?	☒	☐	☐
6	Are samples within specified holding times?	☒	☐	☐
7	Was proper **temperature** (thermal preservation) of cooler at receipt adhered to?	☐	☐	☒
8	Were **custody seals** on outside of cooler/Box/Container?	☐	☐	☒
	Location of seal(s)? _____ Sealing Lid?	☐	☐	☒
	Were signature and date included?	☐	☐	☒
	Were seals intact?	☐	☐	☒
9	Do containers have appropriate **preservation**, according to method/SOP or Client specified information?	☐	☐	☒
	Is there a client indication that the submitted samples are **pH** preserved?	☐	☐	☒
	Were **VOA vials** checked for presence/absence of air bubbles?	☐	☐	☒
	Does the client/method/SOP require that the analyst check the sample pH and if necessary alter it?	☐	☐	☒
10	**Tubes:** Are the tubes capped and intact?	☐	☐	☒
11	**Badges:** Are the badges properly capped and intact?	☐	☐	☒
	Are dual bed badges separated and individually capped and intact?	☐	☐	☒

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P1903177-001.01	6.0 L Silonite Can					
P1903177-002.01	6.0 L Silonite Can					
P1903177-003.01	6.0 L Ambient Can					
P1903177-004.01	6.0 L Ambient Can					

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_052919_Stripper** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P1903177-001

Test Code: EPA TO-15 Date Collected: 5/29/19
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 6/4/19
Analyst: Simon Cao Date Analyzed: 6/12 - 6/13/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.0080 Liter(s)
Test Notes: 0.0040 Liter(s)
Container ID: AS01320

Initial Pressure (psig): -0.09 Final Pressure (psig): 3.55

Container Dilution Factor: 1.25

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	81	ND	47	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	81	ND	16	
74-87-3	Chloromethane	ND	78	ND	38	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	80	ND	11	
75-01-4	Vinyl Chloride	**120**	83	**46**	32	
106-99-0	1,3-Butadiene	ND	81	ND	37	
74-83-9	Bromomethane	ND	78	ND	20	
75-00-3	Chloroethane	ND	80	ND	30	
64-17-5	Ethanol	ND	800	ND	420	
75-05-8	Acetonitrile	ND	81	ND	48	
107-02-8	Acrolein	ND	160	ND	68	
67-64-1	Acetone	ND	840	ND	360	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	83	ND	15	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	330	ND	130	
107-13-1	Acrylonitrile	ND	81	ND	37	
75-35-4	1,1-Dichloroethene	**190**	84	**49**	21	
75-09-2	Methylene Chloride	**7,200**	84	**2,100**	24	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	83	ND	26	
76-13-1	Trichlorotrifluoroethane (CFC 113)	**16,000**	83	**2,100**	11	
75-15-0	Carbon Disulfide	ND	170	ND	55	
156-60-5	trans-1,2-Dichloroethene	ND	83	ND	21	
75-34-3	1,1-Dichloroethane	ND	81	ND	20	
1634-04-4	Methyl tert-Butyl Ether	ND	84	ND	23	
108-05-4	Vinyl Acetate	ND	830	ND	240	
78-93-3	2-Butanone (MEK)	ND	160	ND	53	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_052919_Stripper** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P1903177-001

Test Code: EPA TO-15 Date Collected: 5/29/19
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 6/4/19
Analyst: Simon Cao Date Analyzed: 6/12 - 6/13/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.0080 Liter(s)
Test Notes: 0.0040 Liter(s)
Container ID: AS01320

Initial Pressure (psig): -0.09 Final Pressure (psig): 3.55

Container Dilution Factor: 1.25

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	**9,200**	83	**2,300**	21	
141-78-6	Ethyl Acetate	ND	170	ND	48	
110-54-3	n-Hexane	ND	84	ND	24	
67-66-3	Chloroform	ND	84	ND	17	
109-99-9	Tetrahydrofuran (THF)	ND	83	ND	28	
107-06-2	1,2-Dichloroethane	**180**	83	**45**	20	
71-55-6	1,1,1-Trichloroethane	ND	84	ND	15	
71-43-2	Benzene	ND	81	ND	25	
56-23-5	Carbon Tetrachloride	ND	81	ND	13	
110-82-7	Cyclohexane	ND	160	ND	45	
78-87-5	1,2-Dichloropropane	ND	84	ND	18	
75-27-4	Bromodichloromethane	ND	83	ND	12	
79-01-6	Trichloroethene	**21,000**	170	**3,900**	31	**D**
123-91-1	1,4-Dioxane	ND	83	ND	23	
80-62-6	Methyl Methacrylate	ND	170	ND	42	
142-82-5	n-Heptane	ND	84	ND	21	
10061-01-5	cis-1,3-Dichloropropene	ND	88	ND	19	
108-10-1	4-Methyl-2-pentanone	ND	83	ND	20	
10061-02-6	trans-1,3-Dichloropropene	ND	83	ND	18	
79-00-5	1,1,2-Trichloroethane	ND	84	ND	15	
108-88-3	Toluene	ND	83	ND	22	
591-78-6	2-Hexanone	ND	84	ND	21	
124-48-1	Dibromochloromethane	ND	84	ND	9.9	
106-93-4	1,2-Dibromoethane	ND	84	ND	11	
123-86-4	n-Butyl Acetate	ND	84	ND	18	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

D = The reported result is from a dilution.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_052919_Stripper** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P1903177-001

Test Code: EPA TO-15 Date Collected: 5/29/19
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 6/4/19
Analyst: Simon Cao Date Analyzed: 6/12 - 6/13/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.0080 Liter(s)
Test Notes: 0.0040 Liter(s)
Container ID: AS01320

Initial Pressure (psig): -0.09 Final Pressure (psig): 3.55

Container Dilution Factor: 1.25

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	84	ND	18	
127-18-4	Tetrachloroethene	**150**	83	**22**	12	
108-90-7	Chlorobenzene	ND	83	ND	18	
100-41-4	Ethylbenzene	ND	81	ND	19	
179601-23-1	m,p-Xylenes	ND	170	ND	40	
75-25-2	Bromoform	ND	83	ND	8.0	
100-42-5	Styrene	ND	83	ND	19	
95-47-6	o-Xylene	ND	83	ND	19	
111-84-2	n-Nonane	ND	84	ND	16	
79-34-5	1,1,2,2-Tetrachloroethane	ND	83	ND	12	
98-82-8	Cumene	ND	83	ND	17	
80-56-8	alpha-Pinene	ND	81	ND	15	
103-65-1	n-Propylbenzene	ND	84	ND	17	
622-96-8	4-Ethyltoluene	ND	83	ND	17	
108-67-8	1,3,5-Trimethylbenzene	ND	83	ND	17	
95-63-6	1,2,4-Trimethylbenzene	ND	83	ND	17	
100-44-7	Benzyl Chloride	ND	170	ND	33	
541-73-1	1,3-Dichlorobenzene	ND	84	ND	14	
106-46-7	1,4-Dichlorobenzene	ND	84	ND	14	
95-50-1	1,2-Dichlorobenzene	ND	84	ND	14	
5989-27-5	d-Limonene	ND	80	ND	14	
96-12-8	1,2-Dibromo-3-chloropropane	ND	81	ND	8.4	
120-82-1	1,2,4-Trichlorobenzene	ND	83	ND	11	
91-20-3	Naphthalene	ND	80	ND	15	
87-68-3	Hexachlorobutadiene	ND	83	ND	7.8	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_052919_Stripper_a** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P1903177-002

Test Code: EPA TO-15 Date Collected: 5/29/19
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 6/4/19
Analyst: Simon Cao Date Analyzed: 6/12 - 6/13/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.0080 Liter(s)
Test Notes: 0.0040 Liter(s)
Container ID: AS00732

Initial Pressure (psig): -0.10 Final Pressure (psig): 3.62

Container Dilution Factor: 1.25

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	81	ND	47	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	81	ND	16	
74-87-3	Chloromethane	ND	78	ND	38	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	80	ND	11	
75-01-4	Vinyl Chloride	**110**	83	**43**	32	
106-99-0	1,3-Butadiene	ND	81	ND	37	
74-83-9	Bromomethane	ND	78	ND	20	
75-00-3	Chloroethane	ND	80	ND	30	
64-17-5	Ethanol	ND	800	ND	420	
75-05-8	Acetonitrile	ND	81	ND	48	
107-02-8	Acrolein	ND	160	ND	68	
67-64-1	Acetone	ND	840	ND	360	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	83	ND	15	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	330	ND	130	
107-13-1	Acrylonitrile	ND	81	ND	37	
75-35-4	1,1-Dichloroethene	**180**	84	**45**	21	
75-09-2	Methylene Chloride	**6,400**	84	**1,800**	24	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	83	ND	26	
76-13-1	Trichlorotrifluoroethane (CFC 113)	**14,000**	83	**1,900**	11	
75-15-0	Carbon Disulfide	ND	170	ND	55	
156-60-5	trans-1,2-Dichloroethene	ND	83	ND	21	
75-34-3	1,1-Dichloroethane	ND	81	ND	20	
1634-04-4	Methyl tert-Butyl Ether	ND	84	ND	23	
108-05-4	Vinyl Acetate	ND	830	ND	240	
78-93-3	2-Butanone (MEK)	ND	160	ND	53	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_052919_Stripper_a** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P1903177-002

Test Code: EPA TO-15 Date Collected: 5/29/19
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 6/4/19
Analyst: Simon Cao Date Analyzed: 6/12 - 6/13/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.0080 Liter(s)
Test Notes: 0.0040 Liter(s)
Container ID: AS00732

Initial Pressure (psig): -0.10 Final Pressure (psig): 3.62

Container Dilution Factor: 1.25

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	**8,400**	83	**2,100**	21	
141-78-6	Ethyl Acetate	ND	170	ND	48	
110-54-3	n-Hexane	ND	84	ND	24	
67-66-3	Chloroform	ND	84	ND	17	
109-99-9	Tetrahydrofuran (THF)	ND	83	ND	28	
107-06-2	1,2-Dichloroethane	**170**	83	**41**	20	
71-55-6	1,1,1-Trichloroethane	ND	84	ND	15	
71-43-2	Benzene	ND	81	ND	25	
56-23-5	Carbon Tetrachloride	ND	81	ND	13	
110-82-7	Cyclohexane	ND	160	ND	45	
78-87-5	1,2-Dichloropropane	ND	84	ND	18	
75-27-4	Bromodichloromethane	ND	83	ND	12	
79-01-6	Trichloroethene	**19,000**	170	**3,500**	31	**D**
123-91-1	1,4-Dioxane	ND	83	ND	23	
80-62-6	Methyl Methacrylate	ND	170	ND	42	
142-82-5	n-Heptane	ND	84	ND	21	
10061-01-5	cis-1,3-Dichloropropene	ND	88	ND	19	
108-10-1	4-Methyl-2-pentanone	ND	83	ND	20	
10061-02-6	trans-1,3-Dichloropropene	ND	83	ND	18	
79-00-5	1,1,2-Trichloroethane	ND	84	ND	15	
108-88-3	Toluene	ND	83	ND	22	
591-78-6	2-Hexanone	ND	84	ND	21	
124-48-1	Dibromochloromethane	ND	84	ND	9.9	
106-93-4	1,2-Dibromoethane	ND	84	ND	11	
123-86-4	n-Butyl Acetate	ND	84	ND	18	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

D = The reported result is from a dilution.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_052919_Stripper_a** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P1903177-002

Test Code: EPA TO-15 Date Collected: 5/29/19
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 6/4/19
Analyst: Simon Cao Date Analyzed: 6/12 - 6/13/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.0080 Liter(s)
Test Notes: 0.0040 Liter(s)
Container ID: AS00732

Initial Pressure (psig): -0.10 Final Pressure (psig): 3.62

Container Dilution Factor: 1.25

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	84	ND	18	
127-18-4	Tetrachloroethene	**130**	83	**20**	12	
108-90-7	Chlorobenzene	ND	83	ND	18	
100-41-4	Ethylbenzene	ND	81	ND	19	
179601-23-1	m,p-Xylenes	ND	170	ND	40	
75-25-2	Bromoform	ND	83	ND	8.0	
100-42-5	Styrene	ND	83	ND	19	
95-47-6	o-Xylene	ND	83	ND	19	
111-84-2	n-Nonane	ND	84	ND	16	
79-34-5	1,1,2,2-Tetrachloroethane	ND	83	ND	12	
98-82-8	Cumene	ND	83	ND	17	
80-56-8	alpha-Pinene	ND	81	ND	15	
103-65-1	n-Propylbenzene	ND	84	ND	17	
622-96-8	4-Ethyltoluene	ND	83	ND	17	
108-67-8	1,3,5-Trimethylbenzene	ND	83	ND	17	
95-63-6	1,2,4-Trimethylbenzene	ND	83	ND	17	
100-44-7	Benzyl Chloride	ND	170	ND	33	
541-73-1	1,3-Dichlorobenzene	ND	84	ND	14	
106-46-7	1,4-Dichlorobenzene	ND	84	ND	14	
95-50-1	1,2-Dichlorobenzene	ND	84	ND	14	
5989-27-5	d-Limonene	ND	80	ND	14	
96-12-8	1,2-Dibromo-3-chloropropane	ND	81	ND	8.4	
120-82-1	1,2,4-Trichlorobenzene	ND	83	ND	11	
91-20-3	Naphthalene	ND	80	ND	15	
87-68-3	Hexachlorobutadiene	ND	83	ND	7.8	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_052919_GWTP** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P1903177-003

Test Code: EPA TO-15 Date Collected: 5/29/19
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 6/4/19
Analyst: Simon Cao Date Analyzed: 6/12/19
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC02346

Initial Pressure (psig): -2.16 Final Pressure (psig): 3.68

Container Dilution Factor: 1.47

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	**1.6**	0.76	**0.96**	0.44	
75-71-8	Dichlorodifluoromethane (CFC 12)	**2.7**	0.76	**0.55**	0.15	
74-87-3	Chloromethane	ND	0.74	ND	0.36	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.75	ND	0.11	
75-01-4	Vinyl Chloride	ND	0.78	ND	0.30	
106-99-0	1,3-Butadiene	ND	0.76	ND	0.35	
74-83-9	Bromomethane	ND	0.74	ND	0.19	
75-00-3	Chloroethane	ND	0.75	ND	0.28	
64-17-5	Ethanol	**8.6**	7.5	**4.6**	4.0	
75-05-8	Acetonitrile	ND	0.76	ND	0.46	
107-02-8	Acrolein	ND	1.5	ND	0.64	
67-64-1	Acetone	**11**	7.9	**4.6**	3.3	
75-69-4	Trichlorofluoromethane (CFC 11)	**1.6**	0.78	**0.29**	0.14	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	3.1	ND	1.3	
107-13-1	Acrylonitrile	ND	0.76	ND	0.35	
75-35-4	1,1-Dichloroethene	ND	0.79	ND	0.20	
75-09-2	Methylene Chloride	**2.1**	0.79	**0.61**	0.23	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.78	ND	0.25	
76-13-1	Trichlorotrifluoroethane (CFC 113)	**23**	0.78	**3.0**	0.10	
75-15-0	Carbon Disulfide	ND	1.6	ND	0.52	
156-60-5	trans-1,2-Dichloroethene	ND	0.78	ND	0.20	
75-34-3	1,1-Dichloroethane	ND	0.76	ND	0.19	
1634-04-4	Methyl tert-Butyl Ether	ND	0.79	ND	0.22	
108-05-4	Vinyl Acetate	ND	7.8	ND	2.2	
78-93-3	2-Butanone (MEK)	**7.5**	1.5	**2.5**	0.50	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_052919_GWTP** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P1903177-003

Test Code: EPA TO-15 Date Collected: 5/29/19
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 6/4/19
Analyst: Simon Cao Date Analyzed: 6/12/19
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC02346

Initial Pressure (psig): -2.16 Final Pressure (psig): 3.68

Container Dilution Factor: 1.47

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	**4.2**	0.78	**1.1**	0.20	
141-78-6	Ethyl Acetate	**2.9**	1.6	**0.80**	0.45	
110-54-3	n-Hexane	**0.86**	0.79	**0.24**	0.23	
67-66-3	Chloroform	ND	0.79	ND	0.16	
109-99-9	Tetrahydrofuran (THF)	**1.1**	0.78	**0.37**	0.26	
107-06-2	1,2-Dichloroethane	ND	0.78	ND	0.19	
71-55-6	1,1,1-Trichloroethane	ND	0.79	ND	0.15	
71-43-2	Benzene	ND	0.76	ND	0.24	
56-23-5	Carbon Tetrachloride	ND	0.76	ND	0.12	
110-82-7	Cyclohexane	ND	1.5	ND	0.43	
78-87-5	1,2-Dichloropropane	ND	0.79	ND	0.17	
75-27-4	Bromodichloromethane	ND	0.78	ND	0.12	
79-01-6	Trichloroethene	**12**	0.78	**2.1**	0.15	
123-91-1	1,4-Dioxane	ND	0.78	ND	0.22	
80-62-6	Methyl Methacrylate	ND	1.6	ND	0.40	
142-82-5	n-Heptane	ND	0.79	ND	0.19	
10061-01-5	cis-1,3-Dichloropropene	ND	0.82	ND	0.18	
108-10-1	4-Methyl-2-pentanone	**5.0**	0.78	**1.2**	0.19	
10061-02-6	trans-1,3-Dichloropropene	ND	0.78	ND	0.17	
79-00-5	1,1,2-Trichloroethane	ND	0.79	ND	0.15	
108-88-3	Toluene	**3.6**	0.78	**0.96**	0.21	
591-78-6	2-Hexanone	ND	0.79	ND	0.19	
124-48-1	Dibromochloromethane	ND	0.79	ND	0.093	
106-93-4	1,2-Dibromoethane	ND	0.79	ND	0.10	
123-86-4	n-Butyl Acetate	ND	0.79	ND	0.17	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_052919_GWTP** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P1903177-003

Test Code: EPA TO-15 Date Collected: 5/29/19
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 6/4/19
Analyst: Simon Cao Date Analyzed: 6/12/19
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC02346

Initial Pressure (psig): -2.16 Final Pressure (psig): 3.68

Container Dilution Factor: 1.47

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.79	ND	0.17	
127-18-4	Tetrachloroethene	ND	0.78	ND	0.11	
108-90-7	Chlorobenzene	ND	0.78	ND	0.17	
100-41-4	Ethylbenzene	ND	0.76	ND	0.18	
179601-23-1	m,p-Xylenes	**1.6**	1.6	**0.37**	0.37	
75-25-2	Bromoform	ND	0.78	ND	0.075	
100-42-5	Styrene	ND	0.78	ND	0.18	
95-47-6	o-Xylene	ND	0.78	ND	0.18	
111-84-2	n-Nonane	ND	0.79	ND	0.15	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.78	ND	0.11	
98-82-8	Cumene	ND	0.78	ND	0.16	
80-56-8	alpha-Pinene	**1.6**	0.76	**0.28**	0.14	
103-65-1	n-Propylbenzene	ND	0.79	ND	0.16	
622-96-8	4-Ethyltoluene	ND	0.78	ND	0.16	
108-67-8	1,3,5-Trimethylbenzene	ND	0.78	ND	0.16	
95-63-6	1,2,4-Trimethylbenzene	ND	0.78	ND	0.16	
100-44-7	Benzyl Chloride	ND	1.6	ND	0.31	
541-73-1	1,3-Dichlorobenzene	ND	0.79	ND	0.13	
106-46-7	1,4-Dichlorobenzene	ND	0.79	ND	0.13	
95-50-1	1,2-Dichlorobenzene	ND	0.79	ND	0.13	
5989-27-5	d-Limonene	ND	0.75	ND	0.13	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.76	ND	0.079	
120-82-1	1,2,4-Trichlorobenzene	ND	0.78	ND	0.10	
91-20-3	Naphthalene	ND	0.75	ND	0.14	
87-68-3	Hexachlorobutadiene	ND	0.78	ND	0.073	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_0529_Downwind_South** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P1903177-004

Test Code: EPA TO-15 Date Collected: 5/30/19
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 6/4/19
Analyst: Simon Cao Date Analyzed: 6/12/19
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC02318

Initial Pressure (psig): 0.12 Final Pressure (psig): 3.52

Container Dilution Factor: 1.23

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	**3.9**	0.64	**2.3**	0.37	
75-71-8	Dichlorodifluoromethane (CFC 12)	**14**	0.64	**2.8**	0.13	
74-87-3	Chloromethane	ND	0.62	ND	0.30	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.63	ND	0.090	
75-01-4	Vinyl Chloride	ND	0.65	ND	0.26	
106-99-0	1,3-Butadiene	ND	0.64	ND	0.29	
74-83-9	Bromomethane	ND	0.62	ND	0.16	
75-00-3	Chloroethane	ND	0.63	ND	0.24	
64-17-5	Ethanol	**38**	6.3	**20**	3.3	
75-05-8	Acetonitrile	**0.90**	0.64	**0.54**	0.38	
107-02-8	Acrolein	**2.0**	1.2	**0.86**	0.54	
67-64-1	Acetone	**33**	6.6	**14**	2.8	
75-69-4	Trichlorofluoromethane (CFC 11)	**13**	0.65	**2.4**	0.12	
67-63-0	2-Propanol (Isopropyl Alcohol)	**7.2**	2.6	**2.9**	1.1	
107-13-1	Acrylonitrile	ND	0.64	ND	0.29	
75-35-4	1,1-Dichloroethene	ND	0.66	ND	0.17	
75-09-2	Methylene Chloride	ND	0.66	ND	0.19	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.65	ND	0.21	
76-13-1	Trichlorotrifluoroethane (CFC 113)	**0.67**	0.65	**0.087**	0.085	
75-15-0	Carbon Disulfide	**3.2**	1.4	**1.0**	0.43	
156-60-5	trans-1,2-Dichloroethene	ND	0.65	ND	0.16	
75-34-3	1,1-Dichloroethane	ND	0.64	ND	0.16	
1634-04-4	Methyl tert-Butyl Ether	ND	0.66	ND	0.18	
108-05-4	Vinyl Acetate	ND	6.5	ND	1.9	
78-93-3	2-Butanone (MEK)	**13**	1.2	**4.3**	0.42	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_0529_Downwind_South** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P1903177-004

Test Code: EPA TO-15 Date Collected: 5/30/19
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 6/4/19
Analyst: Simon Cao Date Analyzed: 6/12/19
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC02318

Initial Pressure (psig): 0.12 Final Pressure (psig): 3.52

Container Dilution Factor: 1.23

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.65	ND	0.16	
141-78-6	Ethyl Acetate	**67**	1.4	**19**	0.38	
110-54-3	n-Hexane	**8.9**	0.66	**2.5**	0.19	
67-66-3	Chloroform	**0.74**	0.66	**0.15**	0.14	
109-99-9	Tetrahydrofuran (THF)	**21**	0.65	**7.1**	0.22	
107-06-2	1,2-Dichloroethane	**1.5**	0.65	**0.38**	0.16	
71-55-6	1,1,1-Trichloroethane	ND	0.66	ND	0.12	
71-43-2	Benzene	**1.7**	0.64	**0.54**	0.20	
56-23-5	Carbon Tetrachloride	ND	0.64	ND	0.10	
110-82-7	Cyclohexane	**1.9**	1.2	**0.56**	0.36	
78-87-5	1,2-Dichloropropane	ND	0.66	ND	0.14	
75-27-4	Bromodichloromethane	ND	0.65	ND	0.097	
79-01-6	Trichloroethene	ND	0.65	ND	0.12	
123-91-1	1,4-Dioxane	ND	0.65	ND	0.18	
80-62-6	Methyl Methacrylate	ND	1.4	ND	0.33	
142-82-5	n-Heptane	**4.9**	0.66	**1.2**	0.16	
10061-01-5	cis-1,3-Dichloropropene	ND	0.69	ND	0.15	
108-10-1	4-Methyl-2-pentanone	**0.92**	0.65	**0.22**	0.16	
10061-02-6	trans-1,3-Dichloropropene	ND	0.65	ND	0.14	
79-00-5	1,1,2-Trichloroethane	ND	0.66	ND	0.12	
108-88-3	Toluene	**30**	0.65	**7.9**	0.17	
591-78-6	2-Hexanone	ND	0.66	ND	0.16	
124-48-1	Dibromochloromethane	ND	0.66	ND	0.078	
106-93-4	1,2-Dibromoethane	ND	0.66	ND	0.086	
123-86-4	n-Butyl Acetate	**1.4**	0.66	**0.29**	0.14	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **LH18/24-Air_0529_Downwind_South** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P1903177-004

Test Code: EPA TO-15 Date Collected: 5/30/19
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: 6/4/19
Analyst: Simon Cao Date Analyzed: 6/12/19
Sample Type: 6.0 L Summa Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:
Container ID: AC02318

Initial Pressure (psig): 0.12 Final Pressure (psig): 3.52

Container Dilution Factor: 1.23

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	**1.5**	0.66	**0.32**	0.14	
127-18-4	Tetrachloroethene	**2.7**	0.65	**0.40**	0.096	
108-90-7	Chlorobenzene	ND	0.65	ND	0.14	
100-41-4	Ethylbenzene	**3.1**	0.64	**0.70**	0.15	
179601-23-1	m,p-Xylenes	**9.9**	1.4	**2.3**	0.31	
75-25-2	Bromoform	ND	0.65	ND	0.063	
100-42-5	Styrene	**0.87**	0.65	**0.20**	0.15	
95-47-6	o-Xylene	**3.5**	0.65	**0.80**	0.15	
111-84-2	n-Nonane	**1.1**	0.66	**0.21**	0.13	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.65	ND	0.095	
98-82-8	Cumene	ND	0.65	ND	0.13	
80-56-8	alpha-Pinene	**2.2**	0.64	**0.40**	0.11	
103-65-1	n-Propylbenzene	ND	0.66	ND	0.14	
622-96-8	4-Ethyltoluene	**0.88**	0.65	**0.18**	0.13	
108-67-8	1,3,5-Trimethylbenzene	**0.75**	0.65	**0.15**	0.13	
95-63-6	1,2,4-Trimethylbenzene	**3.0**	0.65	**0.61**	0.13	
100-44-7	Benzyl Chloride	ND	1.4	ND	0.26	
541-73-1	1,3-Dichlorobenzene	ND	0.66	ND	0.11	
106-46-7	1,4-Dichlorobenzene	ND	0.66	ND	0.11	
95-50-1	1,2-Dichlorobenzene	ND	0.66	ND	0.11	
5989-27-5	d-Limonene	**1.3**	0.63	**0.24**	0.11	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.64	ND	0.066	
120-82-1	1,2,4-Trichlorobenzene	ND	0.65	ND	0.088	
91-20-3	Naphthalene	ND	0.63	ND	0.12	
87-68-3	Hexachlorobutadiene	ND	0.65	ND	0.061	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P190612-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 6/12/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	0.52	ND	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.52	ND	0.11	
74-87-3	Chloromethane	ND	0.50	ND	0.24	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.51	ND	0.073	
75-01-4	Vinyl Chloride	ND	0.53	ND	0.21	
106-99-0	1,3-Butadiene	ND	0.52	ND	0.24	
74-83-9	Bromomethane	ND	0.50	ND	0.13	
75-00-3	Chloroethane	ND	0.51	ND	0.19	
64-17-5	Ethanol	ND	5.1	ND	2.7	
75-05-8	Acetonitrile	ND	0.52	ND	0.31	
107-02-8	Acrolein	ND	1.0	ND	0.44	
67-64-1	Acetone	ND	5.4	ND	2.3	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	0.53	ND	0.094	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	2.1	ND	0.85	
107-13-1	Acrylonitrile	ND	0.52	ND	0.24	
75-35-4	1,1-Dichloroethene	ND	0.54	ND	0.14	
75-09-2	Methylene Chloride	ND	0.54	ND	0.16	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.53	ND	0.17	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.53	ND	0.069	
75-15-0	Carbon Disulfide	ND	1.1	ND	0.35	
156-60-5	trans-1,2-Dichloroethene	ND	0.53	ND	0.13	
75-34-3	1,1-Dichloroethane	ND	0.52	ND	0.13	
1634-04-4	Methyl tert-Butyl Ether	ND	0.54	ND	0.15	
108-05-4	Vinyl Acetate	ND	5.3	ND	1.5	
78-93-3	2-Butanone (MEK)	ND	1.0	ND	0.34	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P190612-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 6/12/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.53	ND	0.13	
141-78-6	Ethyl Acetate	ND	1.1	ND	0.31	
110-54-3	n-Hexane	ND	0.54	ND	0.15	
67-66-3	Chloroform	ND	0.54	ND	0.11	
109-99-9	Tetrahydrofuran (THF)	ND	0.53	ND	0.18	
107-06-2	1,2-Dichloroethane	ND	0.53	ND	0.13	
71-55-6	1,1,1-Trichloroethane	ND	0.54	ND	0.099	
71-43-2	Benzene	ND	0.52	ND	0.16	
56-23-5	Carbon Tetrachloride	ND	0.52	ND	0.083	
110-82-7	Cyclohexane	ND	1.0	ND	0.29	
78-87-5	1,2-Dichloropropane	ND	0.54	ND	0.12	
75-27-4	Bromodichloromethane	ND	0.53	ND	0.079	
79-01-6	Trichloroethene	ND	0.53	ND	0.099	
123-91-1	1,4-Dioxane	ND	0.53	ND	0.15	
80-62-6	Methyl Methacrylate	ND	1.1	ND	0.27	
142-82-5	n-Heptane	ND	0.54	ND	0.13	
10061-01-5	cis-1,3-Dichloropropene	ND	0.56	ND	0.12	
108-10-1	4-Methyl-2-pentanone	ND	0.53	ND	0.13	
10061-02-6	trans-1,3-Dichloropropene	ND	0.53	ND	0.12	
79-00-5	1,1,2-Trichloroethane	ND	0.54	ND	0.099	
108-88-3	Toluene	ND	0.53	ND	0.14	
591-78-6	2-Hexanone	ND	0.54	ND	0.13	
124-48-1	Dibromochloromethane	ND	0.54	ND	0.063	
106-93-4	1,2-Dibromoethane	ND	0.54	ND	0.070	
123-86-4	n-Butyl Acetate	ND	0.54	ND	0.11	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P190612-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 6/12/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.54	ND	0.12	
127-18-4	Tetrachloroethene	ND	0.53	ND	0.078	
108-90-7	Chlorobenzene	ND	0.53	ND	0.12	
100-41-4	Ethylbenzene	ND	0.52	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.1	ND	0.25	
75-25-2	Bromoform	ND	0.53	ND	0.051	
100-42-5	Styrene	ND	0.53	ND	0.12	
95-47-6	o-Xylene	ND	0.53	ND	0.12	
111-84-2	n-Nonane	ND	0.54	ND	0.10	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.53	ND	0.077	
98-82-8	Cumene	ND	0.53	ND	0.11	
80-56-8	alpha-Pinene	ND	0.52	ND	0.093	
103-65-1	n-Propylbenzene	ND	0.54	ND	0.11	
622-96-8	4-Ethyltoluene	ND	0.53	ND	0.11	
108-67-8	1,3,5-Trimethylbenzene	ND	0.53	ND	0.11	
95-63-6	1,2,4-Trimethylbenzene	ND	0.53	ND	0.11	
100-44-7	Benzyl Chloride	ND	1.1	ND	0.21	
541-73-1	1,3-Dichlorobenzene	ND	0.54	ND	0.090	
106-46-7	1,4-Dichlorobenzene	ND	0.54	ND	0.090	
95-50-1	1,2-Dichlorobenzene	ND	0.54	ND	0.090	
5989-27-5	d-Limonene	ND	0.51	ND	0.092	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.52	ND	0.054	
120-82-1	1,2,4-Trichlorobenzene	ND	0.53	ND	0.071	
91-20-3	Naphthalene	ND	0.51	ND	0.097	
87-68-3	Hexachlorobutadiene	ND	0.53	ND	0.050	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P190613-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 6/13/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
115-07-1	Propene	ND	0.52	ND	0.30	
75-71-8	Dichlorodifluoromethane (CFC 12)	ND	0.52	ND	0.11	
74-87-3	Chloromethane	ND	0.50	ND	0.24	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	ND	0.51	ND	0.073	
75-01-4	Vinyl Chloride	ND	0.53	ND	0.21	
106-99-0	1,3-Butadiene	ND	0.52	ND	0.24	
74-83-9	Bromomethane	ND	0.50	ND	0.13	
75-00-3	Chloroethane	ND	0.51	ND	0.19	
64-17-5	Ethanol	ND	5.1	ND	2.7	
75-05-8	Acetonitrile	ND	0.52	ND	0.31	
107-02-8	Acrolein	ND	1.0	ND	0.44	
67-64-1	Acetone	ND	5.4	ND	2.3	
75-69-4	Trichlorofluoromethane (CFC 11)	ND	0.53	ND	0.094	
67-63-0	2-Propanol (Isopropyl Alcohol)	ND	2.1	ND	0.85	
107-13-1	Acrylonitrile	ND	0.52	ND	0.24	
75-35-4	1,1-Dichloroethene	ND	0.54	ND	0.14	
75-09-2	Methylene Chloride	ND	0.54	ND	0.16	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	ND	0.53	ND	0.17	
76-13-1	Trichlorotrifluoroethane (CFC 113)	ND	0.53	ND	0.069	
75-15-0	Carbon Disulfide	ND	1.1	ND	0.35	
156-60-5	trans-1,2-Dichloroethene	ND	0.53	ND	0.13	
75-34-3	1,1-Dichloroethane	ND	0.52	ND	0.13	
1634-04-4	Methyl tert-Butyl Ether	ND	0.54	ND	0.15	
108-05-4	Vinyl Acetate	ND	5.3	ND	1.5	
78-93-3	2-Butanone (MEK)	ND	1.0	ND	0.34	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P190613-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 6/13/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	ND	0.53	ND	0.13	
141-78-6	Ethyl Acetate	ND	1.1	ND	0.31	
110-54-3	n-Hexane	ND	0.54	ND	0.15	
67-66-3	Chloroform	ND	0.54	ND	0.11	
109-99-9	Tetrahydrofuran (THF)	ND	0.53	ND	0.18	
107-06-2	1,2-Dichloroethane	ND	0.53	ND	0.13	
71-55-6	1,1,1-Trichloroethane	ND	0.54	ND	0.099	
71-43-2	Benzene	ND	0.52	ND	0.16	
56-23-5	Carbon Tetrachloride	ND	0.52	ND	0.083	
110-82-7	Cyclohexane	ND	1.0	ND	0.29	
78-87-5	1,2-Dichloropropane	ND	0.54	ND	0.12	
75-27-4	Bromodichloromethane	ND	0.53	ND	0.079	
79-01-6	Trichloroethene	ND	0.53	ND	0.099	
123-91-1	1,4-Dioxane	ND	0.53	ND	0.15	
80-62-6	Methyl Methacrylate	ND	1.1	ND	0.27	
142-82-5	n-Heptane	ND	0.54	ND	0.13	
10061-01-5	cis-1,3-Dichloropropene	ND	0.56	ND	0.12	
108-10-1	4-Methyl-2-pentanone	ND	0.53	ND	0.13	
10061-02-6	trans-1,3-Dichloropropene	ND	0.53	ND	0.12	
79-00-5	1,1,2-Trichloroethane	ND	0.54	ND	0.099	
108-88-3	Toluene	ND	0.53	ND	0.14	
591-78-6	2-Hexanone	ND	0.54	ND	0.13	
124-48-1	Dibromochloromethane	ND	0.54	ND	0.063	
106-93-4	1,2-Dibromoethane	ND	0.54	ND	0.070	
123-86-4	n-Butyl Acetate	ND	0.54	ND	0.11	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Method Blank** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P190613-MB

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 6/13/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 1.00 Liter(s)
Test Notes:

Container Dilution Factor: 1.00

CAS #	Compound	Result µg/m³	MRL µg/m³	Result ppbV	MRL ppbV	Data Qualifier
111-65-9	n-Octane	ND	0.54	ND	0.12	
127-18-4	Tetrachloroethene	ND	0.53	ND	0.078	
108-90-7	Chlorobenzene	ND	0.53	ND	0.12	
100-41-4	Ethylbenzene	ND	0.52	ND	0.12	
179601-23-1	m,p-Xylenes	ND	1.1	ND	0.25	
75-25-2	Bromoform	ND	0.53	ND	0.051	
100-42-5	Styrene	ND	0.53	ND	0.12	
95-47-6	o-Xylene	ND	0.53	ND	0.12	
111-84-2	n-Nonane	ND	0.54	ND	0.10	
79-34-5	1,1,2,2-Tetrachloroethane	ND	0.53	ND	0.077	
98-82-8	Cumene	ND	0.53	ND	0.11	
80-56-8	alpha-Pinene	ND	0.52	ND	0.093	
103-65-1	n-Propylbenzene	ND	0.54	ND	0.11	
622-96-8	4-Ethyltoluene	ND	0.53	ND	0.11	
108-67-8	1,3,5-Trimethylbenzene	ND	0.53	ND	0.11	
95-63-6	1,2,4-Trimethylbenzene	ND	0.53	ND	0.11	
100-44-7	Benzyl Chloride	ND	1.1	ND	0.21	
541-73-1	1,3-Dichlorobenzene	ND	0.54	ND	0.090	
106-46-7	1,4-Dichlorobenzene	ND	0.54	ND	0.090	
95-50-1	1,2-Dichlorobenzene	ND	0.54	ND	0.090	
5989-27-5	d-Limonene	ND	0.51	ND	0.092	
96-12-8	1,2-Dibromo-3-chloropropane	ND	0.52	ND	0.054	
120-82-1	1,2,4-Trichlorobenzene	ND	0.53	ND	0.071	
91-20-3	Naphthalene	ND	0.51	ND	0.097	
87-68-3	Hexachlorobutadiene	ND	0.53	ND	0.050	

ND = Compound was analyzed for, but not detected above the laboratory reporting limit.
MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

ALS ENVIRONMENTAL

SURROGATE SPIKE RECOVERY RESULTS

Client: **Bhate Environmental Associates, Inc.**
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Project ID: P1903177

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date(s) Collected: 5/29 - 5/30/19
Analyst: Simon Cao Date(s) Received: 6/4/19
Sample Type: 6.0 L Silonite Canister(s) / 6.0 L Summa Canister(s) Date(s) Analyzed: 6/12 - 6/13/19
Test Notes:

Client Sample ID	ALS Sample ID	1,2-Dichloroethane-d4 Percent Recovered	Toluene-d8 Percent Recovered	Bromofluorobenzene Percent Recovered	Acceptance Limits	Data Qualifier
Method Blank	P190612-MB	**102**	**100**	**99**	70-130	
Method Blank	P190613-MB	**105**	**99**	**96**	70-130	
Lab Control Sample	P190612-LCS	**100**	**99**	**98**	70-130	
Lab Control Sample	P190613-LCS	**104**	**99**	**98**	70-130	
LH18/24-Air_052919_Stripper	P1903177-001	**101**	**100**	**98**	70-130	
LH18/24-Air_052919_Stripper_a	P1903177-002	**101**	**100**	**97**	70-130	
LH18/24-Air_052919_GWTP	P1903177-003	**107**	**99**	**98**	70-130	
LH18/24-Air_0529_Downwind_South	P1903177-004	**107**	**97**	**98**	70-130	

Surrogate percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly from the on-column percent recovery.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P190612-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 6/12/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
115-07-1	Propene	211	**215**	**102**	53-112	
75-71-8	Dichlorodifluoromethane (CFC 12)	210	**197**	**94**	62-103	
74-87-3	Chloromethane	211	**213**	**101**	51-121	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	211	**197**	**93**	56-111	
75-01-4	Vinyl Chloride	214	**205**	**96**	57-117	
106-99-0	1,3-Butadiene	210	**219**	**104**	53-134	
74-83-9	Bromomethane	212	**205**	**97**	65-110	
75-00-3	Chloroethane	214	**203**	**95**	64-111	
64-17-5	Ethanol	1,020	**969**	**95**	57-124	
75-05-8	Acetonitrile	206	**204**	**99**	57-126	
107-02-8	Acrolein	205	**190**	**93**	62-121	
67-64-1	Acetone	1,060	**1000**	**94**	60-113	
75-69-4	Trichlorofluoromethane (CFC 11)	211	**201**	**95**	63-104	
67-63-0	2-Propanol (Isopropyl Alcohol)	413	**400**	**97**	60-124	
107-13-1	Acrylonitrile	207	**201**	**97**	66-125	
75-35-4	1,1-Dichloroethene	218	**203**	**93**	68-107	
75-09-2	Methylene Chloride	217	**201**	**93**	66-105	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	216	**212**	**98**	63-127	
76-13-1	Trichlorotrifluoroethane (CFC 113)	216	**201**	**93**	59-109	
75-15-0	Carbon Disulfide	218	**200**	**92**	67-109	
156-60-5	trans-1,2-Dichloroethene	214	**202**	**94**	70-115	
75-34-3	1,1-Dichloroethane	216	**205**	**95**	66-106	
1634-04-4	Methyl tert-Butyl Ether	214	**213**	**100**	67-109	
108-05-4	Vinyl Acetate	1,060	**1030**	**97**	68-136	
78-93-3	2-Butanone (MEK)	208	**182**	**88**	71-116	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P190612-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 6/12/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	211	**199**	**94**	67-110	
141-78-6	Ethyl Acetate	436	**424**	**97**	64-127	
110-54-3	n-Hexane	216	**205**	**95**	60-115	
67-66-3	Chloroform	217	**204**	**94**	66-105	
109-99-9	Tetrahydrofuran (THF)	216	**199**	**92**	65-110	
107-06-2	1,2-Dichloroethane	215	**201**	**93**	60-110	
71-55-6	1,1,1-Trichloroethane	215	**204**	**95**	64-108	
71-43-2	Benzene	211	**185**	**88**	67-106	
56-23-5	Carbon Tetrachloride	212	**200**	**94**	64-112	
110-82-7	Cyclohexane	416	**400**	**96**	67-110	
78-87-5	1,2-Dichloropropane	216	**206**	**95**	66-112	
75-27-4	Bromodichloromethane	215	**211**	**98**	67-113	
79-01-6	Trichloroethene	213	**203**	**95**	66-108	
123-91-1	1,4-Dioxane	214	**202**	**94**	70-116	
80-62-6	Methyl Methacrylate	431	**435**	**101**	73-118	
142-82-5	n-Heptane	215	**206**	**96**	66-110	
10061-01-5	cis-1,3-Dichloropropene	214	**213**	**100**	75-120	
108-10-1	4-Methyl-2-pentanone	209	**213**	**102**	65-124	
10061-02-6	trans-1,3-Dichloropropene	213	**218**	**102**	77-123	
79-00-5	1,1,2-Trichloroethane	215	**207**	**96**	68-112	
108-88-3	Toluene	212	**192**	**91**	62-111	
591-78-6	2-Hexanone	214	**207**	**97**	59-128	
124-48-1	Dibromochloromethane	213	**209**	**98**	67-123	
106-93-4	1,2-Dibromoethane	216	**205**	**95**	66-122	
123-86-4	n-Butyl Acetate	219	**214**	**98**	64-128	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P190612-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 6/12/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
111-65-9	n-Octane	217	**203**	**94**	65-114	
127-18-4	Tetrachloroethene	213	**199**	**93**	55-120	
108-90-7	Chlorobenzene	215	**198**	**92**	61-114	
100-41-4	Ethylbenzene	212	**196**	**92**	64-113	
179601-23-1	m,p-Xylenes	426	**393**	**92**	64-114	
75-25-2	Bromoform	213	**214**	**100**	65-132	
100-42-5	Styrene	212	**210**	**99**	67-124	
95-47-6	o-Xylene	214	**200**	**93**	65-114	
111-84-2	n-Nonane	215	**203**	**94**	64-117	
79-34-5	1,1,2,2-Tetrachloroethane	214	**194**	**91**	66-119	
98-82-8	Cumene	214	**200**	**93**	61-116	
80-56-8	alpha-Pinene	211	**210**	**100**	65-120	
103-65-1	n-Propylbenzene	218	**204**	**94**	63-117	
622-96-8	4-Ethyltoluene	214	**215**	**100**	63-124	
108-67-8	1,3,5-Trimethylbenzene	214	**198**	**93**	60-117	
95-63-6	1,2,4-Trimethylbenzene	215	**204**	**95**	61-122	
100-44-7	Benzyl Chloride	217	**229**	**106**	77-142	
541-73-1	1,3-Dichlorobenzene	216	**202**	**94**	61-125	
106-46-7	1,4-Dichlorobenzene	216	**202**	**94**	59-123	
95-50-1	1,2-Dichlorobenzene	216	**202**	**94**	61-126	
5989-27-5	d-Limonene	211	**225**	**107**	66-124	
96-12-8	1,2-Dibromo-3-chloropropane	209	**212**	**101**	67-138	
120-82-1	1,2,4-Trichlorobenzene	214	**215**	**100**	62-141	
91-20-3	Naphthalene	203	**222**	**109**	62-145	
87-68-3	Hexachlorobutadiene	209	**201**	**96**	49-131	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P190613-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 6/13/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
115-07-1	Propene	211	**217**	**103**	53-112	
75-71-8	Dichlorodifluoromethane (CFC 12)	210	**197**	**94**	62-103	
74-87-3	Chloromethane	211	**219**	**104**	51-121	
76-14-2	1,2-Dichloro-1,1,2,2-tetrafluoroethane (CFC 114)	211	**191**	**91**	56-111	
75-01-4	Vinyl Chloride	214	**204**	**95**	57-117	
106-99-0	1,3-Butadiene	210	**216**	**103**	53-134	
74-83-9	Bromomethane	212	**201**	**95**	65-110	
75-00-3	Chloroethane	214	**201**	**94**	64-111	
64-17-5	Ethanol	1,020	**979**	**96**	57-124	
75-05-8	Acetonitrile	206	**206**	**100**	57-126	
107-02-8	Acrolein	205	**188**	**92**	62-121	
67-64-1	Acetone	1,060	**999**	**94**	60-113	
75-69-4	Trichlorofluoromethane (CFC 11)	211	**198**	**94**	63-104	
67-63-0	2-Propanol (Isopropyl Alcohol)	413	**405**	**98**	60-124	
107-13-1	Acrylonitrile	207	**201**	**97**	66-125	
75-35-4	1,1-Dichloroethene	218	**197**	**90**	68-107	
75-09-2	Methylene Chloride	217	**198**	**91**	66-105	
107-05-1	3-Chloro-1-propene (Allyl Chloride)	216	**214**	**99**	63-127	
76-13-1	Trichlorotrifluoroethane (CFC 113)	216	**194**	**90**	59-109	
75-15-0	Carbon Disulfide	218	**197**	**90**	67-109	
156-60-5	trans-1,2-Dichloroethene	214	**202**	**94**	70-115	
75-34-3	1,1-Dichloroethane	216	**204**	**94**	66-106	
1634-04-4	Methyl tert-Butyl Ether	214	**211**	**99**	67-109	
108-05-4	Vinyl Acetate	1,060	**1010**	**95**	68-136	
78-93-3	2-Butanone (MEK)	208	**180**	**87**	71-116	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P190613-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 6/13/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
156-59-2	cis-1,2-Dichloroethene	211	**198**	**94**	67-110	
141-78-6	Ethyl Acetate	436	**416**	**95**	64-127	
110-54-3	n-Hexane	216	**203**	**94**	60-115	
67-66-3	Chloroform	217	**201**	**93**	66-105	
109-99-9	Tetrahydrofuran (THF)	216	**195**	**90**	65-110	
107-06-2	1,2-Dichloroethane	215	**202**	**94**	60-110	
71-55-6	1,1,1-Trichloroethane	215	**200**	**93**	64-108	
71-43-2	Benzene	211	**180**	**85**	67-106	
56-23-5	Carbon Tetrachloride	212	**196**	**92**	64-112	
110-82-7	Cyclohexane	416	**389**	**94**	67-110	
78-87-5	1,2-Dichloropropane	216	**202**	**94**	66-112	
75-27-4	Bromodichloromethane	215	**206**	**96**	67-113	
79-01-6	Trichloroethene	213	**196**	**92**	66-108	
123-91-1	1,4-Dioxane	214	**197**	**92**	70-116	
80-62-6	Methyl Methacrylate	431	**419**	**97**	73-118	
142-82-5	n-Heptane	215	**201**	**93**	66-110	
10061-01-5	cis-1,3-Dichloropropene	214	**208**	**97**	75-120	
108-10-1	4-Methyl-2-pentanone	209	**210**	**100**	65-124	
10061-02-6	trans-1,3-Dichloropropene	213	**214**	**100**	77-123	
79-00-5	1,1,2-Trichloroethane	215	**200**	**93**	68-112	
108-88-3	Toluene	212	**185**	**87**	62-111	
591-78-6	2-Hexanone	214	**204**	**95**	59-128	
124-48-1	Dibromochloromethane	213	**201**	**94**	67-123	
106-93-4	1,2-Dibromoethane	216	**197**	**91**	66-122	
123-86-4	n-Butyl Acetate	219	**212**	**97**	64-128	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

LABORATORY CONTROL SAMPLE SUMMARY

Client: **Bhate Environmental Associates, Inc.**
Client Sample ID: **Lab Control Sample** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150** ALS Sample ID: P190613-LCS

Test Code: EPA TO-15 Date Collected: NA
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Date Received: NA
Analyst: Simon Cao Date Analyzed: 6/13/19
Sample Type: 6.0 L Silonite Canister Volume(s) Analyzed: 0.125 Liter(s)
Test Notes:

CAS #	Compound	Spike Amount µg/m³	Result µg/m³	% Recovery	ALS Acceptance Limits	Data Qualifier
111-65-9	n-Octane	217	**198**	**91**	65-114	
127-18-4	Tetrachloroethene	213	**190**	**89**	55-120	
108-90-7	Chlorobenzene	215	**190**	**88**	61-114	
100-41-4	Ethylbenzene	212	**189**	**89**	64-113	
179601-23-1	m,p-Xylenes	426	**387**	**91**	64-114	
75-25-2	Bromoform	213	**204**	**96**	65-132	
100-42-5	Styrene	212	**201**	**95**	67-124	
95-47-6	o-Xylene	214	**193**	**90**	65-114	
111-84-2	n-Nonane	215	**201**	**93**	64-117	
79-34-5	1,1,2,2-Tetrachloroethane	214	**188**	**88**	66-119	
98-82-8	Cumene	214	**192**	**90**	61-116	
80-56-8	alpha-Pinene	211	**203**	**96**	65-120	
103-65-1	n-Propylbenzene	218	**198**	**91**	63-117	
622-96-8	4-Ethyltoluene	214	**197**	**92**	63-124	
108-67-8	1,3,5-Trimethylbenzene	214	**191**	**89**	60-117	
95-63-6	1,2,4-Trimethylbenzene	215	**197**	**92**	61-122	
100-44-7	Benzyl Chloride	217	**223**	**103**	77-142	
541-73-1	1,3-Dichlorobenzene	216	**194**	**90**	61-125	
106-46-7	1,4-Dichlorobenzene	216	**193**	**89**	59-123	
95-50-1	1,2-Dichlorobenzene	216	**195**	**90**	61-126	
5989-27-5	d-Limonene	211	**220**	**104**	66-124	
96-12-8	1,2-Dibromo-3-chloropropane	209	**205**	**98**	67-138	
120-82-1	1,2,4-Trichlorobenzene	214	**207**	**97**	62-141	
91-20-3	Naphthalene	203	**215**	**106**	62-145	
87-68-3	Hexachlorobutadiene	209	**195**	**93**	49-131	

Laboratory Control Sample percent recovery is verified and accepted based on the on-column result.
Reported results are shown in concentration units and as a result of the calculation, may vary slightly.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150**

Internal Standard Area and RT Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Lab File ID: 06121902.D
Analyst: Simon Cao Date Analyzed: 6/12/19
Sample Type: 6.0 L Silonite Canister(s) Time Analyzed: 06:14
Test Notes:

		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
	24 Hour Standard	202233	9.15	917369	11.12	490228	15.46
	Upper Limit	283126	9.48	1284317	11.45	686319	15.79
	Lower Limit	121340	8.82	550421	10.79	294137	15.13
	Client Sample ID						
01	Method Blank	181881	9.13	846947	11.11	438055	15.46
02	Lab Control Sample	188479	9.16	844497	11.12	445152	15.46
03	LH18/24-Air_052919_Stripper	199331	9.13	905011	11.11	471298	15.46
04	LH18/24-Air_052919_Stripper_a	194774	9.13	883357	11.11	462420	15.46
05	LH18/24-Air_052919_GWTP	169351	9.13	794745	11.11	415955	15.46
06	LH18/24-Air_0529_Downwind_South	168656	9.14	781505	11.11	422001	15.46
07							
08							
09							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							
20							

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = 140% of internal standard area
AREA LOWER LIMIT = 60% of internal standard area
RT UPPER LIMIT = 0.33 minutes of internal standard RT
RT LOWER LIMIT = 0.33 minutes of internal standard RT

# Column used to flag values outside QC limits with an I.
I = Internal standard not within the specified limits.

ALS ENVIRONMENTAL

RESULTS OF ANALYSIS

Client: **Bhate Environmental Associates, Inc.** ALS Project ID: P1903177
Client Project ID: **LHAAP-GWTP / NW01312.0150**

Internal Standard Area and RT Summary

Test Code: EPA TO-15
Instrument ID: Tekmar AUTOCAN/Agilent 5973inert/6890N/MS9 Lab File ID: 06131902.D
Analyst: Simon Cao Date Analyzed: 6/13/19
Sample Type: 6.0 L Silonite Canister(s) Time Analyzed: 06:14
Test Notes:

		IS1 (BCM)		IS2 (DFB)		IS3 (CBZ)	
		AREA #	RT #	AREA #	RT #	AREA #	RT #
	24 Hour Standard	188687	9.16	865051	11.12	464814	15.46
	Upper Limit	264162	9.49	1211071	11.45	650740	15.79
	Lower Limit	113212	8.83	519031	10.79	278888	15.13
	Client Sample ID						
01	Method Blank	171243	9.13	795421	11.11	417260	15.46
02	Lab Control Sample	180652	9.16	817398	11.12	434407	15.46
03	LH18/24-Air_052919_Stripper (Dilution)	189523	9.13	857075	11.11	447294	15.46
04	LH18/24-Air_052919_Stripper_a (Dilution)	182299	9.13	833276	11.11	436528	15.46
05							
06							
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15							
16							
17							
18							
19							
20							

IS1 (BCM) = Bromochloromethane
IS2 (DFB) = 1,4-Difluorobenzene
IS3 (CBZ) = Chlorobenzene-d5

AREA UPPER LIMIT = 140% of internal standard area
AREA LOWER LIMIT = 60% of internal standard area
RT UPPER LIMIT = 0.33 minutes of internal standard RT
RT LOWER LIMIT = 0.33 minutes of internal standard RT

# Column used to flag values outside QC limits with an I.
I = Internal standard not within the specified limits.

00942837

Data File: I:\MS09\Data\2019_06\12\06121920.D
Acq On : 12 Jun 2019 16:51 Operator: SC
Sample : P1903177-001 (8.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

6/13/19

Quant Time: Jun 13 16:02:44 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.13	130	199331	12.500	ng	-0.04
37) 1,4-Difluorobenzene (IS2)	11.11	114	905011	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	15.46	82	471298	12.500	ng	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4(...	9.92	65	365903	12.595	ng	-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.80%			
57) Toluene-d8 (SS2)	13.55	98	1097539	12.485	ng	-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.84%			
73) Bromofluorobenzene (SS3)	17.05	174	287969	12.211	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.68%			
Target Compounds						Qvalue
2) Propene	3.88	42	1206	N.D.		
3) Dichlorodifluoromethan...	3.98	85	1242	N.D.		
4) Chloromethane	4.17	50	455	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	4.45	62	24005	0.758	ng	100
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	5.39	45	125	N.D.		
11) Acetonitrile	5.58	41	516	N.D.		
12) Acrolein	5.72	56	400	N.D.		
13) Acetone	5.87	58	9668	0.552	ng	99
14) Trichlorofluoromethane	6.02	101	1009	N.D.		
15) 2-Propanol (Isopropanol)	6.17	45	3560	N.D.		
16) Acrylonitrile	6.54	53	1510	N.D.		
17) 1,1-Dichloroethene	6.71	96	23323	1.242	ng	98
18) 2-Methyl-2-Propanol (t...	6.87	59	37	N.D.		
19) Methylene Chloride	6.85	84	933951	45.811	ng	97
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	7.18	151	1488760	101.339	ng	100
22) Carbon Disulfide	7.15	76	1305	N.D.		
23) trans-1,2-Dichloroethene	7.89	61	7588	N.D.		
24) 1,1-Dichloroethane	8.10	63	8671	N.D.		
25) Methyl tert-Butyl Ether	8.13	73	601	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.		
27) 2-Butanone (MEK)	8.54	72	995	N.D.		
28) cis-1,2-Dichloroethene	8.97	61	1823745	58.712	ng	100
29) Diisopropyl Ether	9.27	87	1090	N.D.		
30) Ethyl Acetate	9.27	61	1090	N.D.		
31) n-Hexane	9.22	57	1531	N.D.		
32) Chloroform	9.27	83	10140	N.D.		
34) Tetrahydrofuran (THF)	9.73	72	747	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	10.03	62	32735	1.178	ng	99
38) 1,1,1-Trichloroethane	10.29	97	1138	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	10.72	56	1479	N.D.		
41) Benzene	10.76	78	7061	N.D.		
42) Carbon Tetrachloride	10.90	117	2916	N.D.		
43) Cyclohexane	11.04	84	2218	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	11.81	130	2792334	138.853	ng	100
48) 1,4-Dioxane	11.83	88	418	N.D.		
49) 2,2,4-Trimethylpentane...	11.87	57	3902	N.D.		

Data File: I:\MS09\Data\2019_06\12\06121920.D
Acq On : 12 Jun 2019 16:51 Operator: SC
Sample : P1903177-001 (8.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

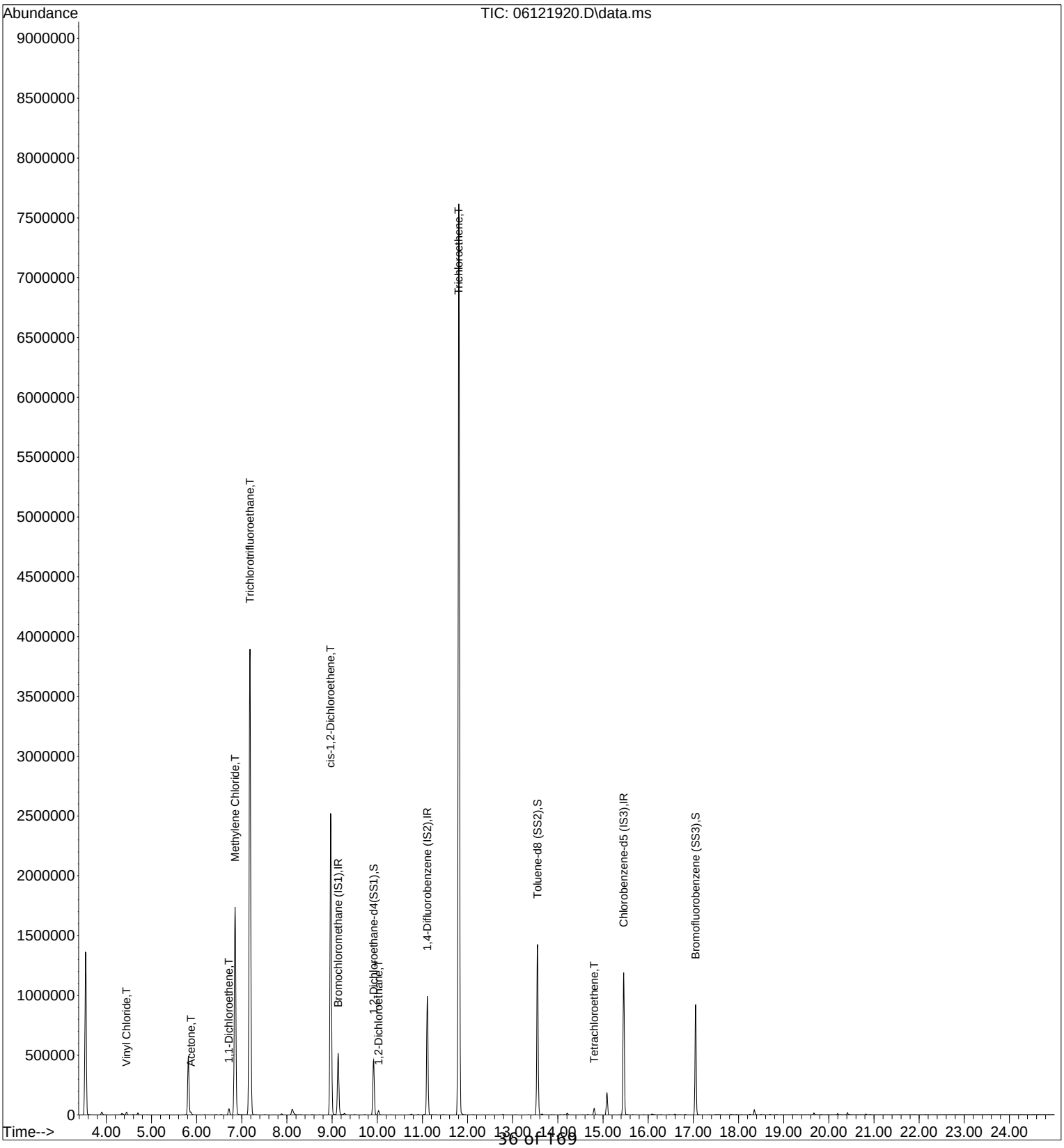
Quant Time: Jun 13 16:02:44 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
50) Methyl Methacrylate	0.00	100	0	N.D. d	
51) n-Heptane	12.13	71	607	N.D.	
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.	
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.	
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
55) 1,1,2-Trichloroethane	13.35	97	815	N.D.	
58) Toluene	13.65	91	6704	N.D.	
59) 2-Hexanone	13.91	43	2131	N.D.	
60) Dibromochloromethane	0.00	129	0	N.D.	
61) 1,2-Dibromoethane	0.00	107	0	N.D.	
62) n-Butyl Acetate	14.56	43	145	N.D.	
63) n-Octane	14.67	57	837	N.D.	
64) Tetrachloroethene	14.80	166	18960	0.949 ng	100
65) Chlorobenzene	0.00	112	0	N.D.	
66) Ethylbenzene	15.90	91	2599	N.D.	
67) m- & p-Xylenes	16.08	91	8180	N.D.	
68) Bromoform	0.00	173	0	N.D.	
69) Styrene	16.47	104	1403	N.D.	
70) o-Xylene	16.58	91	4324	N.D.	
71) n-Nonane	16.82	43	2583	N.D.	
72) 1,1,2,2-Tetrachloroethane	16.66	83	158	N.D.	
74) Cumene	17.20	105	326	N.D.	
75) alpha-Pinene	17.60	93	804	N.D.	
76) n-Propylbenzene	17.73	91	782	N.D.	
77) 3-Ethyltoluene	17.83	105	3672	N.D.	
78) 4-Ethyltoluene	17.88	105	1502	N.D.	
79) 1,3,5-Trimethylbenzene	17.96	105	1540	N.D.	
80) alpha-Methylstyrene	0.00	118	0	N.D.	
81) 2-Ethyltoluene	18.16	105	1569	N.D.	
82) 1,2,4-Trimethylbenzene	18.39	105	3702	N.D.	
83) n-Decane	18.50	57	1816	N.D.	
84) Benzyl Chloride	18.38	91	418	N.D.	
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.	
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.	
87) sec-Butylbenzene	18.66	105	210	N.D.	
88) 4-Isopropyltoluene (p-...	18.83	119	988	N.D.	
89) 1,2,3-Trimethylbenzene	18.83	105	1124	N.D.	
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.	
91) d-Limonene	18.99	68	541	N.D.	
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.	
93) n-Undecane	19.83	57	1182	N.D.	
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.	
95) Naphthalene	20.89	128	868	N.D.	
96) n-Dodecane	20.92	57	1336	N.D.	
97) Hexachlorobutadiene	0.00	225	0	N.D.	
98) Cyclohexanone	16.28	55	954	N.D.	
99) tert-Butylbenzene	18.38	119	391	N.D.	
100) n-Butylbenzene	19.27	91	501	N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2019_06\12\06121920.D
Acq On : 12 Jun 2019 16:51 Operator: SC
Sample : P1903177-001 (8.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jun 13 16:02:44 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\12\06121920.D
Acq On : 12 Jun 2019 16:51 Operator: SC
Sample : P1903177-001 (8.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

6/13/19

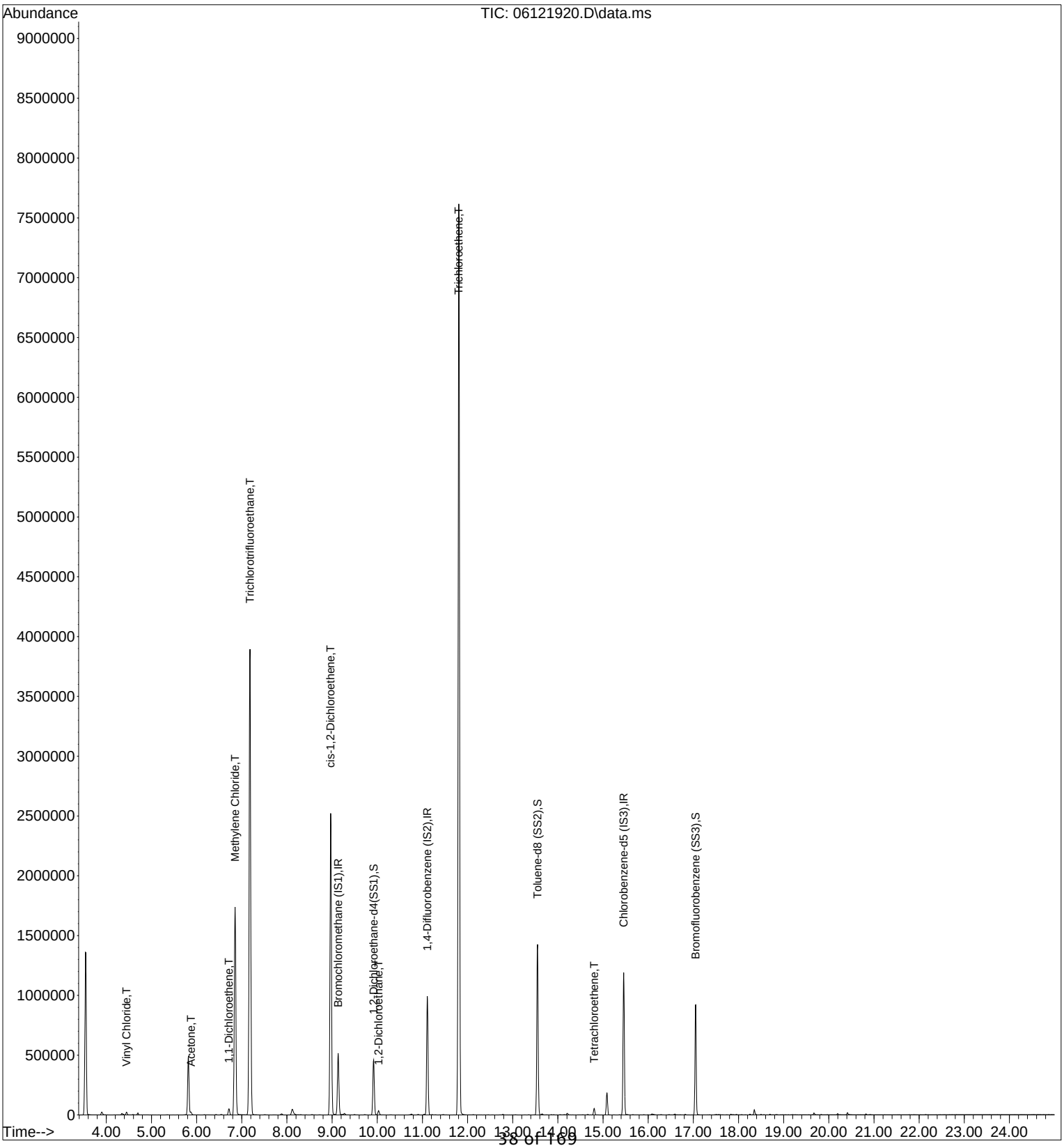
Quant Time: Jun 13 16:02:44 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

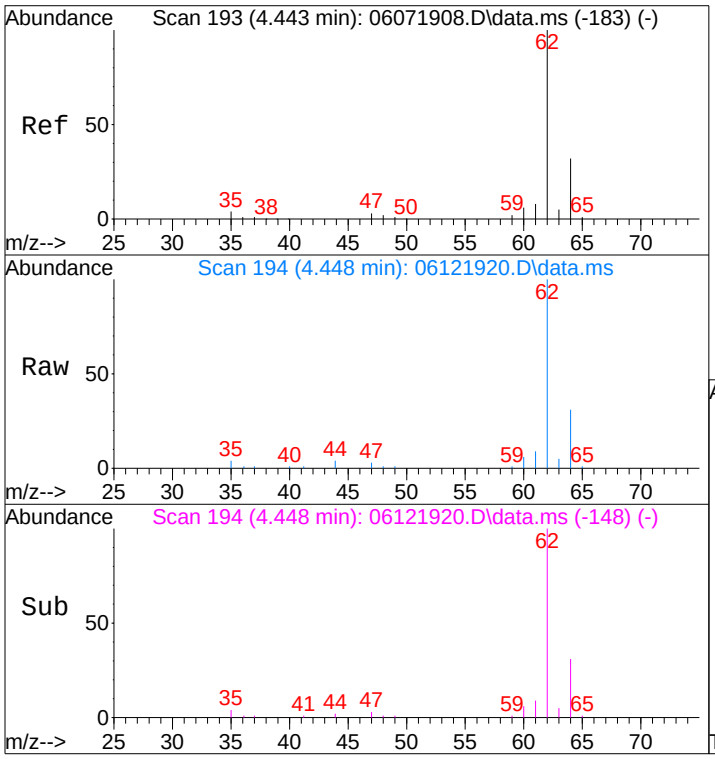
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.13	130	199331	12.500	ng	-0.04
37) 1,4-Difluorobenzene (IS2)	11.11	114	905011	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	15.46	82	471298	12.500	ng	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4(...	9.92	65	365903	12.595	ng	-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.80%			
57) Toluene-d8 (SS2)	13.55	98	1097539	12.485	ng	-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.84%			
73) Bromofluorobenzene (SS3)	17.05	174	287969	12.211	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.68%			
Target Compounds						Qvalue
6) Vinyl Chloride	4.45	62	24005	0.758	ng	100
13) Acetone	5.87	58	9668	0.552	ng	99
17) 1,1-Dichloroethene	6.71	96	23323	1.242	ng	98
19) Methylene Chloride	6.85	84	933951	45.811	ng	97
21) Trichlorotrifluoroethane	7.18	151	1488760	101.339	ng	100
28) cis-1,2-Dichloroethene	8.97	61	1823745	58.712	ng	100
36) 1,2-Dichloroethane	10.03	62	32735	1.178	ng	99
47) Trichloroethene	11.81	130	2792334	138.853	ng	100
64) Tetrachloroethene	14.80	166	18960	0.949	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2019_06\12\06121920.D
Acq On : 12 Jun 2019 16:51 Operator: SC
Sample : P1903177-001 (8.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jun 13 16:02:44 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

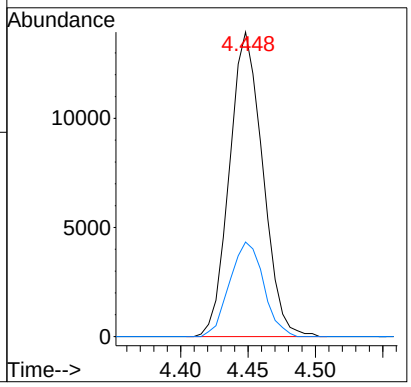


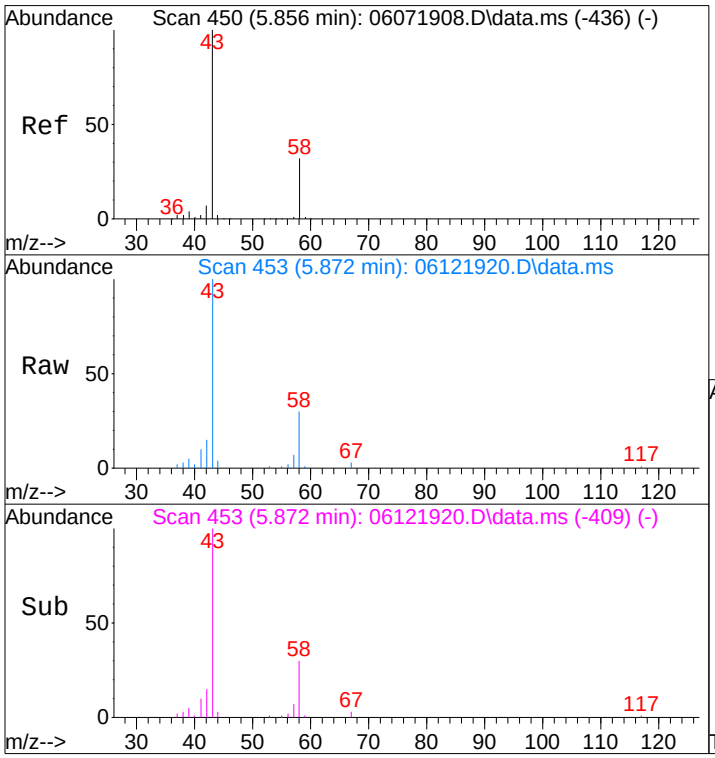


#6
Vinyl Chloride
Concen: 0.76 ng
RT: 4.45 min Scan# 194
Delta R.T. 0.000 min
Lab File: 06121920.D
Acq: 12 Jun 2019 16:51

Tgt Ion: 62 Resp: 24005

Ion	Ratio	Lower	Upper
62	100		
64	31.6	11.6	51.6

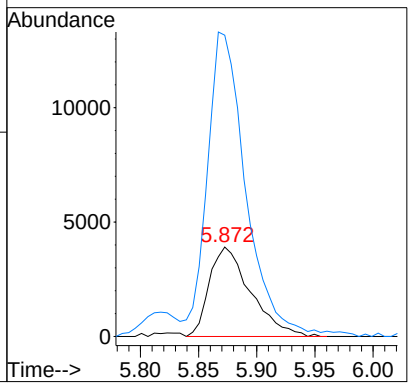


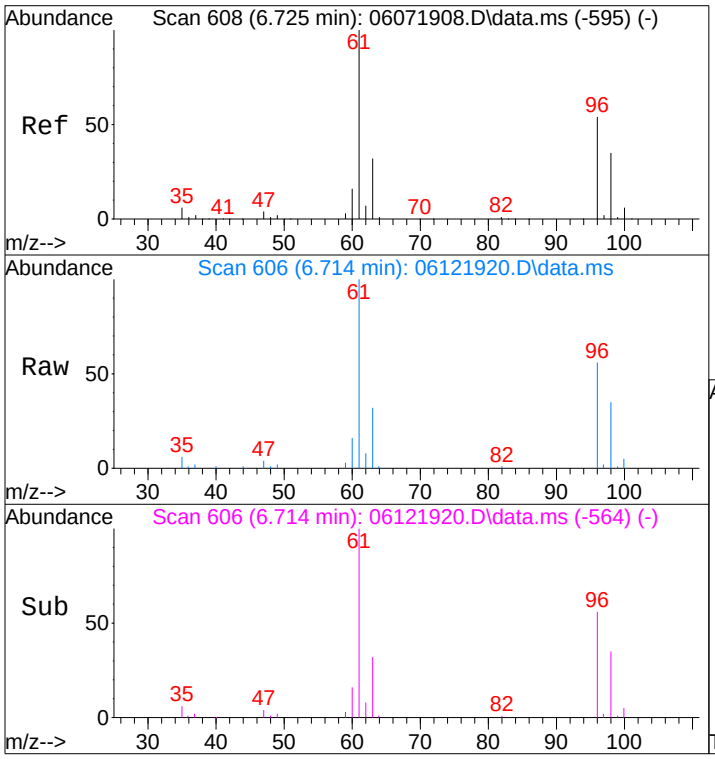


#13
Acetone
Concen: 0.55 ng
RT: 5.87 min Scan# 453
Delta R.T. -0.006 min
Lab File: 06121920.D
Acq: 12 Jun 2019 16:51

Tgt Ion: 58 Resp: 9668

Ion	Ratio	Lower	Upper
58	100		
43	320.5	287.7	347.7

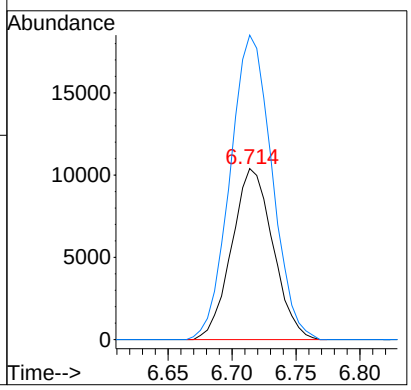


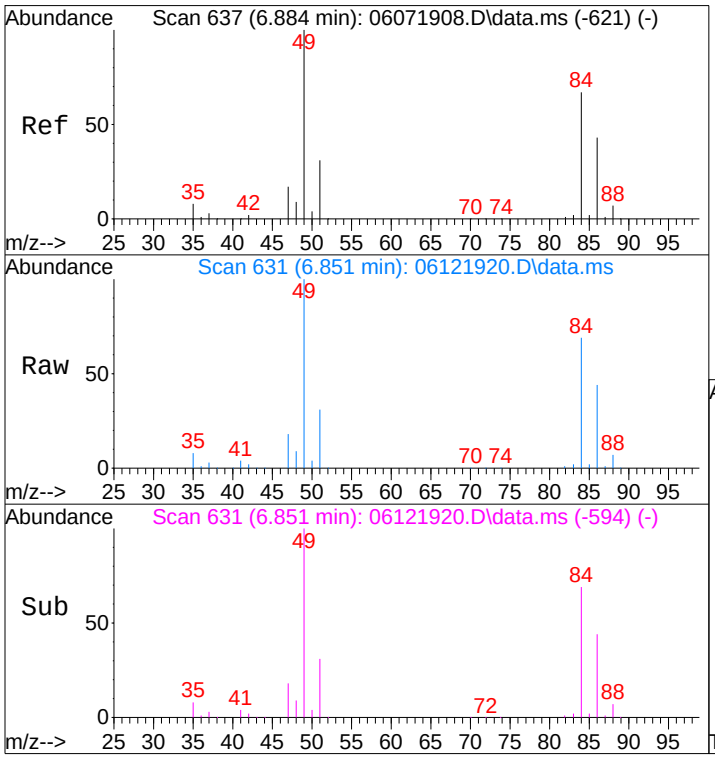


#17
1,1-Dichloroethene
Concen: 1.24 ng
RT: 6.71 min Scan# 606
Delta R.T. -0.022 min
Lab File: 06121920.D
Acq: 12 Jun 2019 16:51

Tgt Ion: 96 Resp: 23323

Ion	Ratio	Lower	Upper
96	100		
61	180.9	163.6	203.6

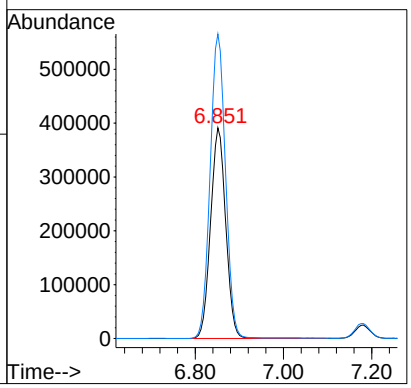


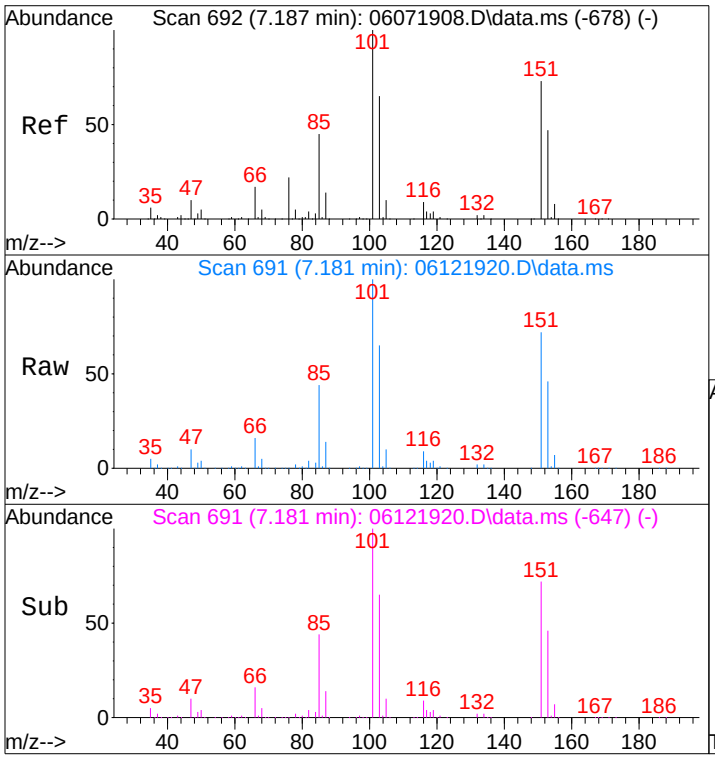


#19
Methylene Chloride
Concen: 45.81 ng
RT: 6.85 min Scan# 631
Delta R.T. -0.049 min
Lab File: 06121920.D
Acq: 12 Jun 2019 16:51

Tgt Ion: 84 Resp: 933951

Ion	Ratio	Lower	Upper
84	100		
49	146.7	125.7	175.7

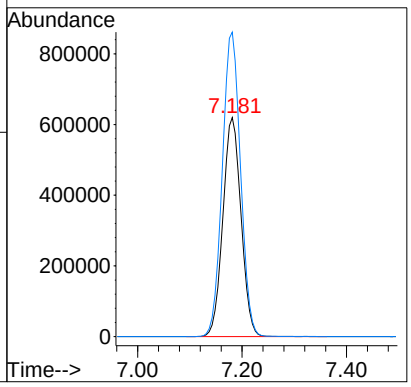


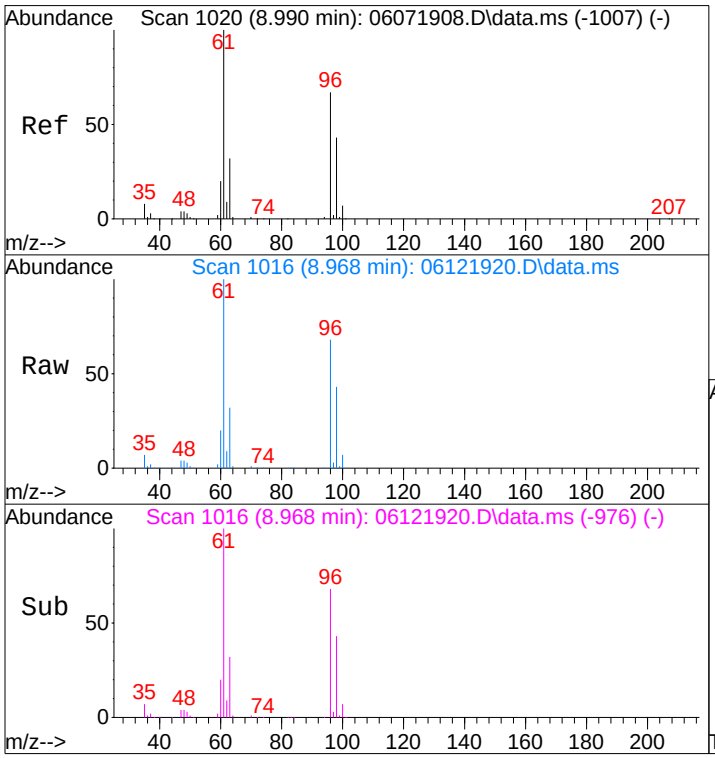


#21
Trichlorotrifluoroethane
Concen: 101.34 ng
RT: 7.18 min Scan# 691
Delta R.T. -0.011 min
Lab File: 06121920.D
Acq: 12 Jun 2019 16:51

Tgt Ion:151 Resp: 1488760

Ion	Ratio	Lower	Upper
151	100		
101	139.6	119.9	159.9

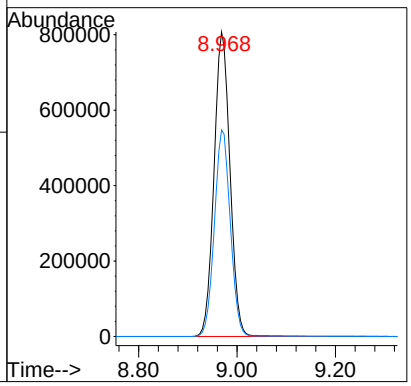


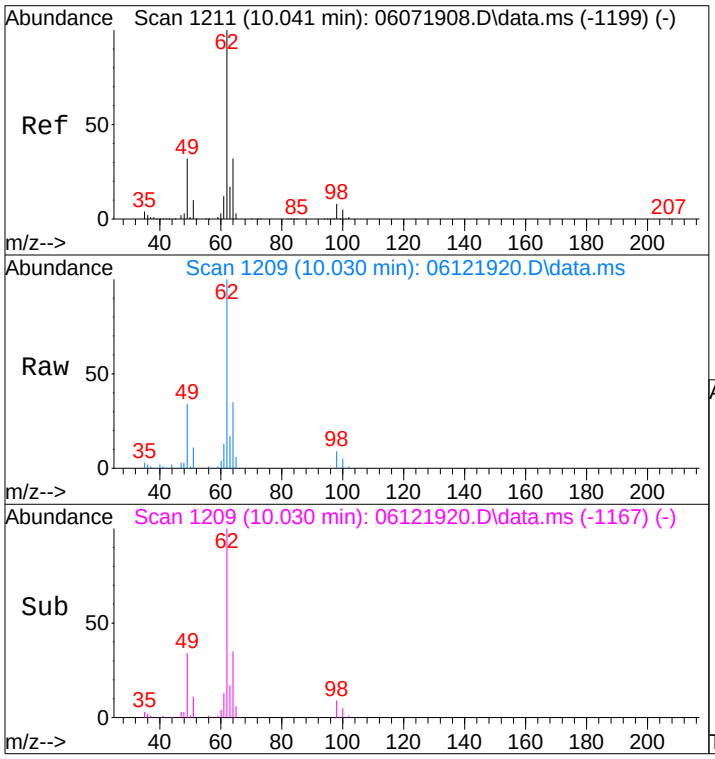


#28
cis-1,2-Dichloroethene
Concen: 58.71 ng
RT: 8.97 min Scan# 1016
Delta R.T. -0.033 min
Lab File: 06121920.D
Acq: 12 Jun 2019 16:51

Tgt Ion: 61 Resp: 1823745

Ion	Ratio	Lower	Upper
61	100		
96	67.8	47.8	87.8

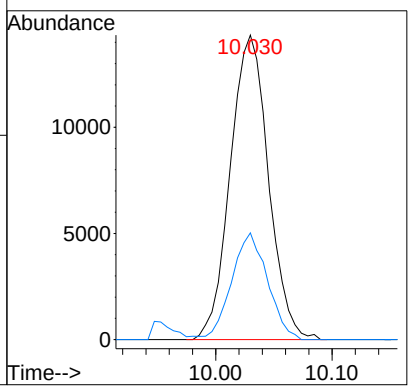


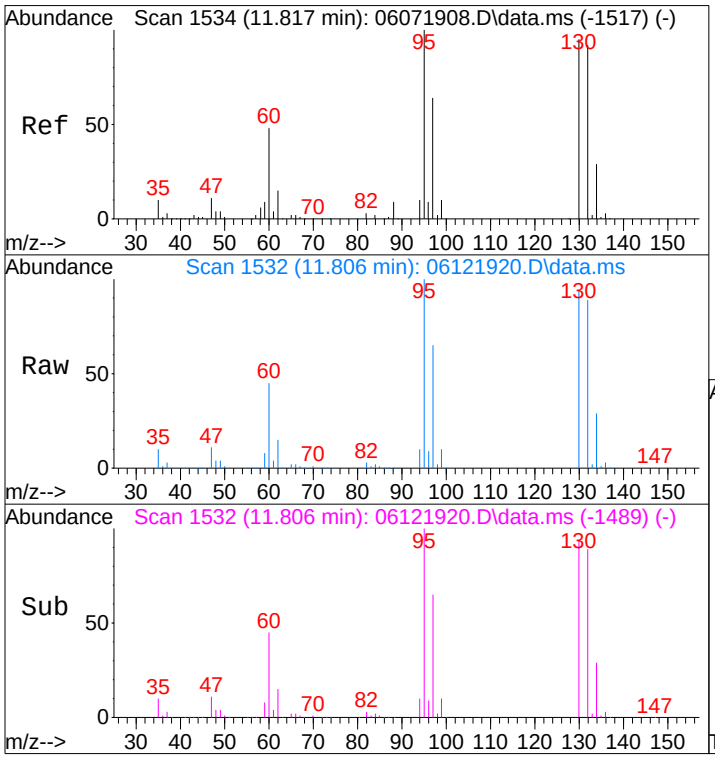


#36
1,2-Dichloroethane
Concen: 1.18 ng
RT: 10.03 min Scan# 1209
Delta R.T. -0.022 min
Lab File: 06121920.D
Acq: 12 Jun 2019 16:51

Tgt Ion: 62 Resp: 32735

Ion	Ratio	Lower	Upper
62	100		
64	32.9	12.3	52.3

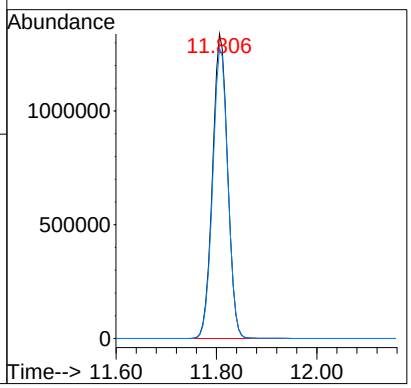


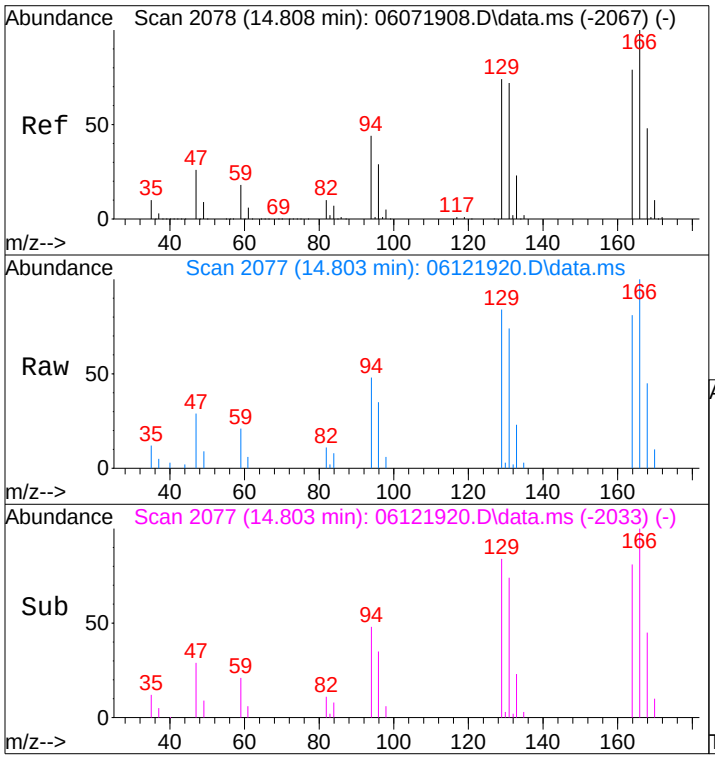


#47
Trichloroethene
Concen: 138.85 ng
RT: 11.81 min Scan# 1532
Delta R.T. -0.016 min
Lab File: 06121920.D
Acq: 12 Jun 2019 16:51

Tgt Ion:130 Resp: 2792334

Ion	Ratio	Lower	Upper
130	100		
132	96.1	75.9	115.9

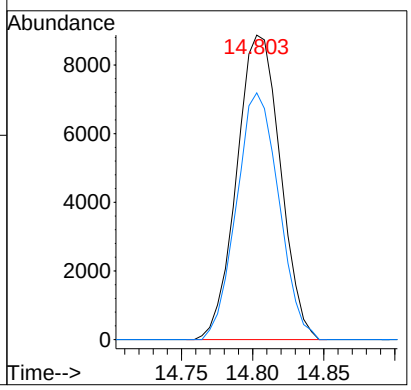




#64
Tetrachloroethene
Concen: 0.95 ng
RT: 14.80 min Scan# 2077
Delta R.T. -0.011 min
Lab File: 06121920.D
Acq: 12 Jun 2019 16:51

Tgt Ion:166 Resp: 18960

Ion	Ratio	Lower	Upper
166	100		
164	78.6	58.7	98.7



Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\13\06131908.D
Acq On : 13 Jun 2019 10:00 Operator: SC
Sample : P1903177-001Dil (4.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

6/13/19

Quant Time: Jun 13 10:52:28 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.13	130	189523	12.500	ng	-0.04
37) 1,4-Difluorobenzene (IS2)	11.11	114	857075	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	15.46	82	447294	12.500	ng	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4(...	9.91	65	351543	12.727	ng	-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 101.84%			
57) Toluene-d8 (SS2)	13.55	98	1035679	12.413	ng	-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.28%			
73) Bromofluorobenzene (SS3)	17.05	174	270003	12.064	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 96.48%			
Target Compounds						Qvalue
2) Propene	3.89	42	798	N.D.		
3) Dichlorodifluoromethan...	3.90	85	938	N.D.		
4) Chloromethane	4.18	50	330	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	4.45	62	11456	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	5.35	45	2041	N.D.		
11) Acetonitrile	5.58	41	710	N.D.		
12) Acrolein	5.72	56	289	N.D.		
13) Acetone	5.87	58	7313	N.D.		
14) Trichlorofluoromethane	6.02	101	388	N.D.		
15) 2-Propanol (Isopropanol)	6.17	45	3085	N.D.		
16) Acrylonitrile	6.55	53	690	N.D.		
17) 1,1-Dichloroethene	6.71	96	11205	0.627	ng	97
18) 2-Methyl-2-Propanol (t...	6.91	59	33	N.D.		
19) Methylene Chloride	6.85	84	440986	22.750	ng	99
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D. d		
21) Trichlorotrifluoroethane	7.18	151	695033	49.759	ng	99
22) Carbon Disulfide	7.15	76	1044	N.D.		
23) trans-1,2-Dichloroethene	7.88	61	3469	N.D.		
24) 1,1-Dichloroethane	8.10	63	4064	N.D.		
25) Methyl tert-Butyl Ether	8.12	73	471	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.		
27) 2-Butanone (MEK)	8.57	72	459	N.D.		
28) cis-1,2-Dichloroethene	8.97	61	860082	29.122	ng	99
29) Diisopropyl Ether	9.28	87	422	N.D.		
30) Ethyl Acetate	0.00	61	0	N.D.		
31) n-Hexane	9.23	57	515	N.D.		
32) Chloroform	9.28	83	4961	N.D.		
34) Tetrahydrofuran (THF)	9.72	72	387	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	10.03	62	15547	0.588	ng	100
38) 1,1,1-Trichloroethane	10.29	97	477	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	10.71	56	1306	N.D.		
41) Benzene	10.76	78	4988	N.D.		
42) Carbon Tetrachloride	10.90	117	1303	N.D.		
43) Cyclohexane	11.04	84	1120	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D. d		
47) Trichloroethene	11.81	130	1264053	66.373	ng	100
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	11.87	57	2394	N.D.		

Data File: I:\MS09\Data\2019_06\13\06131908.D
Acq On : 13 Jun 2019 10:00 Operator: SC
Sample : P1903177-001Dil (4.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

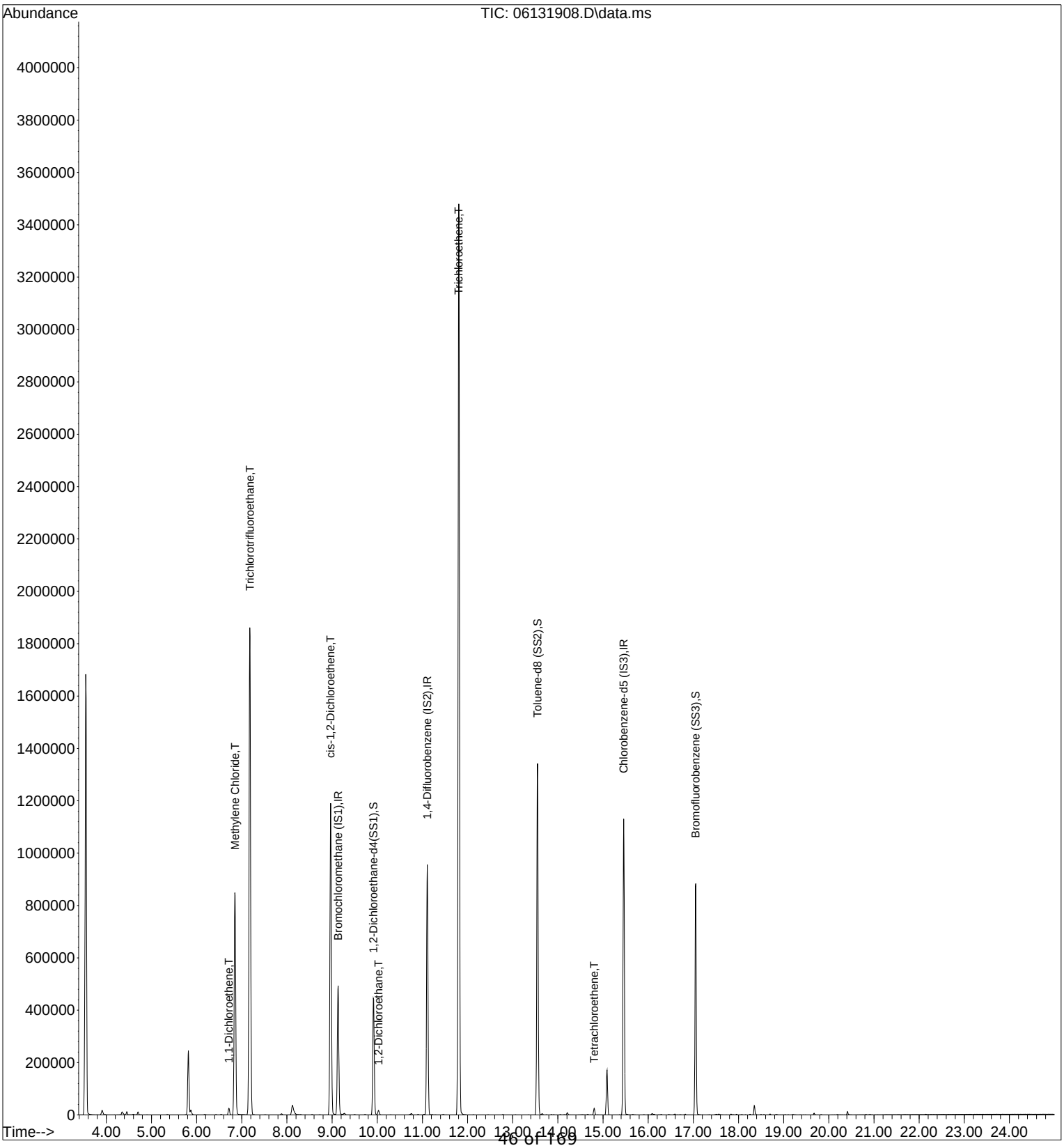
Quant Time: Jun 13 10:52:28 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
50) Methyl Methacrylate	11.81	100	3059	N.D.	
51) n-Heptane	12.12	71	190	N.D.	
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.	
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.	
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
55) 1,1,2-Trichloroethane	13.36	97	384	N.D.	
58) Toluene	13.65	91	3471	N.D.	
59) 2-Hexanone	13.91	43	1185	N.D.	
60) Dibromochloromethane	0.00	129	0	N.D.	
61) 1,2-Dibromoethane	0.00	107	0	N.D.	
62) n-Butyl Acetate	14.67	43	1367	N.D.	
63) n-Octane	14.65	57	402	N.D.	
64) Tetrachloroethene	14.80	166	8784	0.463 ng	100
65) Chlorobenzene	0.00	112	0	N.D.	
66) Ethylbenzene	15.90	91	1301	N.D.	
67) m- & p-Xylenes	16.08	91	4896	N.D.	
68) Bromoform	0.00	173	0	N.D.	
69) Styrene	16.48	104	687	N.D.	
70) o-Xylene	16.58	91	2555	N.D.	
71) n-Nonane	16.82	43	1487	N.D.	
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
74) Cumene	17.19	105	221	N.D.	
75) alpha-Pinene	17.61	93	411	N.D.	
76) n-Propylbenzene	17.73	91	523	N.D.	
77) 3-Ethyltoluene	17.83	105	2448	N.D.	
78) 4-Ethyltoluene	17.88	105	931	N.D.	
79) 1,3,5-Trimethylbenzene	17.95	105	1007	N.D.	
80) alpha-Methylstyrene	0.00	118	0	N.D.	
81) 2-Ethyltoluene	18.16	105	1003	N.D.	
82) 1,2,4-Trimethylbenzene	18.39	105	2380	N.D.	
83) n-Decane	18.50	57	681	N.D.	
84) Benzyl Chloride	18.39	91	306	N.D.	
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.	
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.	
87) sec-Butylbenzene	18.83	105	740	N.D.	
88) 4-Isopropyltoluene (p-...	18.83	119	677	N.D.	
89) 1,2,3-Trimethylbenzene	18.83	105	740	N.D.	
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.	
91) d-Limonene	18.98	68	365	N.D.	
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.	
93) n-Undecane	19.83	57	622	N.D.	
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.	
95) Naphthalene	20.90	128	1050	N.D.	
96) n-Dodecane	20.92	57	454	N.D.	
97) Hexachlorobutadiene	0.00	225	0	N.D.	
98) Cyclohexanone	16.28	55	677	N.D.	
99) tert-Butylbenzene	18.35	119	1066	N.D.	
100) n-Butylbenzene	19.27	91	209	N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

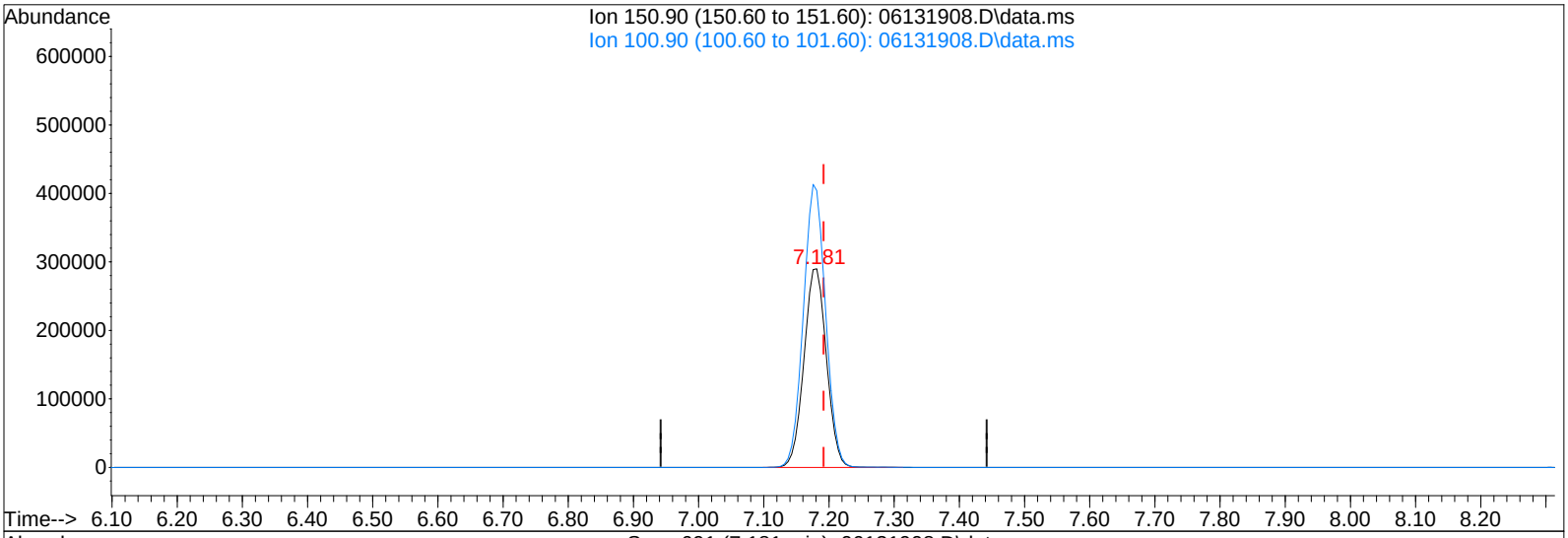
Data File: I:\MS09\Data\2019_06\13\06131908.D
Acq On : 13 Jun 2019 10:00 Operator: SC
Sample : P1903177-001Dil (4.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

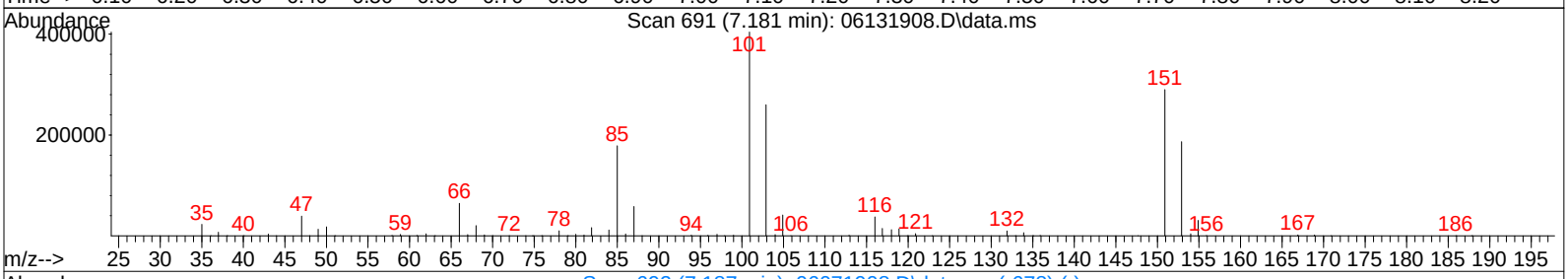
Quant Time: Jun 13 10:52:28 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

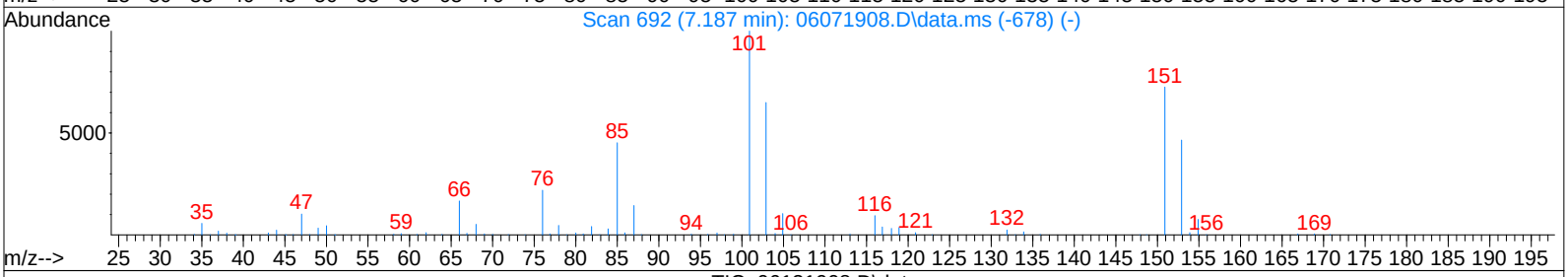


Data File: I:\MS09\Data\2019_06\13\06131908.D
Acq On : 13 Jun 2019 10:00 Operator: SC
Sample : P1903177-001Dil (4.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jun 13 10:51:52 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M







TIC: 06131908.D\data.ms

(21) Trichlorotrifluoroethane (T)

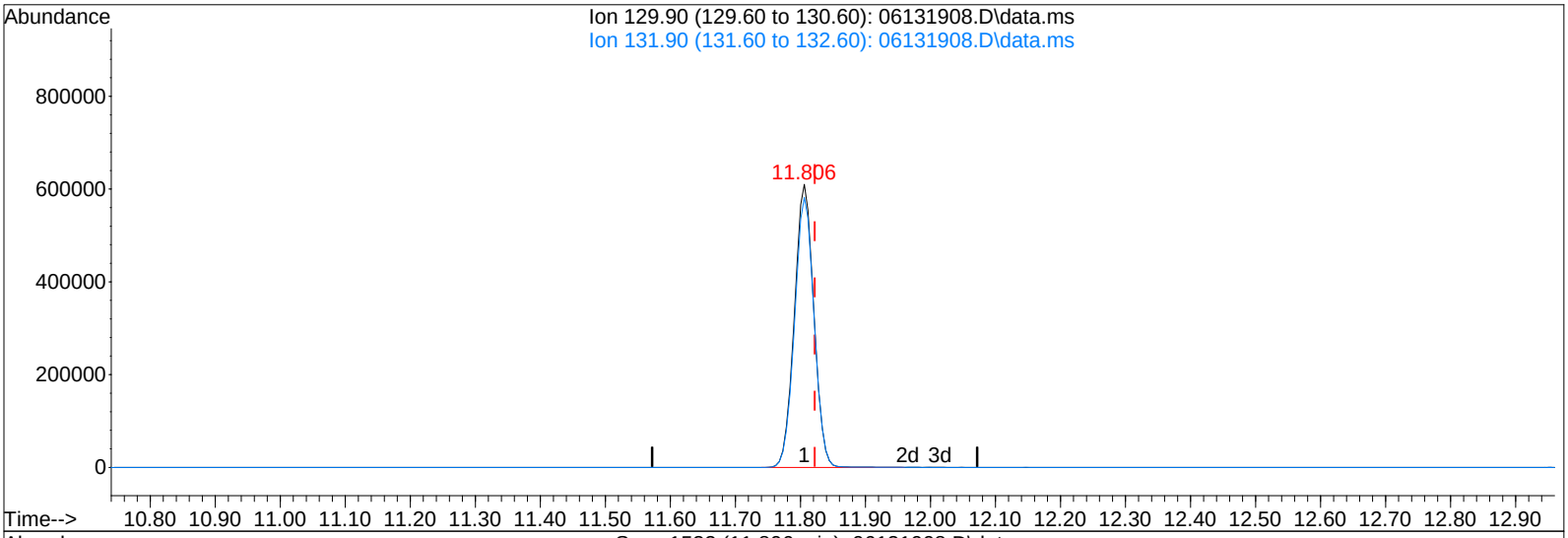
7.181min (-0.011) 49.76ng

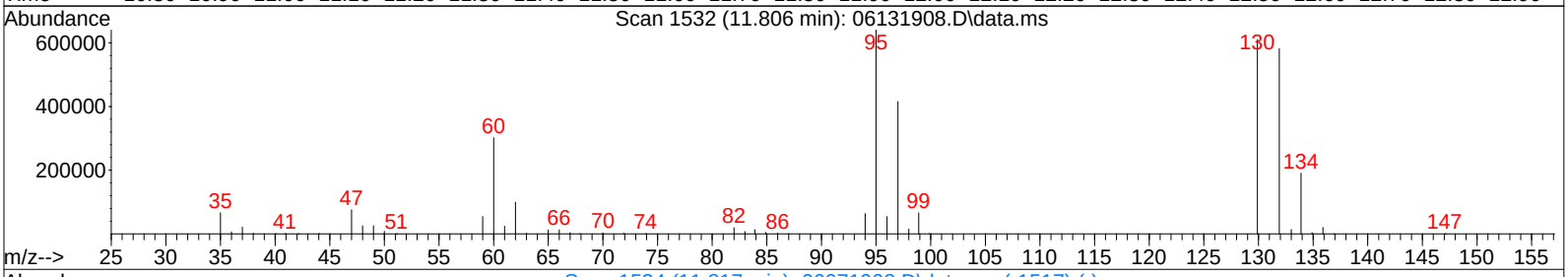
response 695033

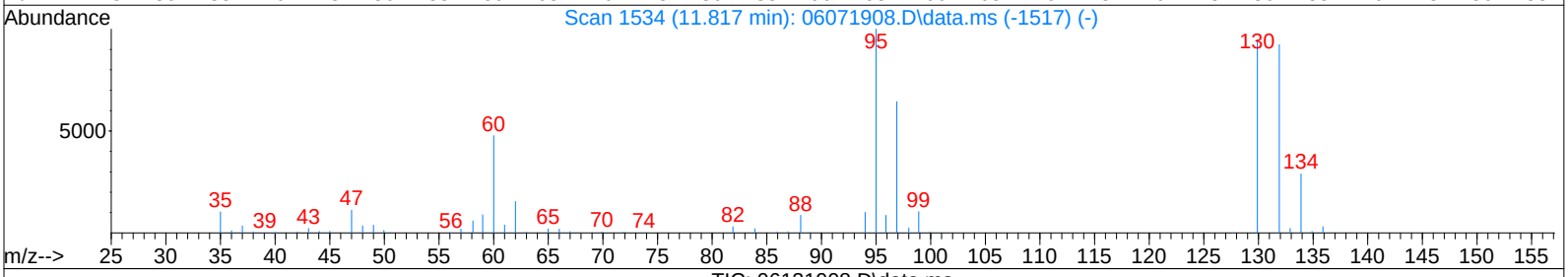
Ion	Exp%	Act%
150.90	100	100
100.90	139.90	140.58
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS09\Data\2019_06\13\06131908.D
Acq On : 13 Jun 2019 10:00 Operator: SC
Sample : P1903177-001Dil (4.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jun 13 10:51:52 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M







TIC: 06131908.D\data.ms

(47) Trichloroethene (T)

11.806min (-0.016) 66.37ng

response 1264053

Ion	Exp%	Act%
129.90	100	100
131.90	95.90	95.76
0.00	0.00	0.00
0.00	0.00	0.00

Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\12\06121921.D
Acq On : 12 Jun 2019 17:25 Operator: SC
Sample : P1903177-002 (8.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

6/13/19

Quant Time: Jun 13 16:05:10 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.13	130	194774	12.500	ng	-0.04
37) 1,4-Difluorobenzene (IS2)	11.11	114	883357	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	15.46	82	462420	12.500	ng	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4(...	9.92	65	357395	12.590	ng	-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.72%			
57) Toluene-d8 (SS2)	13.55	98	1072863	12.438	ng	-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.52%			
73) Bromofluorobenzene (SS3)	17.05	174	281935	12.185	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.44%			
Target Compounds						Qvalue
2) Propene	3.88	42	1120	N.D.		
3) Dichlorodifluoromethan...	3.98	85	3553	N.D.		
4) Chloromethane	4.17	50	479	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	4.45	62	21538	0.696	ng	99
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	5.34	45	1989	N.D.		
11) Acetonitrile	5.58	41	304	N.D.		
12) Acrolein	5.72	56	373	N.D.		
13) Acetone	5.87	58	11871	0.694	ng	95
14) Trichlorofluoromethane	6.02	101	2971	N.D.		
15) 2-Propanol (Isopropanol)	6.17	45	3191	N.D.		
16) Acrylonitrile	6.54	53	1501	N.D.		
17) 1,1-Dichloroethene	6.71	96	21094	1.149	ng	100
18) 2-Methyl-2-Propanol (t...	6.87	59	42	N.D.		
19) Methylene Chloride	6.85	84	816594	40.992	ng	98
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.	d	
21) Trichlorotrifluoroethane	7.18	151	1305572	90.949	ng	100
22) Carbon Disulfide	7.15	76	1165	N.D.		
23) trans-1,2-Dichloroethene	7.88	61	4791	N.D.		
24) 1,1-Dichloroethane	8.10	63	7466	N.D.		
25) Methyl tert-Butyl Ether	8.12	73	479	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.		
27) 2-Butanone (MEK)	8.56	72	1971	N.D.		
28) cis-1,2-Dichloroethene	8.97	61	1634893	53.864	ng	100
29) Diisopropyl Ether	9.28	87	834	N.D.		
30) Ethyl Acetate	9.40	61	152	N.D.		
31) n-Hexane	9.22	57	1677	N.D.		
32) Chloroform	9.28	83	8950	N.D.		
34) Tetrahydrofuran (THF)	9.71	72	2444	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	10.03	62	28794	1.060	ng	99
38) 1,1,1-Trichloroethane	10.30	97	1066	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	10.72	56	1171	N.D.		
41) Benzene	10.76	78	7177	N.D.		
42) Carbon Tetrachloride	10.91	117	2644	N.D.		
43) Cyclohexane	11.03	84	2079	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	11.81	130	2472873	125.982	ng	100
48) 1,4-Dioxane	11.82	88	382	N.D.		
49) 2,2,4-Trimethylpentane...	11.87	57	6429	N.D.		

Data File: I:\MS09\Data\2019_06\12\06121921.D
Acq On : 12 Jun 2019 17:25 Operator: SC
Sample : P1903177-002 (8.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

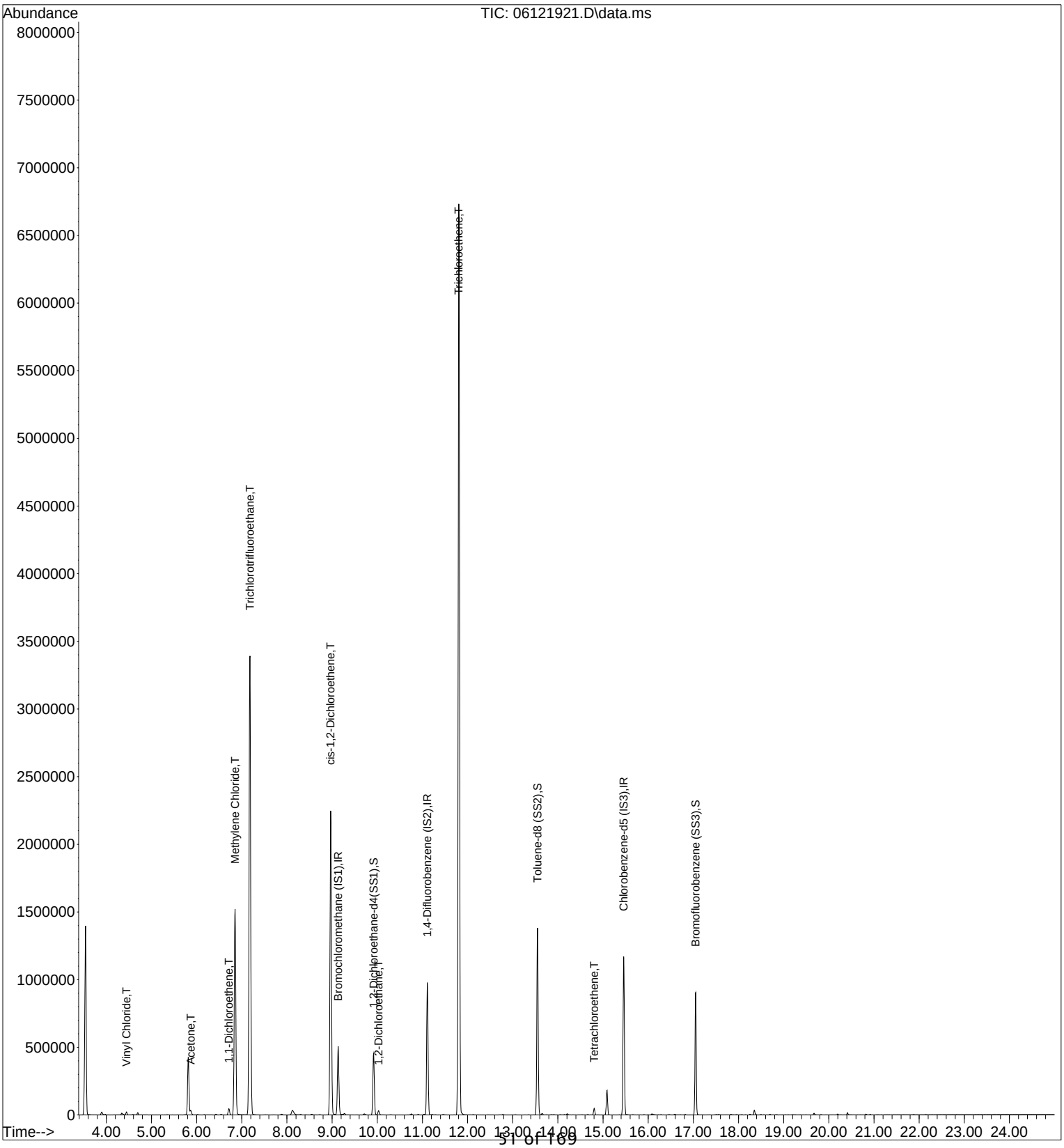
Quant Time: Jun 13 16:05:10 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
50) Methyl Methacrylate	0.00	100	0	N.D. d	
51) n-Heptane	12.12	71	521	N.D.	
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.	
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.	
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
55) 1,1,2-Trichloroethane	13.36	97	713	N.D.	
58) Toluene	13.65	91	8070	N.D.	
59) 2-Hexanone	13.91	43	2151	N.D.	
60) Dibromochloromethane	0.00	129	0	N.D.	
61) 1,2-Dibromoethane	0.00	107	0	N.D.	
62) n-Butyl Acetate	14.67	43	1824	N.D.	
63) n-Octane	14.67	57	642	N.D.	
64) Tetrachloroethene	14.80	166	16626	0.848 ng	100
65) Chlorobenzene	0.00	112	0	N.D.	
66) Ethylbenzene	15.91	91	2701	N.D.	
67) m- & p-Xylenes	16.08	91	7719	N.D.	
68) Bromoform	0.00	173	0	N.D.	
69) Styrene	16.47	104	1284	N.D.	
70) o-Xylene	16.58	91	3709	N.D.	
71) n-Nonane	16.82	43	2019	N.D.	
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.	
74) Cumene	17.20	105	159	N.D.	
75) alpha-Pinene	17.61	93	571	N.D.	
76) n-Propylbenzene	17.72	91	689	N.D.	
77) 3-Ethyltoluene	17.83	105	3122	N.D.	
78) 4-Ethyltoluene	17.88	105	1278	N.D.	
79) 1,3,5-Trimethylbenzene	17.96	105	1207	N.D.	
80) alpha-Methylstyrene	0.00	118	0	N.D.	
81) 2-Ethyltoluene	18.16	105	1236	N.D.	
82) 1,2,4-Trimethylbenzene	18.38	105	3365	N.D.	
83) n-Decane	18.50	57	1319	N.D.	
84) Benzyl Chloride	18.38	91	352	N.D.	
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.	
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.	
87) sec-Butylbenzene	18.67	105	106	N.D.	
88) 4-Isopropyltoluene (p-...	18.83	119	729	N.D.	
89) 1,2,3-Trimethylbenzene	18.83	105	1040	N.D.	
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.	
91) d-Limonene	18.98	68	385	N.D.	
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.	
93) n-Undecane	19.83	57	1120	N.D.	
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.	
95) Naphthalene	20.90	128	594	N.D.	
96) n-Dodecane	20.92	57	1325	N.D.	
97) Hexachlorobutadiene	0.00	225	0	N.D.	
98) Cyclohexanone	16.26	55	570	N.D.	
99) tert-Butylbenzene	18.39	119	352	N.D.	
100) n-Butylbenzene	19.26	91	357	N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2019_06\12\06121921.D
Acq On : 12 Jun 2019 17:25 Operator: SC
Sample : P1903177-002 (8.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jun 13 16:05:10 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\12\06121921.D
Acq On : 12 Jun 2019 17:25 Operator: SC
Sample : P1903177-002 (8.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

6/13/19

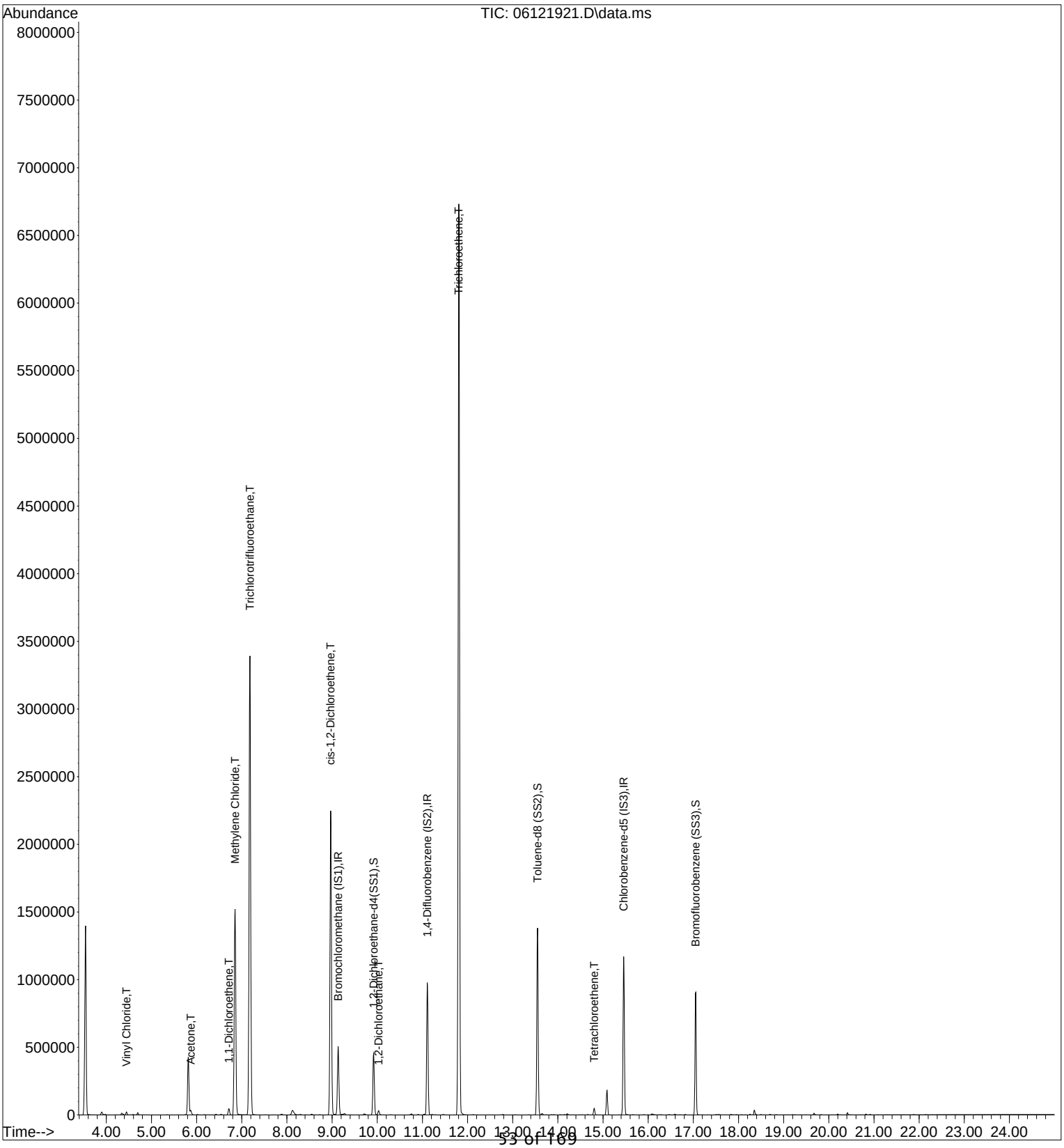
Quant Time: Jun 13 16:05:10 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

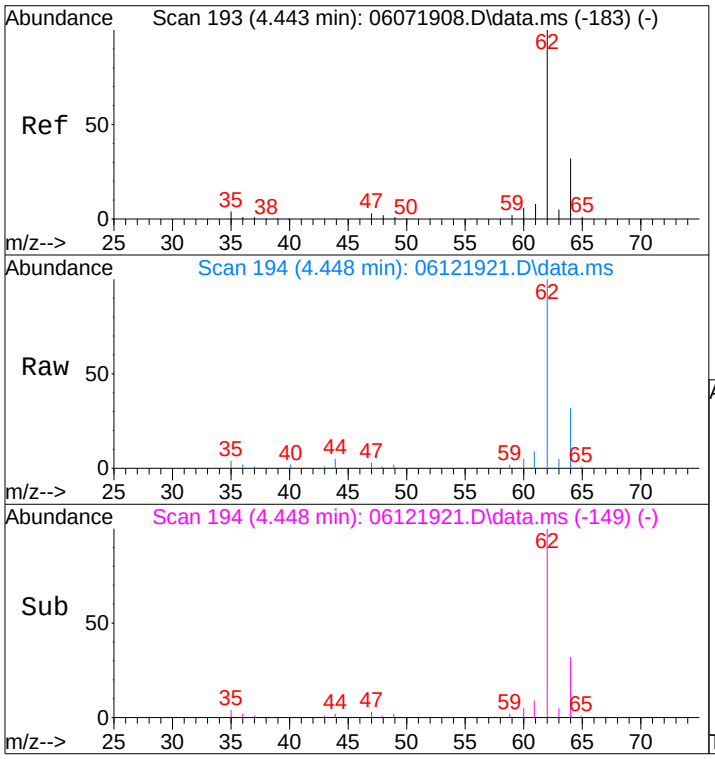
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.13	130	194774	12.500	ng	-0.04
37) 1,4-Difluorobenzene (IS2)	11.11	114	883357	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	15.46	82	462420	12.500	ng	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4(...	9.92	65	357395	12.590	ng	-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.72%			
57) Toluene-d8 (SS2)	13.55	98	1072863	12.438	ng	-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.52%			
73) Bromofluorobenzene (SS3)	17.05	174	281935	12.185	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.44%			
Target Compounds						Qvalue
6) Vinyl Chloride	4.45	62	21538	0.696	ng	99
13) Acetone	5.87	58	11871	0.694	ng	95
17) 1,1-Dichloroethene	6.71	96	21094	1.149	ng	100
19) Methylene Chloride	6.85	84	816594	40.992	ng	98
21) Trichlorotrifluoroethane	7.18	151	1305572	90.949	ng	100
28) cis-1,2-Dichloroethene	8.97	61	1634893	53.864	ng	100
36) 1,2-Dichloroethane	10.03	62	28794	1.060	ng	99
47) Trichloroethene	11.81	130	2472873	125.982	ng	100
64) Tetrachloroethene	14.80	166	16626	0.848	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2019_06\12\06121921.D
Acq On : 12 Jun 2019 17:25 Operator: SC
Sample : P1903177-002 (8.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jun 13 16:05:10 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

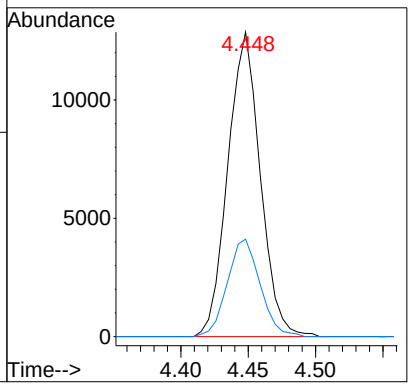


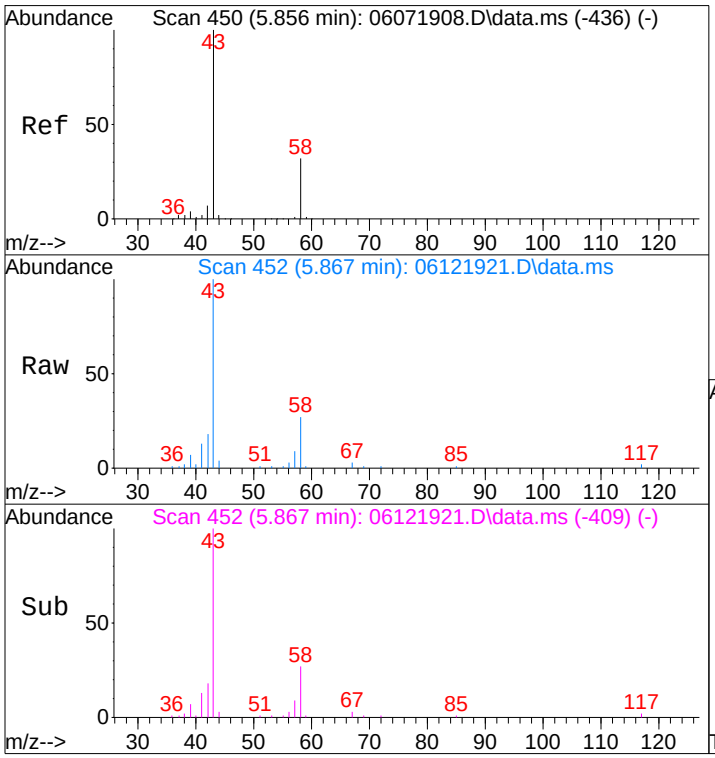


#6
Vinyl Chloride
Concen: 0.70 ng
RT: 4.45 min Scan# 194
Delta R.T. 0.000 min
Lab File: 06121921.D
Acq: 12 Jun 2019 17:25

Tgt Ion: 62 Resp: 21538

Ion	Ratio	Lower	Upper
62	100		
64	32.3	11.6	51.6

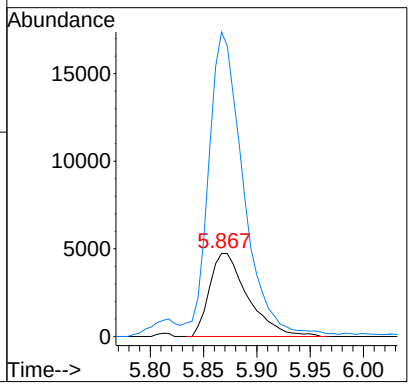


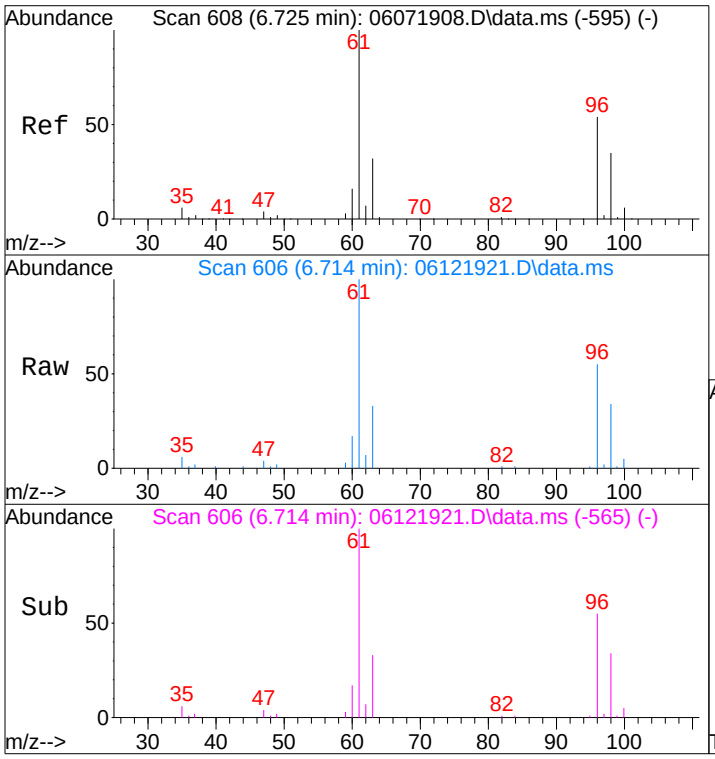


#13
Acetone
Concen: 0.69 ng
RT: 5.87 min Scan# 452
Delta R.T. -0.011 min
Lab File: 06121921.D
Acq: 12 Jun 2019 17:25

Tgt Ion: 58 Resp: 11871

Ion	Ratio	Lower	Upper
58	100		
43	327.2	287.7	347.7

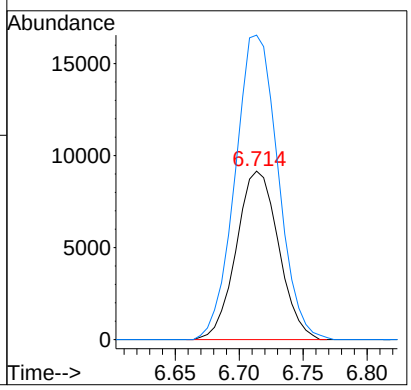


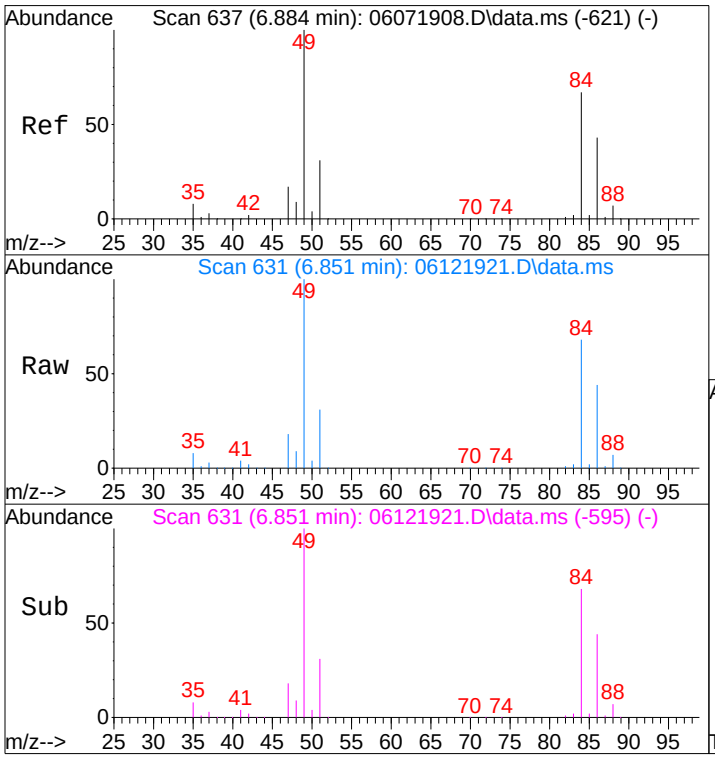


#17
1,1-Dichloroethene
Concen: 1.15 ng
RT: 6.71 min Scan# 606
Delta R.T. -0.022 min
Lab File: 06121921.D
Acq: 12 Jun 2019 17:25

Tgt Ion: 96 Resp: 21094

Ion	Ratio	Lower	Upper
96	100		
61	183.6	163.6	203.6

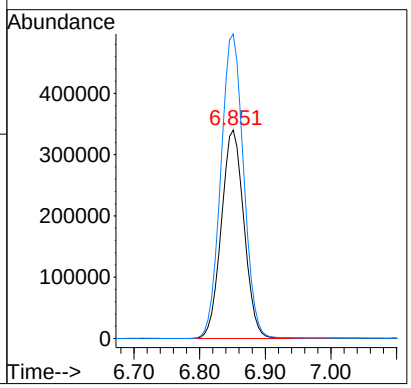


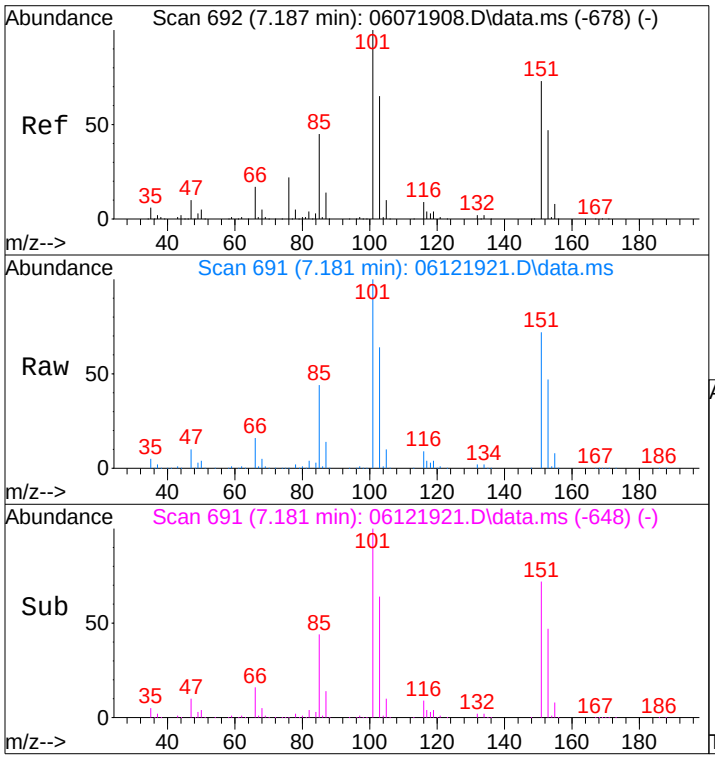


#19
Methylene Chloride
Concen: 40.99 ng
RT: 6.85 min Scan# 631
Delta R.T. -0.049 min
Lab File: 06121921.D
Acq: 12 Jun 2019 17:25

Tgt Ion: 84 Resp: 816594

Ion	Ratio	Lower	Upper
84	100		
49	147.6	125.7	175.7

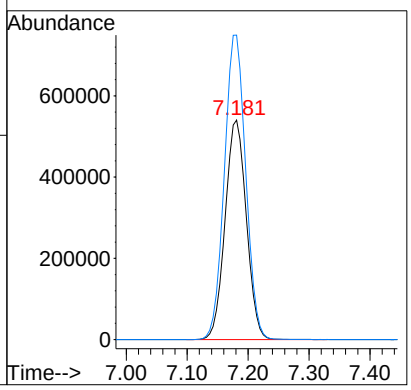


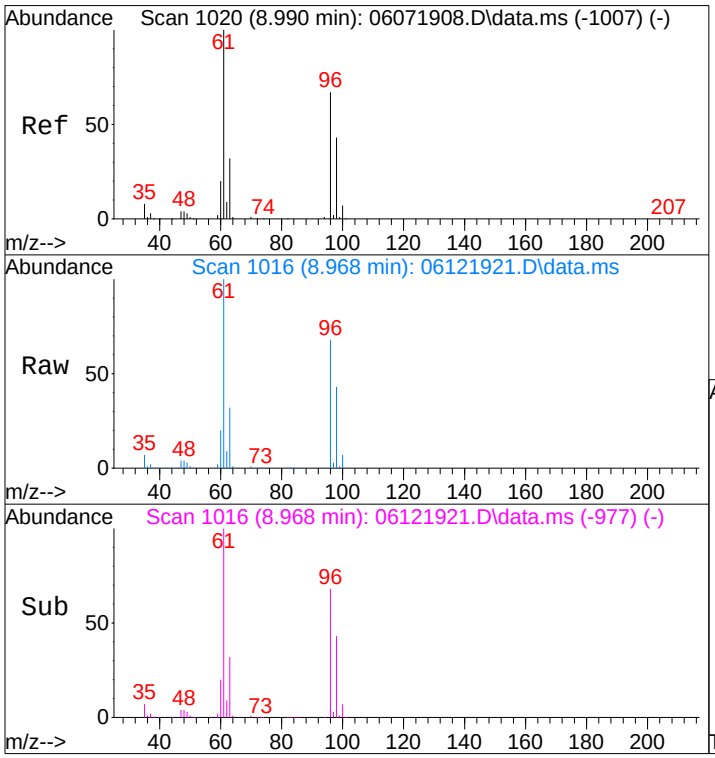


#21
Trichlorotrifluoroethane
Concen: 90.95 ng
RT: 7.18 min Scan# 691
Delta R.T. -0.011 min
Lab File: 06121921.D
Acq: 12 Jun 2019 17:25

Tgt Ion:151 Resp: 1305572

Ion	Ratio	Lower	Upper
151	100		
101	139.7	119.9	159.9

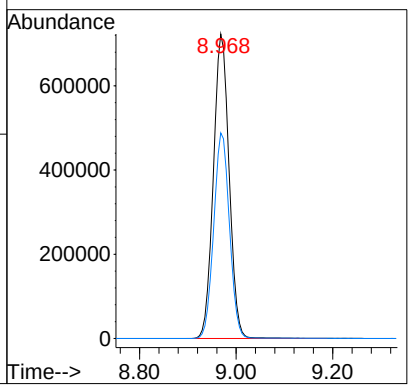


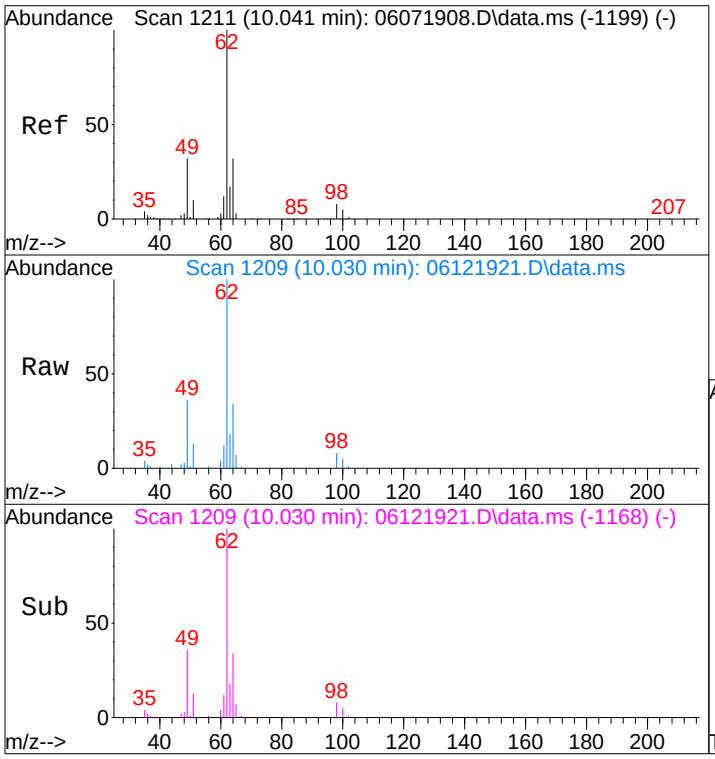


#28
cis-1,2-Dichloroethene
Concen: 53.86 ng
RT: 8.97 min Scan# 1016
Delta R.T. -0.033 min
Lab File: 06121921.D
Acq: 12 Jun 2019 17:25

Tgt Ion: 61 Resp: 1634893

Ion	Ratio	Lower	Upper
61	100		
96	67.8	47.8	87.8

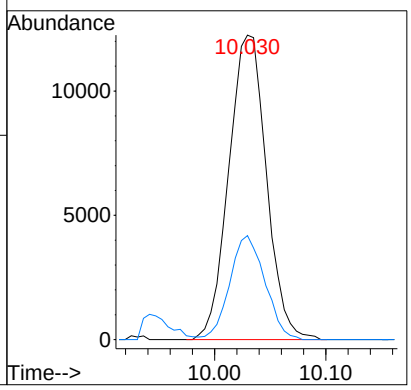


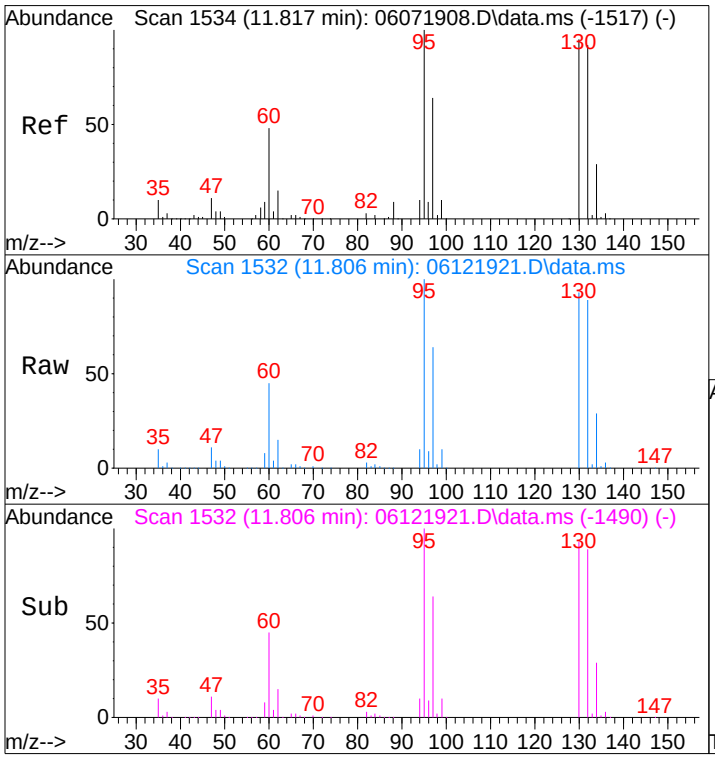


#36
1,2-Dichloroethane
Concen: 1.06 ng
RT: 10.03 min Scan# 1209
Delta R.T. -0.022 min
Lab File: 06121921.D
Acq: 12 Jun 2019 17:25

Tgt Ion: 62 Resp: 28794

Ion	Ratio	Lower	Upper
62	100		
64	31.9	12.3	52.3

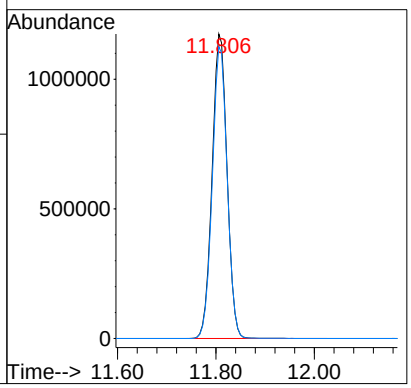


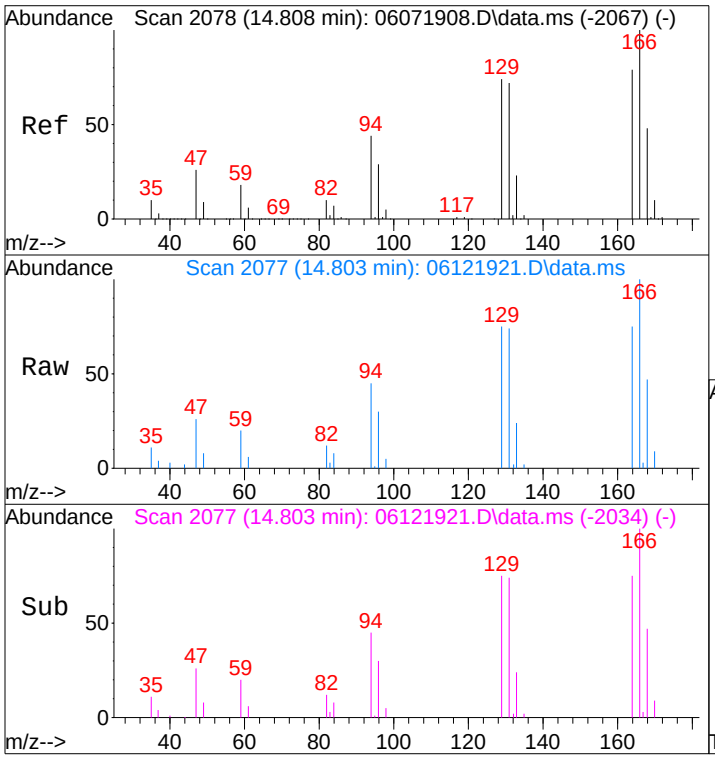


#47
Trichloroethene
Concen: 125.98 ng
RT: 11.81 min Scan# 1532
Delta R.T. -0.016 min
Lab File: 06121921.D
Acq: 12 Jun 2019 17:25

Tgt Ion:130 Resp: 2472873

Ion	Ratio	Lower	Upper
130	100		
132	95.9	75.9	115.9

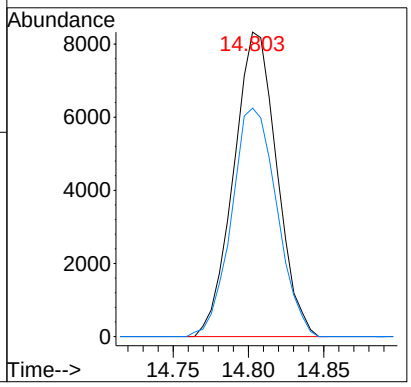




#64
Tetrachloroethene
Concen: 0.85 ng
RT: 14.80 min Scan# 2077
Delta R.T. -0.011 min
Lab File: 06121921.D
Acq: 12 Jun 2019 17:25

Tgt Ion:166 Resp: 16626

Ion	Ratio	Lower	Upper
166	100		
164	78.6	58.7	98.7



Data File: I:\MS09\Data\2019_06\13\06131909.D
Acq On : 13 Jun 2019 10:33 Operator: SC
Sample : P1903177-002Dil (4.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

6/13/19

Quant Time: Jun 13 11:03:01 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.13	130	182299	12.500	ng	-0.04
37) 1,4-Difluorobenzene (IS2)	11.11	114	833276	12.500	ng	-0.02
56) Chlorobenzene-d5 (IS3)	15.46	82	436528	12.500	ng	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4(...	9.91	65	344829	12.979	ng	-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 103.84%			
57) Toluene-d8 (SS2)	13.55	98	1008758	12.389	ng	-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.12%			
73) Bromofluorobenzene (SS3)	17.05	174	265456	12.153	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.20%			
Target Compounds						Qvalue
2) Propene	3.88	42	798	N.D.		
3) Dichlorodifluoromethan...	3.98	85	1705	N.D.		
4) Chloromethane	4.18	50	291	N.D.		
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.		
6) Vinyl Chloride	4.45	62	10309	N.D.		
7) 1,3-Butadiene	0.00	54	0	N.D.		
8) Bromomethane	0.00	94	0	N.D.		
9) Chloroethane	0.00	64	0	N.D.		
10) Ethanol	5.45	45	37	N.D.		
11) Acetonitrile	5.58	41	603	N.D.		
12) Acrolein	5.71	56	249	N.D.		
13) Acetone	5.87	58	8015	0.501	ng	89
14) Trichlorofluoromethane	6.02	101	1430	N.D.		
15) 2-Propanol (Isopropanol)	6.17	45	2796	N.D.		
16) Acrylonitrile	6.54	53	657	N.D.		
17) 1,1-Dichloroethene	6.71	96	9927	0.578	ng	99
18) 2-Methyl-2-Propanol (t...	6.71	59	499	N.D.		
19) Methylene Chloride	6.85	84	382576	20.519	ng	99
20) 3-Chloro-1-propene (Al...	6.94	41	116	N.D.		
21) Trichlorotrifluoroethane	7.18	151	606577	45.147	ng	99
22) Carbon Disulfide	7.14	76	813	N.D.		
23) trans-1,2-Dichloroethene	7.87	61	2186	N.D.		
24) 1,1-Dichloroethane	8.10	63	3576	N.D.		
25) Methyl tert-Butyl Ether	8.14	73	201	N.D.		
26) Vinyl Acetate	0.00	86	0	N.D.		
27) 2-Butanone (MEK)	8.54	72	1077	N.D.		
28) cis-1,2-Dichloroethene	8.97	61	767007	26.999	ng	99
29) Diisopropyl Ether	9.27	87	336	N.D.		
30) Ethyl Acetate	9.22	61	763	N.D.		
31) n-Hexane	9.22	57	960	N.D.		
32) Chloroform	9.27	83	4208	N.D.		
34) Tetrahydrofuran (THF)	9.71	72	1252	N.D.		
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.		
36) 1,2-Dichloroethane	10.03	62	14143	0.556	ng	98
38) 1,1,1-Trichloroethane	10.29	97	413	N.D.		
39) Isopropyl Acetate	0.00	61	0	N.D.		
40) 1-Butanol	10.72	56	1016	N.D.		
41) Benzene	10.76	78	5046	N.D.		
42) Carbon Tetrachloride	10.90	117	1214	N.D.		
43) Cyclohexane	11.04	84	1033	N.D.		
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.		
45) 1,2-Dichloropropane	0.00	63	0	N.D.		
46) Bromodichloromethane	0.00	83	0	N.D.	d	
47) Trichloroethene	11.81	130	1117360	60.346	ng	100
48) 1,4-Dioxane	0.00	88	0	N.D.		
49) 2,2,4-Trimethylpentane...	11.87	57	3535	N.D.		

Data File: I:\MS09\Data\2019_06\13\06131909.D
Acq On : 13 Jun 2019 10:33 Operator: SC
Sample : P1903177-002Dil (4.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

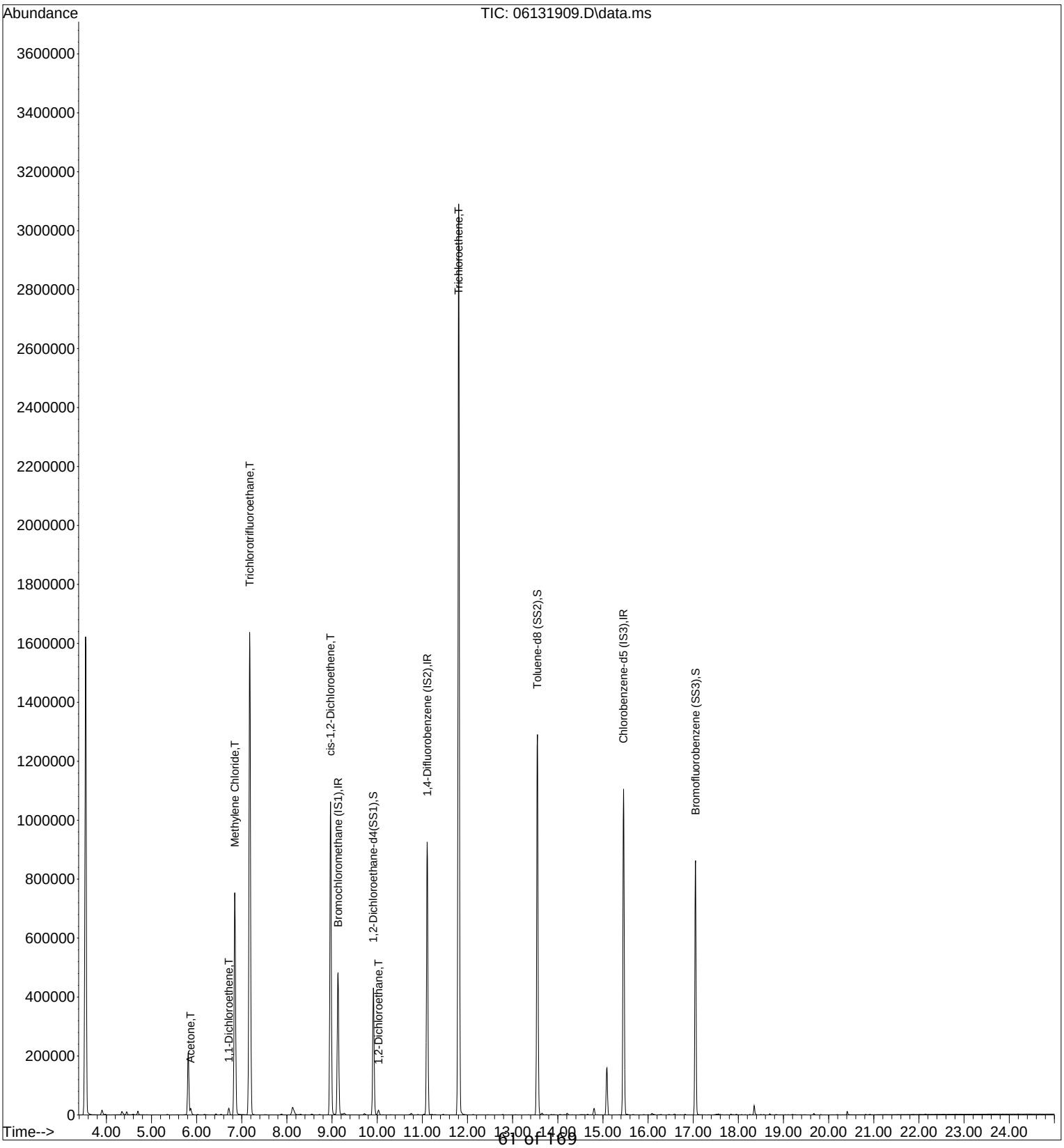
Quant Time: Jun 13 11:03:01 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc Units Dev(Min)
50) Methyl Methacrylate	11.80	100	2673	N.D.
51) n-Heptane	12.12	71	189	N.D.
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.
55) 1,1,2-Trichloroethane	13.35	97	293	N.D.
58) Toluene	13.65	91	4191	N.D.
59) 2-Hexanone	13.91	43	1251	N.D.
60) Dibromochloromethane	0.00	129	0	N.D.
61) 1,2-Dibromoethane	0.00	107	0	N.D.
62) n-Butyl Acetate	14.67	43	1238	N.D.
63) n-Octane	14.67	57	411	N.D.
64) Tetrachloroethene	14.80	166	7684	N.D.
65) Chlorobenzene	0.00	112	0	N.D.
66) Ethylbenzene	15.91	91	1439	N.D.
67) m- & p-Xylenes	16.08	91	4534	N.D.
68) Bromoform	0.00	173	0	N.D.
69) Styrene	16.47	104	578	N.D.
70) o-Xylene	16.58	91	2295	N.D.
71) n-Nonane	16.82	43	1248	N.D.
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.
74) Cumene	17.20	105	110	N.D.
75) alpha-Pinene	17.60	93	353	N.D.
76) n-Propylbenzene	17.73	91	404	N.D.
77) 3-Ethyltoluene	17.83	105	2160	N.D.
78) 4-Ethyltoluene	17.87	105	808	N.D.
79) 1,3,5-Trimethylbenzene	17.95	105	836	N.D.
80) alpha-Methylstyrene	0.00	118	0	N.D.
81) 2-Ethyltoluene	18.16	105	818	N.D.
82) 1,2,4-Trimethylbenzene	18.38	105	2171	N.D.
83) n-Decane	18.49	57	628	N.D.
84) Benzyl Chloride	18.38	91	177	N.D.
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.
87) sec-Butylbenzene	18.83	105	651	N.D.
88) 4-Isopropyltoluene (p-...	18.83	119	578	N.D.
89) 1,2,3-Trimethylbenzene	18.83	105	651	N.D.
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.
91) d-Limonene	18.99	68	211	N.D.
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.
93) n-Undecane	19.82	57	410	N.D.
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.
95) Naphthalene	20.90	128	750	N.D.
96) n-Dodecane	20.92	57	522	N.D.
97) Hexachlorobutadiene	0.00	225	0	N.D.
98) Cyclohexanone	16.27	55	508	N.D.
99) tert-Butylbenzene	18.35	119	1030	N.D.
100) n-Butylbenzene	0.00	91	0	N.D.

(#) = qualifier out of range (m) = manual integration (+) = signals summed

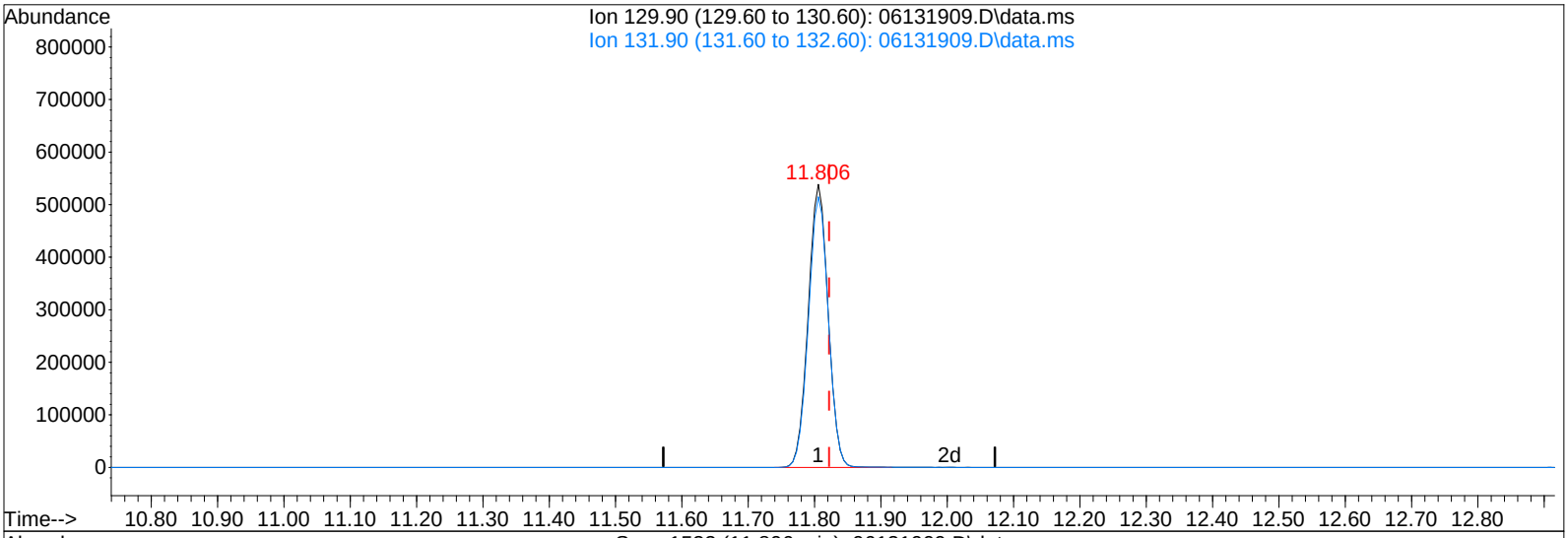
Data File: I:\MS09\Data\2019_06\13\06131909.D
Acq On : 13 Jun 2019 10:33 Operator: SC
Sample : P1903177-002Dil (4.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

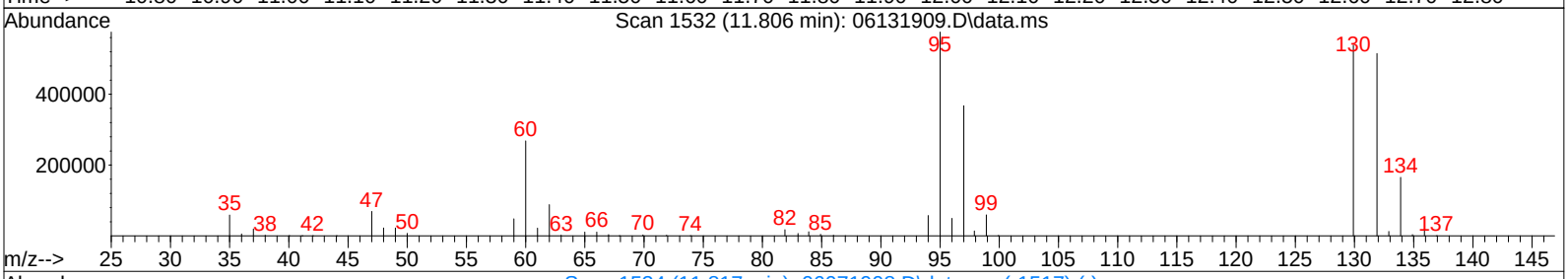
Quant Time: Jun 13 11:03:01 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

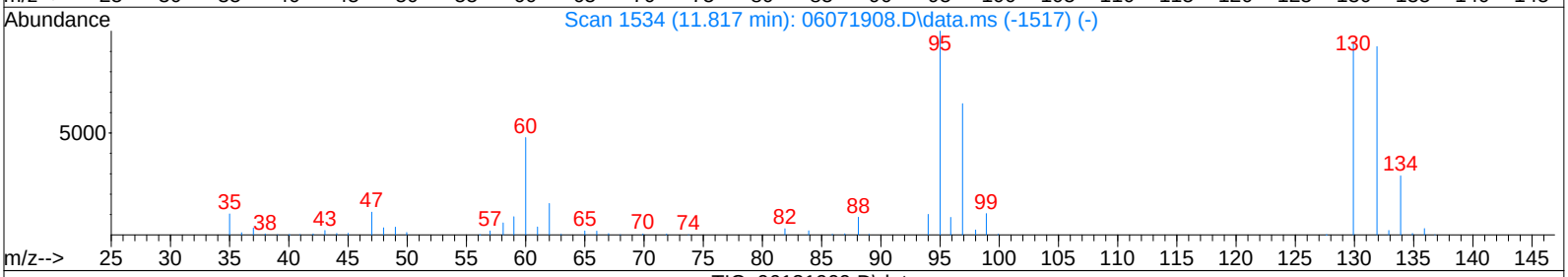


Data File: I:\MS09\Data\2019_06\13\06131909.D
Acq On : 13 Jun 2019 10:33 Operator: SC
Sample : P1903177-002Dil (4.0mL)
Misc : S31-05131901
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Jun 13 11:02:35 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M







TIC: 06131909.D\data.ms

(47) Trichloroethene (T)

11.806min (-0.016) 60.35ng

response 1117360

Ion	Exp%	Act%
129.90	100	100
131.90	95.90	96.15
0.00	0.00	0.00
0.00	0.00	0.00

Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\12\06121923.D
Acq On : 12 Jun 2019 18:32 Operator: SC
Sample : P1903177-003 (1000mL)
Misc : S31-05131901
ALS Vial : 9 Sample Multiplier: 1

6/13/19

Quant Time: Jun 13 16:08:43 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.13	130	169351	12.500	ng		-0.04
37) 1,4-Difluorobenzene (IS2)	11.11	114	794745	12.500	ng		-0.02
56) Chlorobenzene-d5 (IS3)	15.46	82	415955	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.91	65	330265	13.381	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 107.04%				
57) Toluene-d8 (SS2)	13.55	98	964721	12.434	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.44%				
73) Bromofluorobenzene (SS3)	17.05	174	255185	12.261	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.08%				
Target Compounds							Qvalue
2) Propene	3.85	42	24321m	1.120	ng		
3) Dichlorodifluoromethan...	3.96	85	58803	1.848	ng		100
4) Chloromethane	4.16	50	7373	N.D.			
5) 1,2-Dichloro-1,1,2,2-t...	4.34	135	909	N.D.			
6) Vinyl Chloride	4.44	62	2289	N.D.			
7) 1,3-Butadiene	4.63	54	853	N.D.			
8) Bromomethane	4.93	94	356	N.D.			
9) Chloroethane	0.00	64	0	N.D.			
10) Ethanol	5.34	45	97955	5.831	ng		100
11) Acetonitrile	5.55	41	14442	N.D.			
12) Acrolein	5.69	56	4988	N.D.			
13) Acetone	5.84	58	110205	7.413	ng	#	1
14) Trichlorofluoromethane	6.02	101	29257	1.095	ng		98
15) 2-Propanol (Isopropanol)	6.15	45	89413	1.637	ng		100
16) Acrylonitrile	6.36	53	439	N.D.			
17) 1,1-Dichloroethene	6.71	96	2023	N.D.			
18) 2-Methyl-2-Propanol (t...	6.82	59	6278	N.D.			
19) Methylene Chloride	6.85	84	24784	1.431	ng		100
20) 3-Chloro-1-propene (Al...	6.98	41	164	N.D.			
21) Trichlorotrifluoroethane	7.18	151	196351	15.732	ng		99
22) Carbon Disulfide	7.14	76	7032	N.D.			
23) trans-1,2-Dichloroethene	7.89	61	432	N.D.			
24) 1,1-Dichloroethane	8.08	63	348	N.D.			
25) Methyl tert-Butyl Ether	8.12	73	307	N.D.			
26) Vinyl Acetate	8.30	86	663	N.D.			
27) 2-Butanone (MEK)	8.51	72	72918	5.095	ng		93
28) cis-1,2-Dichloroethene	8.97	61	75379	2.856	ng		99
29) Diisopropyl Ether	9.22	87	218	N.D.			
30) Ethyl Acetate	9.22	61	13966	1.959	ng		97
31) n-Hexane	9.22	57	19794	0.582	ng		99
32) Chloroform	9.28	83	2740	N.D.			
34) Tetrahydrofuran (THF)	9.69	72	9394	0.737	ng		92
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.			
36) 1,2-Dichloroethane	10.02	62	6868	N.D.			
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.			
39) Isopropyl Acetate	10.67	61	320	N.D.			
40) 1-Butanol	0.00	56	0	N.D.	d		
41) Benzene	10.75	78	27614	N.D.			
42) Carbon Tetrachloride	10.90	117	6514	N.D.			
43) Cyclohexane	11.03	84	8184	N.D.			
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.			
45) 1,2-Dichloropropane	11.56	63	545	N.D.			
46) Bromodichloromethane	11.70	83	329	N.D.			
47) Trichloroethene	11.81	130	138521	7.844	ng		99
48) 1,4-Dioxane	11.82	88	263	N.D.			
49) 2,2,4-Trimethylpentane...	11.87	57	31254	N.D.			

Data File: I:\MS09\Data\2019_06\12\06121923.D
Acq On : 12 Jun 2019 18:32 Operator: SC
Sample : P1903177-003 (1000mL)
Misc : S31-05131901
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Jun 13 16:08:43 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

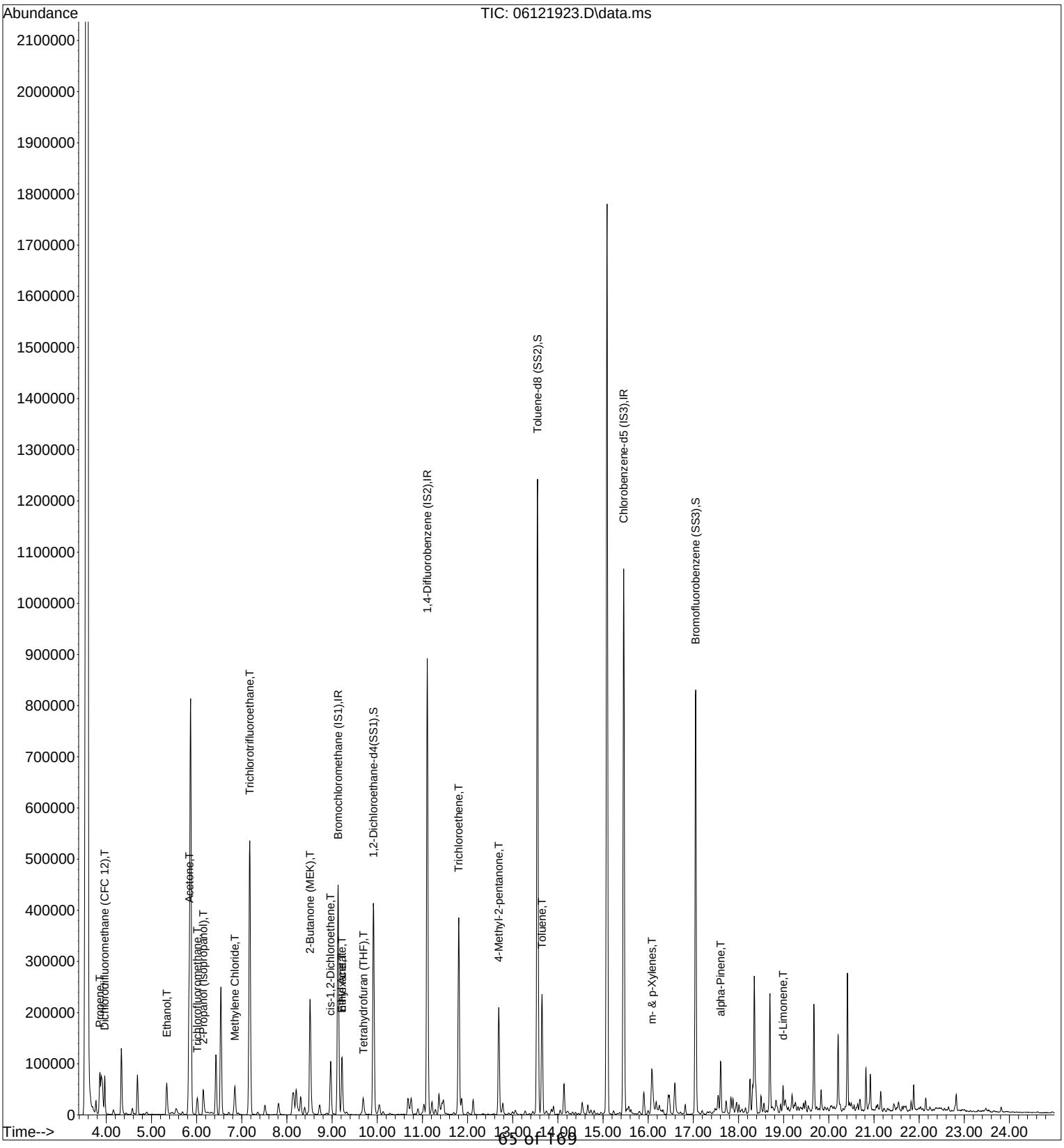
Internal Standards	R.T.	QIon	Response	Conc Units	Dev(Min)
50) Methyl Methacrylate	12.00	100	639	N.D.	
51) n-Heptane	12.12	71	7182	N.D.	
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.	
53) 4-Methyl-2-pentanone	12.69	58	65862	3.426 ng	95
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.	
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.	
58) Toluene	13.65	91	189685	2.454 ng	99
59) 2-Hexanone	13.90	43	9598	N.D.	
60) Dibromochloromethane	0.00	129	0	N.D.	
61) 1,2-Dibromoethane	0.00	107	0	N.D.	
62) n-Butyl Acetate	14.54	43	19273	N.D.	
63) n-Octane	14.67	57	4009	N.D.	
64) Tetrachloroethene	14.80	166	2463	N.D.	
65) Chlorobenzene	15.50	112	506	N.D.	
66) Ethylbenzene	15.90	91	37200	N.D.	
67) m- & p-Xylenes	16.08	91	73996	1.107 ng	98
68) Bromoform	16.17	173	339	N.D.	
69) Styrene	16.47	104	18514	N.D.	
70) o-Xylene	16.58	91	28804	N.D.	
71) n-Nonane	16.82	43	8049	N.D.	
72) 1,1,2,2-Tetrachloroethane	16.60	83	446	N.D.	
74) Cumene	17.20	105	2580	N.D.	
75) alpha-Pinene	17.61	93	44916	1.062 ng	99
76) n-Propylbenzene	17.73	91	8213	N.D.	
77) 3-Ethyltoluene	17.83	105	18769	N.D.	
78) 4-Ethyltoluene	17.88	105	7943	N.D.	
79) 1,3,5-Trimethylbenzene	17.96	105	6512	N.D.	
80) alpha-Methylstyrene	18.12	118	1207	N.D.	
81) 2-Ethyltoluene	18.15	105	7410	N.D.	
82) 1,2,4-Trimethylbenzene	18.38	105	28793	N.D.	
83) n-Decane	18.50	57	12644	N.D.	
84) Benzyl Chloride	18.53	91	121	N.D.	
85) 1,3-Dichlorobenzene	18.61	146	649	N.D.	
86) 1,4-Dichlorobenzene	18.61	146	649	N.D.	
87) sec-Butylbenzene	18.67	105	1722	N.D.	
88) 4-Isopropyltoluene (p-...	18.83	119	5410	N.D.	
89) 1,2,3-Trimethylbenzene	18.83	105	7895	N.D.	
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.	
91) d-Limonene	18.99	68	14432m	0.494 ng	
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.	
93) n-Undecane	19.83	57	13949	N.D.	
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.	
95) Naphthalene	20.89	128	8097	N.D.	
96) n-Dodecane	0.00	57	0	N.D. d	
97) Hexachlorobutadiene	0.00	225	0	N.D.	
98) Cyclohexanone	16.24	55	9414	N.D.	
99) tert-Butylbenzene	18.35	119	6804	N.D.	
100) n-Butylbenzene	19.27	91	5885	N.D.	

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\12\06121923.D
Acq On : 12 Jun 2019 18:32 Operator: SC
Sample : P1903177-003 (1000mL)
Misc : S31-05131901
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Jun 13 16:08:43 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\12\06121923.D
Acq On : 12 Jun 2019 18:32 Operator: SC
Sample : P1903177-003 (1000mL)
Misc : S31-05131901
ALS Vial : 9 Sample Multiplier: 1

6/13/19

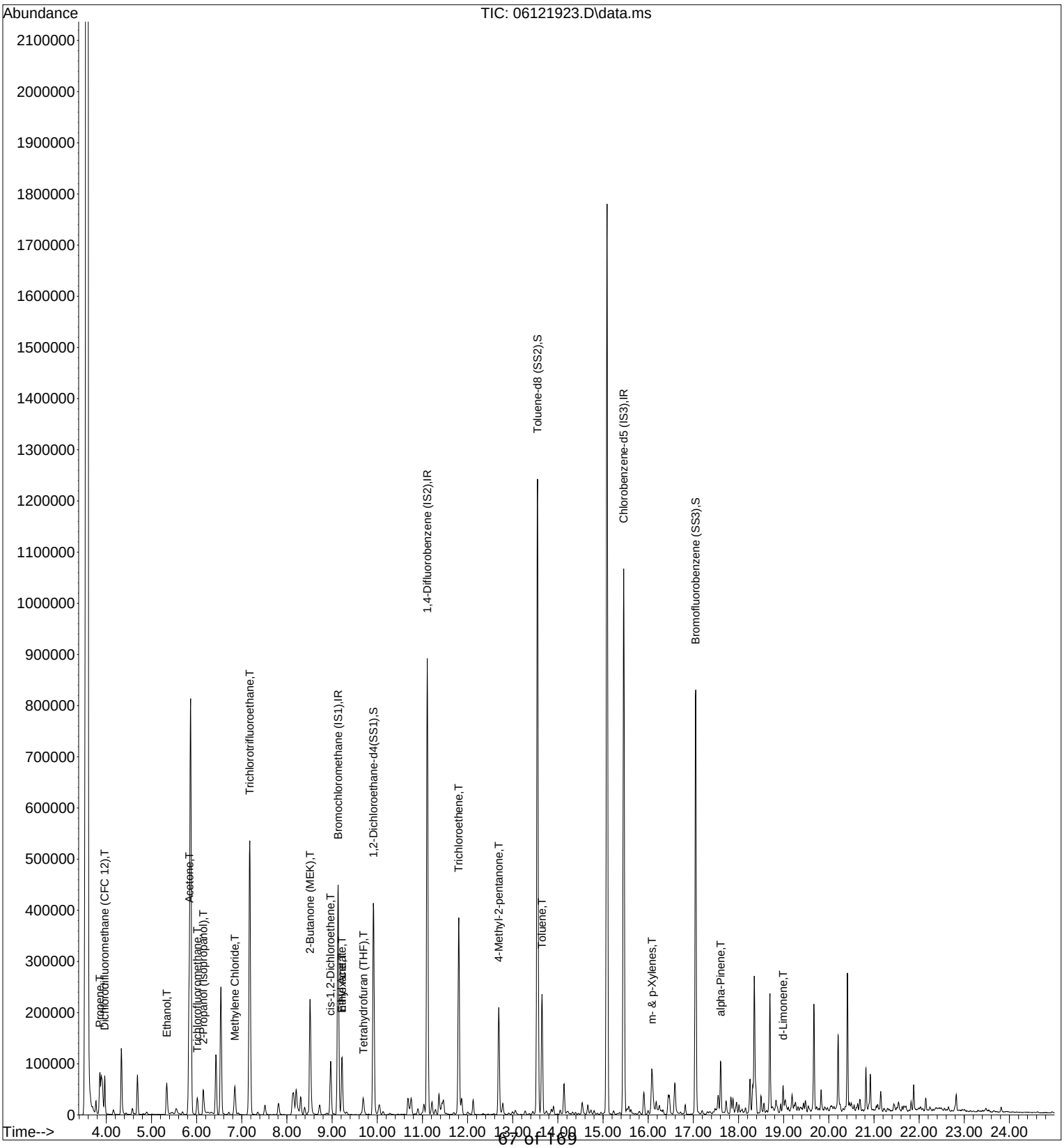
Quant Time: Jun 13 16:08:43 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

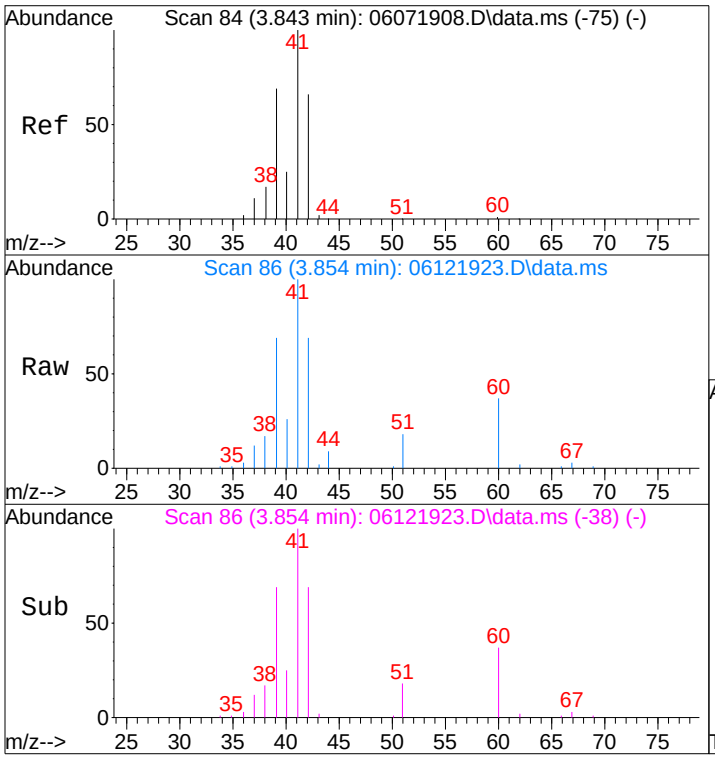
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.13	130	169351	12.500	ng		-0.04
37) 1,4-Difluorobenzene (IS2)	11.11	114	794745	12.500	ng		-0.02
56) Chlorobenzene-d5 (IS3)	15.46	82	415955	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.91	65	330265	13.381	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 107.04%				
57) Toluene-d8 (SS2)	13.55	98	964721	12.434	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.44%				
73) Bromofluorobenzene (SS3)	17.05	174	255185	12.261	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.08%				
Target Compounds							Qvalue
2) Propene	3.85	42	24321m	1.120	ng		
3) Dichlorodifluoromethan...	3.96	85	58803	1.848	ng		100
10) Ethanol	5.34	45	97955	5.831	ng		100
13) Acetone	5.84	58	110205	7.413	ng	#	1
14) Trichlorofluoromethane	6.02	101	29257	1.095	ng		98
15) 2-Propanol (Isopropanol)	6.15	45	89413	1.637	ng		100
19) Methylene Chloride	6.85	84	24784	1.431	ng		100
21) Trichlorotrifluoroethane	7.18	151	196351	15.732	ng		99
27) 2-Butanone (MEK)	8.51	72	72918	5.095	ng		93
28) cis-1,2-Dichloroethene	8.97	61	75379	2.856	ng		99
30) Ethyl Acetate	9.22	61	13966	1.959	ng		97
31) n-Hexane	9.22	57	19794	0.582	ng		99
34) Tetrahydrofuran (THF)	9.69	72	9394	0.737	ng		92
47) Trichloroethene	11.81	130	138521	7.844	ng		99
53) 4-Methyl-2-pentanone	12.69	58	65862	3.426	ng		95
58) Toluene	13.65	91	189685	2.454	ng		99
67) m- & p-Xylenes	16.08	91	73996	1.107	ng		98
75) alpha-Pinene	17.61	93	44916	1.062	ng		99
91) d-Limonene	18.99	68	14432m	0.494	ng		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2019_06\12\06121923.D
Acq On : 12 Jun 2019 18:32 Operator: SC
Sample : P1903177-003 (1000mL)
Misc : S31-05131901
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Jun 13 16:08:43 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

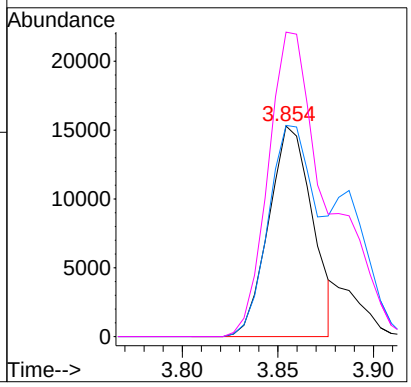


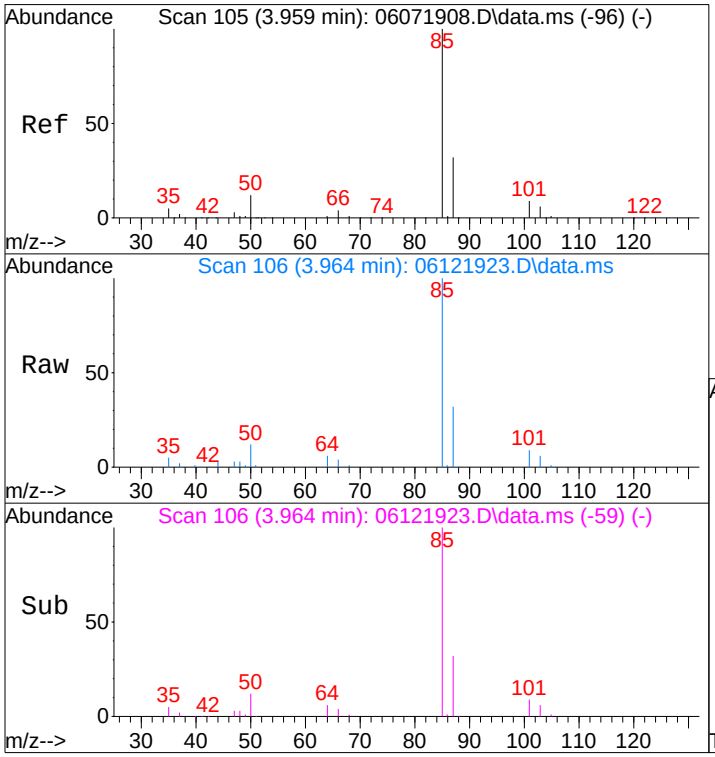


#2
Propene
Concen: 1.12 ng m
RT: 3.85 min Scan# 86
Delta R.T. 0.011 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion: 42 Resp: 24321

Ion	Ratio	Lower	Upper
42	100		
39	164.8	84.8	124.8#
41	200.2	130.3	170.3#

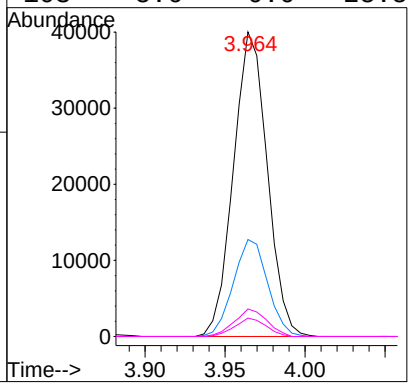


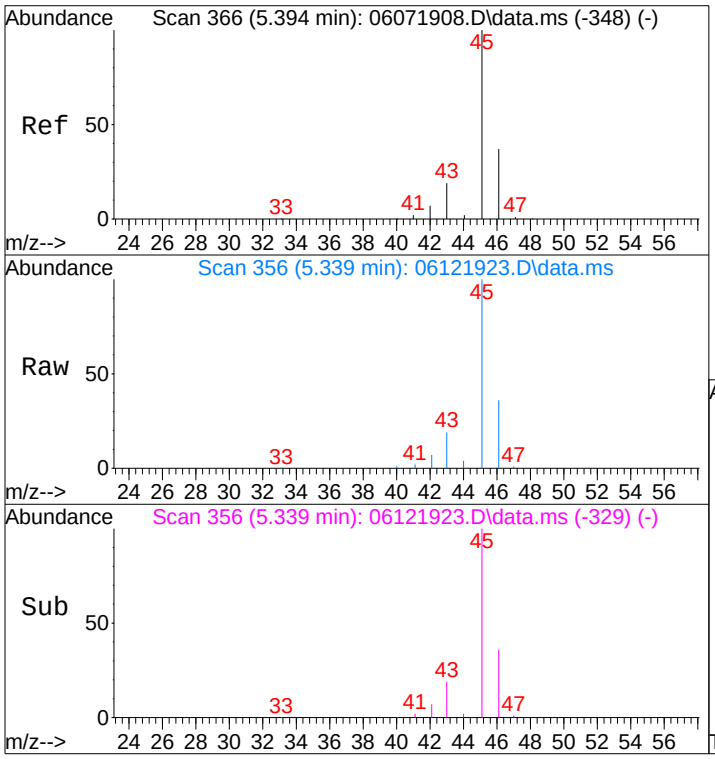


#3
Dichlorodifluoromethane (CFC 12)
Concen: 1.85 ng
RT: 3.96 min Scan# 106
Delta R.T. 0.006 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion: 85 Resp: 58803

Ion	Ratio	Lower	Upper
85	100		
87	32.3	12.3	52.3
101	8.7	0.0	28.6
103	5.6	0.0	25.5

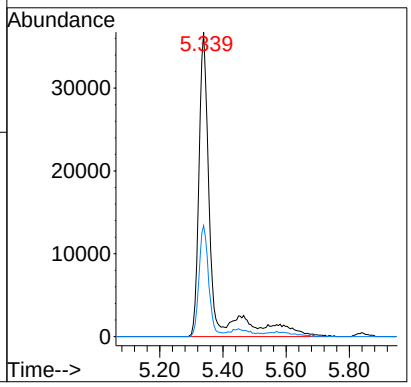


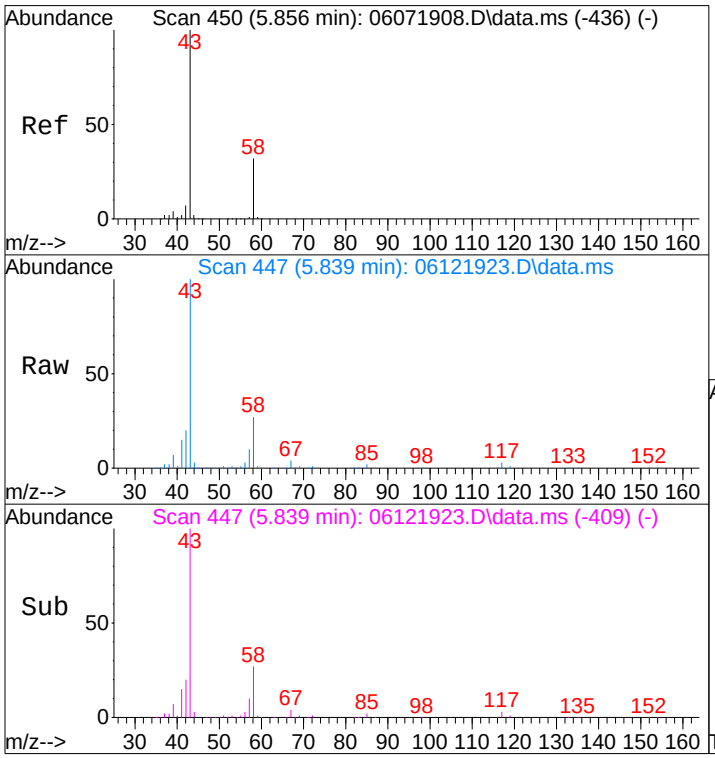


#10
Ethanol
Concen: 5.83 ng
RT: 5.34 min Scan# 356
Delta R.T. -0.099 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion: 45 Resp: 97955

Ion	Ratio	Lower	Upper
45	100		
46	37.0	17.1	57.1

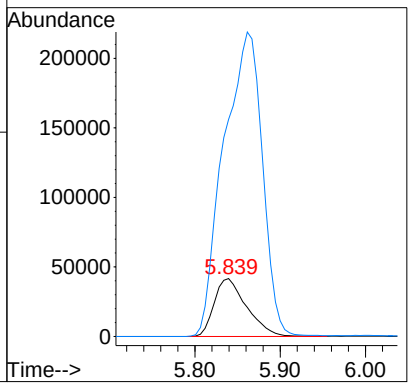


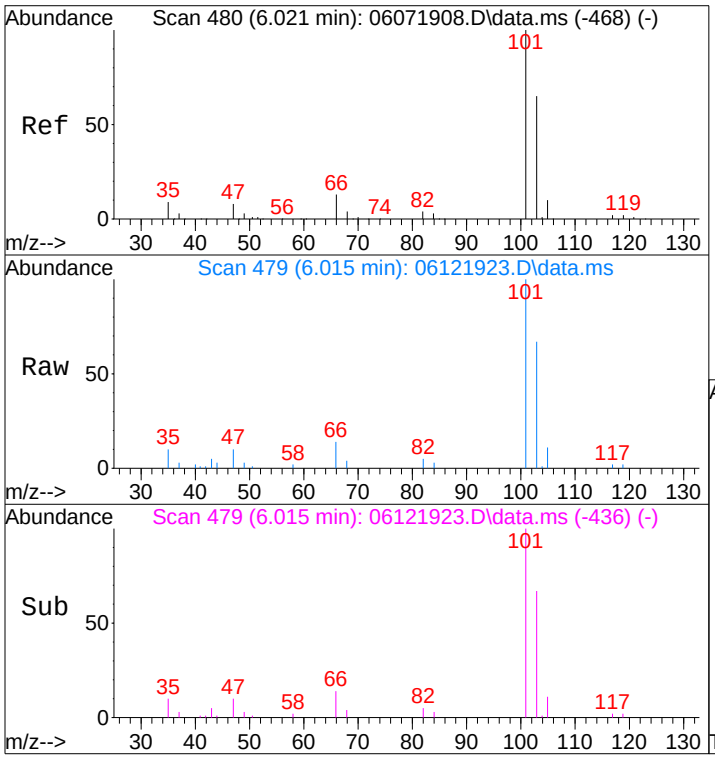


#13
Acetone
Concen: 7.41 ng
RT: 5.84 min Scan# 447
Delta R.T. -0.039 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion: 58 Resp: 110205

Ion	Ratio	Lower	Upper
58	100		
43	626.4	287.7	347.7#

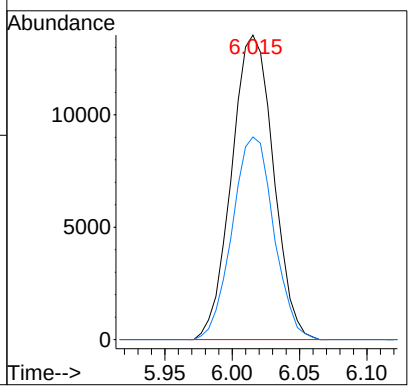


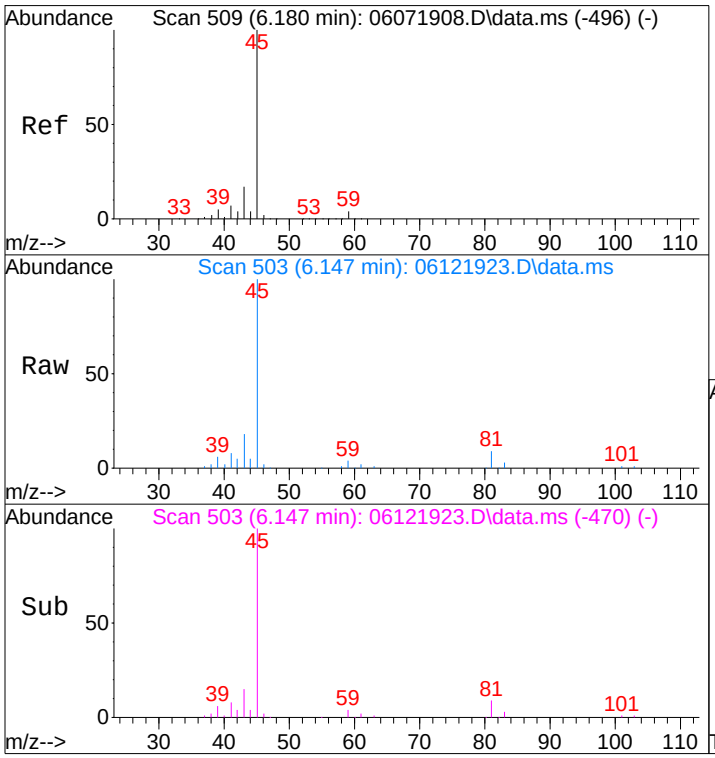


#14
Trichlorofluoromethane
Concen: 1.09 ng
RT: 6.02 min Scan# 479
Delta R.T. -0.016 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion:101 Resp: 29257

Ion	Ratio	Lower	Upper
101	100		
103	66.1	44.7	84.7

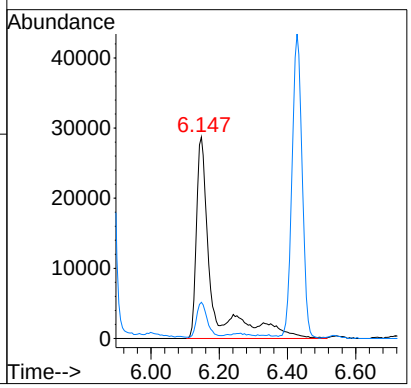


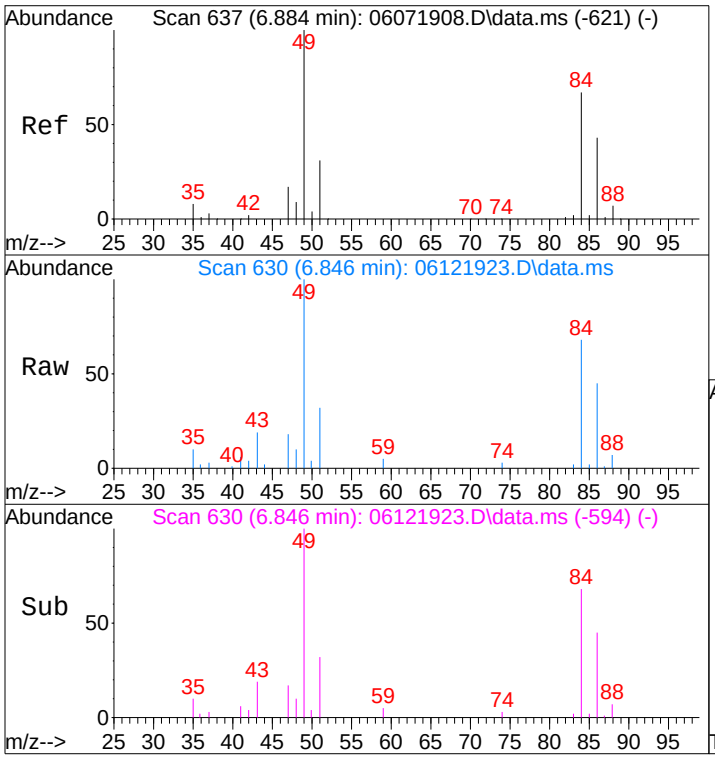


#15
2-Propanol (Isopropanol)
Concen: 1.64 ng
RT: 6.15 min Scan# 503
Delta R.T. -0.071 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion: 45 Resp: 89413

Ion	Ratio	Lower	Upper
45	100		
43	17.5	0.0	37.3

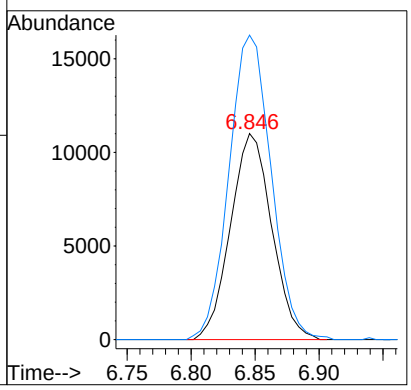


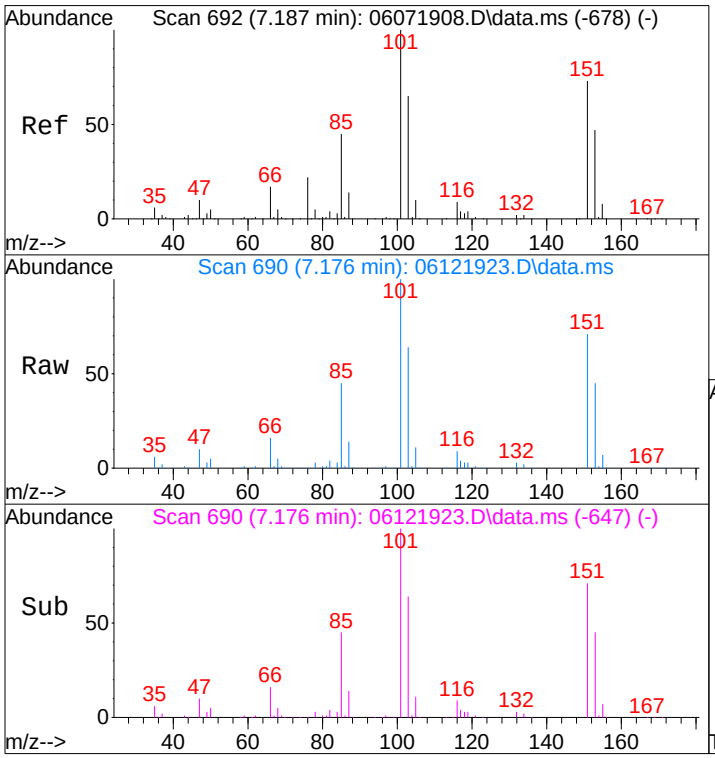


#19
Methylene Chloride
Concen: 1.43 ng
RT: 6.85 min Scan# 630
Delta R.T. -0.055 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion: 84 Resp: 24784

Ion	Ratio	Lower	Upper
84	100		
49	151.0	125.7	175.7

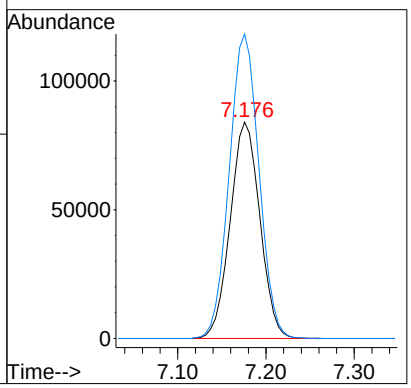


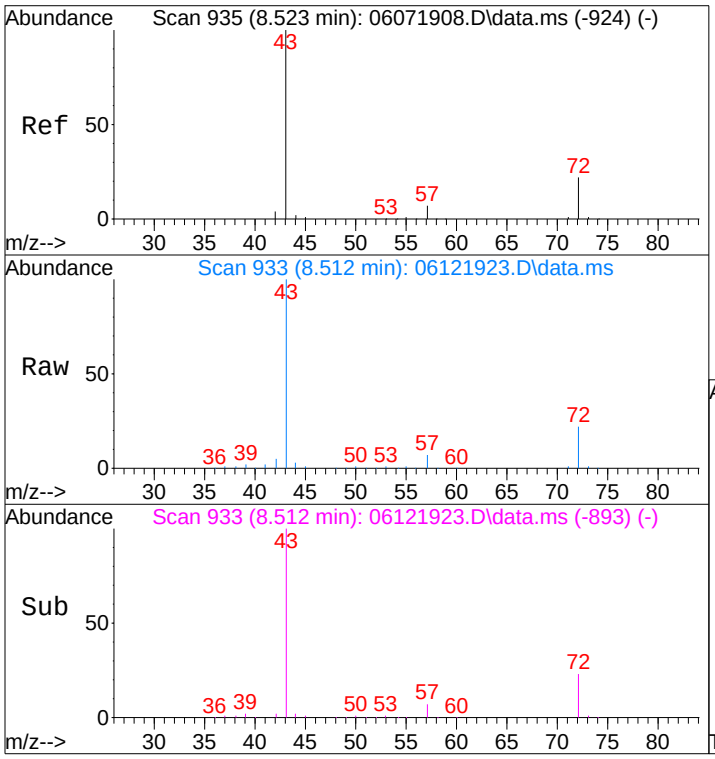


#21
Trichlorotrifluoroethane
Concen: 15.73 ng
RT: 7.18 min Scan# 690
Delta R.T. -0.016 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion:151 Resp: 196351

Ion	Ratio	Lower	Upper
151	100		
101	141.0	119.9	159.9

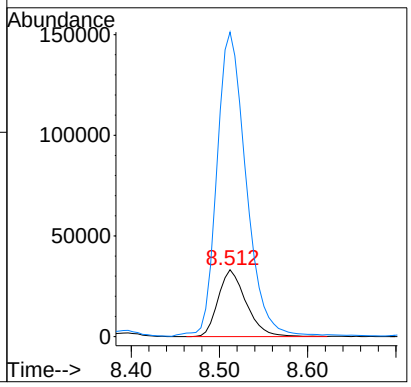


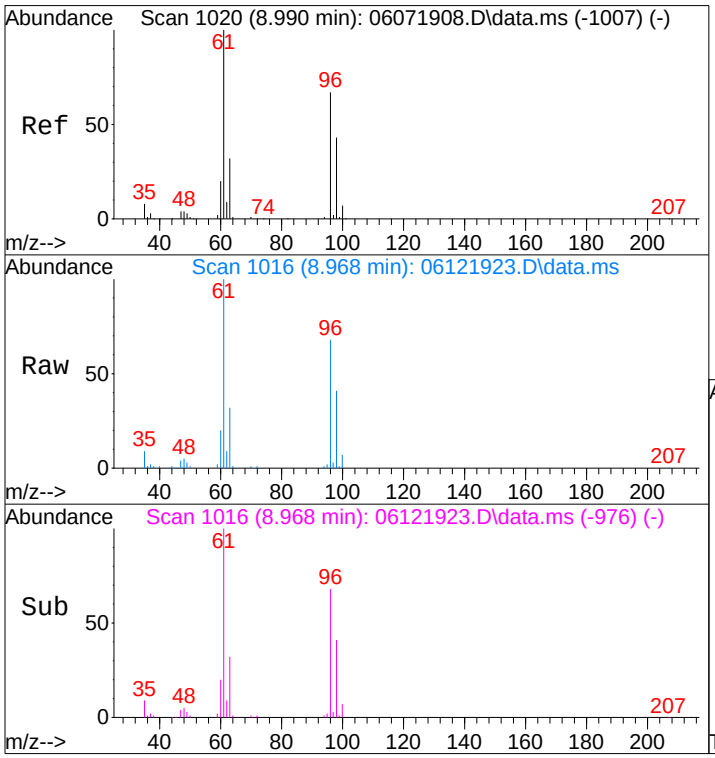


#27
2-Butanone (MEK)
Concen: 5.09 ng
RT: 8.51 min Scan# 933
Delta R.T. -0.033 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion: 72 Resp: 72918

Ion	Ratio	Lower	Upper
72	100		
43	475.4	436.0	476.0

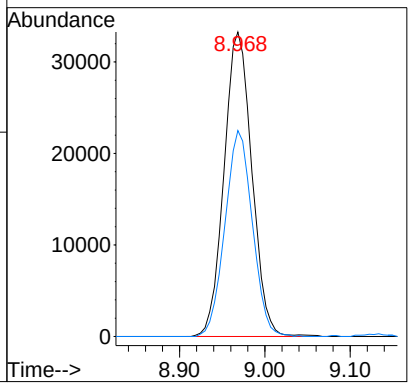


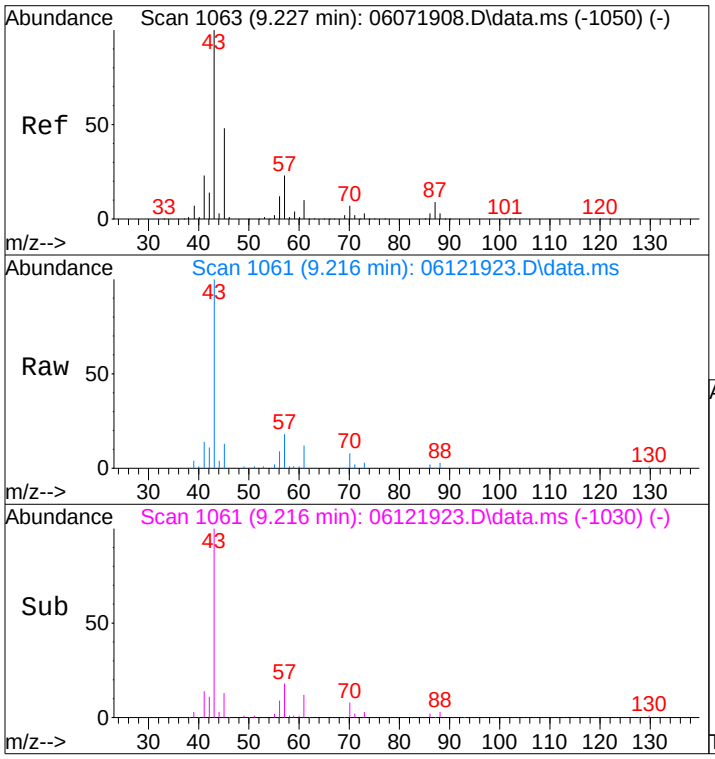


#28
cis-1,2-Dichloroethene
Concen: 2.86 ng
RT: 8.97 min Scan# 1016
Delta R.T. -0.033 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion: 61 Resp: 75379

Ion	Ratio	Lower	Upper
61	100		
96	66.6	47.8	87.8

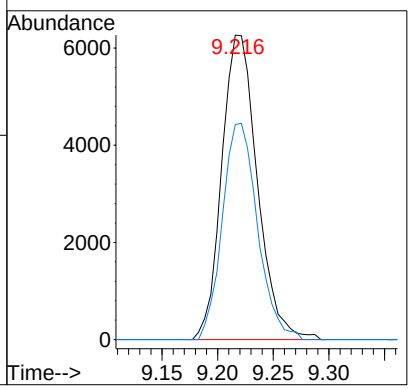


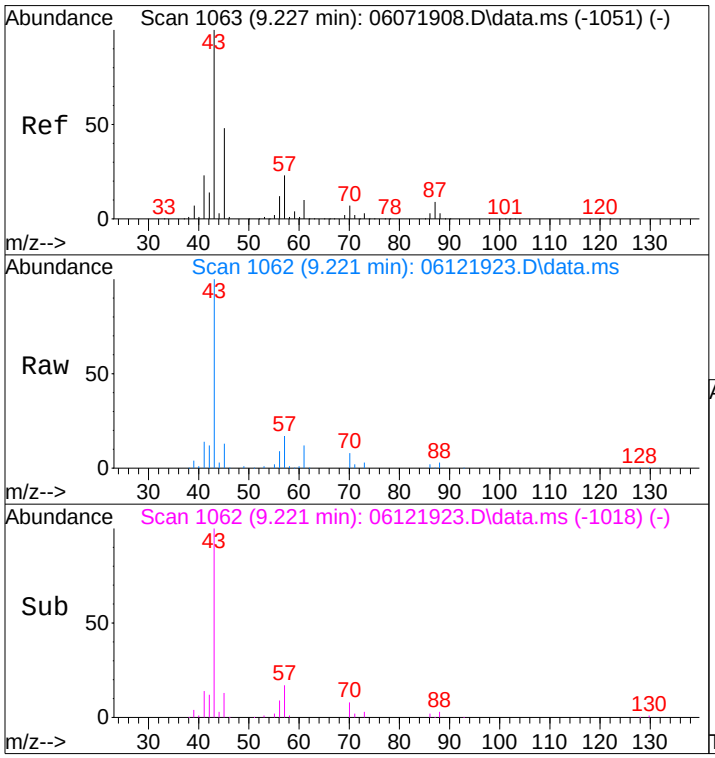


#30
Ethyl Acetate
Concen: 1.96 ng
RT: 9.22 min Scan# 1061
Delta R.T. -0.027 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion: 61 Resp: 13966

Ion	Ratio	Lower	Upper
61	100		
70	70.0	52.1	92.1

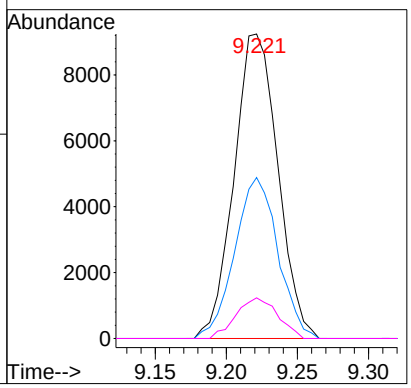


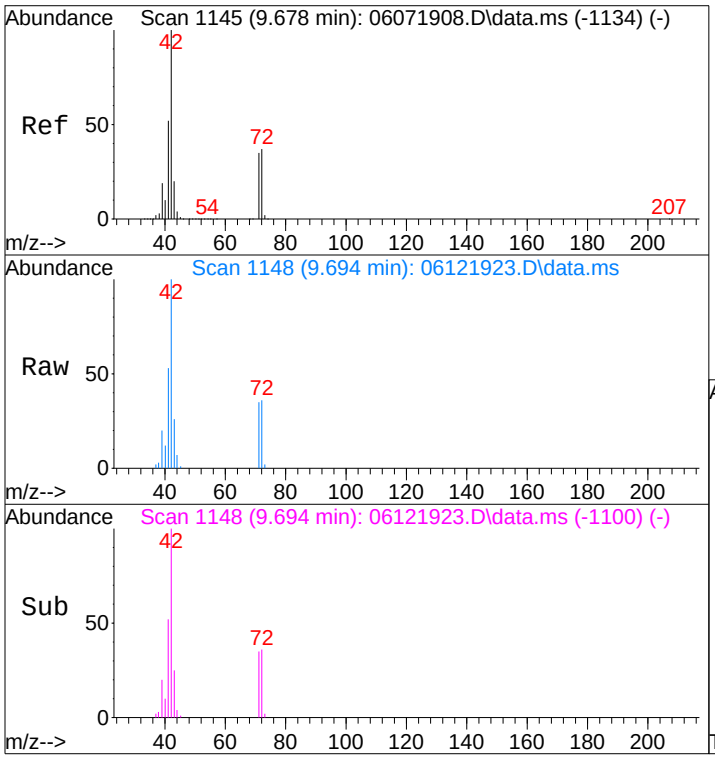


#31
n-Hexane
Concen: 0.58 ng
RT: 9.22 min Scan# 1062
Delta R.T. -0.011 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion: 57 Resp: 19794

Ion	Ratio	Lower	Upper
57	100		
56	52.1	40.8	61.2
86	12.7	10.3	15.5

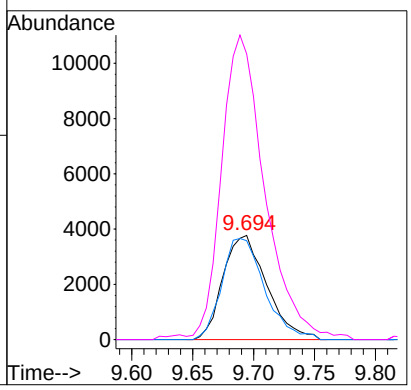


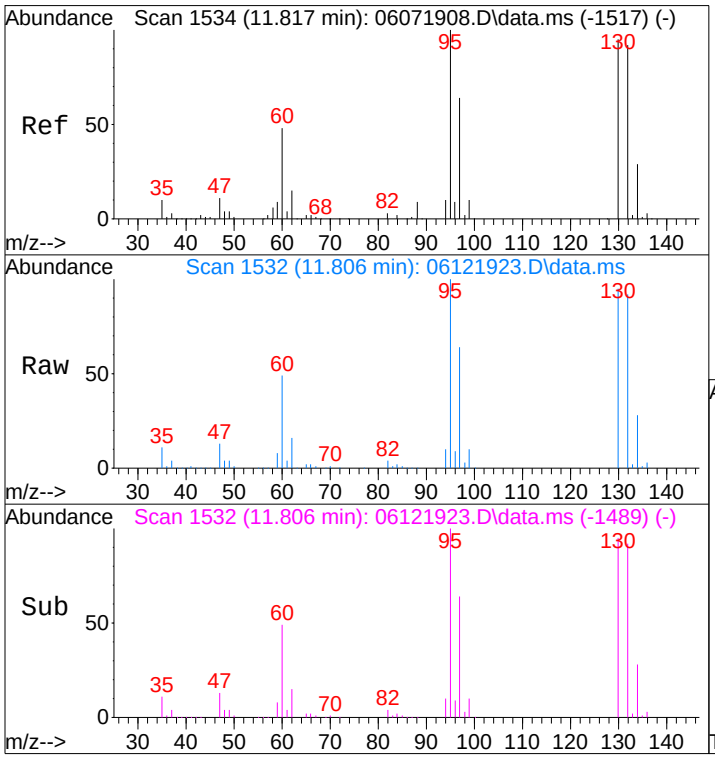


#34
Tetrahydrofuran (THF)
Concen: 0.74 ng
RT: 9.69 min Scan# 1148
Delta R.T. 0.011 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion: 72 Resp: 9394

Ion	Ratio	Lower	Upper
72	100		
71	95.3	76.8	116.8
42	292.3	253.3	293.3

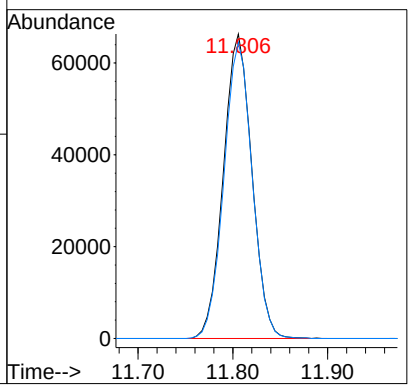


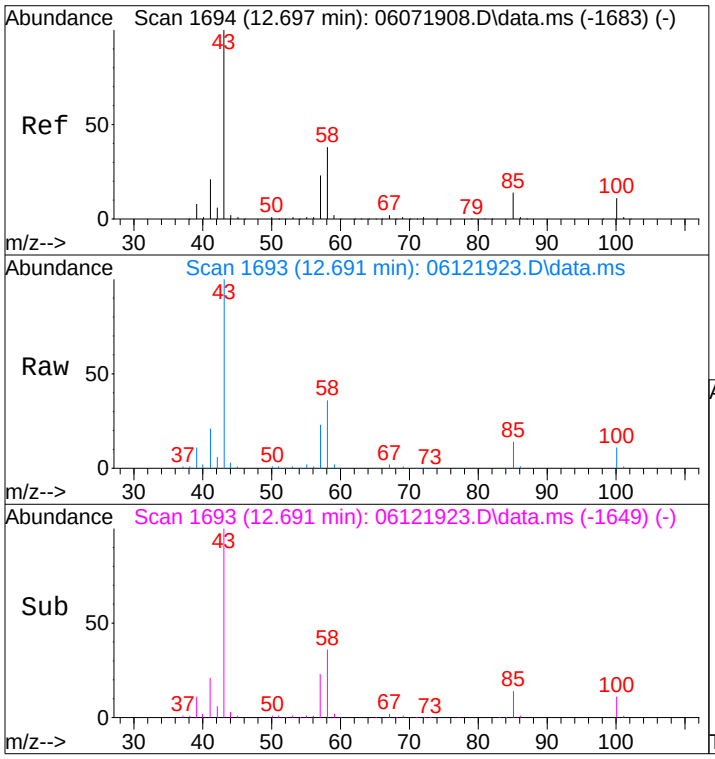


#47
Trichloroethene
Concen: 7.84 ng
RT: 11.81 min Scan# 1532
Delta R.T. -0.016 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion:130 Resp: 138521

Ion	Ratio	Lower	Upper
130	100		
132	96.6	75.9	115.9

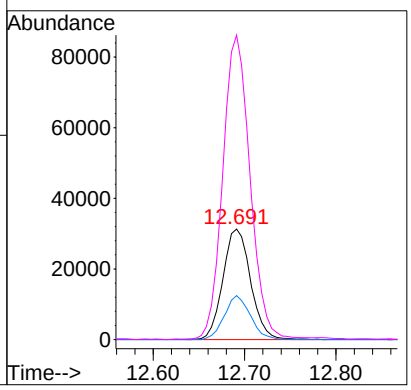


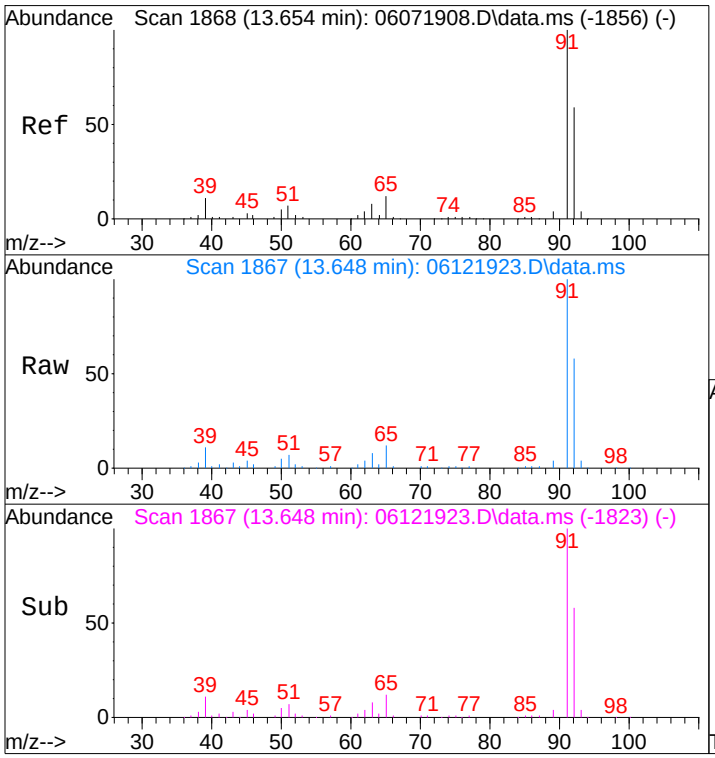


#53
4-Methyl-2-pentanone
Concen: 3.43 ng
RT: 12.69 min Scan# 1693
Delta R.T. -0.011 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion: 58 Resp: 65862

Ion	Ratio	Lower	Upper
58	100		
85	37.4	31.5	47.3
43	273.7	211.1	316.7

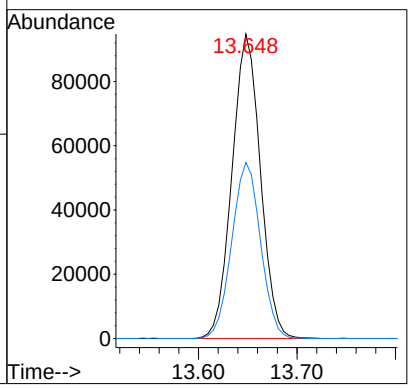


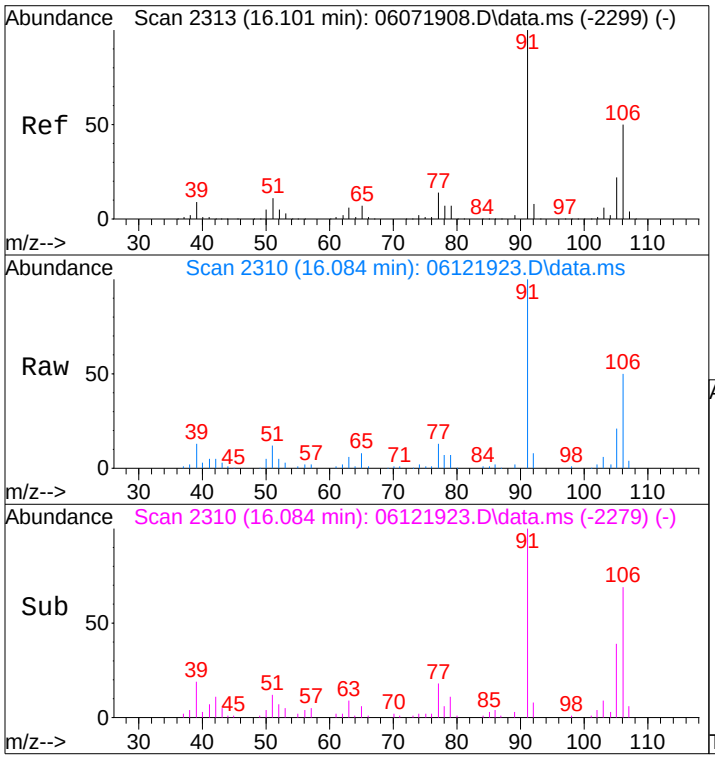


#58
Toluene
Concen: 2.45 ng
RT: 13.65 min Scan# 1867
Delta R.T. -0.011 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion: 91 Resp: 189685

Ion	Ratio	Lower	Upper
91	100		
92	58.6	39.0	79.0

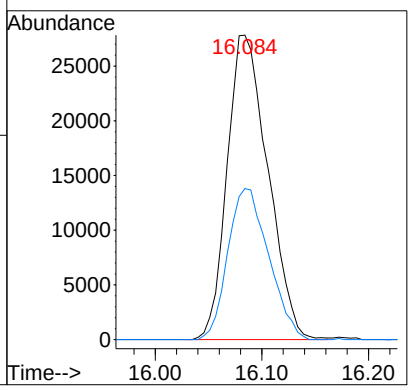


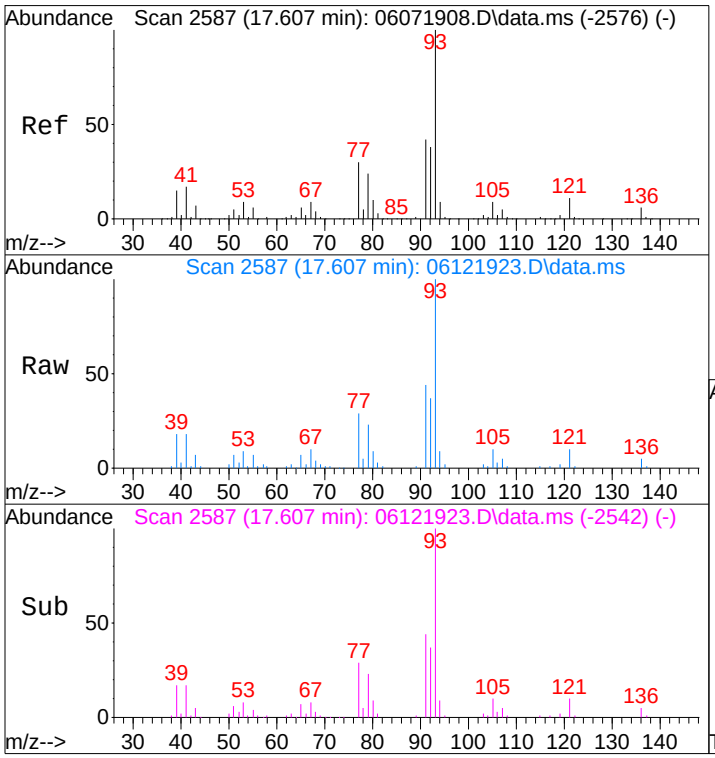


#67
m- & p-Xylenes
Concen: 1.11 ng
RT: 16.08 min Scan# 2310
Delta R.T. -0.027 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion: 91 Resp: 73996

Ion	Ratio	Lower	Upper
91	100		
106	49.6	28.1	68.1

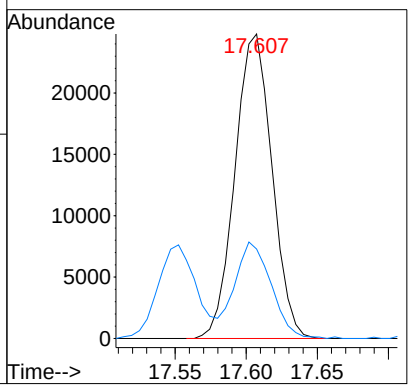


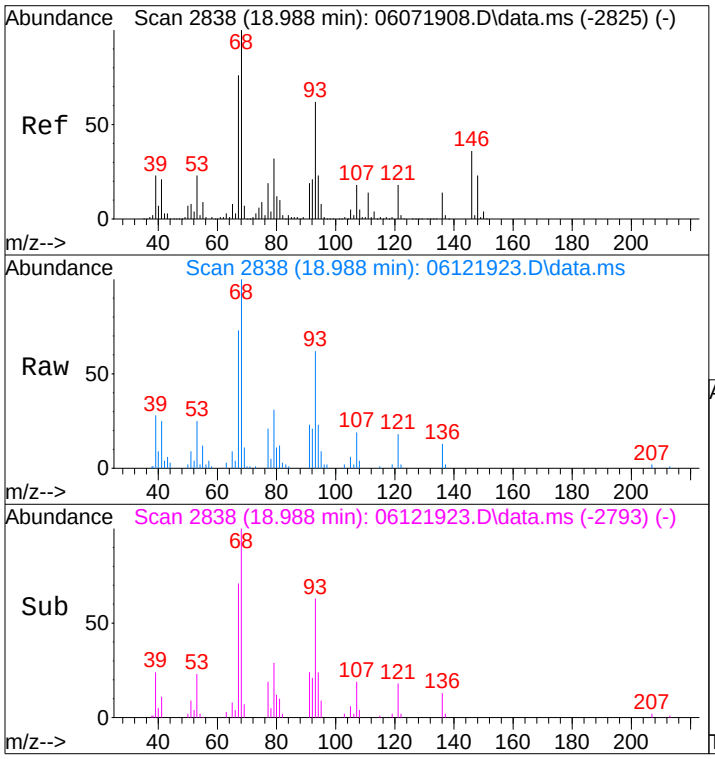


#75
alpha-Pinene
Concen: 1.06 ng
RT: 17.61 min Scan# 2587
Delta R.T. -0.005 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

Tgt Ion: 93 Resp: 44916

Ion	Ratio	Lower	Upper
93	100		
77	31.1	10.4	50.4

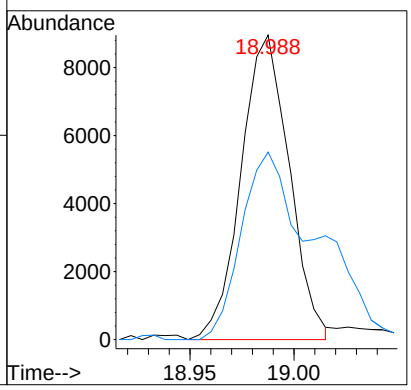




#91
d-Limonene
Concen: 0.49 ng m
RT: 18.99 min Scan# 2838
Delta R.T. -0.005 min
Lab File: 06121923.D
Acq: 12 Jun 2019 18:32

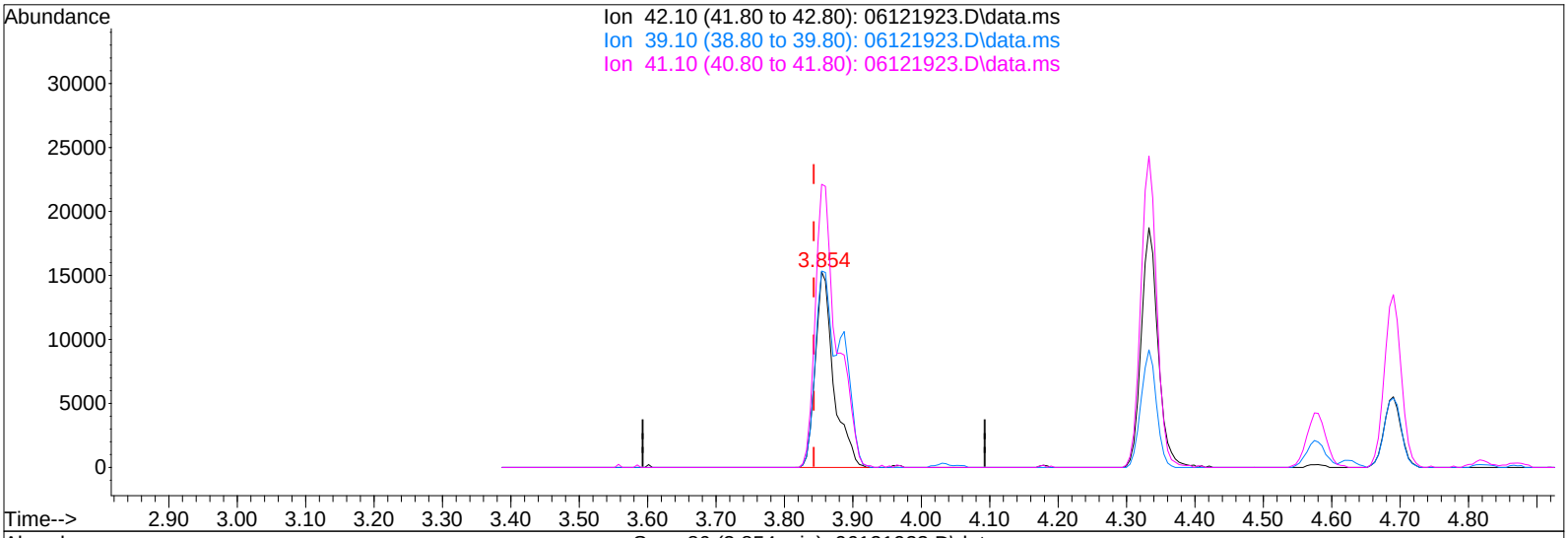
Tgt Ion: 68 Resp: 14432

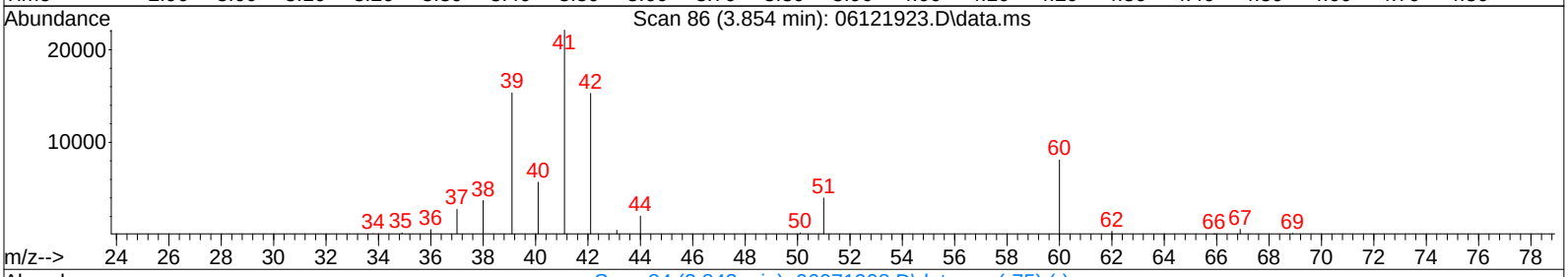
Ion	Ratio	Lower	Upper
68	100		
93	98.2	43.1	83.1#

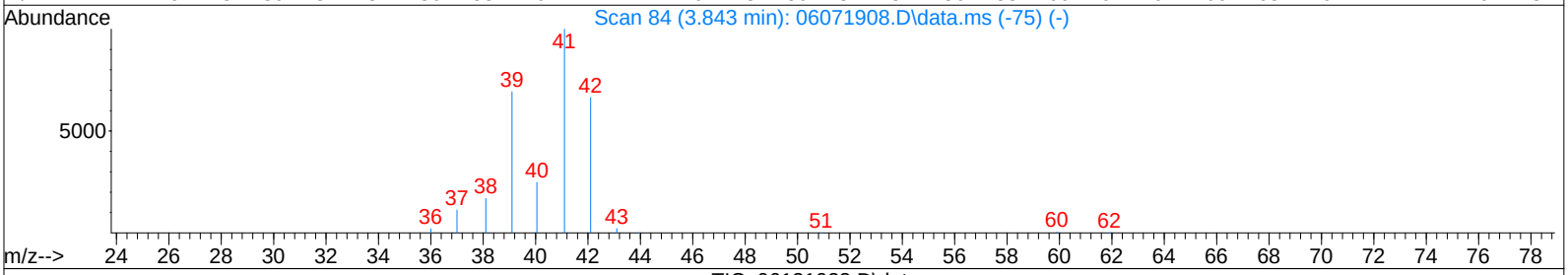


Data File: I:\MS09\Data\2019_06\12\06121923.D
Acq On : 12 Jun 2019 18:32 Operator: SC
Sample : P1903177-003 (1000mL)
Misc : S31-05131901
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Jun 13 08:51:46 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M







TIC: 06121923.D\data.ms

(2) Propene (T)

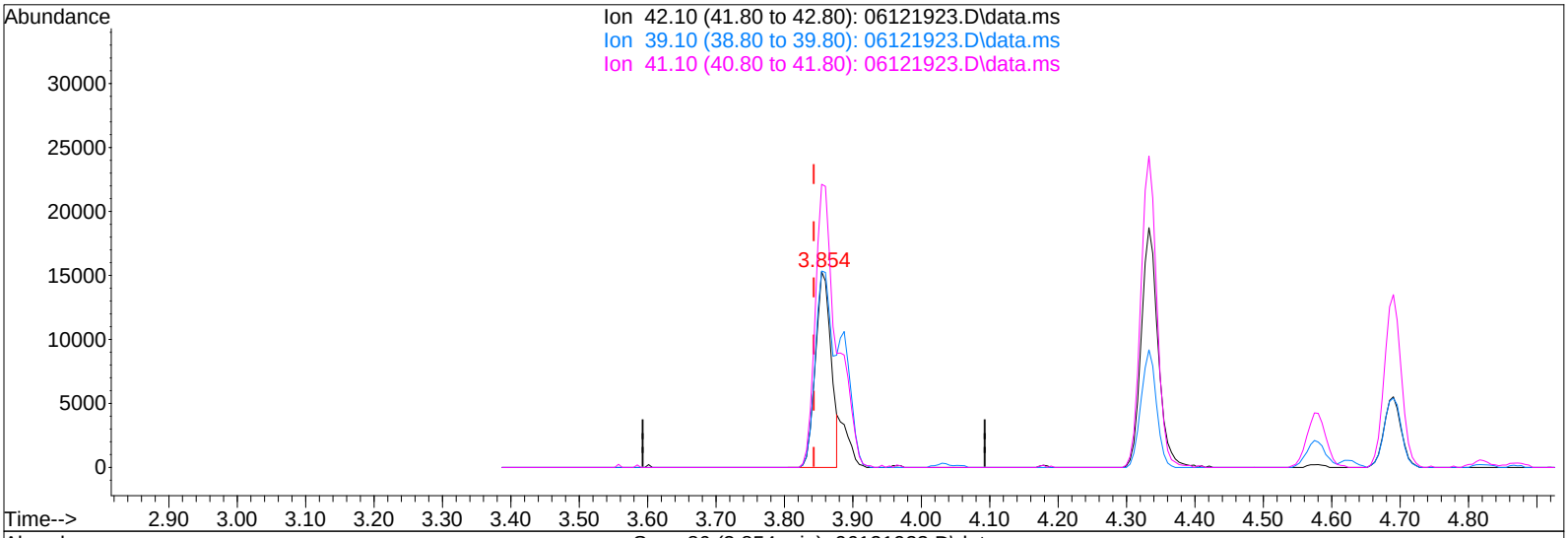
3.854min (+0.011) 1.30ng

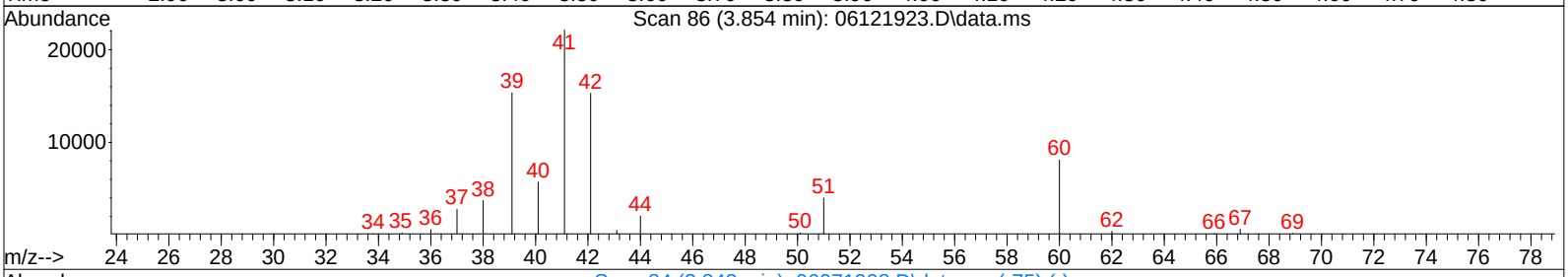
response 28265

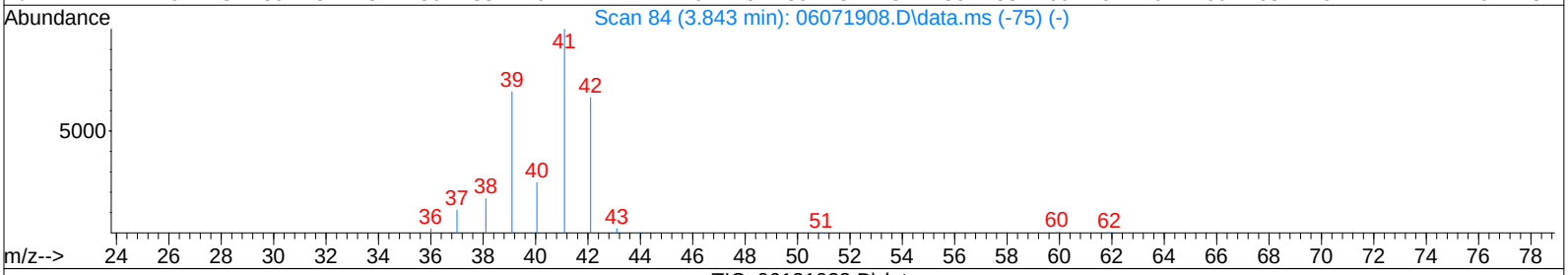
Ion	Exp%	Act%
42.10	100	100
39.10	104.80	141.84#
41.10	150.30	172.24#
0.00	0.00	0.00

Data File: I:\MS09\Data\2019_06\12\06121923.D
Acq On : 12 Jun 2019 18:32 Operator: SC
Sample : P1903177-003 (1000mL)
Misc : S31-05131901
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Jun 13 08:51:46 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M







TIC: 06121923.D\data.ms

(2) Propene (T)

3.854min (+0.011) 1.12ng m

response 24321

Ion	Exp%	Act%
42.10	100	100
39.10	104.80	164.84#
41.10	150.30	200.18#
0.00	0.00	0.00

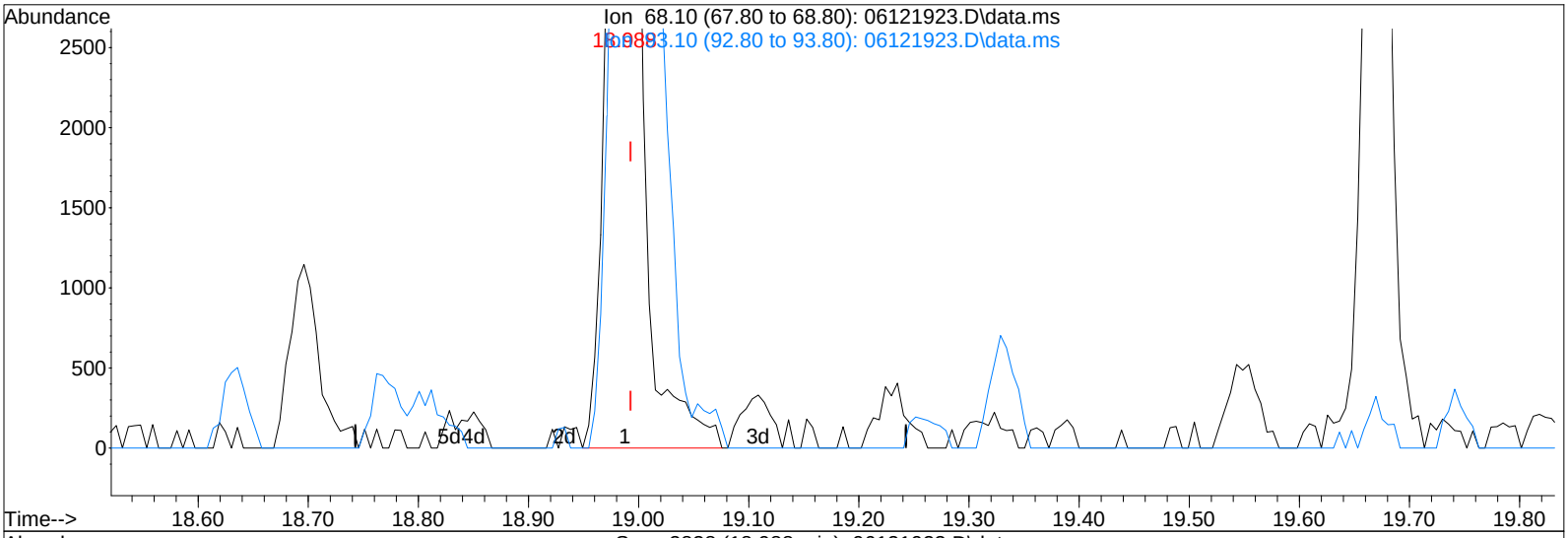
IPC

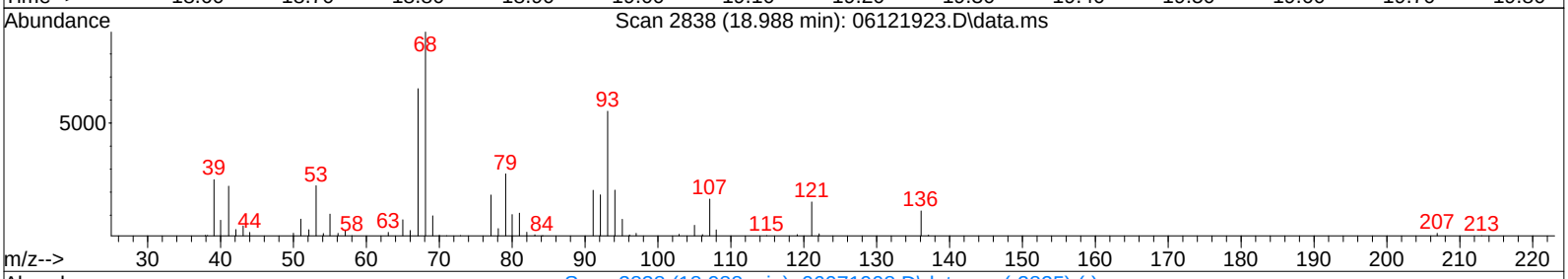
6/13/19

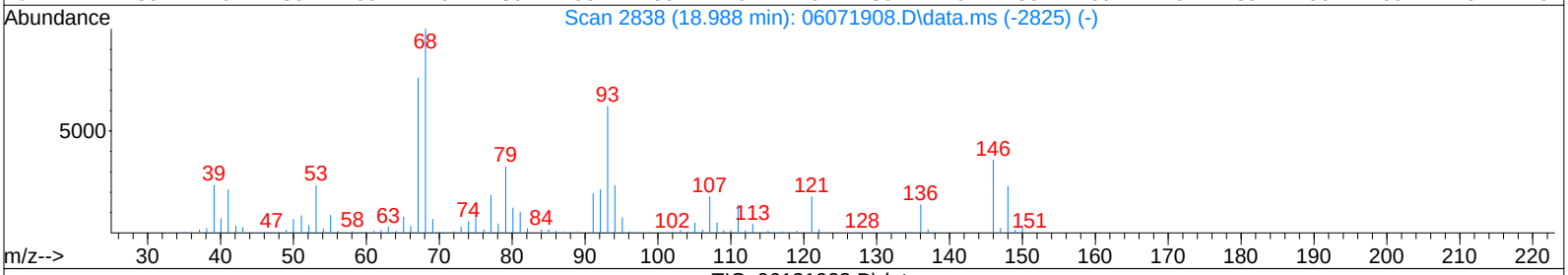
6/14/19

Data File: I:\MS09\Data\2019_06\12\06121923.D
Acq On : 12 Jun 2019 18:32 Operator: SC
Sample : P1903177-003 (1000mL)
Misc : S31-05131901
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Jun 13 08:51:46 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M







TIC: 06121923.D\data.ms

(91) d-Limonene (T)

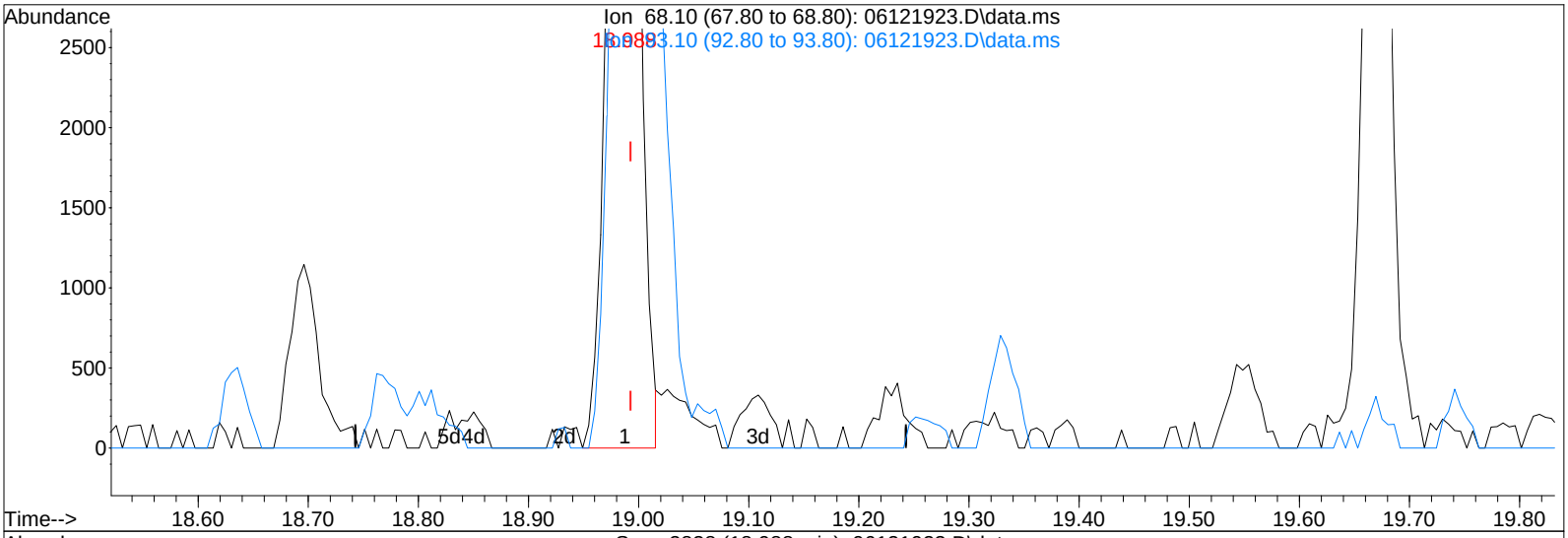
18.988min (-0.005) 0.52ng

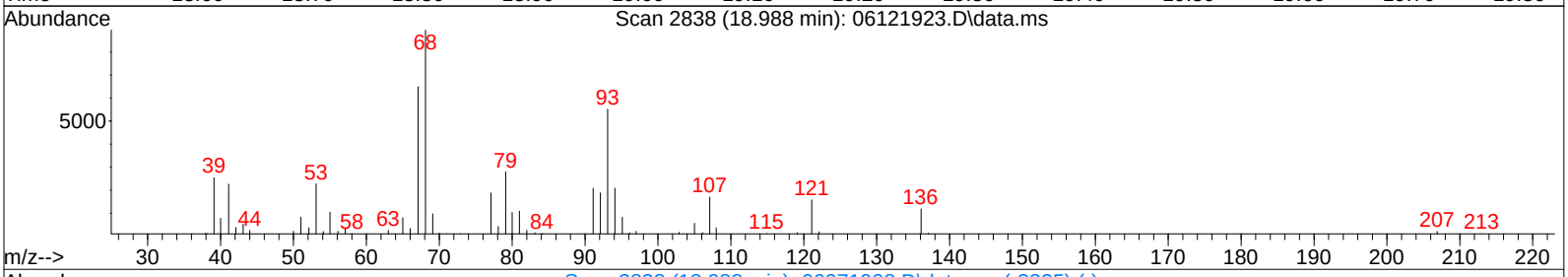
response 15223

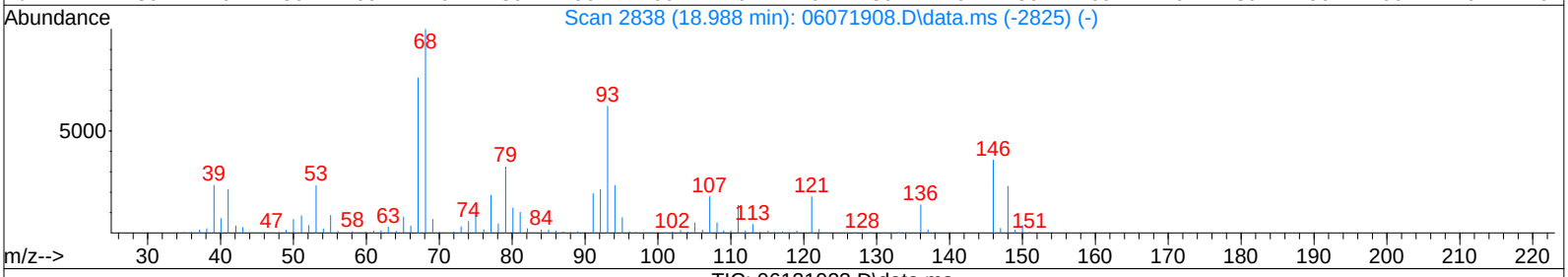
Ion	Exp%	Act%
68.10	100	100
93.10	63.10	93.12#
0.00	0.00	0.00
0.00	0.00	0.00

Data File: I:\MS09\Data\2019_06\12\06121923.D
Acq On : 12 Jun 2019 18:32 Operator: SC
Sample : P1903177-003 (1000mL)
Misc : S31-05131901
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Jun 13 08:51:46 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M







TIC: 06121923.D\data.ms

(91) d-Limonene (T)

18.988min (-0.005) 0.49ng m

response 14432

Ion	Exp%	Act%
68.10	100	100
93.10	63.10	98.23#
0.00	0.00	0.00
0.00	0.00	0.00

IPC

6/13/19

6/14/19

Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\12\06121925.D
Acq On : 12 Jun 2019 19:39 Operator: SC
Sample : P1903177-004 (1000mL)
Misc : S31-05131901
ALS Vial : 10 Sample Multiplier: 1

6/13/19

Quant Time: Jun 13 16:12:52 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.14	130	168656	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	11.11	114	781505	12.500	ng		-0.02
56) Chlorobenzene-d5 (IS3)	15.46	82	422001	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.92	65	327369	13.319	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 106.56%				
57) Toluene-d8 (SS2)	13.55	98	958750	12.180	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.44%				
73) Bromofluorobenzene (SS3)	17.05	174	259264	12.278	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.24%				
Target Compounds							Qvalue
2) Propene	3.84	42	68425m	3.164	ng		
3) Dichlorodifluoromethan...	3.95	85	356386	11.247	ng		99
4) Chloromethane	4.15	50	8433	N.D.			
5) 1,2-Dichloro-1,1,2,2-t...	4.32	135	1085	N.D.			
6) Vinyl Chloride	4.43	62	264	N.D.			
7) 1,3-Butadiene	4.61	54	535	N.D.			
8) Bromomethane	4.92	94	439	N.D.			
9) Chloroethane	5.13	64	236	N.D.			
10) Ethanol	5.35	45	510767	30.529	ng		100
11) Acetonitrile	5.55	41	30005	0.734	ng		97
12) Acrolein	5.69	56	21250	1.610	ng		99
13) Acetone	5.82	58	392290	26.495	ng		95
14) Trichlorofluoromethane	6.02	101	286459	10.761	ng		99
15) 2-Propanol (Isopropanol)	6.15	45	319842	5.879	ng		98
16) Acrylonitrile	0.00	53	0	N.D.	d		
17) 1,1-Dichloroethene	0.00	96	0	N.D.			
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D.	d		
19) Methylene Chloride	6.86	84	7036	N.D.			
20) 3-Chloro-1-propene (Al...	6.92	41	11917	N.D.			
21) Trichlorotrifluoroethane	7.18	151	6746	0.543	ng		99
22) Carbon Disulfide	7.14	76	171134	2.563	ng		98
23) trans-1,2-Dichloroethene	7.88	61	611	N.D.			
24) 1,1-Dichloroethane	8.10	63	469	N.D.			
25) Methyl tert-Butyl Ether	8.13	73	441	N.D.			
26) Vinyl Acetate	0.00	86	0	N.D.	d		
27) 2-Butanone (MEK)	8.51	72	146629	10.287	ng	#	91
28) cis-1,2-Dichloroethene	8.97	61	3709	N.D.			
29) Diisopropyl Ether	0.00	87	0	N.D.	d		
30) Ethyl Acetate	9.21	61	388239	54.680	ng		97
31) n-Hexane	9.22	57	244440	7.221	ng		99
32) Chloroform	9.29	83	17161	0.598	ng		100
34) Tetrahydrofuran (THF)	9.67	72	215553	16.982	ng		97
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.			
36) 1,2-Dichloroethane	10.04	62	29204	1.242	ng		100
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.			
39) Isopropyl Acetate	10.67	61	652	N.D.			
40) 1-Butanol	0.00	56	0	N.D.	d		
41) Benzene	10.76	78	113337	1.414	ng		99
42) Carbon Tetrachloride	10.90	117	7626	N.D.			
43) Cyclohexane	11.04	84	44280	1.562	ng		99
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.			
45) 1,2-Dichloropropane	11.57	63	2328	N.D.			
46) Bromodichloromethane	11.78	83	4734	N.D.			
47) Trichloroethene	11.81	130	3324	N.D.			
48) 1,4-Dioxane	11.82	88	321	N.D.			
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.	d		

Data File: I:\MS09\Data\2019_06\12\06121925.D
Acq On : 12 Jun 2019 19:39 Operator: SC
Sample : P1903177-004 (1000mL)
Misc : S31-05131901
ALS Vial : 10 Sample Multiplier: 1

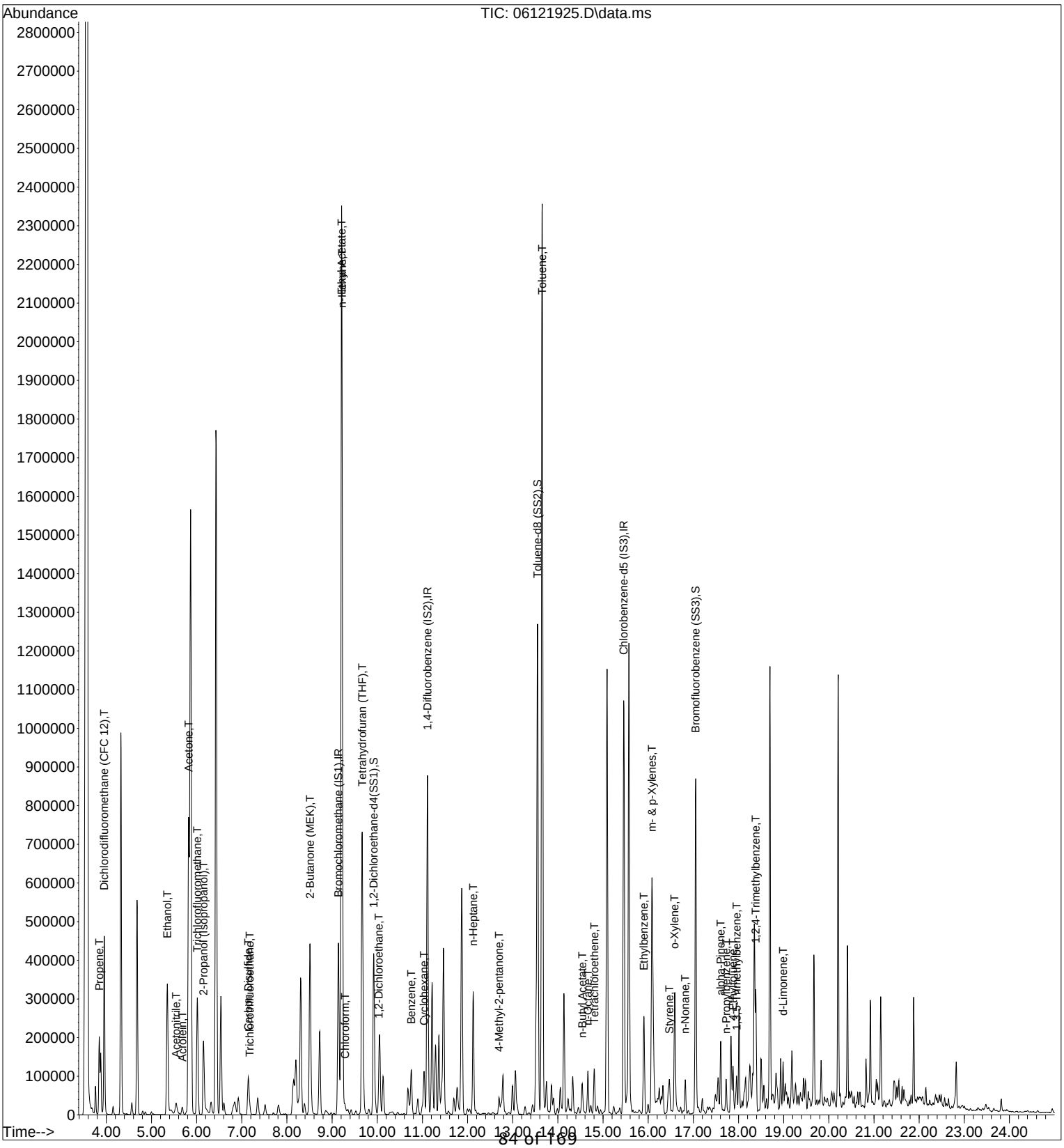
Quant Time: Jun 13 16:12:52 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
50) Methyl Methacrylate	12.00	100	1476	N.D.		
51) n-Heptane	12.12	71	76778	3.964 ng		100
52) cis-1,3-Dichloropropene	12.56	75	227	N.D.		
53) 4-Methyl-2-pentanone	12.70	58	14110	0.746 ng		94
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	13.35	97	106	N.D.		
58) Toluene	13.65	91	1893877	24.147 ng		100
59) 2-Hexanone	13.90	43	20959	N.D.		
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	14.54	43	63463	1.133 ng		97
63) n-Octane	14.67	57	22565	1.207 ng		96
64) Tetrachloroethene	14.81	166	39614	2.215 ng		99
65) Chlorobenzene	15.51	112	6512	N.D.		
66) Ethylbenzene	15.90	91	218795	2.486 ng		99
67) m- & p-Xylenes	16.08	91	547393	8.074 ng		99
68) Bromoform	16.16	173	330	N.D.		
69) Styrene	16.47	104	35227	0.707 ng		98
70) o-Xylene	16.58	91	188964	2.830 ng		99
71) n-Nonane	16.82	43	40695	0.877 ng		94
72) 1,1,2,2-Tetrachloroethane	16.51	83	860	N.D.		
74) Cumene	17.20	105	14760	N.D.		
75) alpha-Pinene	17.61	93	77977	1.817 ng		99
76) n-Propylbenzene	17.73	91	51853	0.506 ng		91
77) 3-Ethyltoluene	0.00	105	0	N.D. d		
78) 4-Ethyltoluene	17.88	105	55504	0.714 ng		98
79) 1,3,5-Trimethylbenzene	17.96	105	41839	0.611 ng		99
80) alpha-Methylstyrene	18.11	118	9565	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D. d		
82) 1,2,4-Trimethylbenzene	18.38	105	170363	2.455 ng		88
83) n-Decane	0.00	57	0	N.D. d		
84) Benzyl Chloride	18.51	91	519	N.D.		
85) 1,3-Dichlorobenzene	18.54	146	182	N.D.		
86) 1,4-Dichlorobenzene	18.61	146	5002	N.D.		
87) sec-Butylbenzene	18.67	105	5318	N.D.		
88) 4-Isopropyltoluene (p-...	18.83	119	15931	N.D.		
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D. d		
90) 1,2-Dichlorobenzene	18.98	146	144	N.D.		
91) d-Limonene	18.99	68	32011	1.081 ng	#	67
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D. d		
94) 1,2,4-Trichlorobenzene	20.77	180	130	N.D.		
95) Naphthalene	20.90	128	16723	N.D.		
96) n-Dodecane	0.00	57	0	N.D. d		
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D. d		
99) tert-Butylbenzene	18.38	119	18643	N.D.		
100) n-Butylbenzene	19.27	91	15982	N.D.		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2019_06\12\06121925.D
Acq On : 12 Jun 2019 19:39 Operator: SC
Sample : P1903177-004 (1000mL)
Misc : S31-05131901
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Jun 13 16:12:52 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\12\06121925.D
Acq On : 12 Jun 2019 19:39 Operator: SC
Sample : P1903177-004 (1000mL)
Misc : S31-05131901
ALS Vial : 10 Sample Multiplier: 1

6/13/19

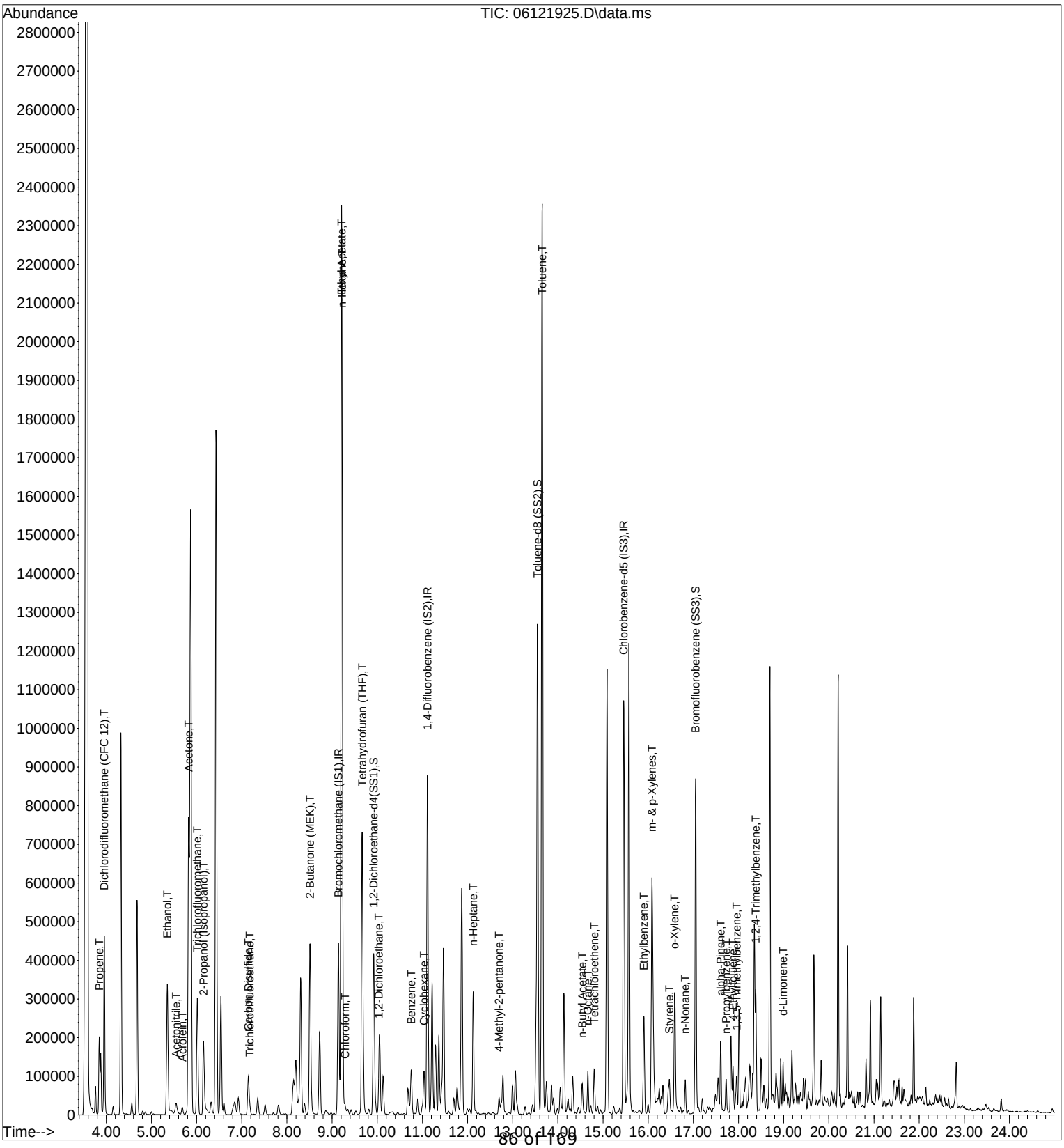
Quant Time: Jun 13 16:12:52 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

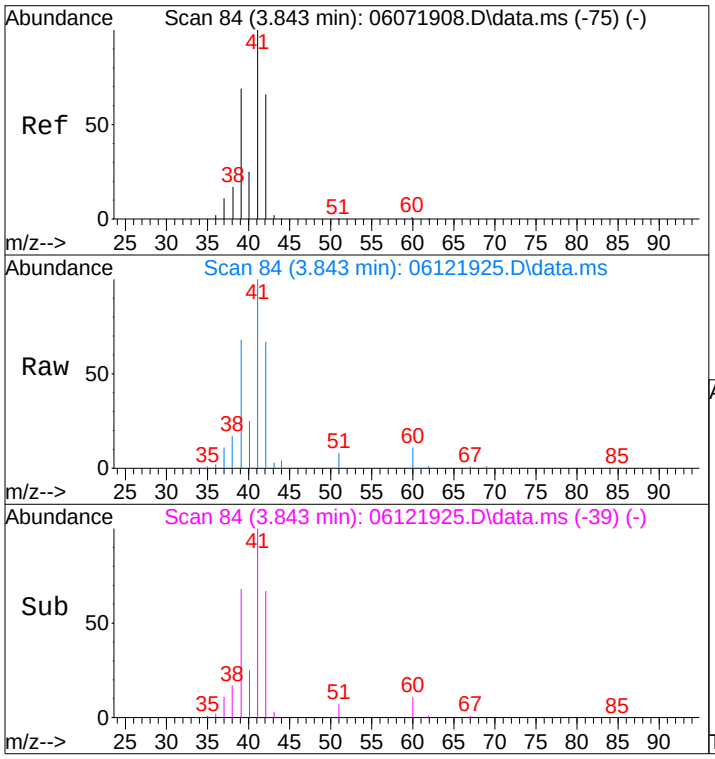
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.14	130	168656	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	11.11	114	781505	12.500	ng		-0.02
56) Chlorobenzene-d5 (IS3)	15.46	82	422001	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.92	65	327369	13.319	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 106.56%				
57) Toluene-d8 (SS2)	13.55	98	958750	12.180	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.44%				
73) Bromofluorobenzene (SS3)	17.05	174	259264	12.278	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.24%				
Target Compounds							Qvalue
2) Propene	3.84	42	68425m	3.164	ng		
3) Dichlorodifluoromethan...	3.95	85	356386	11.247	ng		99
10) Ethanol	5.35	45	510767	30.529	ng		100
11) Acetonitrile	5.55	41	30005	0.734	ng		97
12) Acrolein	5.69	56	21250	1.610	ng		99
13) Acetone	5.82	58	392290	26.495	ng		95
14) Trichlorofluoromethane	6.02	101	286459	10.761	ng		99
15) 2-Propanol (Isopropanol)	6.15	45	319842	5.879	ng		98
21) Trichlorotrifluoroethane	7.18	151	6746	0.543	ng		99
22) Carbon Disulfide	7.14	76	171134	2.563	ng		98
27) 2-Butanone (MEK)	8.51	72	146629	10.287	ng	#	91
30) Ethyl Acetate	9.21	61	388239	54.680	ng		97
31) n-Hexane	9.22	57	244440	7.221	ng		99
32) Chloroform	9.29	83	17161	0.598	ng		100
34) Tetrahydrofuran (THF)	9.67	72	215553	16.982	ng		97
36) 1,2-Dichloroethane	10.04	62	29204	1.242	ng		100
41) Benzene	10.76	78	113337	1.414	ng		99
43) Cyclohexane	11.04	84	44280	1.562	ng		99
51) n-Heptane	12.12	71	76778	3.964	ng		100
53) 4-Methyl-2-pentanone	12.70	58	14110	0.746	ng		94
58) Toluene	13.65	91	1893877	24.147	ng		100
62) n-Butyl Acetate	14.54	43	63463	1.133	ng		97
63) n-Octane	14.67	57	22565	1.207	ng		96
64) Tetrachloroethene	14.81	166	39614	2.215	ng		99
66) Ethylbenzene	15.90	91	218795	2.486	ng		99
67) m- & p-Xylenes	16.08	91	547393	8.074	ng		99
69) Styrene	16.47	104	35227	0.707	ng		98
70) o-Xylene	16.58	91	188964	2.830	ng		99
71) n-Nonane	16.82	43	40695	0.877	ng		94
75) alpha-Pinene	17.61	93	77977	1.817	ng		99
76) n-Propylbenzene	17.73	91	51853	0.506	ng		91
78) 4-Ethyltoluene	17.88	105	55504	0.714	ng		98
79) 1,3,5-Trimethylbenzene	17.96	105	41839	0.611	ng		99
82) 1,2,4-Trimethylbenzene	18.38	105	170363	2.455	ng		88
91) d-Limonene	18.99	68	32011	1.081	ng	#	67

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2019_06\12\06121925.D
Acq On : 12 Jun 2019 19:39 Operator: SC
Sample : P1903177-004 (1000mL)
Misc : S31-05131901
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Jun 13 16:12:52 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

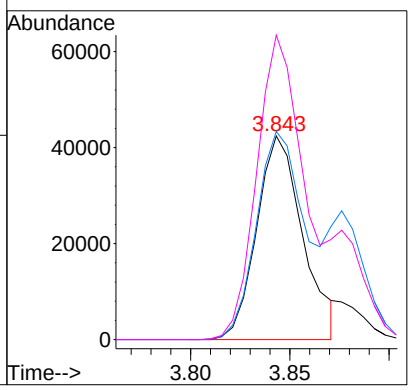


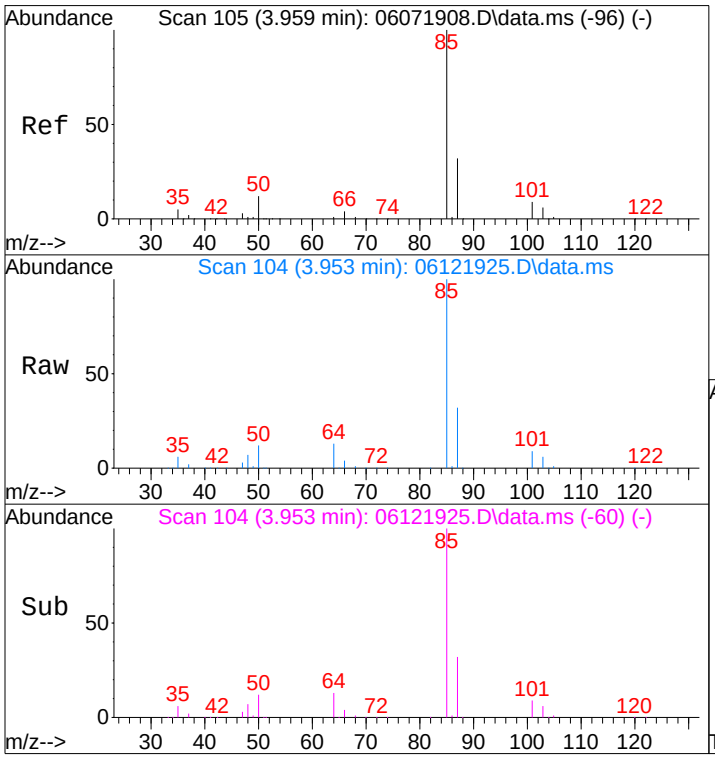


#2
Propene
Concen: 3.16 ng m
RT: 3.84 min Scan# 84
Delta R.T. 0.000 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 42 Resp: 68425

Ion	Ratio	Lower	Upper
42	100		
39	107.6	84.8	124.8
41	190.5	130.3	170.3#

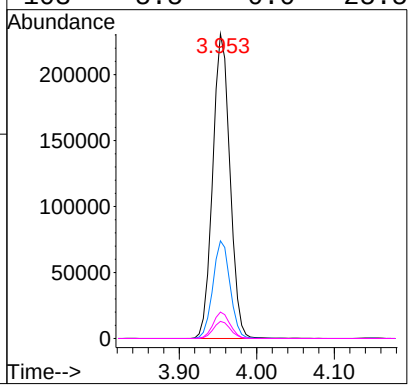


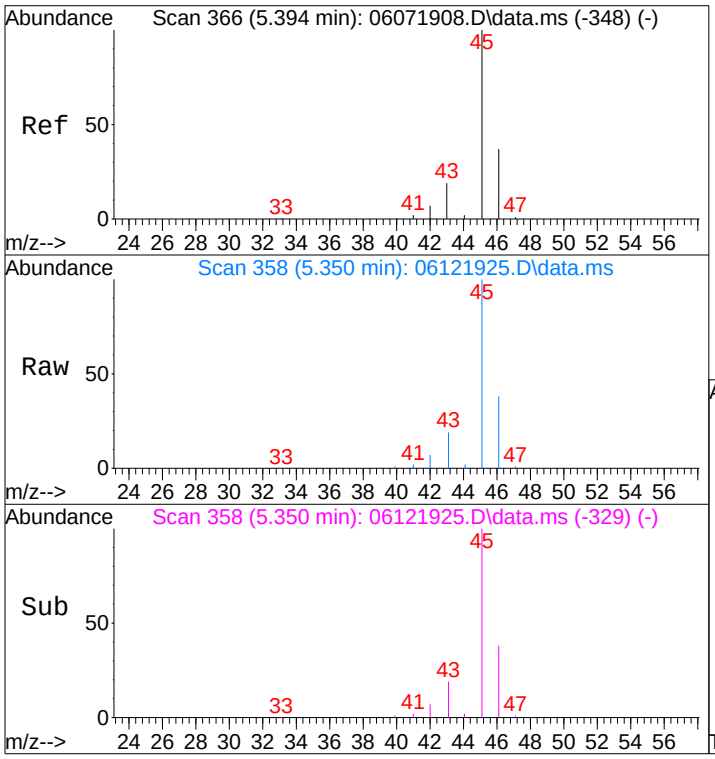


#3
Dichlorodifluoromethane (CFC 12)
Concen: 11.25 ng
RT: 3.95 min Scan# 104
Delta R.T. -0.005 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 85 Resp: 356386

Ion	Ratio	Lower	Upper
85	100		
87	31.9	12.3	52.3
101	8.5	0.0	28.6
103	5.5	0.0	25.5

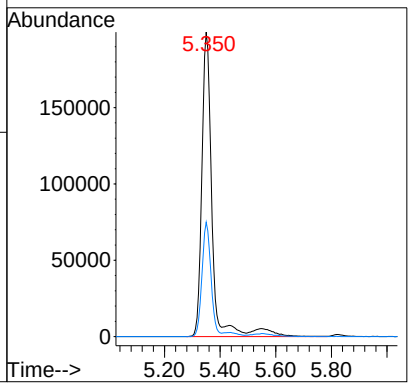


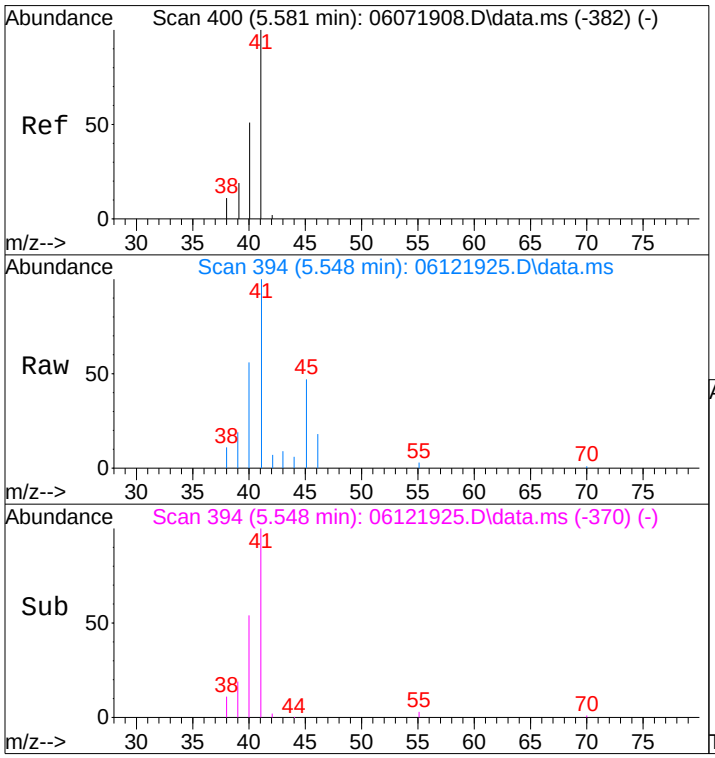


#10
Ethanol
Concen: 30.53 ng
RT: 5.35 min Scan# 358
Delta R.T. -0.088 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 45 Resp: 510767

Ion	Ratio	Lower	Upper
45	100		
46	36.8	17.1	57.1

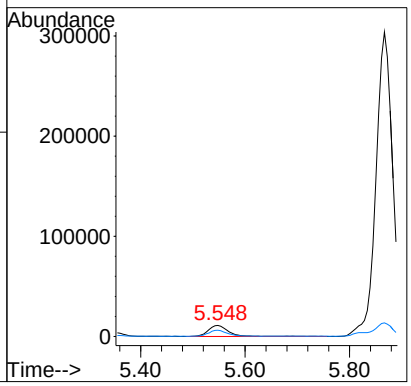


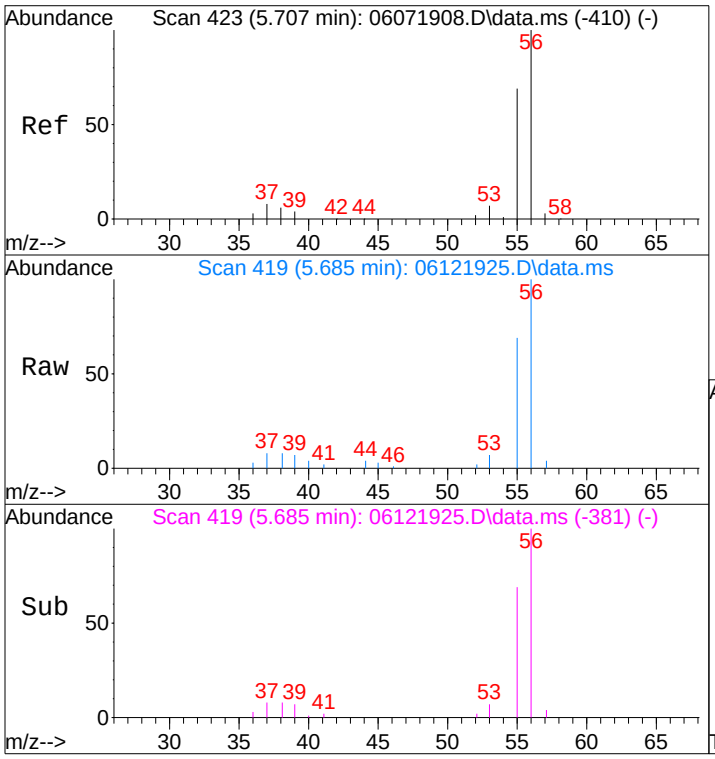


#11
Acetonitrile
Concen: 0.73 ng
RT: 5.55 min Scan# 394
Delta R.T. -0.066 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 41 Resp: 30005

Ion	Ratio	Lower	Upper
41	100		
40	50.0	32.2	72.2

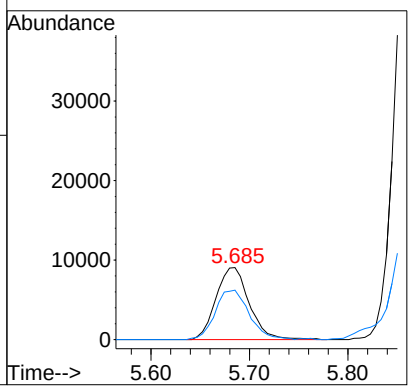


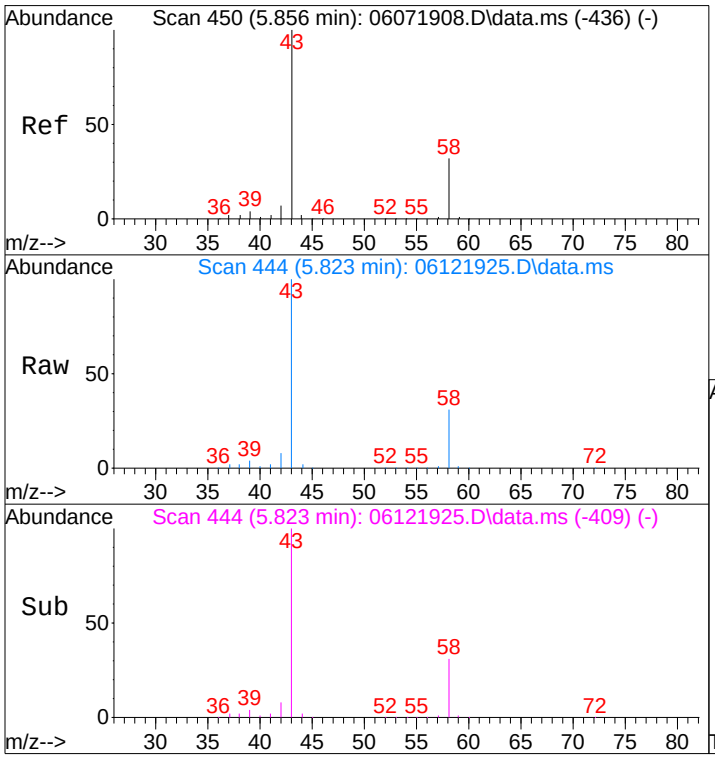


#12
Acrolein
Concen: 1.61 ng
RT: 5.69 min Scan# 419
Delta R.T. -0.044 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 56 Resp: 21250

Ion	Ratio	Lower	Upper
56	100		
55	70.1	49.6	89.6

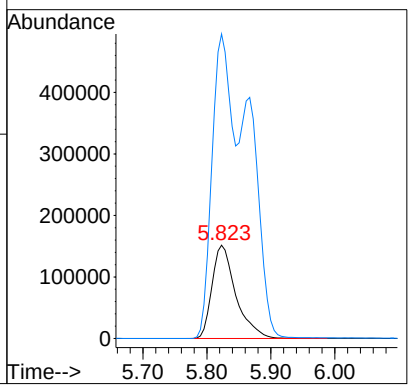


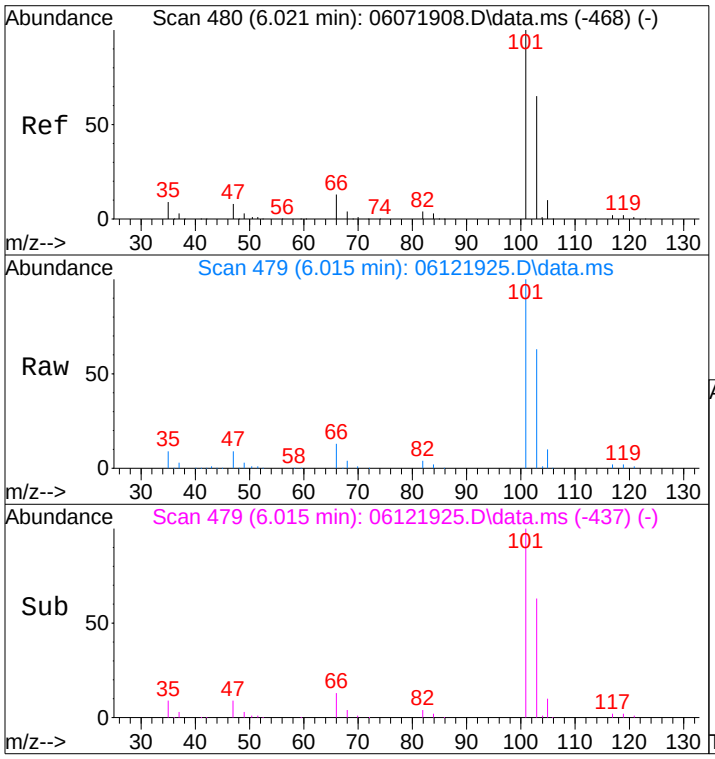


#13
Acetone
Concen: 26.49 ng
RT: 5.82 min Scan# 444
Delta R.T. -0.055 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 58 Resp: 392290

Ion	Ratio	Lower	Upper
58	100		
43	306.7	287.7	347.7

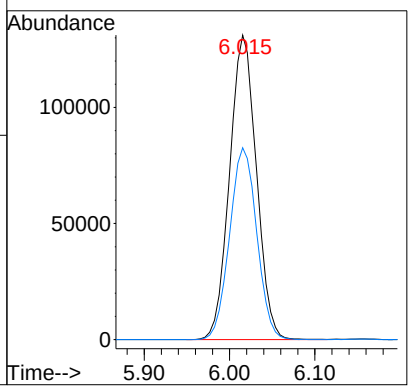


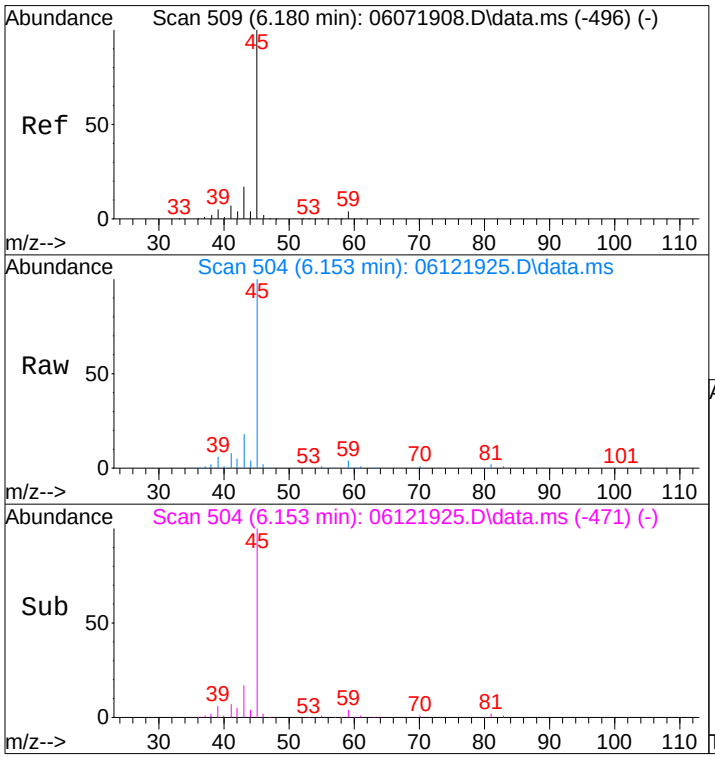


#14
Trichlorofluoromethane
Concen: 10.76 ng
RT: 6.02 min Scan# 479
Delta R.T. -0.016 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion:101 Resp: 286459

Ion	Ratio	Lower	Upper
101	100		
103	63.7	44.7	84.7

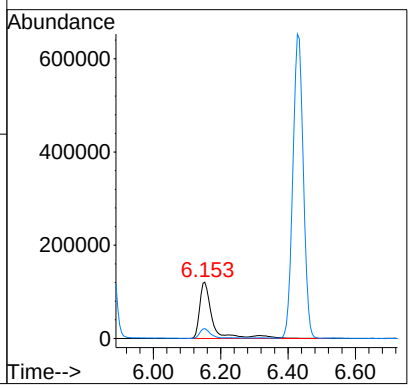


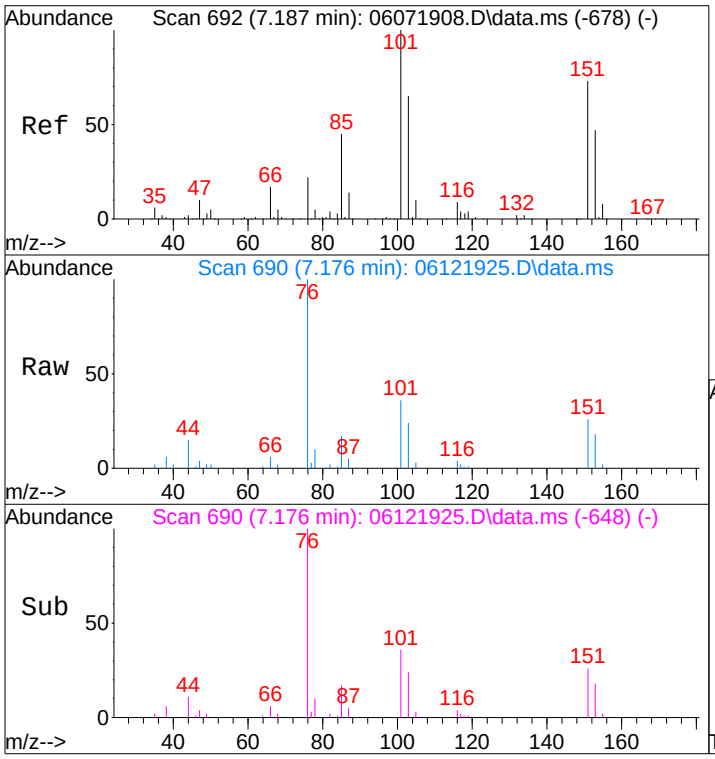


#15
2-Propanol (Isopropanol)
Concen: 5.88 ng
RT: 6.15 min Scan# 504
Delta R.T. -0.066 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 45 Resp: 319842

Ion	Ratio	Lower	Upper
45	100		
43	16.6	0.0	37.3

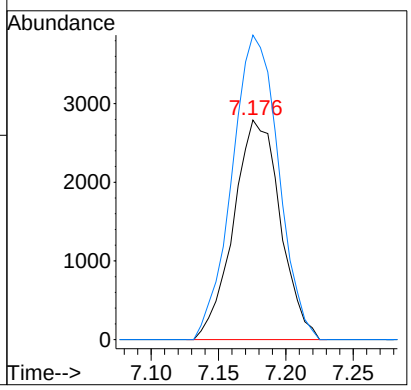


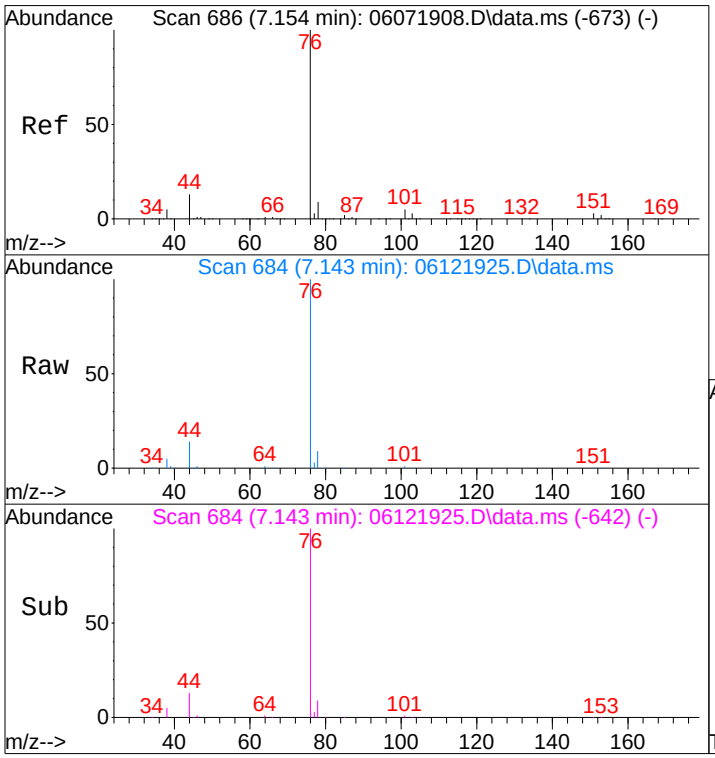


#21
Trichlorotrifluoroethane
Concen: 0.54 ng
RT: 7.18 min Scan# 690
Delta R.T. -0.016 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion:151 Resp: 6746

Ion	Ratio	Lower	Upper
151	100		
101	138.1	119.9	159.9

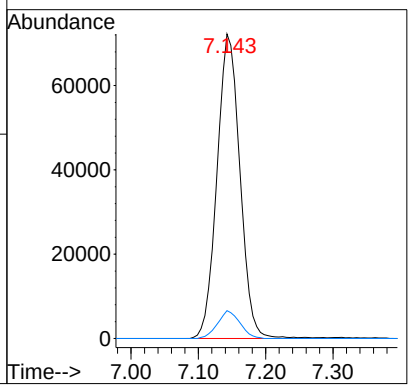


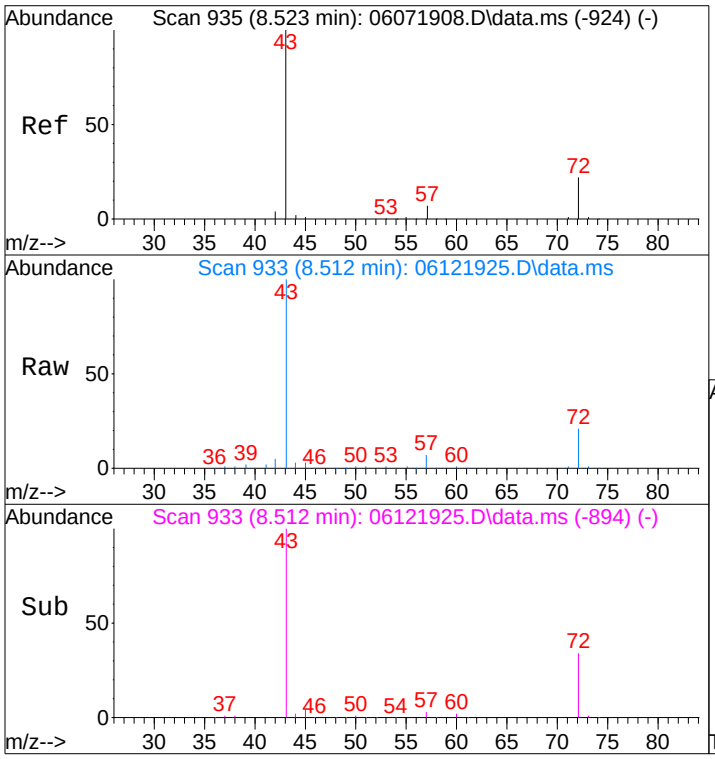


#22
Carbon Disulfide
Concen: 2.56 ng
RT: 7.14 min Scan# 684
Delta R.T. -0.016 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 76 Resp: 171134

Ion	Ratio	Lower	Upper
76	100		
78	8.9	0.0	29.7

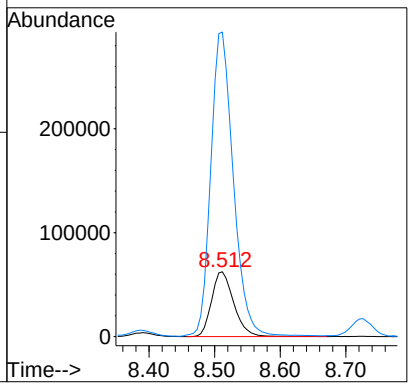


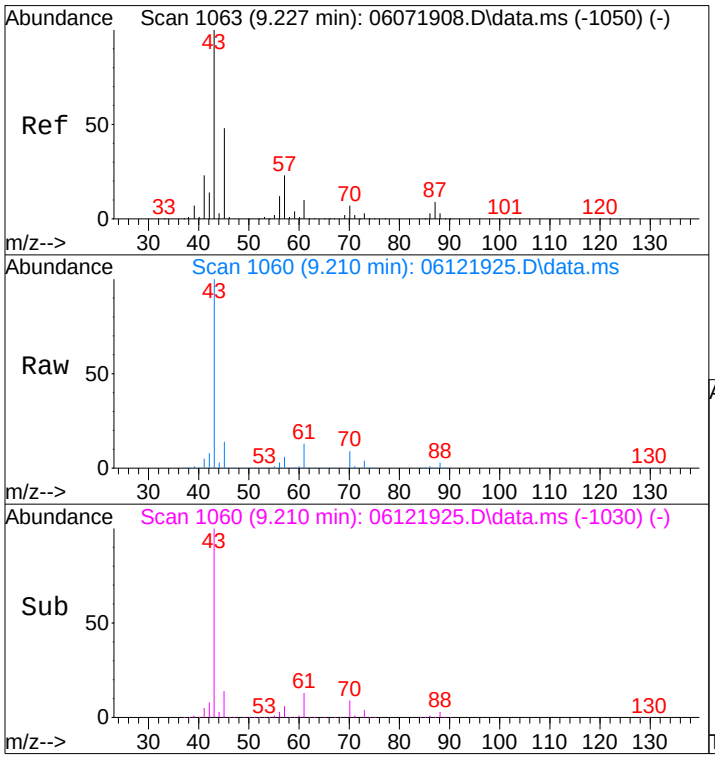


#27
2-Butanone (MEK)
Concen: 10.29 ng
RT: 8.51 min Scan# 933
Delta R.T. -0.033 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 72 Resp: 146629

Ion	Ratio	Lower	Upper
72	100		
43	478.1	436.0	476.0#

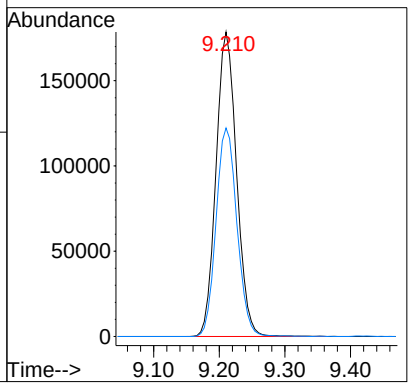


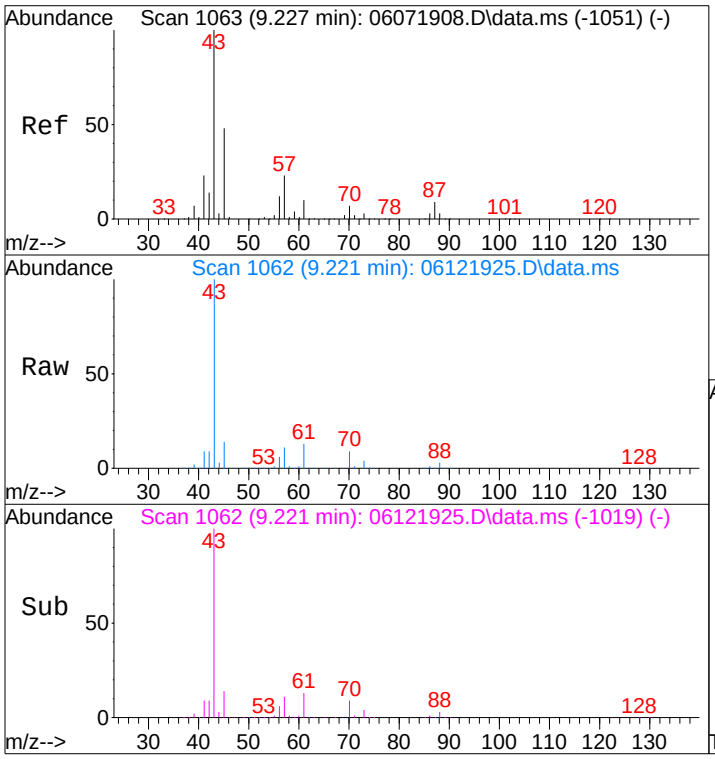


#30
Ethyl Acetate
Concen: 54.68 ng
RT: 9.21 min Scan# 1060
Delta R.T. -0.033 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 61 Resp: 388239

Ion	Ratio	Lower	Upper
61	100		
70	69.7	52.1	92.1

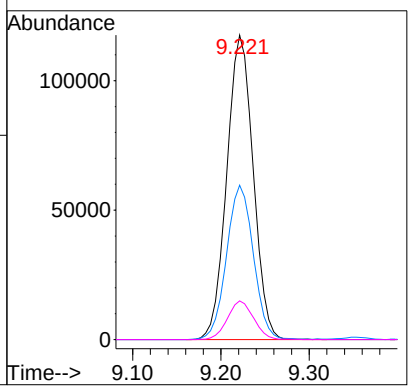


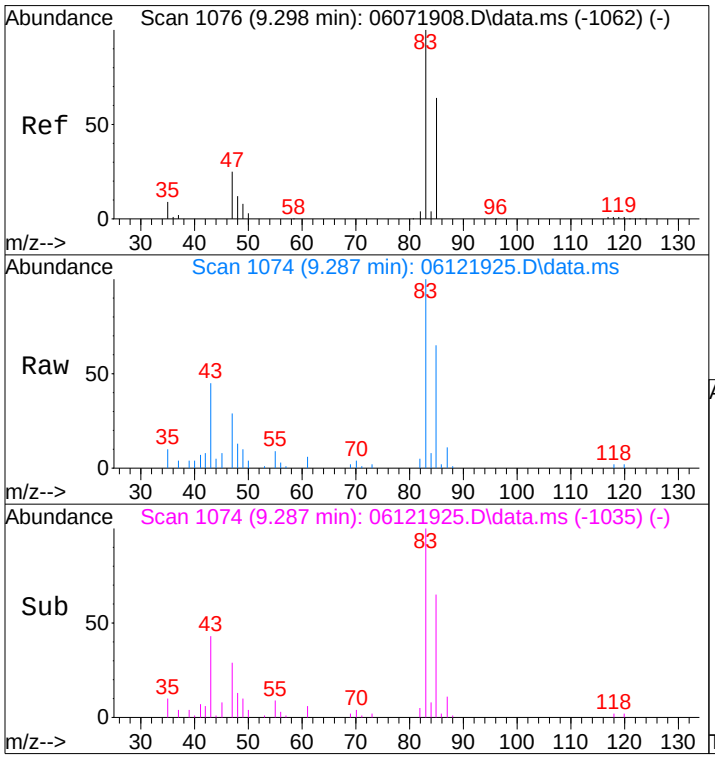


#31
n-Hexane
Concen: 7.22 ng
RT: 9.22 min Scan# 1062
Delta R.T. -0.011 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 57 Resp: 244440

Ion	Ratio	Lower	Upper
57	100		
56	51.6	40.8	61.2
86	12.6	10.3	15.5

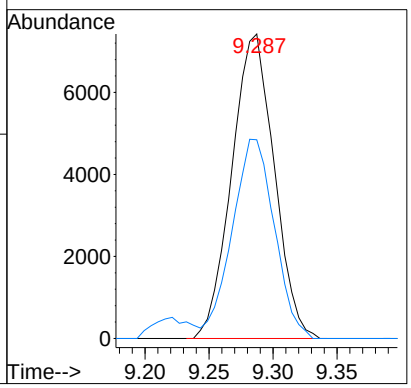


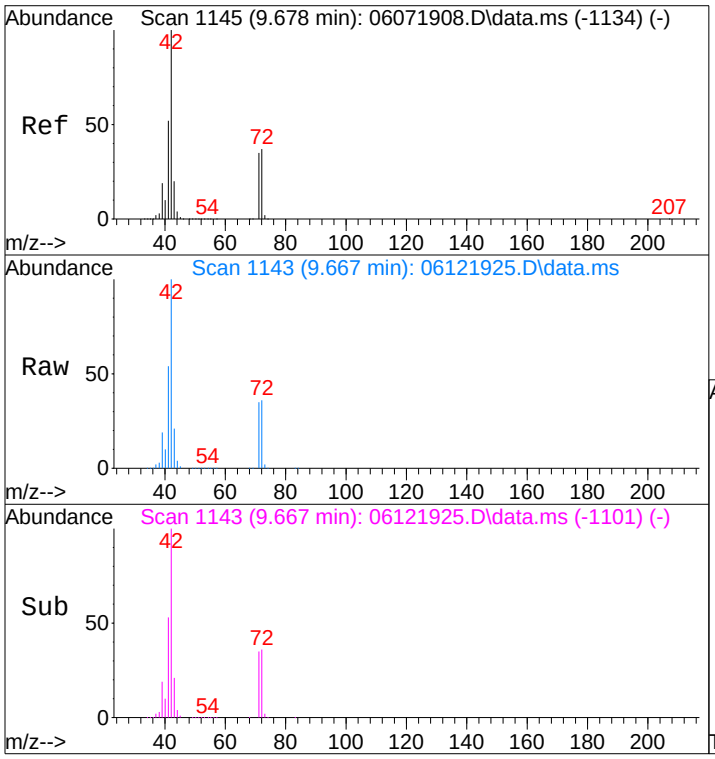


#32
Chloroform
Concen: 0.60 ng
RT: 9.29 min Scan# 1074
Delta R.T. -0.033 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 83 Resp: 17161

Ion	Ratio	Lower	Upper
83	100		
85	65.0	44.8	84.8

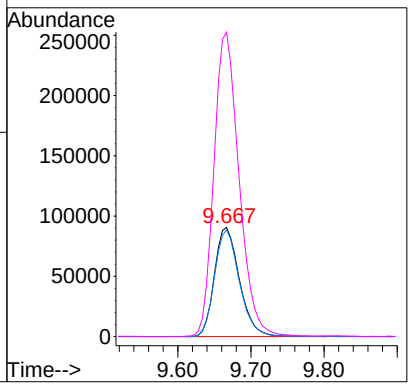


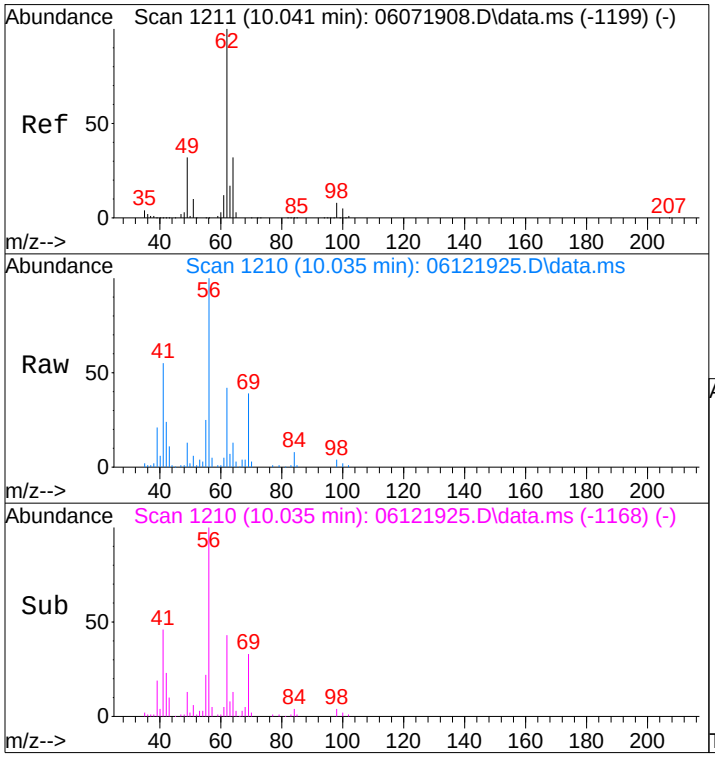


#34
Tetrahydrofuran (THF)
Concen: 16.98 ng
RT: 9.67 min Scan# 1143
Delta R.T. -0.016 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 72 Resp: 215553

Ion	Ratio	Lower	Upper
72	100		
71	96.5	76.8	116.8
42	280.3	253.3	293.3

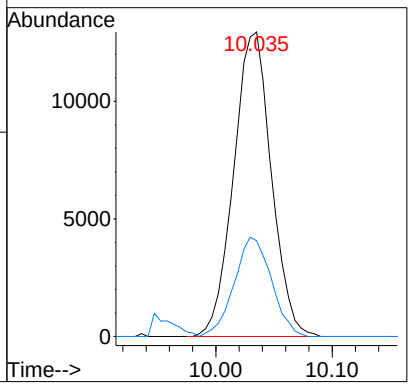


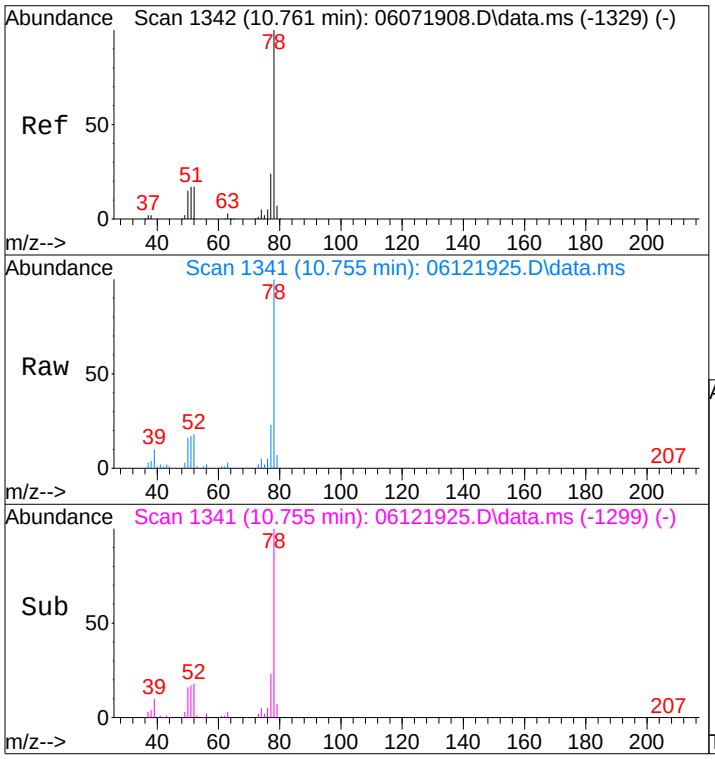


#36
1,2-Dichloroethane
Concen: 1.24 ng
RT: 10.04 min Scan# 1210
Delta R.T. -0.016 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 62 Resp: 29204

Ion	Ratio	Lower	Upper
62	100		
64	32.2	12.3	52.3

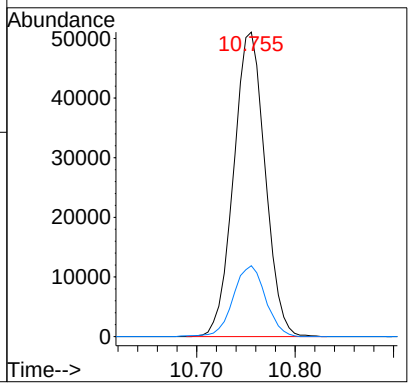


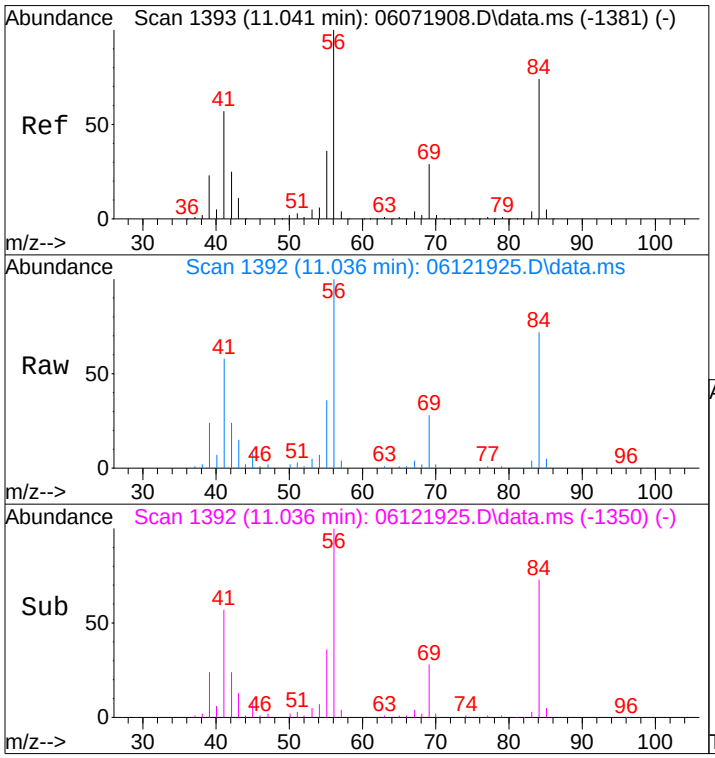


#41
Benzene
Concen: 1.41 ng
RT: 10.76 min Scan# 1341
Delta R.T. -0.016 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 78 Resp: 113337

Ion	Ratio	Lower	Upper
78	100		
77	24.0	3.6	43.6

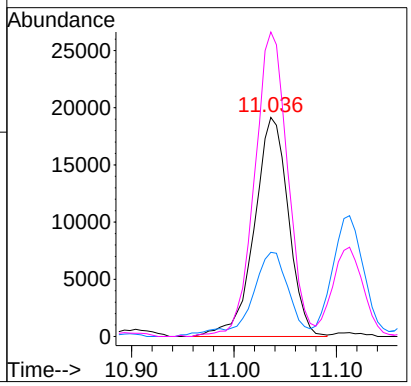


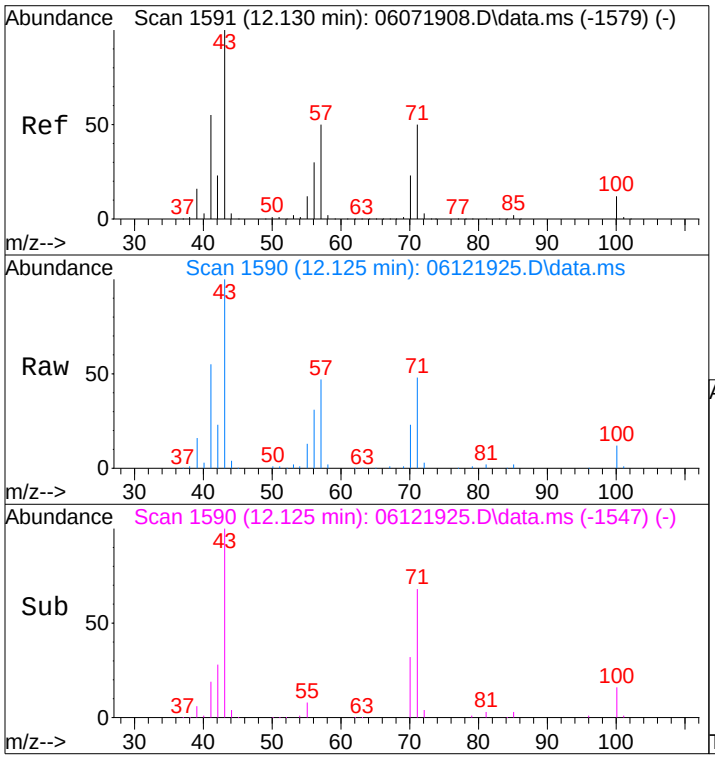


#43
Cyclohexane
Concen: 1.56 ng
RT: 11.04 min Scan# 1392
Delta R.T. -0.016 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 84 Resp: 44280

Ion	Ratio	Lower	Upper
84	100		
69	41.7	18.7	58.7
56	134.8	115.3	155.3

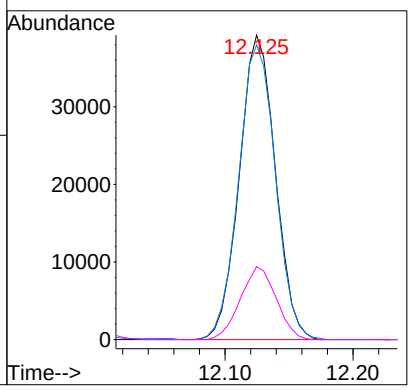


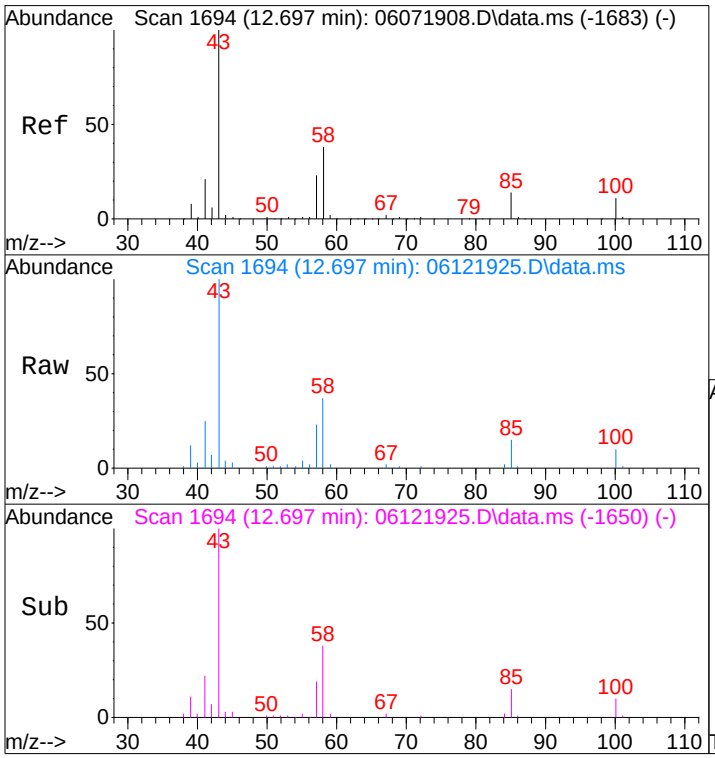


#51
n-Heptane
Concen: 3.96 ng
RT: 12.12 min Scan# 1590
Delta R.T. -0.011 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 71 Resp: 76778

Ion	Ratio	Lower	Upper
71	100		
57	99.0	78.7	118.7
100	23.8	3.7	43.7

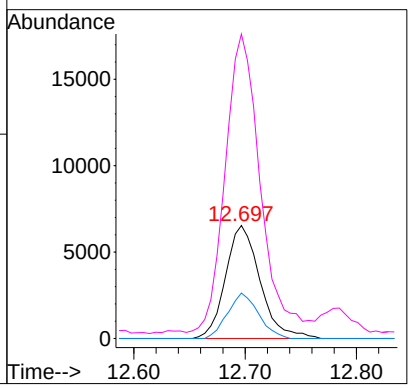


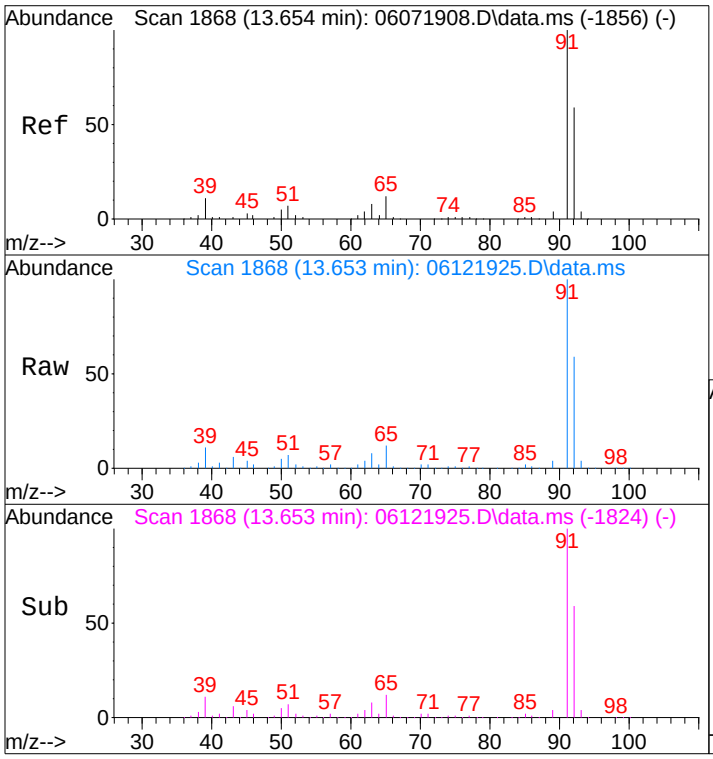


#53
4-Methyl-2-pentanone
Concen: 0.75 ng
RT: 12.70 min Scan# 1694
Delta R.T. -0.005 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 58 Resp: 14110

Ion	Ratio	Lower	Upper
58	100		
85	35.8	31.5	47.3
43	275.5	211.1	316.7

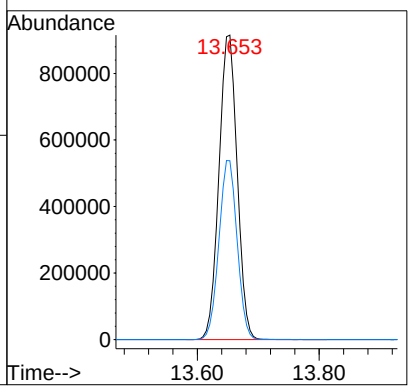


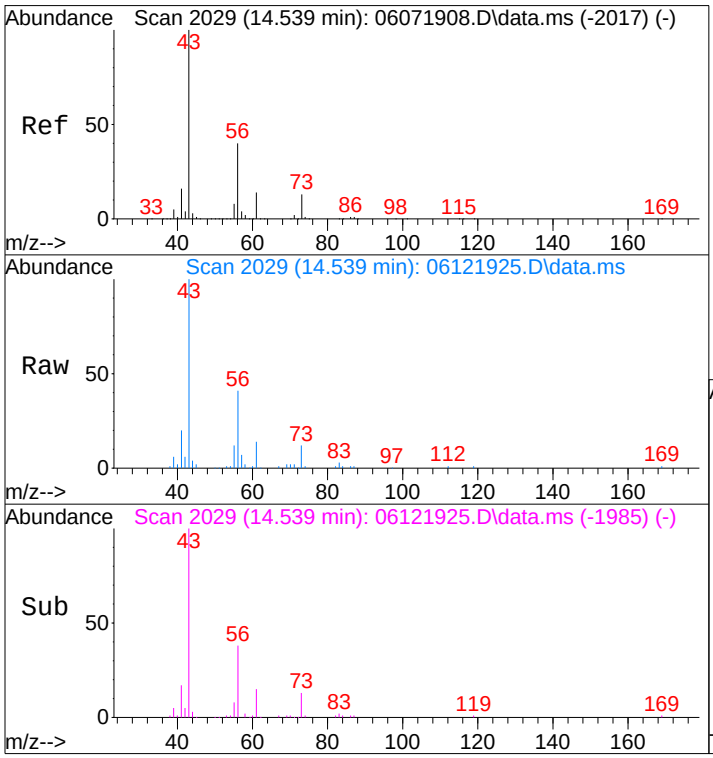


#58
Toluene
Concen: 24.15 ng
RT: 13.65 min Scan# 1868
Delta R.T. -0.005 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 91 Resp: 1893877

Ion	Ratio	Lower	Upper
91	100		
92	58.7	39.0	79.0

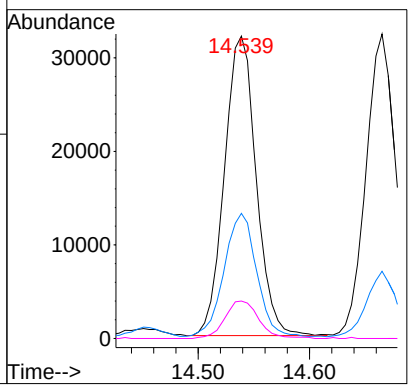


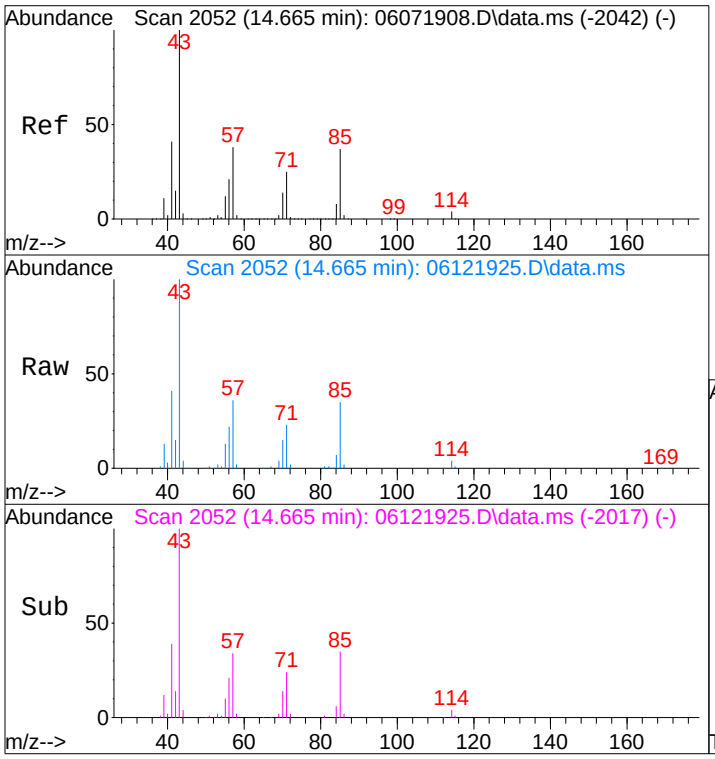


#62
n-Butyl Acetate
Concen: 1.13 ng
RT: 14.54 min Scan# 2029
Delta R.T. -0.005 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 43 Resp: 63463

Ion	Ratio	Lower	Upper
43	100		
56	42.6	20.1	60.1
73	13.4	0.0	32.9

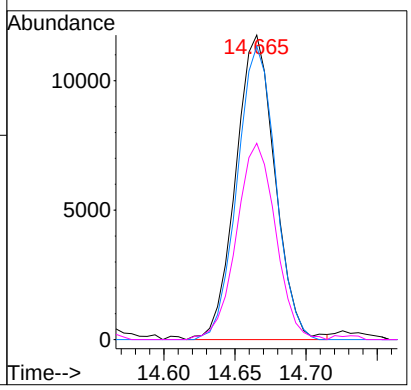


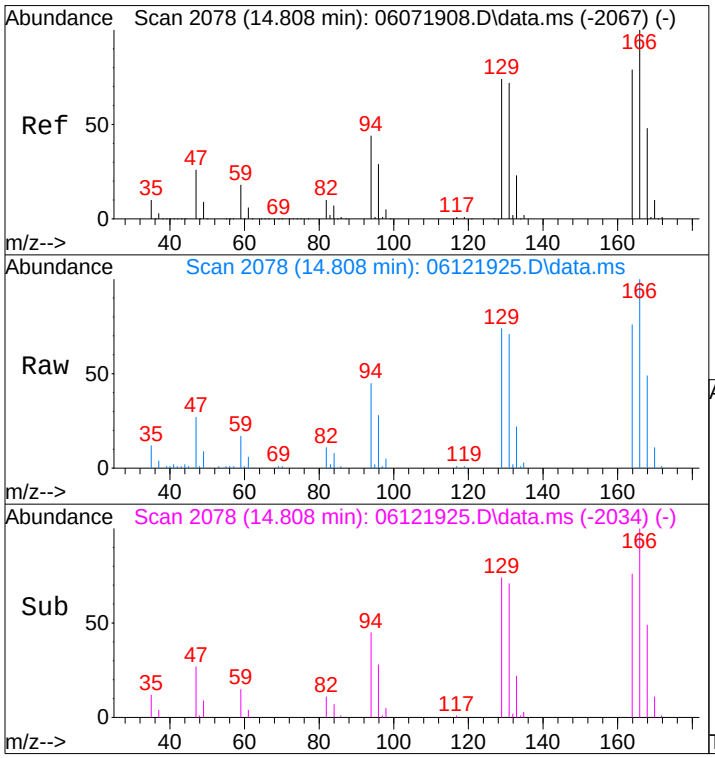


#63
n-Octane
Concen: 1.21 ng
RT: 14.67 min Scan# 2052
Delta R.T. -0.005 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 57 Resp: 22565

Ion	Ratio	Lower	Upper
57	100		
85	94.1	79.0	118.6
71	64.4	52.6	78.8

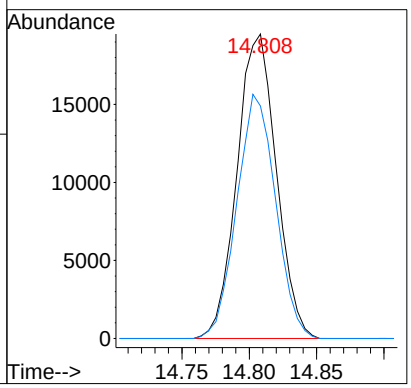


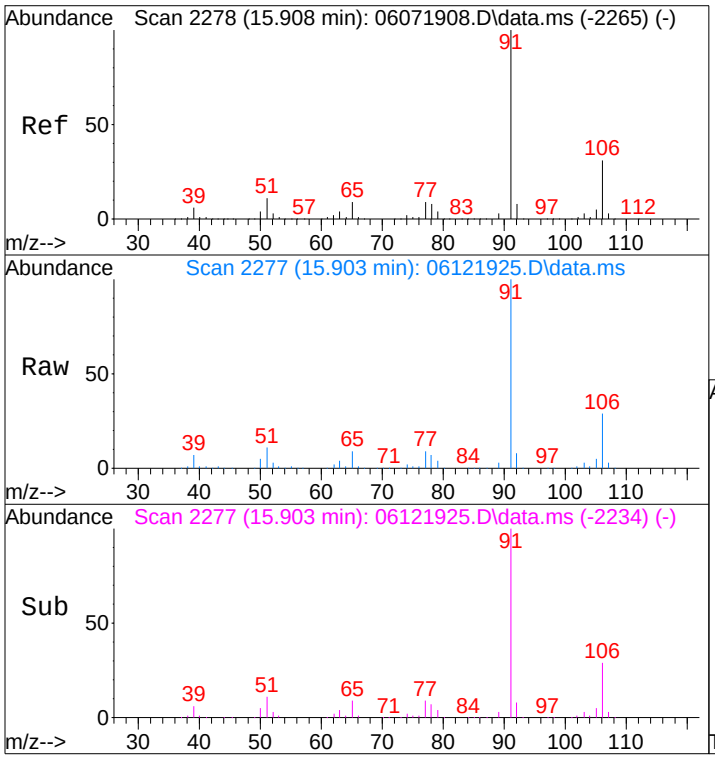


#64
Tetrachloroethene
Concen: 2.21 ng
RT: 14.81 min Scan# 2078
Delta R.T. -0.005 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion:166 Resp: 39614

Ion	Ratio	Lower	Upper
166	100		
164	79.2	58.7	98.7

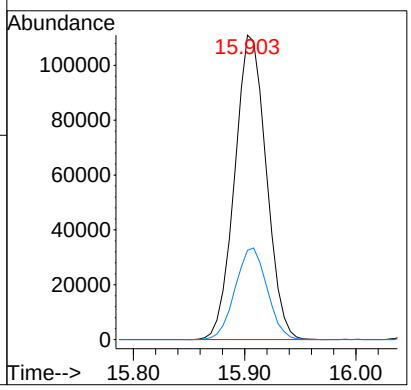


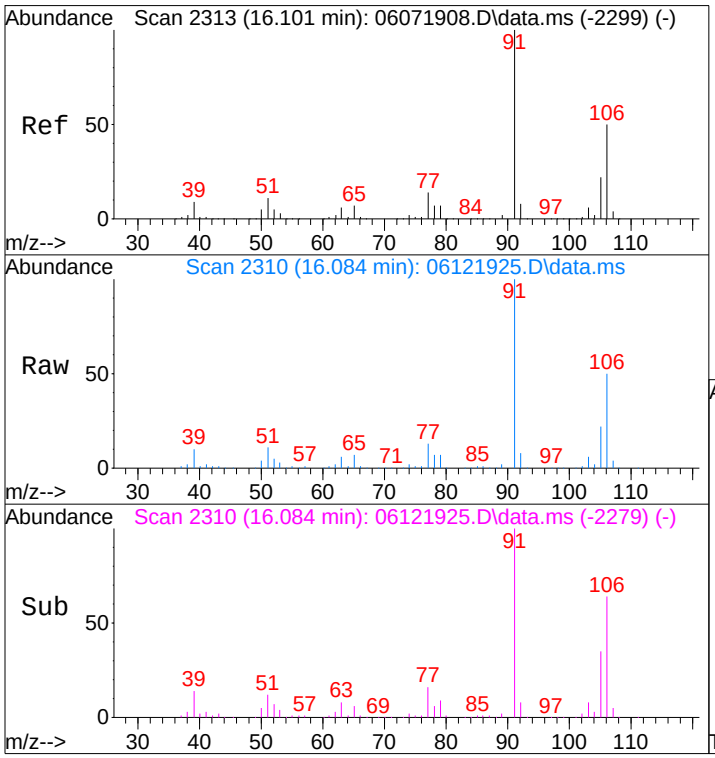


#66
Ethylbenzene
Concen: 2.49 ng
RT: 15.90 min Scan# 2277
Delta R.T. -0.011 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 91 Resp: 218795

Ion	Ratio	Lower	Upper
91	100		
106	30.4	11.0	51.0

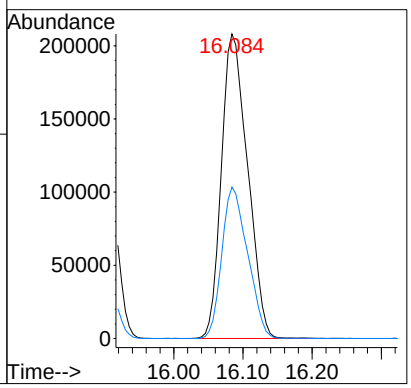


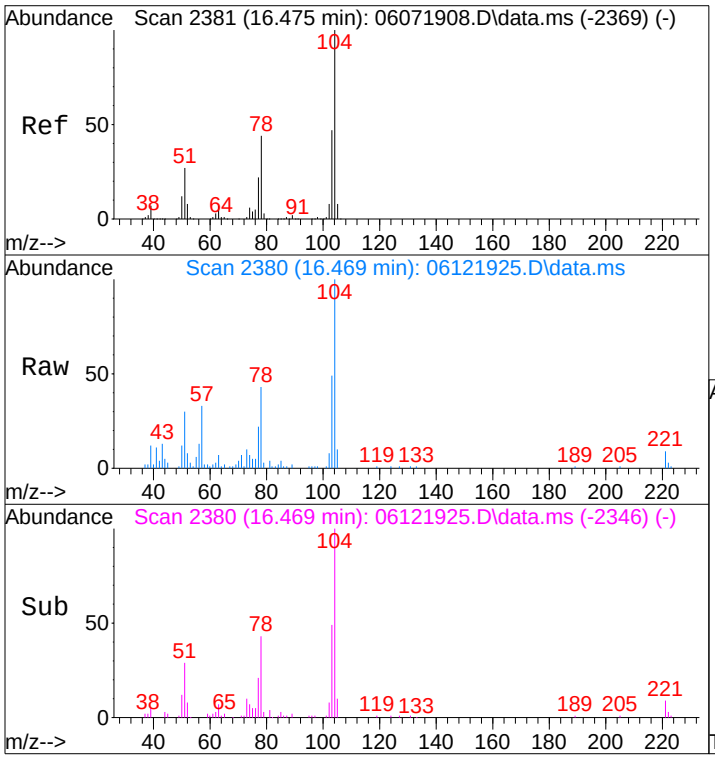


#67
m- & p-Xylenes
Concen: 8.07 ng
RT: 16.08 min Scan# 2310
Delta R.T. -0.027 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 91 Resp: 547393

Ion	Ratio	Lower	Upper
91	100		
106	48.9	28.1	68.1

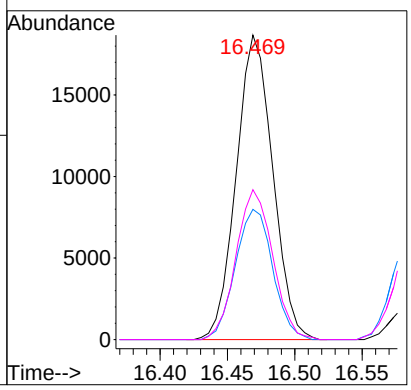


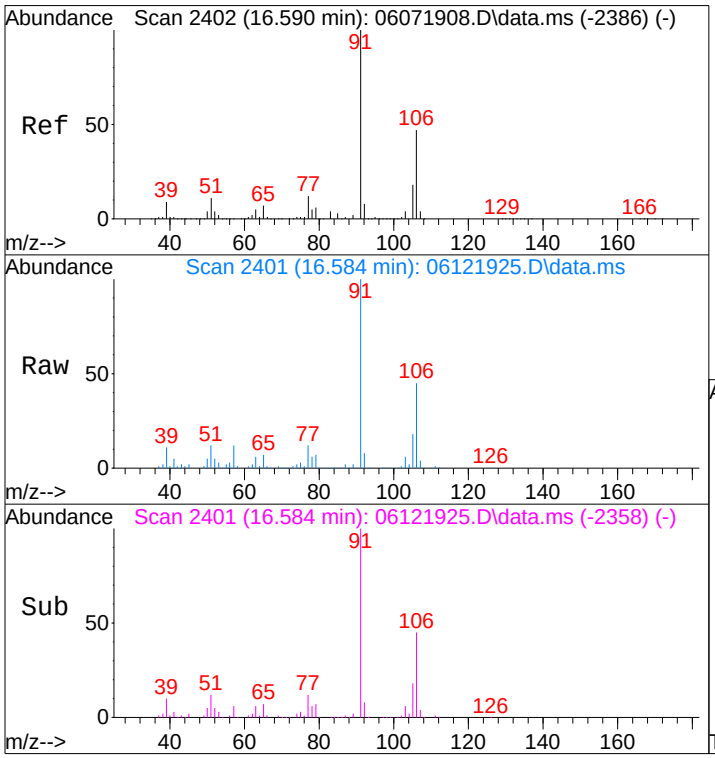


#69
Styrene
Concen: 0.71 ng
RT: 16.47 min Scan# 2380
Delta R.T. -0.011 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion:104 Resp: 35227

Ion	Ratio	Lower	Upper
104	100		
78	43.8	24.0	64.0
103	49.4	27.3	67.3

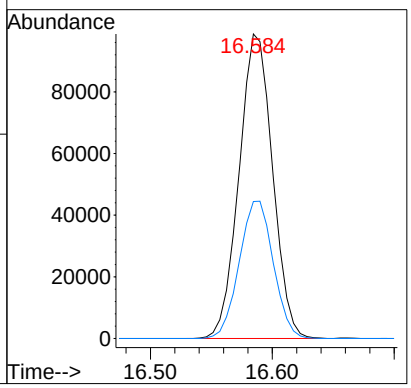


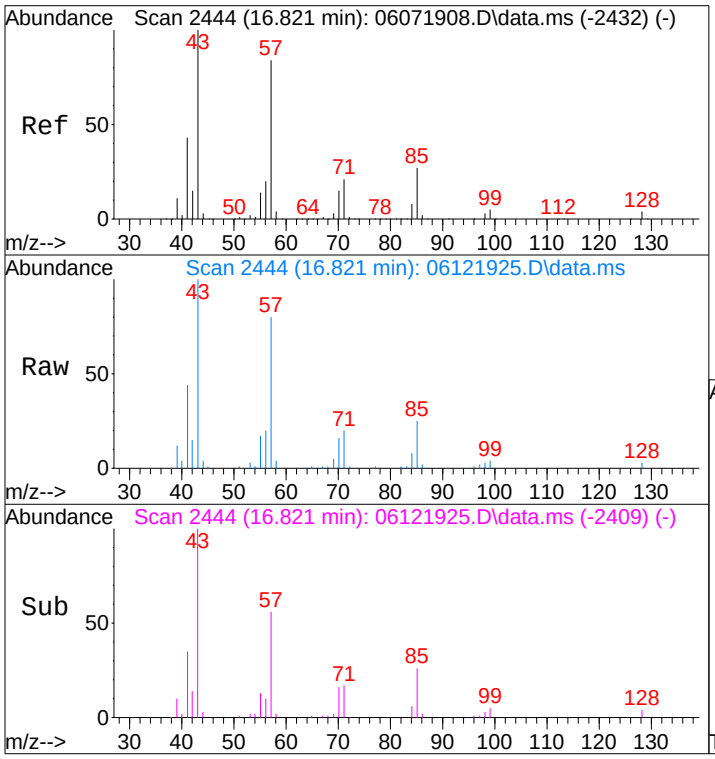


#70
o-Xylene
Concen: 2.83 ng
RT: 16.58 min Scan# 2401
Delta R.T. -0.011 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 91 Resp: 188964

Ion	Ratio	Lower	Upper
91	100		
106	45.8	26.6	66.6

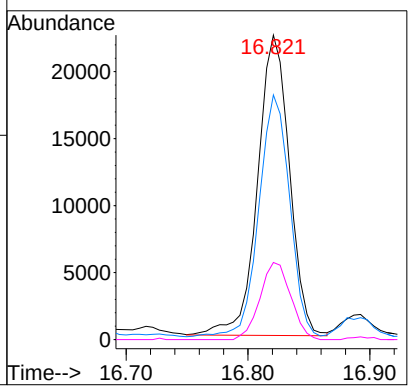


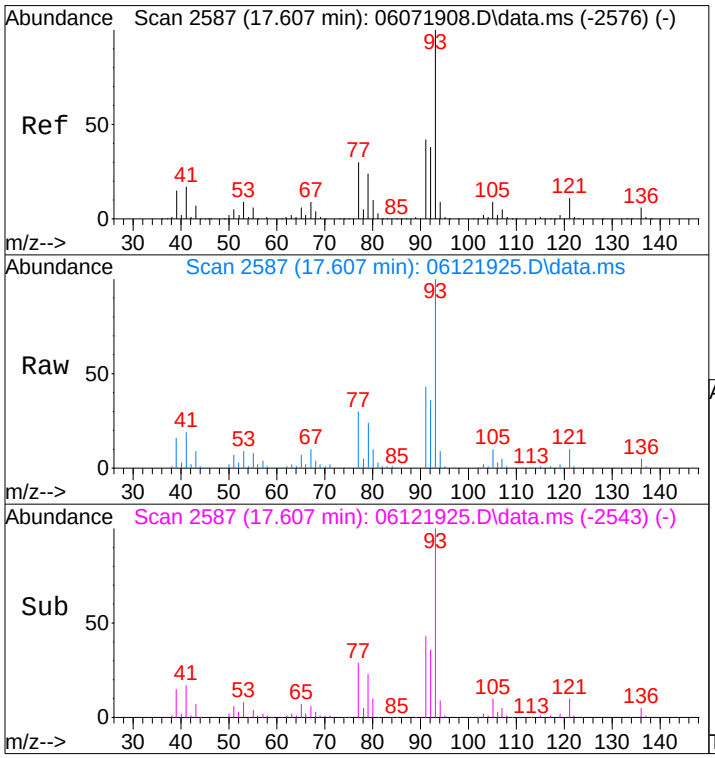


#71
n-Nonane
Concen: 0.88 ng
RT: 16.82 min Scan# 2444
Delta R.T. -0.005 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 43 Resp: 40695

Ion	Ratio	Lower	Upper
43	100		
57	77.9	63.3	103.3
85	24.7	7.7	47.7

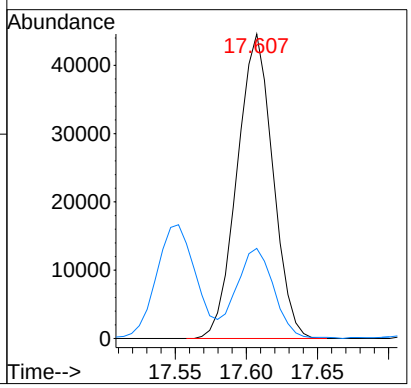


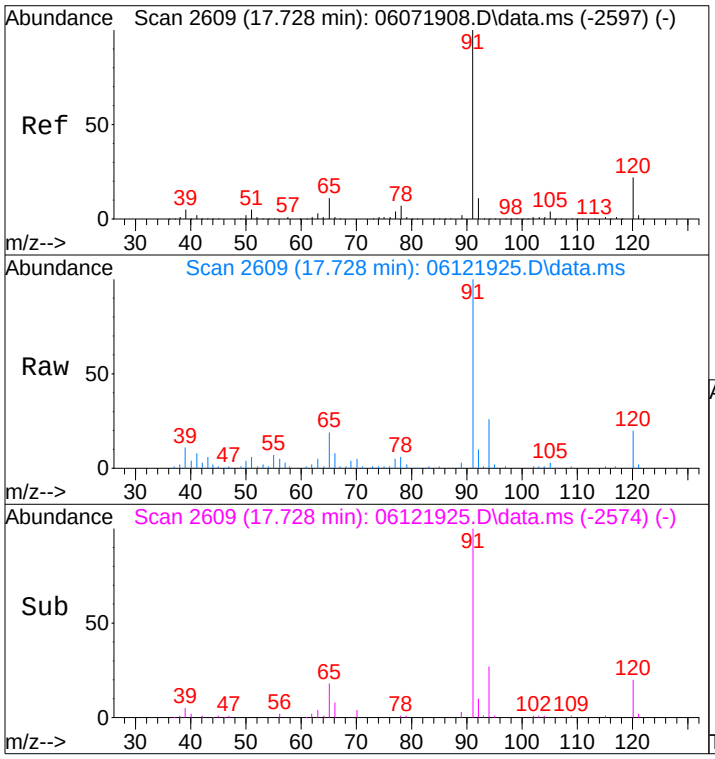


#75
alpha-Pinene
Concen: 1.82 ng
RT: 17.61 min Scan# 2587
Delta R.T. -0.005 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 93 Resp: 77977

Ion	Ratio	Lower	Upper
93	100		
77	30.7	10.4	50.4

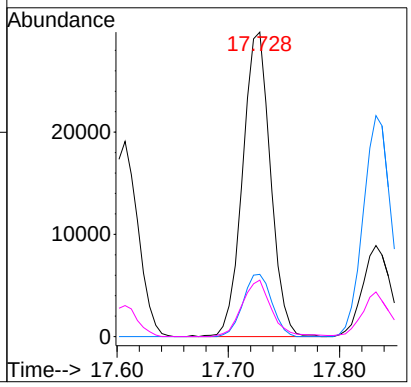


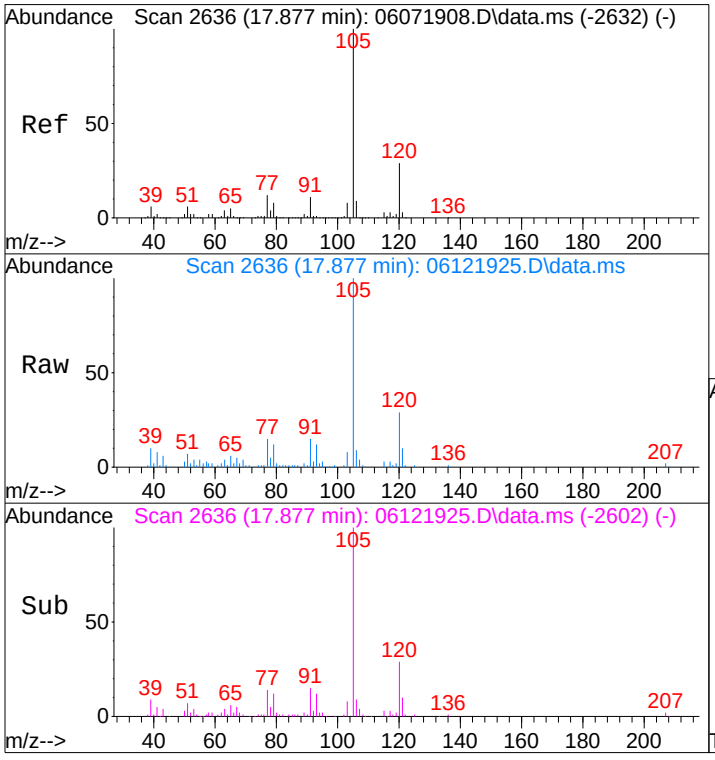


#76
n-Propylbenzene
Concen: 0.51 ng
RT: 17.73 min Scan# 2609
Delta R.T. -0.005 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion: 91 Resp: 51853

Ion	Ratio	Lower	Upper
91	100		
120	21.0	1.9	41.9
65	19.7	0.0	30.6

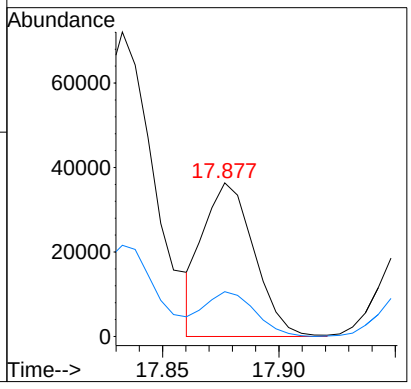


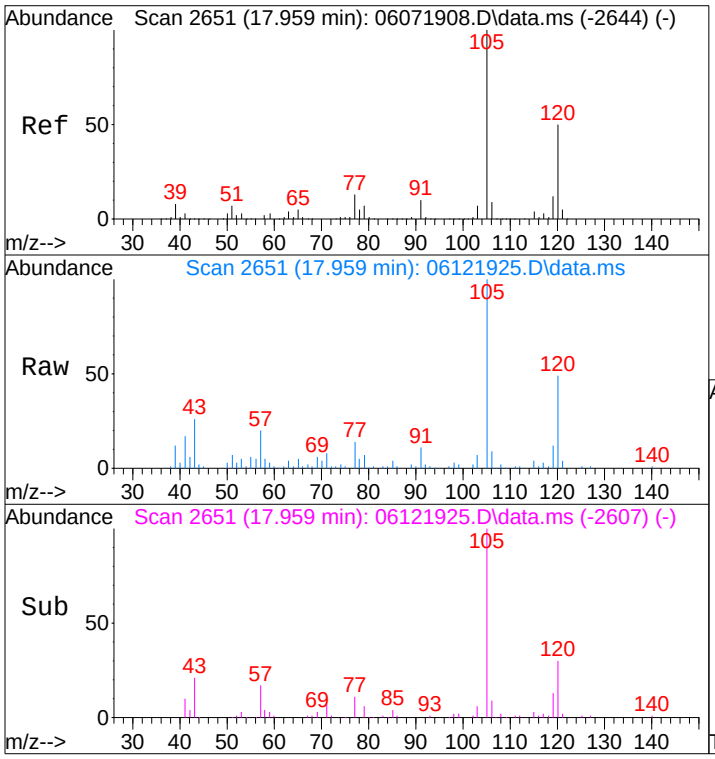


#78
4-Ethyltoluene
Concen: 0.71 ng
RT: 17.88 min Scan# 2636
Delta R.T. -0.011 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion:105 Resp: 55504

Ion	Ratio	Lower	Upper
105	100		
120	29.2	8.0	48.0

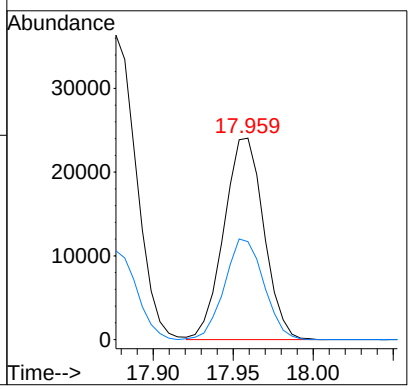


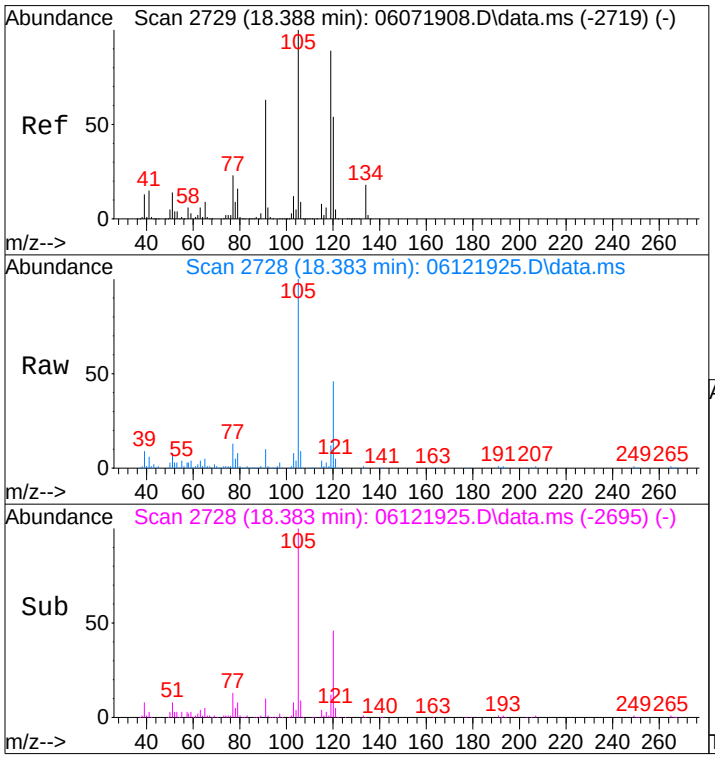


#79
1,3,5-Trimethylbenzene
Concen: 0.61 ng
RT: 17.96 min Scan# 2651
Delta R.T. -0.005 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion:105 Resp: 41839

Ion	Ratio	Lower	Upper
105	100		
120	49.0	29.5	69.5

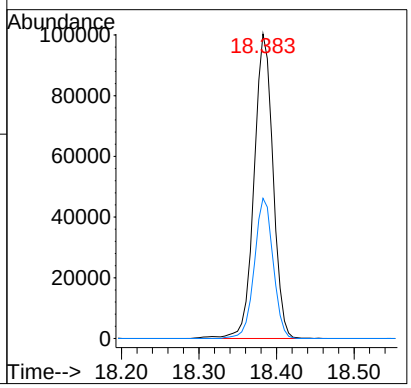


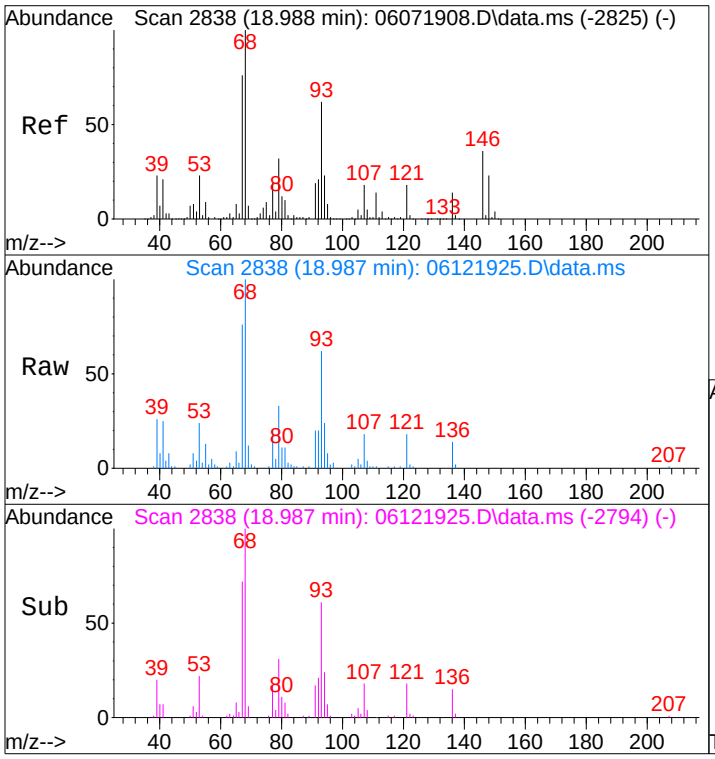


#82
1,2,4-Trimethylbenzene
Concen: 2.45 ng
RT: 18.38 min Scan# 2728
Delta R.T. -0.016 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

Tgt Ion:105 Resp: 170363

Ion	Ratio	Lower	Upper
105	100		
120	45.5	34.0	74.0

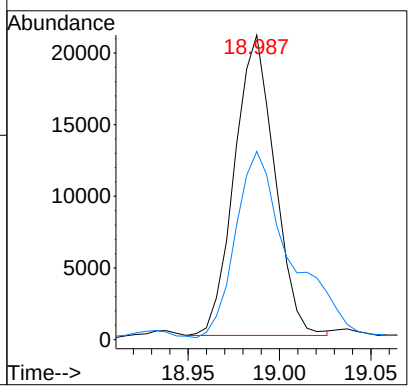




#91
d-Limonene
Concen: 1.08 ng
RT: 18.99 min Scan# 2838
Delta R.T. -0.005 min
Lab File: 06121925.D
Acq: 12 Jun 2019 19:39

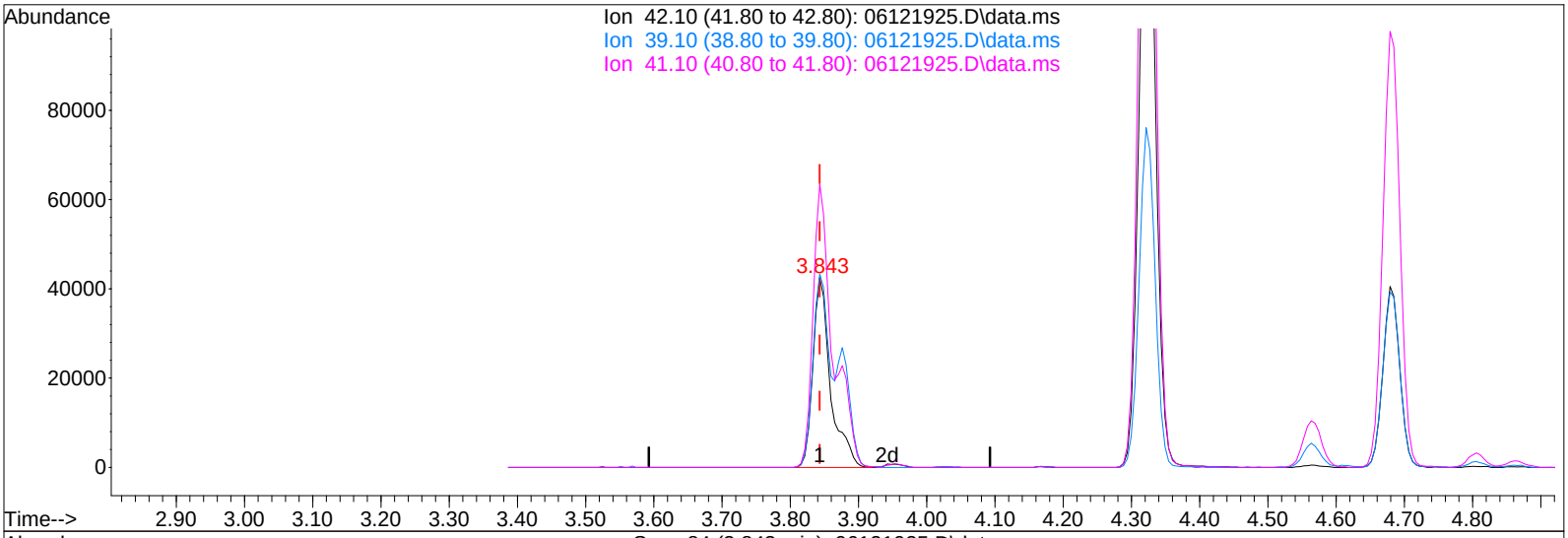
Tgt Ion: 68 Resp: 32011

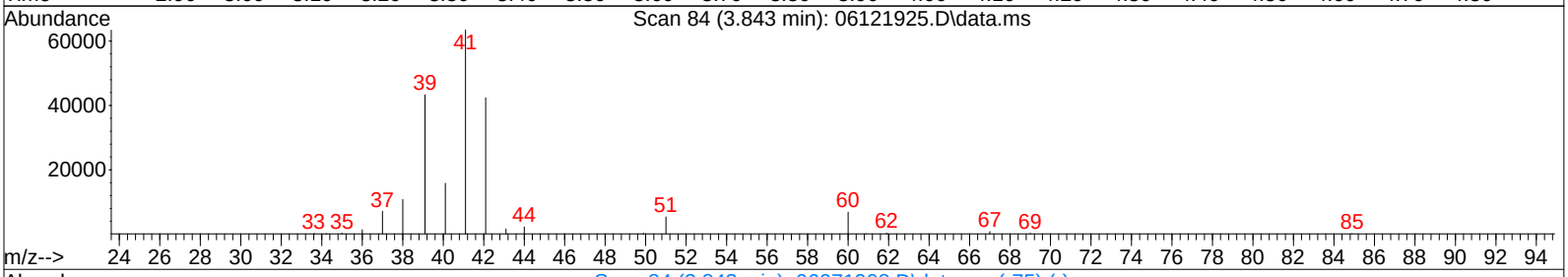
Ion	Ratio	Lower	Upper
68	100		
93	88.7	43.1	83.1#

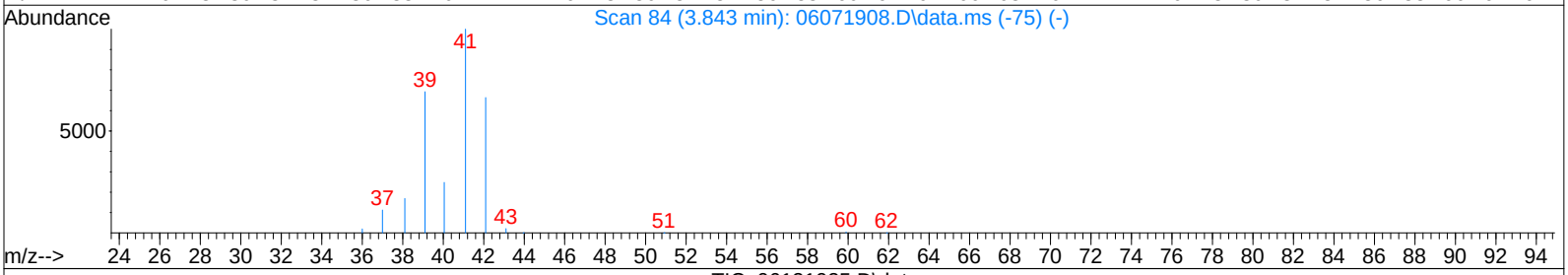


Data File: I:\MS09\Data\2019_06\12\06121925.D
Acq On : 12 Jun 2019 19:39 Operator: SC
Sample : P1903177-004 (1000mL)
Misc : S31-05131901
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Jun 13 08:52:11 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M







TIC: 06121925.D\data.ms

(2) Propene (T)

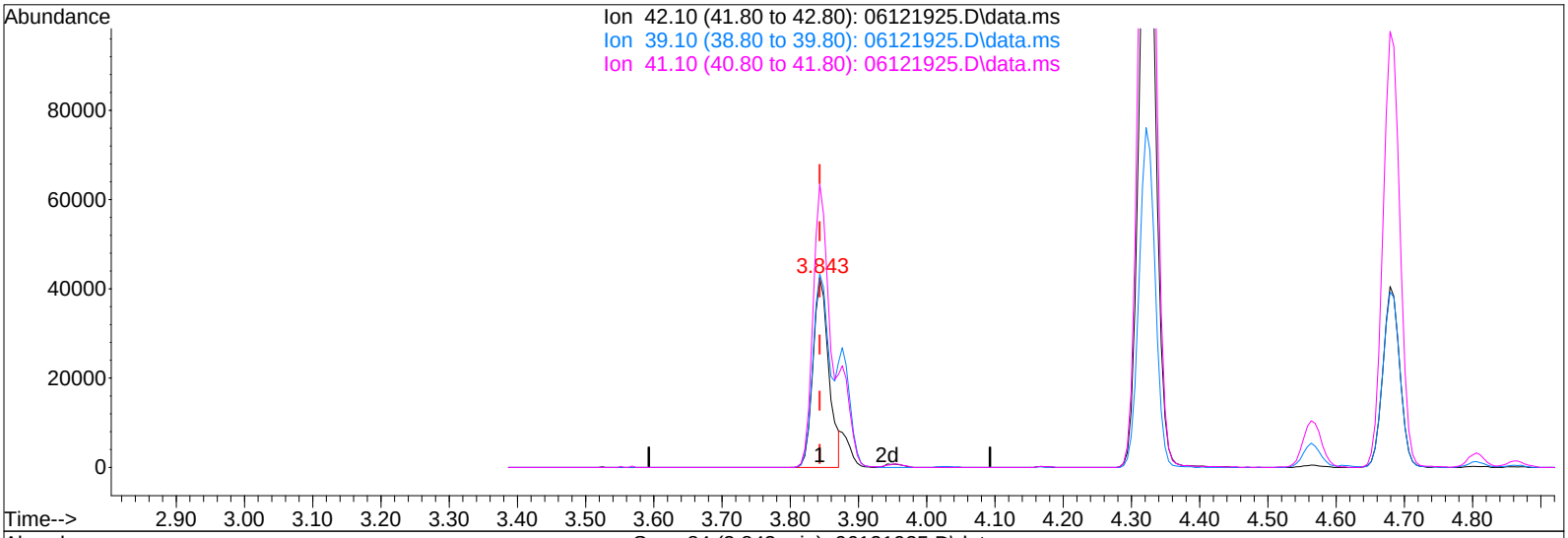
3.843min (+0.000) 3.51ng

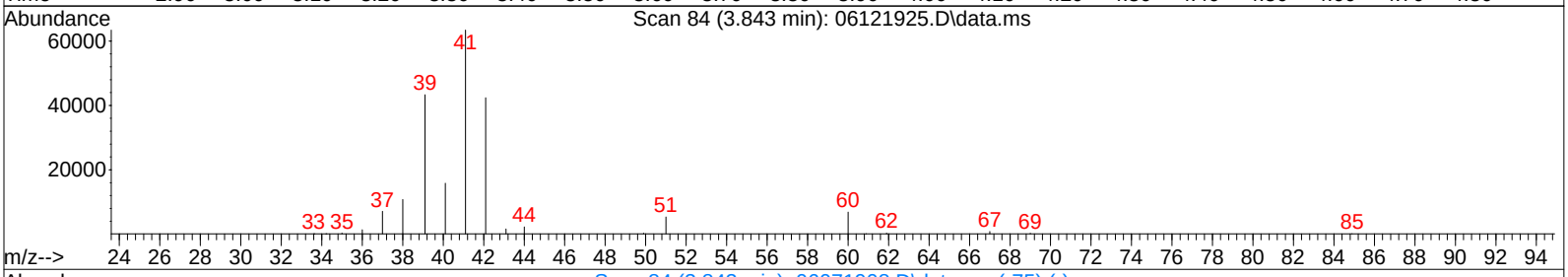
response 75983

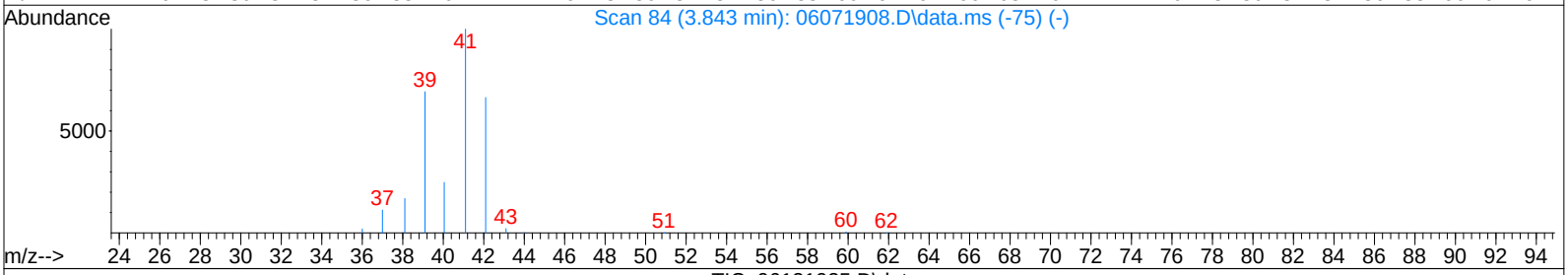
Ion	Exp%	Act%
42.10	100	100
39.10	104.80	96.87
41.10	150.30	171.59#
0.00	0.00	0.00

Data File: I:\MS09\Data\2019_06\12\06121925.D
Acq On : 12 Jun 2019 19:39 Operator: SC
Sample : P1903177-004 (1000mL)
Misc : S31-05131901
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Jun 13 08:52:11 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M







TIC: 06121925.D\data.ms

(2) Propene (T)

3.843min (+0.000) 3.16ng m

response 68425

Ion	Exp%	Act%
42.10	100	100
39.10	104.80	107.56
41.10	150.30	190.54#
0.00	0.00	0.00

IPC

6/13/19

6/14/19

Data File: I:\MS09\Data\2019_06\12\06121904.D
Acq On : 12 Jun 2019 7:21 Operator: SC
Sample : MB R9061219_ 1000mL
Misc : S31-05131901/AC00463
ALS Vial : 2 Sample Multiplier: 1

6/12/19

Quant Time: Jun 12 09:10:22 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.13	130	181881	12.500	ng		-0.04
37) 1,4-Difluorobenzene (IS2)	11.11	114	846947	12.500	ng		-0.02
56) Chlorobenzene-d5 (IS3)	15.46	82	438055	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.91	65	338101	12.755	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 102.00%				
57) Toluene-d8 (SS2)	13.55	98	1024873	12.543	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.32%				
73) Bromofluorobenzene (SS3)	17.05	174	271075	12.367	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.96%				
Target Compounds							Qvalue
2) Propene	0.00	42	0	N.D. d			
3) Dichlorodifluoromethan...	0.00	85	0	N.D.			
4) Chloromethane	0.00	50	0	N.D.			
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.			
6) Vinyl Chloride	0.00	62	0	N.D.			
7) 1,3-Butadiene	0.00	54	0	N.D.			
8) Bromomethane	0.00	94	0	N.D.			
9) Chloroethane	0.00	64	0	N.D.			
10) Ethanol	5.35	45	2304m	0.128	ng		
11) Acetonitrile	5.56	41	1494	0.034	ng	#	49
12) Acrolein	5.71	56	765	0.054	ng		99
13) Acetone	5.86	58	9474	0.593	ng		89
14) Trichlorofluoromethane	0.00	101	0	N.D.			
15) 2-Propanol (Isopropanol)	6.18	45	560	0.010	ng		75
16) Acrylonitrile	0.00	53	0	N.D. d			
17) 1,1-Dichloroethene	0.00	96	0	N.D.			
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D. d			
19) Methylene Chloride	0.00	84	0	N.D.			
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.			
21) Trichlorotrifluoroethane	0.00	151	0	N.D.			
22) Carbon Disulfide	0.00	76	0	N.D. d			
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.			
24) 1,1-Dichloroethane	0.00	63	0	N.D.			
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.			
26) Vinyl Acetate	8.25	86	759	0.170	ng	#	42
27) 2-Butanone (MEK)	8.55	72	551	0.036	ng	#	55
28) cis-1,2-Dichloroethene	0.00	61	0	N.D.			
29) Diisopropyl Ether	0.00	87	0	N.D.			
30) Ethyl Acetate	0.00	61	0	N.D.			
31) n-Hexane	0.00	57	0	N.D.			
32) Chloroform	0.00	83	0	N.D.			
34) Tetrahydrofuran (THF)	9.73	72	292	0.021	ng	#	81
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.			
36) 1,2-Dichloroethane	0.00	62	0	N.D.			
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.			
39) Isopropyl Acetate	0.00	61	0	N.D.			
40) 1-Butanol	0.00	56	0	N.D. d			
41) Benzene	10.75	78	2320	0.027	ng		87
42) Carbon Tetrachloride	0.00	117	0	N.D.			
43) Cyclohexane	0.00	84	0	N.D. d			
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.			
45) 1,2-Dichloropropane	0.00	63	0	N.D.			
46) Bromodichloromethane	0.00	83	0	N.D.			
47) Trichloroethene	0.00	130	0	N.D.			
48) 1,4-Dioxane	0.00	88	0	N.D.			
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.			

Data File: I:\MS09\Data\2019_06\12\06121904.D
Acq On : 12 Jun 2019 7:21 Operator: SC
Sample : MB R9061219_ 1000mL
Misc : S31-05131901/AC00463
ALS Vial : 2 Sample Multiplier: 1

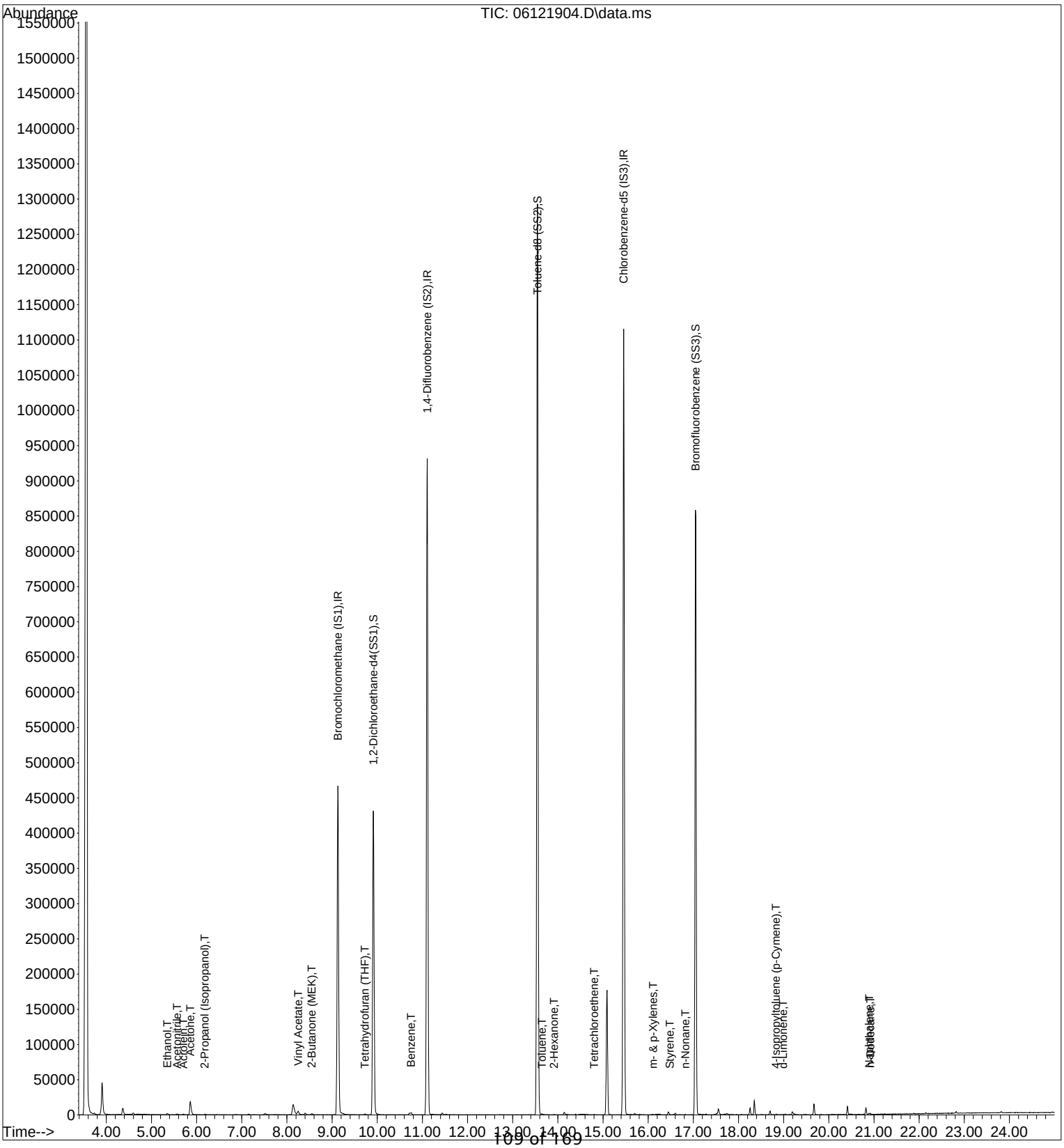
Quant Time: Jun 12 09:10:22 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
50) Methyl Methacrylate	0.00	100	0	N.D.		
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	13.65	91	771	0.009 ng		90
59) 2-Hexanone	13.92	43	523	0.010 ng	#	58
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	0.00	43	0	N.D. d		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	14.80	166	149	0.008 ng		95
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	0.00	91	0	N.D. d		
67) m- & p-Xylenes	16.11	91	640	0.009 ng	#	57
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	16.48	104	263	0.005 ng	#	31
70) o-Xylene	0.00	91	0	N.D. d		
71) n-Nonane	16.83	43	237	0.005 ng	#	63
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	0.00	105	0	N.D. d		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D. d		
77) 3-Ethyltoluene	0.00	105	0	N.D. d		
78) 4-Ethyltoluene	0.00	105	0	N.D. d		
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D. d		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D. d		
82) 1,2,4-Trimethylbenzene	0.00	105	0	N.D. d		
83) n-Decane	0.00	57	0	N.D. d		
84) Benzyl Chloride	0.00	91	0	N.D. d		
85) 1,3-Dichlorobenzene	0.00	146	0	N.D. d		
86) 1,4-Dichlorobenzene	0.00	146	0	N.D. d		
87) sec-Butylbenzene	0.00	105	0	N.D.		
88) 4-Isopropyltoluene (p-...	18.83	119	233	0.003 ng	#	1
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	18.99	68	181	0.006 ng		96
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D. d		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D. d		
95) Naphthalene	20.90	128	1595	0.019 ng	#	71
96) n-Dodecane	20.92	57	475	0.012 ng	#	63
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	0.00	55	0	N.D. d		
99) tert-Butylbenzene	0.00	119	0	N.D. d		
100) n-Butylbenzene	0.00	91	0	N.D. d		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2019_06\12\06121904.D
Acq On : 12 Jun 2019 7:21 Operator: SC
Sample : MB R9061219_ 1000mL
Misc : S31-05131901/AC00463
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 12 09:10:22 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\13\06131904.D
Acq On : 13 Jun 2019 7:21 Operator: SC
Sample : MB R9061319_ 1000mL
Misc : S31-05131901/AC00463
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 13 09:35:06 2019 6/13/19
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.13	130	171243	12.500	ng		-0.04
37) 1,4-Difluorobenzene (IS2)	11.11	114	795421	12.500	ng		-0.02
56) Chlorobenzene-d5 (IS3)	15.46	82	417260	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.91	65	326721	13.091	ng		-0.03
Spiked Amount 12.500	Range 70 - 130		Recovery = 104.72%				
57) Toluene-d8 (SS2)	13.55	98	964654	12.394	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 99.12%				
73) Bromofluorobenzene (SS3)	17.05	174	251793	12.060	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 96.48%				
Target Compounds							Qvalue
2) Propene	0.00	42	0	N.D. d			
3) Dichlorodifluoromethan...	0.00	85	0	N.D.			
4) Chloromethane	0.00	50	0	N.D.			
5) 1,2-Dichloro-1,1,2,2-t...	0.00	135	0	N.D.			
6) Vinyl Chloride	0.00	62	0	N.D.			
7) 1,3-Butadiene	0.00	54	0	N.D.			
8) Bromomethane	0.00	94	0	N.D.			
9) Chloroethane	0.00	64	0	N.D.			
10) Ethanol	5.36	45	2126m	0.125	ng		
11) Acetonitrile	5.56	41	1353	0.033	ng		73
12) Acrolein	5.72	56	605	0.045	ng		87
13) Acetone	5.86	58	7819	0.520	ng		94
14) Trichlorofluoromethane	0.00	101	0	N.D.			
15) 2-Propanol (Isopropanol)	0.00	45	0	N.D. d			
16) Acrylonitrile	0.00	53	0	N.D. d			
17) 1,1-Dichloroethene	0.00	96	0	N.D.			
18) 2-Methyl-2-Propanol (t...	0.00	59	0	N.D. d			
19) Methylene Chloride	0.00	84	0	N.D.			
20) 3-Chloro-1-propene (Al...	0.00	41	0	N.D.			
21) Trichlorotrifluoroethane	0.00	151	0	N.D.			
22) Carbon Disulfide	0.00	76	0	N.D. d			
23) trans-1,2-Dichloroethene	0.00	61	0	N.D.			
24) 1,1-Dichloroethane	0.00	63	0	N.D.			
25) Methyl tert-Butyl Ether	0.00	73	0	N.D.			
26) Vinyl Acetate	8.25	86	563	0.134	ng	#	60
27) 2-Butanone (MEK)	8.55	72	416	0.029	ng	#	26
28) cis-1,2-Dichloroethene	0.00	61	0	N.D.			
29) Diisopropyl Ether	0.00	87	0	N.D.			
30) Ethyl Acetate	0.00	61	0	N.D.			
31) n-Hexane	0.00	57	0	N.D.			
32) Chloroform	0.00	83	0	N.D.			
34) Tetrahydrofuran (THF)	9.73	72	199	0.015	ng	#	58
35) Ethyl tert-Butyl Ether	0.00	87	0	N.D.			
36) 1,2-Dichloroethane	0.00	62	0	N.D.			
38) 1,1,1-Trichloroethane	0.00	97	0	N.D.			
39) Isopropyl Acetate	0.00	61	0	N.D.			
40) 1-Butanol	10.72	56	1552	0.065	ng	#	70
41) Benzene	10.76	78	2026	0.025	ng		91
42) Carbon Tetrachloride	0.00	117	0	N.D.			
43) Cyclohexane	0.00	84	0	N.D. d			
44) tert-Amyl Methyl Ether	0.00	73	0	N.D.			
45) 1,2-Dichloropropane	0.00	63	0	N.D.			
46) Bromodichloromethane	0.00	83	0	N.D.			
47) Trichloroethene	0.00	130	0	N.D.			
48) 1,4-Dioxane	0.00	88	0	N.D.			
49) 2,2,4-Trimethylpentane...	0.00	57	0	N.D.			

Data File: I:\MS09\Data\2019_06\13\06131904.D
Acq On : 13 Jun 2019 7:21 Operator: SC
Sample : MB R9061319_ 1000mL
Misc : S31-05131901/AC00463
ALS Vial : 2 Sample Multiplier: 1

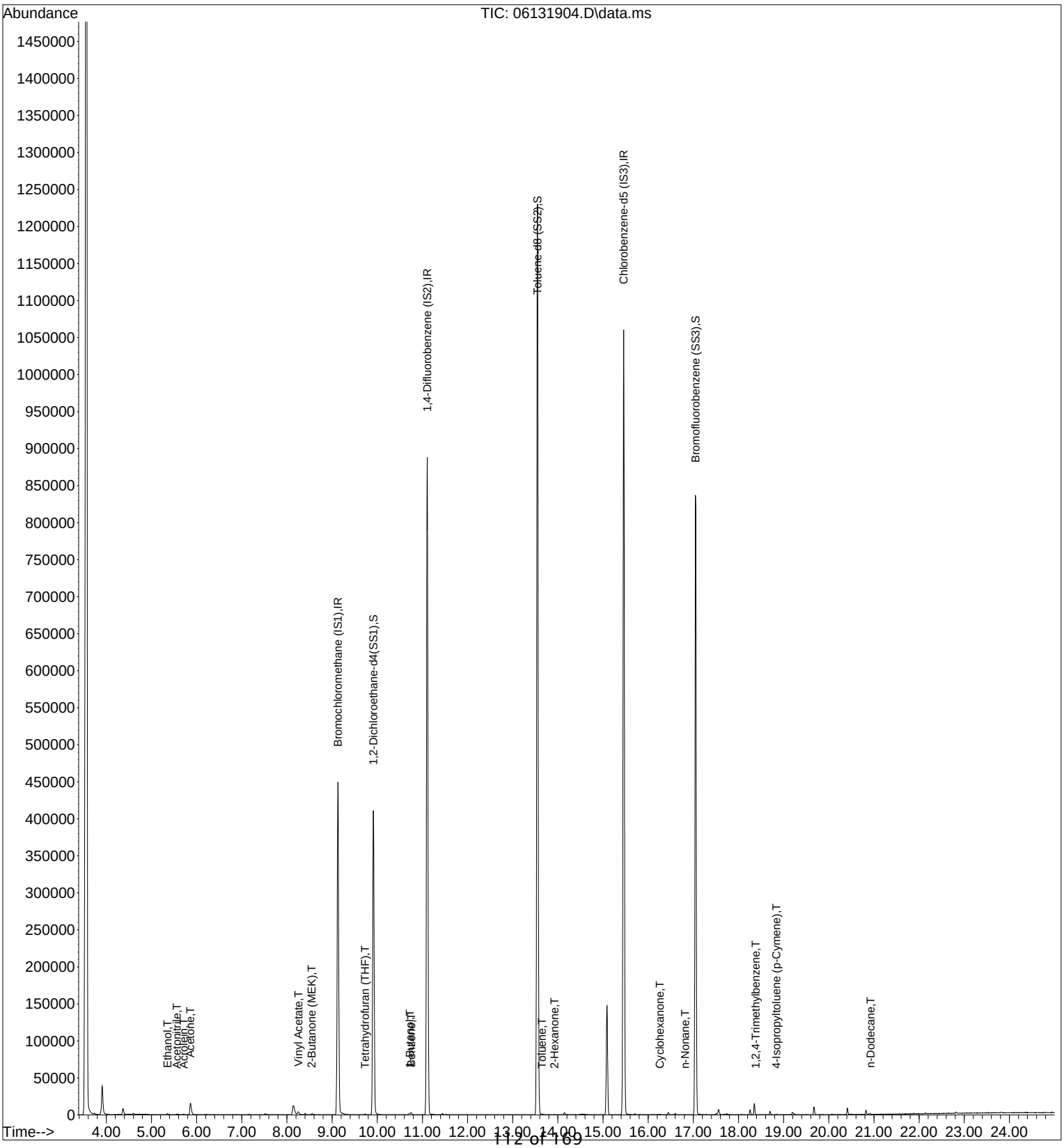
Quant Time: Jun 13 09:35:06 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc Units		Dev(Min)
50) Methyl Methacrylate	0.00	100	0	N.D.		
51) n-Heptane	0.00	71	0	N.D.		
52) cis-1,3-Dichloropropene	0.00	75	0	N.D.		
53) 4-Methyl-2-pentanone	0.00	58	0	N.D.		
54) trans-1,3-Dichloropropene	0.00	75	0	N.D.		
55) 1,1,2-Trichloroethane	0.00	97	0	N.D.		
58) Toluene	13.65	91	564	0.007 ng		91
59) 2-Hexanone	13.92	43	475	0.009 ng	#	58
60) Dibromochloromethane	0.00	129	0	N.D.		
61) 1,2-Dibromoethane	0.00	107	0	N.D.		
62) n-Butyl Acetate	0.00	43	0	N.D. d		
63) n-Octane	0.00	57	0	N.D.		
64) Tetrachloroethene	0.00	166	0	N.D.		
65) Chlorobenzene	0.00	112	0	N.D.		
66) Ethylbenzene	0.00	91	0	N.D. d		
67) m- & p-Xylenes	0.00	91	0	N.D. d		
68) Bromoform	0.00	173	0	N.D.		
69) Styrene	0.00	104	0	N.D. d		
70) o-Xylene	0.00	91	0	N.D. d		
71) n-Nonane	16.82	43	195	0.004 ng	#	18
72) 1,1,2,2-Tetrachloroethane	0.00	83	0	N.D.		
74) Cumene	0.00	105	0	N.D. d		
75) alpha-Pinene	0.00	93	0	N.D.		
76) n-Propylbenzene	0.00	91	0	N.D. d		
77) 3-Ethyltoluene	0.00	105	0	N.D. d		
78) 4-Ethyltoluene	0.00	105	0	N.D. d		
79) 1,3,5-Trimethylbenzene	0.00	105	0	N.D. d		
80) alpha-Methylstyrene	0.00	118	0	N.D.		
81) 2-Ethyltoluene	0.00	105	0	N.D.		
82) 1,2,4-Trimethylbenzene	18.38	105	174	0.003 ng	#	25
83) n-Decane	0.00	57	0	N.D. d		
84) Benzyl Chloride	0.00	91	0	N.D. d		
85) 1,3-Dichlorobenzene	0.00	146	0	N.D.		
86) 1,4-Dichlorobenzene	0.00	146	0	N.D.		
87) sec-Butylbenzene	0.00	105	0	N.D.		
88) 4-Isopropyltoluene (p-...	18.84	119	222	0.003 ng	#	7
89) 1,2,3-Trimethylbenzene	0.00	105	0	N.D.		
90) 1,2-Dichlorobenzene	0.00	146	0	N.D.		
91) d-Limonene	0.00	68	0	N.D. d		
92) 1,2-Dibromo-3-Chloropr...	0.00	157	0	N.D.		
93) n-Undecane	0.00	57	0	N.D. d		
94) 1,2,4-Trichlorobenzene	0.00	180	0	N.D.		
95) Naphthalene	0.00	128	0	N.D. d		
96) n-Dodecane	20.92	57	370	0.009 ng	#	34
97) Hexachlorobutadiene	0.00	225	0	N.D.		
98) Cyclohexanone	16.26	55	386	0.011 ng	#	70
99) tert-Butylbenzene	0.00	119	0	N.D. d		
100) n-Butylbenzene	0.00	91	0	N.D. d		

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2019_06\13\06131904.D
Acq On : 13 Jun 2019 7:21 Operator: SC
Sample : MB R9061319_ 1000mL
Misc : S31-05131901/AC00463
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 13 09:35:06 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\12\06121905.D
Acq On : 12 Jun 2019 7:54 Operator: SC
Sample : LCS R9061219_25ng
Misc : S31-05131901/S31-05241901 (6/22)
ALS Vial : 2 Sample Multiplier: 1

6/12/19

Quant Time: Jun 12 09:13:07 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.16	130	188479	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	11.12	114	844497	12.500	ng		-0.01
56) Chlorobenzene-d5 (IS3)	15.46	82	445152	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.93	65	344457	12.540	ng		-0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.32%				
57) Toluene-d8 (SS2)	13.55	98	1027311	12.372	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.96%				
73) Bromofluorobenzene (SS3)	17.05	174	273139	12.263	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.08%				
Target Compounds							Qvalue
2) Propene	3.84	42	649802	26.885	ng		100
3) Dichlorodifluoromethan...	3.96	85	873413	24.664	ng		100
4) Chloromethane	4.16	50	851084	26.658	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.33	135	395196	24.654	ng		99
6) Vinyl Chloride	4.44	62	769168	25.678	ng		100
7) 1,3-Butadiene	4.62	54	601047	27.343	ng		100
8) Bromomethane	4.93	94	413020	25.569	ng		100
9) Chloroethane	5.15	64	386511	25.374	ng		100
10) Ethanol	5.39	45	2265427	121.165	ng		100
11) Acetonitrile	5.58	41	1162790	25.450	ng		100
12) Acrolein	5.71	56	349433	23.688	ng		100
13) Acetone	5.85	58	2073681	125.324	ng		98
14) Trichlorofluoromethane	6.02	101	746643	25.099	ng		100
15) 2-Propanol (Isopropanol)	6.18	45	3042480	50.040	ng		100
16) Acrylonitrile	6.38	53	773743	25.091	ng		100
17) 1,1-Dichloroethene	6.72	96	450685	25.374	ng		98
18) 2-Methyl-2-Propanol (t...	6.83	59	2772759	53.095	ng		99
19) Methylene Chloride	6.88	84	485260	25.173	ng		98
20) 3-Chloro-1-propene (Al...	7.01	41	942749	26.530	ng		99
21) Trichlorotrifluoroethane	7.19	151	348597	25.095	ng		100
22) Carbon Disulfide	7.15	76	1866022	25.009	ng		100
23) trans-1,2-Dichloroethene	7.90	61	768144	25.293	ng		99
24) 1,1-Dichloroethane	8.12	63	942190	25.629	ng		100
25) Methyl tert-Butyl Ether	8.18	73	1509367	26.621	ng		100
26) Vinyl Acetate	8.29	86	596818	129.297	ng		97
27) 2-Butanone (MEK)	8.52	72	362578	22.763	ng		97
28) cis-1,2-Dichloroethene	8.99	61	732178	24.928	ng		100
29) Diisopropyl Ether	9.22	87	405923	27.194	ng	#	97
30) Ethyl Acetate	9.22	61	420748	53.026	ng		99
31) n-Hexane	9.23	57	970114	25.646	ng		100
32) Chloroform	9.30	83	816799	25.455	ng		100
34) Tetrahydrofuran (THF)	9.67	72	353225	24.902	ng		98
35) Ethyl tert-Butyl Ether	9.77	87	556199	26.286	ng		99
36) 1,2-Dichloroethane	10.04	62	660285	25.122	ng		100
38) 1,1,1-Trichloroethane	10.30	97	704801	25.526	ng		100
39) Isopropyl Acetate	10.67	61	704388	51.443	ng		99
40) 1-Butanol	10.68	56	1289361	51.235	ng		97
41) Benzene	10.76	78	2005894	23.158	ng		100
42) Carbon Tetrachloride	10.91	117	599417	24.989	ng		100
43) Cyclohexane	11.04	84	1530133	49.966	ng		99
44) tert-Amyl Methyl Ether	11.36	73	1403642	26.773	ng		100
45) 1,2-Dichloropropane	11.58	63	544890	25.736	ng		100
46) Bromodichloromethane	11.76	83	666456	26.352	ng		100
47) Trichloroethene	11.82	130	476339	25.384	ng		99
48) 1,4-Dioxane	11.78	88	411777	25.220	ng		100
49) 2,2,4-Trimethylpentane...	11.88	57	2369602	25.294	ng		99

Data File: I:\MS09\Data\2019_06\12\06121905.D
Acq On : 12 Jun 2019 7:54 Operator: SC
Sample : LCS R9061219_25ng
Misc : S31-05131901/S31-05241901 (6/22)
ALS Vial : 2 Sample Multiplier: 1

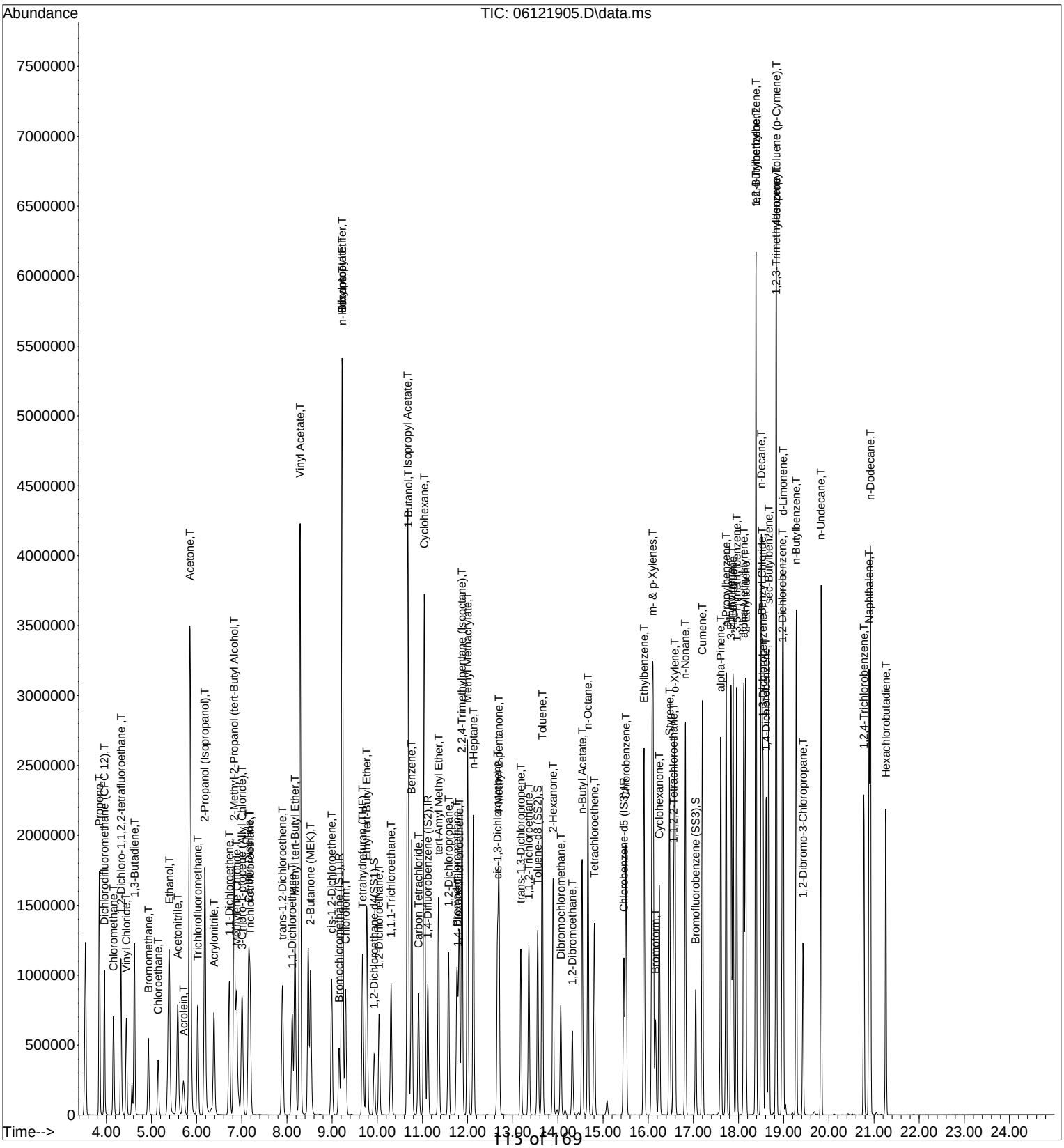
Quant Time: Jun 12 09:13:07 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.00	100	392512	54.371	ng	99
51) n-Heptane	12.13	71	540169	25.811	ng	99
52) cis-1,3-Dichloropropene	12.66	75	860535	26.663	ng	100
53) 4-Methyl-2-pentanone	12.69	58	544472	26.654	ng	99
54) trans-1,3-Dichloropropene	13.18	75	785008	27.206	ng	100
55) 1,1,2-Trichloroethane	13.36	97	462478	25.896	ng	99
58) Toluene	13.65	91	1989332	24.045	ng	100
59) 2-Hexanone	13.90	43	1379050	25.817	ng	99
60) Dibromochloromethane	14.07	129	511650	26.183	ng	100
61) 1,2-Dibromoethane	14.32	107	505652	25.588	ng	100
62) n-Butyl Acetate	14.54	43	1580686	26.747	ng	100
63) n-Octane	14.67	57	499620	25.331	ng	100
64) Tetrachloroethene	14.81	166	468812	24.849	ng	100
65) Chlorobenzene	15.51	112	1243861	24.755	ng	100
66) Ethylbenzene	15.91	91	2278897	24.548	ng	99
67) m- & p-Xylenes	16.10	91	3513353	49.128	ng	99
68) Bromoform	16.16	173	391928	26.707	ng	99
69) Styrene	16.47	104	1380814	26.259	ng	100
70) o-Xylene	16.59	91	1762167	25.015	ng	100
71) n-Nonane	16.82	43	1239144	25.315	ng	100
72) 1,1,2,2-Tetrachloroethane	16.56	83	839578	24.228	ng	100
74) Cumene	17.20	105	2197152	25.017	ng	100
75) alpha-Pinene	17.61	93	1189755	26.275	ng	99
76) n-Propylbenzene	17.73	91	2763582	25.560	ng	100
77) 3-Ethyltoluene	17.83	105	2100063	24.149	ng	100
78) 4-Ethyltoluene	17.88	105	2204748	26.887	ng	100
79) 1,3,5-Trimethylbenzene	17.96	105	1791129	24.801	ng	100
80) alpha-Methylstyrene	18.12	118	999470	29.200	ng	99
81) 2-Ethyltoluene	18.16	105	2133647	25.128	ng	100
82) 1,2,4-Trimethylbenzene	18.39	105	1869084	25.532	ng	100
83) n-Decane	18.50	57	1223569	25.841	ng	100
84) Benzyl Chloride	18.52	91	1772755	28.661	ng	100
85) 1,3-Dichlorobenzene	18.54	146	971840	25.241	ng	100
86) 1,4-Dichlorobenzene	18.61	146	978860	25.212	ng	100
87) sec-Butylbenzene	18.67	105	2425990	25.046	ng	100
88) 4-Isopropyltoluene (p-...	18.84	119	2269488	25.279	ng	100
89) 1,2,3-Trimethylbenzene	18.83	105	1913494	26.085	ng	100
90) 1,2-Dichlorobenzene	18.97	146	940124	25.288	ng	100
91) d-Limonene	18.99	68	880080	28.162	ng	100
92) 1,2-Dibromo-3-Chloropr...	19.43	157	341242	26.559	ng	99
93) n-Undecane	19.83	57	1293991	26.453	ng	100
94) 1,2,4-Trichlorobenzene	20.77	180	700602	26.854	ng	100
95) Naphthalene	20.89	128	2399743	27.748	ng	100
96) n-Dodecane	20.92	57	1324017	31.705	ng	100
97) Hexachlorobutadiene	21.26	225	416590	25.144	ng	99
98) Cyclohexanone	16.24	55	845985	23.120	ng	99
99) tert-Butylbenzene	18.39	119	1763017	25.239	ng	100
100) n-Butylbenzene	19.28	91	2082021	25.461	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2019_06\12\06121905.D
Acq On : 12 Jun 2019 7:54 Operator: SC
Sample : LCS R9061219_25ng
Misc : S31-05131901/S31-05241901 (6/22)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 12 09:13:07 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Data File: I:\MS09\Data\2019_06\13\06131905.D
Acq On : 13 Jun 2019 7:55 Operator: SC
Sample : LCS R9061319_25ng
Misc : S31-05131901/S31-05241901 (6/22)
ALS Vial : 2 Sample Multiplier: 1

6/13/19

Quant Time: Jun 13 09:37:02 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.16	130	180652	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	11.12	114	817398	12.500	ng		-0.01
56) Chlorobenzene-d5 (IS3)	15.46	82	434407	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.93	65	342751	13.018	ng		-0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 104.16%				
57) Toluene-d8 (SS2)	13.55	98	998477	12.322	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.56%				
73) Bromofluorobenzene (SS3)	17.05	174	265291	12.205	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.60%				
Target Compounds							Qvalue
2) Propene	3.84	42	627232	27.075	ng		100
3) Dichlorodifluoromethan...	3.95	85	834935	24.599	ng		100
4) Chloromethane	4.16	50	836044	27.322	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.32	135	367182	23.899	ng		100
6) Vinyl Chloride	4.44	62	730504	25.444	ng		100
7) 1,3-Butadiene	4.62	54	569168	27.015	ng		99
8) Bromomethane	4.93	94	389618	25.165	ng		99
9) Chloroethane	5.15	64	366339	25.092	ng		100
10) Ethanol	5.39	45	2193214	122.385	ng		100
11) Acetonitrile	5.58	41	1127876	25.756	ng		100
12) Acrolein	5.71	56	332209	23.497	ng		99
13) Acetone	5.85	58	1980991	124.909	ng		100
14) Trichlorofluoromethane	6.02	101	705729	24.752	ng		100
15) 2-Propanol (Isopropanol)	6.18	45	2950376	50.627	ng		100
16) Acrylonitrile	6.38	53	742400	25.118	ng		100
17) 1,1-Dichloroethene	6.72	96	419309	24.630	ng		98
18) 2-Methyl-2-Propanol (t...	6.83	59	2652926	53.002	ng		100
19) Methylene Chloride	6.88	84	457890	24.782	ng		99
20) 3-Chloro-1-propene (Al...	7.01	41	910897	26.745	ng		100
21) Trichlorotrifluoroethane	7.19	151	323132	24.270	ng		99
22) Carbon Disulfide	7.15	76	1760471	24.617	ng		100
23) trans-1,2-Dichloroethene	7.90	61	734292	25.226	ng		99
24) 1,1-Dichloroethane	8.12	63	897656	25.475	ng		100
25) Methyl tert-Butyl Ether	8.18	73	1434623	26.399	ng		100
26) Vinyl Acetate	8.29	86	559258	126.409	ng	#	95
27) 2-Butanone (MEK)	8.52	72	344004	22.533	ng		100
28) cis-1,2-Dichloroethene	8.99	61	695406	24.702	ng		98
29) Diisopropyl Ether	9.22	87	381844	26.689	ng		98
30) Ethyl Acetate	9.22	61	395674	52.026	ng		99
31) n-Hexane	9.23	57	922202	25.435	ng		100
32) Chloroform	9.30	83	772637	25.122	ng		99
34) Tetrahydrofuran (THF)	9.68	72	330664	24.321	ng		99
35) Ethyl tert-Butyl Ether	9.77	87	525668	25.919	ng		99
36) 1,2-Dichloroethane	10.04	62	635970	25.246	ng		100
38) 1,1,1-Trichloroethane	10.30	97	668668	25.021	ng		100
39) Isopropyl Acetate	10.67	61	669645	50.527	ng		98
40) 1-Butanol	10.68	56	1227635	50.400	ng		99
41) Benzene	10.76	78	1887161	22.509	ng		100
42) Carbon Tetrachloride	10.91	117	568657	24.493	ng		100
43) Cyclohexane	11.04	84	1441501	48.632	ng		99
44) tert-Amyl Methyl Ether	11.36	73	1325055	26.112	ng		99
45) 1,2-Dichloropropane	11.58	63	518435	25.298	ng		99
46) Bromodichloromethane	11.76	83	631823	25.811	ng		100
47) Trichloroethene	11.82	130	443916	24.440	ng		99
48) 1,4-Dioxane	11.78	88	388247	24.568	ng		99
49) 2,2,4-Trimethylpentane...	11.88	57	2261752	24.943	ng		100

Data File: I:\MS09\Data\2019_06\13\06131905.D
Acq On : 13 Jun 2019 7:55 Operator: SC
Sample : LCS R9061319_25ng
Misc : S31-05131901/S31-05241901 (6/22)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 13 09:37:02 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

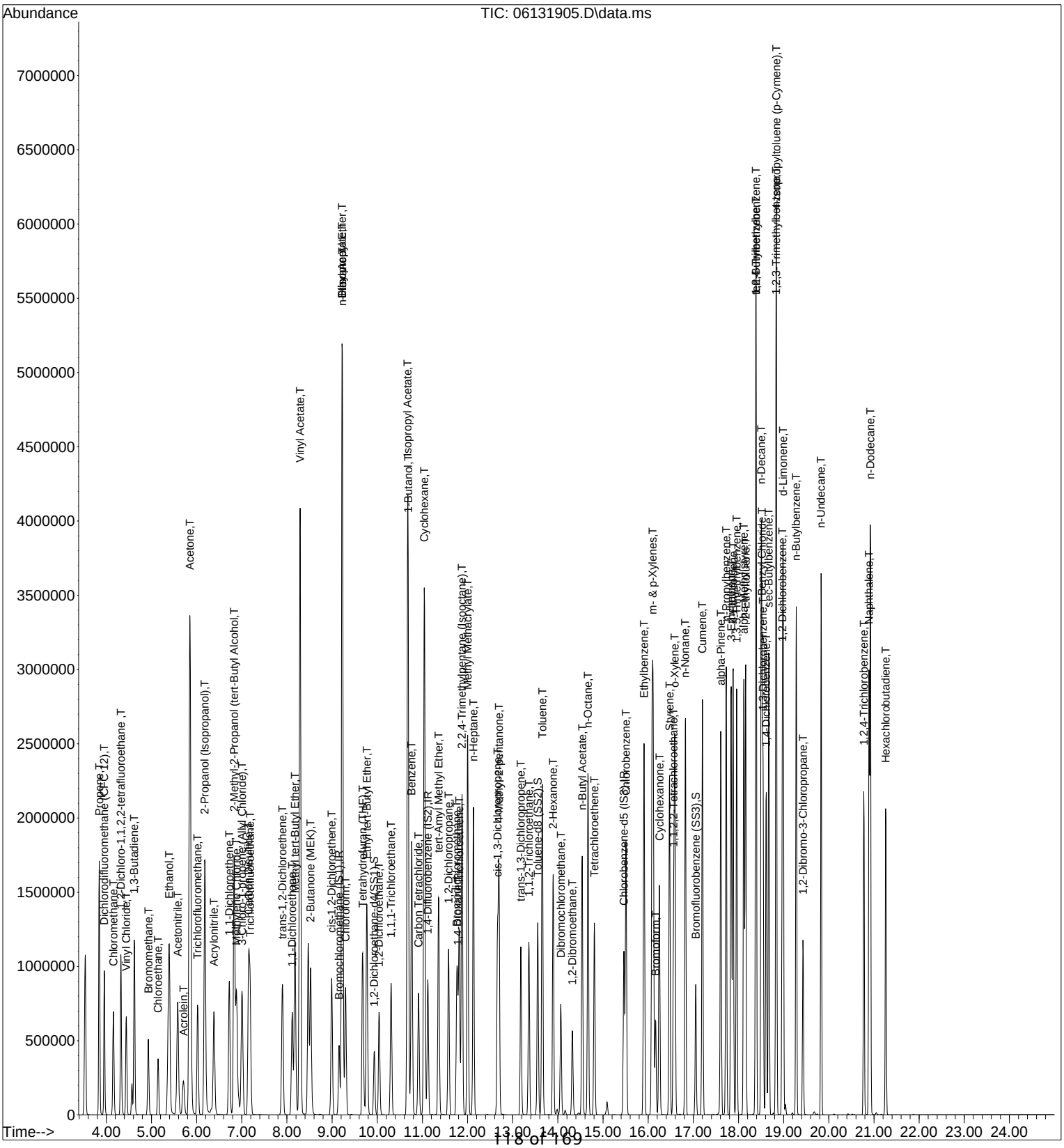
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.00	100	366363	52.431	ng	98
51) n-Heptane	12.13	71	510137	25.184	ng	100
52) cis-1,3-Dichloropropene	12.66	75	812311	26.003	ng	100
53) 4-Methyl-2-pentanone	12.70	58	517782	26.188	ng	99
54) trans-1,3-Dichloropropene	13.18	75	745876	26.707	ng	99
55) 1,1,2-Trichloroethane	13.36	97	432899	25.044	ng	100
58) Toluene	13.65	91	1869844	23.160	ng	100
59) 2-Hexanone	13.90	43	1331392	25.541	ng	100
60) Dibromochloromethane	14.07	129	477978	25.065	ng	100
61) 1,2-Dibromoethane	14.32	107	475935	24.680	ng	100
62) n-Butyl Acetate	14.54	43	1524925	26.442	ng	99
63) n-Octane	14.67	57	476272	24.745	ng	99
64) Tetrachloroethene	14.81	166	436918	23.731	ng	99
65) Chlorobenzene	15.51	112	1165740	23.774	ng	100
66) Ethylbenzene	15.91	91	2142945	23.655	ng	99
67) m- & p-Xylenes	16.10	91	3380042	48.433	ng	99
68) Bromoform	16.17	173	364870	25.478	ng	100
69) Styrene	16.47	104	1291840	25.175	ng	99
70) o-Xylene	16.59	91	1659108	24.134	ng	100
71) n-Nonane	16.82	43	1200544	25.133	ng	99
72) 1,1,2,2-Tetrachloroethane	16.56	83	795378	23.520	ng	100
74) Cumene	17.20	105	2060470	24.041	ng	100
75) alpha-Pinene	17.61	93	1120369	25.355	ng	99
76) n-Propylbenzene	17.73	91	2611992	24.755	ng	99
77) 3-Ethyltoluene	17.84	105	2082085	24.534	ng	96
78) 4-Ethyltoluene	17.88	105	1967319	24.585	ng	97
79) 1,3,5-Trimethylbenzene	17.96	105	1685983	23.922	ng	99
80) alpha-Methylstyrene	18.12	118	940782	28.165	ng	98
81) 2-Ethyltoluene	18.16	105	2009637	24.253	ng	100
82) 1,2,4-Trimethylbenzene	18.39	105	1762487	24.671	ng	100
83) n-Decane	18.50	57	1173685	25.401	ng	99
84) Benzyl Chloride	18.52	91	1682278	27.871	ng	99
85) 1,3-Dichlorobenzene	18.54	146	913338	24.308	ng	100
86) 1,4-Dichlorobenzene	18.61	146	915215	24.156	ng	100
87) sec-Butylbenzene	18.67	105	2292262	24.251	ng	100
88) 4-Isopropyltoluene (p-...	18.84	119	2134368	24.362	ng	99
89) 1,2,3-Trimethylbenzene	18.83	105	1808739	25.266	ng	100
90) 1,2-Dichlorobenzene	18.97	146	883560	24.354	ng	100
91) d-Limonene	18.99	68	837536	27.463	ng	100
92) 1,2-Dibromo-3-Chloropr...	19.43	157	321445	25.637	ng	97
93) n-Undecane	19.83	57	1244916	26.079	ng	99
94) 1,2,4-Trichlorobenzene	20.77	180	658831	25.878	ng	100
95) Naphthalene	20.89	128	2268899	26.884	ng	100
96) n-Dodecane	20.92	57	1269825	31.160	ng	99
97) Hexachlorobutadiene	21.26	225	393899	24.363	ng	99
98) Cyclohexanone	16.25	55	806798	22.594	ng	99
99) tert-Butylbenzene	18.39	119	1656848	24.305	ng	100
100) n-Butylbenzene	19.28	91	1976624	24.770	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\13\06131905.D
Acq On : 13 Jun 2019 7:55 Operator: SC
Sample : LCS R9061319_25ng
Misc : S31-05131901/S31-05241901 (6/22)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 13 09:37:02 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Response Factor Report MS09

Method Path : I:\MS09\Methods\
Method File : R9060719.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Fri Jun 07 14:29:19 2019
Response Via : Initial Calibration

6/7/19

Calibration Files
0.1 =06071903.D 0.2 =06071904.D 0.5 =06071905.D 1.0 =06071906.D 5.0 =06071907.D 25 =06071908.D 50 =06071909.D
100 =06071910.D

		Compound	0.1	0.2	0.5	1.0	5.0	25	50	100	Avg	%RSD
1)	IR	Bromochloromethane...	----------	ISTD	----------							
2)	T	Propene			1.857	1.659	1.387	1.654	1.486	1.575	1.603	10.11
3)	T	Dichlorodifluo...	2.981	2.583	2.570	2.404	1.926	2.273	2.076	1.976	2.349	15.30
4)	T	Chloromethane		2.623	2.552	2.191	1.796	2.222	1.920	1.519	2.117	18.91
5)	T	1,2-Dichloro-1...	1.400	1.143	1.165	1.055	0.831	1.007	0.959	0.944	1.063	16.39
6)	T	Vinyl Chloride	2.585	2.235	2.120	1.965	1.600	1.921	1.777	1.689	1.987	16.19
7)	T	1,3-Butadiene	1.697	1.534	1.547	1.413	1.207	1.519	1.402	1.343	1.458	10.23
8)	T	Bromomethane	1.424	1.248	1.161	0.999	0.858	1.028	0.953	0.900	1.071	17.97
9)	T	Chloroethane	1.242	1.136	1.141	1.008	0.811	0.979	0.901	0.865	1.010	14.99
10)	T	Ethanol	1.602	1.481	1.382	1.253	0.987	1.186	1.056	0.973	1.240	18.84
11)	T	Acetonitrile			3.692	3.407	2.611	3.075	2.775	2.620	3.030	14.70
12)	T	Acrolein	1.265	1.156	1.098	0.986	0.795	0.914	0.822	0.790	0.978	18.36
13)	T	Acetone			1.515	1.370	0.897	1.041	0.922	0.840	1.097	25.41
14)	T	Trichlorofluor...	2.484	2.167	2.186	2.028	1.603	1.900	1.740	1.675	1.973	15.23
15)	T	2-Propanol (Is...	5.107	4.539	4.472	4.191	3.357	4.015	3.590	2.988	4.032	17.22
16)	T	Acrylonitrile	2.462	2.224	2.250	2.097	1.681	2.025	1.851	1.771	2.045	13.01
17)	T	1,1-Dichloroet...	1.564	1.265	1.282	1.162	0.938	1.125	1.055	1.031	1.178	16.51
18)	T	2-Methyl-2-Pro...	4.218	3.769	3.741	3.544	2.829	3.443	3.159	3.004	3.463	13.16
19)	T	Methylene Chlo...	1.634	1.459	1.387	1.285	1.016	1.214	1.131	1.102	1.278	16.10
20)	T	3-Chloro-1-pro...	2.960	2.504	2.572	2.470	1.904	2.350	2.109	1.985	2.357	14.78
21)	T	Trichlorotrifl...	1.132	1.044	0.985	0.932	0.730	0.884	0.836	0.827	0.921	14.09
22)	T	Carbon Disulfide	6.761	5.666	5.270	4.865	3.861	4.673	4.326	4.166	4.948	18.97
23)	T	trans-1,2-Dich...	2.529	2.209	2.212	2.020	1.635	1.970	1.806	1.732	2.014	14.66
24)	T	1,1-Dichloroet...	3.034	2.654	2.644	2.481	2.016	2.399	2.190	2.088	2.438	13.95
25)	T	Methyl tert-Bu...	4.583	4.082	4.082	3.806	3.086	3.706	3.426	3.311	3.760	12.95
26)	T	Vinyl Acetate	0.369	0.312	0.340	0.318	0.247	0.304	0.285	0.274	0.306	12.47
27)	T	2-Butanone (MEK)	1.351	1.241	1.257	1.155	0.778	0.942	0.880	0.846	1.056	20.76
28)	T	cis-1,2-Dichlo...	2.482	2.163	2.125	1.953	1.574	1.891	1.736	1.659	1.948	15.45
29)	T	Diisopropyl Ether			1.192	1.057	0.828	1.010	0.942	0.911	0.990	12.82
30)	T	Ethyl Acetate	0.620	0.580	0.579	0.541	0.459	0.524	0.476	0.430	0.526	12.64
31)	T	n-Hexane	3.263	2.885	2.754	2.563	2.049	2.433	2.178	1.945	2.509	17.95
32)	T	Chloroform	2.667	2.394	2.317	2.128	1.727	2.067	1.902	1.823	2.128	14.92
33)	S	1,2-Dichloroet...	1.784	1.816	1.849	1.869	1.873	1.850	1.792	1.742	1.822	2.56
34)	T	Tetrahydrofura...	1.246	1.083	1.012	0.937	0.736	0.889	0.828	0.795	0.941	17.85
35)	T	Ethyl tert-But...	1.667	1.493	1.531	1.429	1.130	1.395	1.305	1.277	1.403	11.89
36)	T	1,2-Dichloroet...	2.174	1.914	1.949	1.772	1.424	1.704	1.543	1.464	1.743	15.01
37)	IR	1,4-Difluorobenzen...	----------	ISTD	----------							
38)	T	1,1,1-Trichlor...	0.512	0.440	0.441	0.404	0.330	0.403	0.375	0.365	0.409	13.72
39)	T	Isopropyl Acetate	0.241	0.214	0.222	0.205	0.168	0.204	0.189	0.179	0.203	11.67
40)	T	1-Butanol	0.481	0.409	0.399	0.379	0.298	0.363	0.335	0.316	0.372	15.80
41)	T	Benzene	1.840	1.587	1.380	1.234	0.969	1.147	1.068	1.031	1.282	23.60
42)	T	Carbon Tetrach...	0.431	0.387	0.371	0.359	0.287	0.353	0.330	0.323	0.355	12.33

6/7/19

00942922

Method Path : I:\MS09\Methods\
Method File : R9060719.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

43)	T	Cyclohexane	0.582	0.496	0.486	0.444	0.366	0.441	0.412	0.399	0.453	14.90
44)	T	tert-Amyl Meth...	0.956	0.831	0.844	0.768	0.625	0.767	0.718	0.699	0.776	13.10
45)	T	1,2-Dichloropr...	0.390	0.341	0.343	0.317	0.252	0.307	0.284	0.273	0.313	14.13
46)	T	Bromodichlorom...	0.448	0.409	0.397	0.370	0.306	0.374	0.350	0.341	0.374	11.74
47)	T	Trichloroethene	0.372	0.313	0.295	0.270	0.213	0.262	0.250	0.247	0.278	17.51
48)	T	1,4-Dioxane	0.299	0.265	0.269	0.245	0.186	0.233	0.220	0.216	0.242	14.68
49)	T	2,2,4-Trimethy...	1.793	1.538	1.504	1.408	1.131	1.345	1.226	1.148	1.387	16.17
50)	T	Methyl Methacr...	0.120	0.108	0.115	0.107	0.088	0.109	0.104	0.102	0.107	8.92
51)	T	n-Heptane	0.394	0.340	0.335	0.308	0.249	0.301	0.280	0.271	0.310	14.82
52)	T	cis-1,3-Dichlo...	0.576	0.492	0.500	0.466	0.394	0.491	0.458	0.443	0.478	10.96
53)	T	4-Methyl-2-pen...	0.358	0.315	0.322	0.310	0.253	0.307	0.283	0.271	0.302	10.87
54)	T	trans-1,3-Dich...	0.485	0.417	0.445	0.424	0.358	0.453	0.423	0.411	0.427	8.62
55)	T	1,1,2-Trichlor...	0.321	0.298	0.282	0.260	0.210	0.259	0.244	0.240	0.264	13.26
56)	IR	Chlorobenzene-d5 (...	----------ISTD----------									
57)	S	Toluene-d8 (SS2)	2.362	2.360	2.342	2.327	2.308	2.306	2.329	2.319	2.332	0.92
58)	T	Toluene	3.197	2.673	2.499	2.238	1.814	2.150	2.045	1.969	2.323	19.37
59)	T	2-Hexanone	1.889	1.641	1.652	1.562	1.220	1.457	1.337	1.241	1.500	15.37
60)	T	Dibromochlorom...	0.674	0.587	0.575	0.532	0.437	0.544	0.525	0.516	0.549	12.36
61)	T	1,2-Dibromoethane	0.721	0.598	0.589	0.538	0.435	0.538	0.514	0.505	0.555	15.20
62)	T	n-Butyl Acetate	2.034	1.797	1.827	1.725	1.367	1.633	1.502	1.390	1.659	13.96
63)	T	n-Octane	0.739	0.636	0.588	0.547	0.438	0.525	0.492	0.466	0.554	17.76
64)	T	Tetrachloroethene	0.675	0.577	0.579	0.517	0.407	0.505	0.491	0.488	0.530	15.12
65)	T	Chlorobenzene	1.881	1.578	1.490	1.391	1.096	1.329	1.275	1.248	1.411	17.07
66)	T	Ethylbenzene	3.431	2.871	2.753	2.571	2.068	2.496	2.378	2.286	2.607	16.07
67)	T	m- & p-Xylenes	2.664	2.207	2.125	1.950	1.590	1.926	1.838	1.766	2.008	16.36
68)	T	Bromoform	0.473	0.423	0.415	0.391	0.328	0.428	0.419	0.419	0.412	9.93
69)	T	Styrene	1.802	1.584	1.526	1.417	1.204	1.478	1.418	1.383	1.477	11.74
70)	T	o-Xylene	2.607	2.207	2.100	1.940	1.560	1.885	1.794	1.732	1.978	16.46
71)	T	n-Nonane	1.796	1.569	1.507	1.402	1.122	1.321	1.198	1.082	1.375	17.76
72)	T	1,1,2,2-Tetrac...	1.232	1.071	1.031	0.962	0.772	0.944	0.898	0.874	0.973	14.35
73)	S	Bromofluoroben...	0.627	0.620	0.619	0.620	0.622	0.628	0.632	0.635	0.625	0.96
74)	T	Cumene	3.213	2.798	2.633	2.433	1.944	2.345	2.228	2.136	2.466	16.44
75)	T	alpha-Pinene	1.522	1.325	1.330	1.251	1.052	1.279	1.224	1.187	1.271	10.60
76)	T	n-Propylbenzene	3.999	3.340	3.251	3.063	2.415	2.909	2.739	2.574	3.036	16.57
77)	T	3-Ethyltoluene	3.159	2.687	2.597	2.406	1.941	2.299	2.255	2.191	2.442	15.23
78)	T	4-Ethyltoluene	3.007	2.509	2.455	2.301	1.825	2.284	2.086	1.953	2.303	16.09
79)	T	1,3,5-Trimethy...	2.688	2.216	2.182	2.009	1.593	1.934	1.836	1.767	2.028	16.65
80)	T	alpha-Methylst...	1.063	0.941	0.975	0.900	0.862	1.019	0.975	0.954	0.961	6.58
81)	T	2-Ethyltoluene	3.132	2.653	2.561	2.377	1.889	2.273	2.144	2.045	2.384	16.57
82)	T	1,2,4-Trimethy...	2.684	2.255	2.149	2.021	1.607	2.008	1.915	1.806	2.056	15.71
83)	T	n-Decane	1.695	1.514	1.466	1.348	1.077	1.290	1.181	1.065	1.330	16.68
84)	T	Benzyl Chloride	1.871	1.637	1.688	1.642	1.476	1.935	1.862	1.784	1.737	8.82
85)	T	1,3-Dichlorobe...	1.413	1.178	1.154	1.049	0.842	1.040	0.995	0.978	1.081	15.74
86)	T	1,4-Dichlorobe...	1.457	1.228	1.133	1.035	0.841	1.053	0.999	0.975	1.090	17.10
87)	T	sec-Butylbenzene	3.531	3.014	2.957	2.759	2.181	2.602	2.434	2.281	2.720	16.33
88)	T	4-Isopropyltol...	3.315	2.802	2.724	2.503	1.989	2.436	2.295	2.104	2.521	16.87
89)	T	1,2,3-Trimethy...	2.589	2.267	2.198	2.050	1.628	2.026	1.921	1.801	2.060	14.40
90)	T	1,2-Dichlorobe...	1.398	1.122	1.109	1.018	0.811	0.999	0.958	0.936	1.044	16.67
91)	T	d-Limonene	0.982	0.888	0.908	0.851	0.778	0.938	0.872	0.804	0.878	7.66
92)	T	1,2-Dibromo-3-...	0.411	0.363	0.381	0.354	0.295	0.374	0.357	0.351	0.361	9.14
93)	T	n-Undecane	1.705	1.516	1.457	1.392	1.137	1.375	1.259	1.148	1.374	13.96
94)	T	1,2,4-Trichlor...	0.943	0.758	0.724	0.656	0.551	0.761	0.737	0.731	0.733	15.02

00942923

Method Path : I:\MS09\Methods\
Method File : R9060719.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)

95)	T	Naphthalene	2.856	2.341	2.279	2.105	1.987	2.772	2.622	2.466	2.428	12.73
96)	T	n-Dodecane	1.259	1.143	1.153	1.088	1.104	1.322	1.210	1.102	1.173	7.15
97)	T	Hexachlorobuta...	0.576	0.476	0.499	0.454	0.352	0.462	0.450	0.454	0.465	13.32
98)	T	Cyclohexanone	1.352	1.169	1.148	1.075	0.798	0.946	0.890	0.844	1.028	18.55
99)	T	tert-Butylbenzene	2.578	2.207	2.096	1.924	1.537	1.878	1.785	1.687	1.962	16.73
100)	T	n-Butylbenzene	2.932	2.475	2.503	2.322	1.853	2.240	2.087	1.957	2.296	15.07

(#) = Out of Range

Primary Source Standards Concentrations (Working & Initial Calibration)

6/11/19

1ng/L Std. ID:
4ng/L Std. ID: S31-05201906
20ng/L Std. ID: S31-06061905
200ng/L Std. ID: S31-05311906

Dilution Factors:		5	50	250	1000	Working STD Conc.(ng/L):	4	4	4	20	200	200	200	200
	Source Std.	Primary Working Standards				Injection (L):	0.025	0.050	0.125	0.050	0.025	0.125	0.25	0.50
Compounds	mg/m^3	200ng/L	20ng/L	4ng/L	1ng/L	ICAL Points:	0.1ng	0.2ng	0.5ng	1ng	5ng	25ng	50ng	100ng
Propene	1.031	206.2	20.62	4.124	1.031		0.1031	0.2062	0.5155	1.031	5.155	25.775	51.55	103.1
Dichlorodifluoromethane	1.045	209.0	20.90	4.180	1.045		0.1045	0.2090	0.5225	1.045	5.225	26.125	52.25	104.5
Chloromethane	1.008	201.6	20.16	4.032	1.008		0.1008	0.2016	0.5040	1.008	5.040	25.200	50.40	100.8
Freon-114	1.028	205.6	20.56	4.112	1.028		0.1028	0.2056	0.5140	1.028	5.140	25.700	51.40	102.8
Vinyl Chloride	1.051	210.2	21.02	4.204	1.051		0.1051	0.2102	0.5255	1.051	5.255	26.275	52.55	105.1
1,3-Butadiene	1.049	209.8	20.98	4.196	1.049		0.1049	0.2098	0.5245	1.049	5.245	26.225	52.45	104.9
Bromomethane	1.009	201.8	20.18	4.036	1.009		0.1009	0.2018	0.5045	1.009	5.045	25.225	50.45	100.9
Chloroethane	1.022	204.4	20.44	4.088	1.022		0.1022	0.2044	0.5110	1.022	5.110	25.550	51.10	102.2
Ethanol	5.140	1028.0	102.80	20.560	5.140		0.5140	1.0280	2.5700	5.140	25.700	128.500	257.00	514.0
Acetonitrile	1.033	206.6	20.66	4.132	1.033		0.1033	0.2066	0.5165	1.033	5.165	25.825	51.65	103.3
Acrolein	1.028	205.6	20.56	4.112	1.028		0.1028	0.2056	0.5140	1.028	5.140	25.700	51.40	102.8
Acetone	5.370	1074.0	107.40	21.480	5.370		0.5370	1.0740	2.6850	5.370	26.850	134.250	268.50	537.0
Trichlorofluoromethane	1.060	212.0	21.20	4.240	1.060		0.1060	0.2120	0.5300	1.060	5.300	26.500	53.00	106.0
Isopropanol	2.063	412.6	41.26	8.252	2.063		0.2063	0.4126	1.0315	2.063	10.315	51.575	103.15	206.3
Acrylonitrile	1.034	206.8	20.68	4.136	1.034		0.1034	0.2068	0.5170	1.034	5.170	25.850	51.70	103.4
1,1-Dichloroethene	1.074	214.8	21.48	4.296	1.074		0.1074	0.2148	0.5370	1.074	5.370	26.850	53.70	107.4
tert-Butanol	2.144	428.8	42.88	8.576	2.144		0.2144	0.4288	1.0720	2.144	10.720	53.600	107.20	214.4
Methylene Chloride	1.070	214.0	21.40	4.280	1.070		0.1070	0.2140	0.5350	1.070	5.350	26.750	53.50	107.0
Allyl Chloride	1.067	213.4	21.34	4.268	1.067		0.1067	0.2134	0.5335	1.067	5.335	26.675	53.35	106.7
Trichlorotrifluoroethane	1.065	213.0	21.30	4.260	1.065		0.1065	0.2130	0.5325	1.065	5.325	26.625	53.25	106.5
Carbon Disulfide	1.075	215.0	21.50	4.300	1.075		0.1075	0.2150	0.5375	1.075	5.375	26.875	53.75	107.5
trans-1,2-Dichloroethene	1.062	212.4	21.24	4.248	1.062		0.1062	0.2124	0.5310	1.062	5.310	26.550	53.10	106.2
1,1-Dichloroethane	1.030	206.0	20.60	4.120	1.030		0.1030	0.2060	0.5150	1.030	5.150	25.750	51.50	103.0
Methyl tert-Butyl Ether	1.089	217.8	21.78	4.356	1.089		0.1089	0.2178	0.5445	1.089	5.445	27.225	54.45	108.9
Vinyl Acetate	5.252	1050.4	105.04	21.008	5.252		0.5252	1.0504	2.6260	5.252	26.260	131.300	262.60	525.2
2-Butanone	1.027	205.4	20.54	4.108	1.027		0.1027	0.2054	0.5135	1.027	5.135	25.675	51.35	102.7
cis-1,2-Dichloroethene	1.054	210.8	21.08	4.216	1.054		0.1054	0.2108	0.5270	1.054	5.270	26.350	52.70	105.4
Diisopropyl Ether	1.081	216.2	21.62	4.324	1.081		0.1081	0.2162	0.5405	1.081	5.405	27.025	54.05	108.1
Ethyl Acetate	2.166	433.2	43.32	8.664	2.166		0.2166	0.4332	1.0830	2.166	10.830	54.150	108.30	216.6
n-Hexane	1.082	216.4	21.64	4.328	1.082		0.1082	0.2164	0.5410	1.082	5.410	27.050	54.10	108.2
Chloroform	1.077	215.4	21.54	4.308	1.077		0.1077	0.2154	0.5385	1.077	5.385	26.925	53.85	107.7
Tetrahydrofuran	1.068	213.6	21.36	4.272	1.068		0.1068	0.2136	0.5340	1.068	5.340	26.700	53.40	106.8
Ethyl tert-Butyl Ether	1.060	212.0	21.20	4.240	1.060		0.1060	0.2120	0.5300	1.060	5.300	26.500	53.00	106.0
1,2-Dichloroethane	1.061	212.2	21.22	4.244	1.061		0.1061	0.2122	0.5305	1.061	5.305	26.525	53.05	106.1
1,1,1-Trichloroethane	1.081	216.2	21.62	4.324	1.081		0.1081	0.2162	0.5405	1.081	5.405	27.025	54.05	108.1
Isopropyl Acetate	2.066	413.2	41.32	8.264	2.066		0.2066	0.4132	1.0330	2.066	10.330	51.650	103.30	206.6
1-Butanol	2.067	413.4	41.34	8.268	2.067		0.2067	0.4134	1.0335	2.067	10.335	51.675	103.35	206.7
Benzene	1.033	206.6	20.66	4.132	1.033		0.1033	0.2066	0.5165	1.033	5.165	25.825	51.65	103.3
Carbon Tetrachloride	1.036	207.2	20.72	4.144	1.036		0.1036	0.2072	0.5180	1.036	5.180	25.900	51.80	103.6
Cyclohexane	2.087	417.4	41.74	8.348	2.087		0.2087	0.4174	1.0435	2.087	10.435	52.175	104.35	208.7
tert-Amyl Methyl Ether	1.074	214.8	21.48	4.296	1.074		0.1074	0.2148	0.5370	1.074	5.370	26.850	53.70	107.4
1,2-Dichloropropane	1.073	214.6	21.46	4.292	1.073		0.1073	0.2146	0.5365	1.073	5.365	26.825	53.65	107.3
Bromodichloromethane	1.068	213.6	21.36	4.272	1.068		0.1068	0.2136	0.5340	1.068	5.340	26.700	53.40	106.8
Trichloroethene	1.062	212.4	21.24	4.248	1.062		0.1062	0.2124	0.5310	1.062	5.310	26.550	53.10	106.2
1,4-Dioxane	1.064	212.8	21.28	4.256	1.064		0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4
Isooctane	1.061	212.2	21.22	4.244	1.061		0.1061	0.2122	0.5305	1.061	5.305	26.525	53.05	106.1
Methyl Methacrylate	2.135	427.0	42.70	8.540	2.135		0.2135	0.4270	1.0675	2.135	10.675	53.375	106.75	213.5
n-Heptane	1.076	215.2	21.52	4.304	1.076		0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6

Q:\TO15 Std. Concentrations\MS09 Std. Conc\2019\R9060719\ICAL Conc. (Primary Source)

Date Updated: 08/22/18
Version: 0

00942925

Primary Source Standards Concentrations (Working & Initial Calibration)

1ng/L Std. ID:
4ng/L Std. ID: S31-05201906
20ng/L Std. ID: S31-06061905
200ng/L Std. ID: S31-05311906

Dilution Factors:		5	50	250	1000	Working STD Conc.(ng/L):	4	4	4	20	200	200	200	200
	Source Std.	Primary Working Standards				Injection (L):	0.025	0.050	0.125	0.050	0.025	0.125	0.25	0.50
Compounds	mg/m^3	200ng/L	20ng/L	4ng/L	1ng/L	ICAL Points:	0.1ng	0.2ng	0.5ng	1ng	5ng	25ng	50ng	100ng
cis-1,3-Dichloropropene	1.120	224.0	22.40	4.480	1.120		0.1120	0.2240	0.5600	1.120	5.600	28.000	56.00	112.0
4-Methyl-2-pentanone	1.060	212.0	21.20	4.240	1.060		0.1060	0.2120	0.5300	1.060	5.300	26.500	53.00	106.0
trans-1,3-Dichloropropene	1.055	211.0	21.10	4.220	1.055		0.1055	0.2110	0.5275	1.055	5.275	26.375	52.75	105.5
1,1,2-Trichloroethane	1.076	215.2	21.52	4.304	1.076		0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
Toluene	1.052	210.4	21.04	4.208	1.052		0.1052	0.2104	0.5260	1.052	5.260	26.300	52.60	105.2
2-Hexanone	1.074	214.8	21.48	4.296	1.074		0.1074	0.2148	0.5370	1.074	5.370	26.850	53.70	107.4
Dibromochloromethane	1.075	215.0	21.50	4.300	1.075		0.1075	0.2150	0.5375	1.075	5.375	26.875	53.75	107.5
1,2-Dibromoethane	1.076	215.2	21.52	4.304	1.076		0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
n-Butyl Acetate	1.085	217.0	21.70	4.340	1.085		0.1085	0.2170	0.5425	1.085	5.425	27.125	54.25	108.5
n-Octane	1.076	215.2	21.52	4.304	1.076		0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
Tetrachloroethene	1.058	211.6	21.16	4.232	1.058		0.1058	0.2116	0.5290	1.058	5.290	26.450	52.90	105.8
Chlorobenzene	1.066	213.2	21.32	4.264	1.066		0.1066	0.2132	0.5330	1.066	5.330	26.650	53.30	106.6
Ethylbenzene	1.033	206.6	20.66	4.132	1.033		0.1033	0.2066	0.5165	1.033	5.165	25.825	51.65	103.3
m-&p-Xylene	2.123	424.6	42.46	8.492	2.123		0.2123	0.4246	1.0615	2.123	10.615	53.075	106.15	212.3
Bromoform	1.063	212.6	21.26	4.252	1.063		0.1063	0.2126	0.5315	1.063	5.315	26.575	53.15	106.3
Styrene	1.060	212.0	21.20	4.240	1.060		0.1060	0.2120	0.5300	1.060	5.300	26.500	53.00	106.0
o-Xylene	1.062	212.4	21.24	4.248	1.062		0.1062	0.2124	0.5310	1.062	5.310	26.550	53.10	106.2
n-Nonane	1.071	214.2	21.42	4.284	1.071		0.1071	0.2142	0.5355	1.071	5.355	26.775	53.55	107.1
1,1,2,2-Tetrachloroethane	1.064	212.8	21.28	4.256	1.064		0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4
Cumene	1.057	211.4	21.14	4.228	1.057		0.1057	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7
alpha-Pinene	1.035	207.0	20.70	4.140	1.035		0.1035	0.2070	0.5175	1.035	5.175	25.875	51.75	103.5
n-Propylbenzene	1.076	215.2	21.52	4.304	1.076		0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
3-Ethyltoluene	1.062	212.4	21.24	4.248	1.062		0.1062	0.2124	0.5310	1.062	5.310	26.550	53.10	106.2
4-Ethyltoluene	1.061	212.2	21.22	4.244	1.061		0.1061	0.2122	0.5305	1.061	5.305	26.525	53.05	106.1
1,3,5-Trimethylbenzene	1.057	211.4	21.14	4.228	1.057		0.1057	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7
alpha-Methylstyrene	1.058	211.6	21.16	4.232	1.058		0.1058	0.2116	0.5290	1.058	5.290	26.450	52.90	105.8
2-Ethyltoluene	1.072	214.4	21.44	4.288	1.072		0.1072	0.2144	0.5360	1.072	5.360	26.800	53.60	107.2
1,2,4-Trimethylbenzene	1.068	213.6	21.36	4.272	1.068		0.1068	0.2136	0.5340	1.068	5.340	26.700	53.40	106.8
n-Decane	1.076	215.2	21.52	4.304	1.076		0.1076	0.2152	0.5380	1.076	5.380	26.900	53.80	107.6
Benzyl Chloride	1.051	210.2	21.02	4.204	1.051		0.1051	0.2102	0.5255	1.051	5.255	26.275	52.55	105.1
1,3-Dichlorobenzene	1.080	216.0	21.60	4.320	1.080		0.1080	0.2160	0.5400	1.080	5.400	27.000	54.00	108.0
1,4-Dichlorobenzene	1.081	216.2	21.62	4.324	1.081		0.1081	0.2162	0.5405	1.081	5.405	27.025	54.05	108.1
sec-Butylbenzene	1.063	212.6	21.26	4.252	1.063		0.1063	0.2126	0.5315	1.063	5.315	26.575	53.15	106.3
p-Isopropyltoluene	1.042	208.4	20.84	4.168	1.042		0.1042	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2
1,2,3-Trimethylbenzene	1.042	208.4	20.84	4.168	1.042		0.1042	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2
1,2-Dichlorobenzene	1.089	217.8	21.78	4.356	1.089		0.1089	0.2178	0.5445	1.089	5.445	27.225	54.45	108.9
d-Limonene	1.010	202.0	20.20	4.040	1.010		0.1010	0.2020	0.5050	1.010	5.050	25.250	50.50	101.0
1,2-Dibromo-3-chloropropane	1.042	208.4	20.84	4.168	1.042		0.1042	0.2084	0.5210	1.042	5.210	26.050	52.10	104.2
n-Undecane	1.057	211.4	21.14	4.228	1.057		0.1057	0.2114	0.5285	1.057	5.285	26.425	52.85	105.7
1,2,4-Trichlorobenzene	1.064	212.8	21.28	4.256	1.064		0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4
Naphthalene	1.025	205.0	20.50	4.100	1.025		0.1025	0.2050	0.5125	1.025	5.125	25.625	51.25	102.5
n-Dodecane	1.031	206.2	20.62	4.124	1.031		0.1031	0.2062	0.5155	1.031	5.155	25.775	51.55	103.1
Hexachloro-1,3-butadiene	1.053	210.6	21.06	4.212	1.053		0.1053	0.2106	0.5265	1.053	5.265	26.325	52.65	105.3
Methacrylonitrile	1.041	208.2	20.82	4.164	1.041		0.1041	0.2082	0.5205	1.041	5.205	26.025	52.05	104.1
Cyclohexanone	0.982	196.4	19.64	3.928	0.982		0.0982	0.1964	0.4910	0.982	4.910	24.550	49.10	98.2
tert-Butylbenzene	1.067	213.4	21.34	4.268	1.067		0.1067	0.2134	0.5335	1.067	5.335	26.675	53.35	106.7
n-Butylbenzene	1.064	212.8	21.28	4.256	1.064		0.1064	0.2128	0.5320	1.064	5.320	26.600	53.20	106.4

Q:\TO15 Std. Concentrations\MS09 Std. Conc\2019\R9060719\ICAL Conc. (Primary Source)

Calibration Status Report MS09

Method : I:\MS09\Methods\R9060719.M (RTE Integrator)
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration

6/7/19

#	ID	Conc	ISTD Conc	Path\File
1	0.1	0	13	I:\MS09\Data\2019_06\07\06071903.D
2	0.2	0	13	I:\MS09\Data\2019_06\07\06071904.D
3	0.5	1	13	I:\MS09\Data\2019_06\07\06071905.D
4	1.0	1	13	I:\MS09\Data\2019_06\07\06071906.D
5	5.0	5	13	I:\MS09\Data\2019_06\07\06071907.D
6	25	26	13	I:\MS09\Data\2019_06\07\06071908.D
7	50	52	13	I:\MS09\Data\2019_06\07\06071909.D
8	100	103	13	I:\MS09\Data\2019_06\07\06071910.D

#	ID	Update Time	Quant Time	Acquisition Time
1	0.1	Jun 07 14:27 2019	Jun 07 13:45 2019	7 Jun 2019 10:04
2	0.2	Jun 07 14:27 2019	Jun 07 13:42 2019	7 Jun 2019 10:38
3	0.5	Jun 07 14:28 2019	Jun 07 13:41 2019	7 Jun 2019 11:11
4	1.0	Jun 07 14:28 2019	Jun 07 13:39 2019	7 Jun 2019 11:45
5	5.0	Jun 07 14:28 2019	Jun 07 13:38 2019	7 Jun 2019 12:18
6	25	Jun 07 14:28 2019	Jun 07 13:36 2019	7 Jun 2019 12:52
7	50	Jun 07 14:29 2019	Jun 07 13:52 2019	7 Jun 2019 13:25
8	100	Jun 07 14:29 2019	Jun 07 14:25 2019	7 Jun 2019 13:59

R9060719.M Fri Jun 07 16:40:59 2019

Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\07\06071903.D
Acq On : 7 Jun 2019 10:04 Operator: SC
Sample : 0.1ng TO-15 ICAL STD
Misc : S31-05131901/S31-05201906 (6/18)
ALS Vial : 4 Sample Multiplier: 1

6/7/19

Quant Time: Jun 07 13:45:26 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.13	130	191585	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	11.11	114	868994	12.500	ng		-0.01
56) Chlorobenzene-d5 (IS3)	15.46	82	438211	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.91	65	341706	14.134	ng		-0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 113.04%				
57) Toluene-d8 (SS2)	13.55	98	1035076	11.966	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 95.76%				
73) Bromofluorobenzene (SS3)	17.05	174	274803	12.044	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 96.32%				
Target Compounds							Qvalue
2) Propene	3.88	42	3893	0.196	ng		98
3) Dichlorodifluoromethan...	3.98	85	4774	0.135	ng		98
4) Chloromethane	4.17	50	4452	0.153	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.34	135	2206	0.131	ng		91
6) Vinyl Chloride	4.45	62	4164	0.153	ng		98
7) 1,3-Butadiene	4.63	54	2728	0.169	ng		93
8) Bromomethane	4.94	94	2202	0.129	ng		98
9) Chloroethane	5.16	64	1945	0.136	ng		97
10) Ethanol	5.33	45	12622	0.846	ng		95
11) Acetonitrile	5.55	41	7275	0.209	ng		80
12) Acrolein	5.70	56	1993	0.170	ng		94
13) Acetone	5.85	58	17604	1.291	ng		92
14) Trichlorofluoromethane	6.03	101	4035	0.142	ng		96
15) 2-Propanol (Isopropanol)	6.16	45	16148	0.344	ng		97
16) Acrylonitrile	6.35	53	3902	0.148	ng		95
17) 1,1-Dichloroethene	6.72	96	2575	0.141	ng		93
18) 2-Methyl-2-Propanol (t...	6.87	59	13862	0.302	ng		98
19) Methylene Chloride	6.85	84	2679	0.133	ng		96
20) 3-Chloro-1-propene (Al...	6.99	41	4840	0.202	ng		93
21) Trichlorotrifluoroethane	7.19	151	1848	0.142	ng		96
22) Carbon Disulfide	7.15	76	11139	0.163	ng		100
23) trans-1,2-Dichloroethene	7.87	61	4116	0.147	ng		96
24) 1,1-Dichloroethane	8.09	63	4790	0.141	ng		100
25) Methyl tert-Butyl Ether	8.20	73	7650	0.130	ng		98
26) Vinyl Acetate	8.28	86	2972	0.756	ng	#	93
27) 2-Butanone (MEK)	8.54	72	2127	0.151	ng	#	88
28) cis-1,2-Dichloroethene	8.97	61	4009	0.151	ng		98
29) Diisopropyl Ether	9.23	87	2627	0.151	ng	#	60
30) Ethyl Acetate	9.23	61	2058	0.310	ng		96
31) n-Hexane	9.22	57	5412	0.157	ng		99
32) Chloroform	9.27	83	4402	0.131	ng		99
34) Tetrahydrofuran (THF)	9.70	72	2040	0.147	ng		96
35) Ethyl tert-Butyl Ether	9.78	87	2708	0.114	ng		98
36) 1,2-Dichloroethane	10.02	62	3535	0.147	ng		100
38) 1,1,1-Trichloroethane	10.29	97	3846	0.133	ng		96
39) Isopropyl Acetate	10.68	61	3457	0.281	ng	#	91
40) 1-Butanol	10.70	56	6919	0.364	ng		99
41) Benzene	10.75	78	13215	0.156	ng		97
42) Carbon Tetrachloride	10.90	117	3106	0.132	ng		98
43) Cyclohexane	11.04	84	8441	0.269	ng		99
44) tert-Amyl Methyl Ether	11.37	73	7137	0.128	ng		96
45) 1,2-Dichloropropane	11.56	63	2906	0.148	ng		99
46) Bromodichloromethane	11.75	83	3324	0.126	ng		99
47) Trichloroethene	11.80	130	2744	0.134	ng		96
48) 1,4-Dioxane	11.80	88	2211	0.135	ng		91
49) 2,2,4-Trimethylpentane...	11.87	57	13222	0.157	ng		99

Data File: I:\MS09\Data\2019_06\07\06071903.D
Acq On : 7 Jun 2019 10:04 Operator: SC
Sample : 0.1ng TO-15 ICAL STD
Misc : S31-05131901/S31-05201906 (6/18)
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jun 07 13:45:26 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

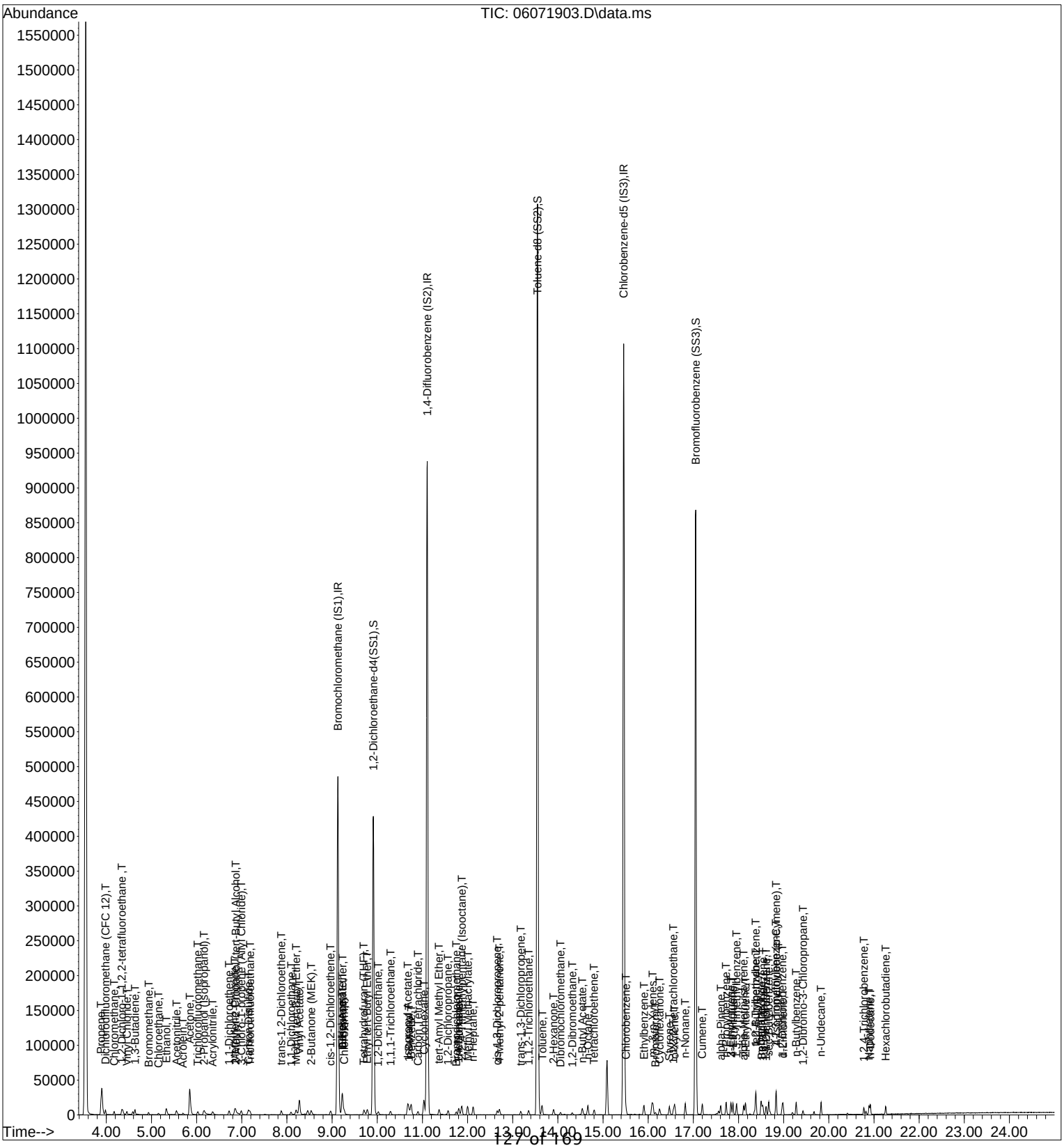
Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
50) Methyl Methacrylate	12.00	100	1782	0.229	ng	#	89
51) n-Heptane	12.12	71	2947	0.139	ng		99
52) cis-1,3-Dichloropropene	12.65	75	4485	0.144	ng		99
53) 4-Methyl-2-pentanone	12.71	58	2639	0.145	ng		90
54) trans-1,3-Dichloropropene	13.18	75	3560	0.134	ng		94
55) 1,1,2-Trichloroethane	13.35	97	2400	0.124	ng		96
58) Toluene	13.65	91	11792	0.130	ng		97
59) 2-Hexanone	13.90	43	7113	0.183	ng		94
60) Dibromochloromethane	14.06	129	2539	0.118	ng		97
61) 1,2-Dibromoethane	14.32	107	2721	0.126	ng		98
62) n-Butyl Acetate	14.54	43	7737	0.181	ng		98
63) n-Octane	14.67	57	2786	0.145	ng		96
64) Tetrachloroethene	14.80	166	2504	0.115	ng		97
65) Chlorobenzene	15.51	112	7028	0.128	ng		99
66) Ethylbenzene	15.91	91	12424	0.123	ng		97
67) m- & p-Xylenes	16.10	91	19825	0.254	ng		97
68) Bromoform	16.16	173	1763	0.106	ng		97
69) Styrene	16.47	104	6697	0.113	ng		99
70) o-Xylene	16.58	91	9707	0.125	ng		98
71) n-Nonane	16.82	43	6744	0.176	ng		100
72) 1,1,2,2-Tetrachloroethane	16.56	83	4594	0.128	ng		99
74) Cumene	17.19	105	11906	0.123	ng		100
75) alpha-Pinene	17.61	93	5524	0.113	ng		96
76) n-Propylbenzene	17.72	91	15086	0.131	ng		98
77) 3-Ethyltoluene	17.83	105	11761	0.125	ng		97
78) 4-Ethyltoluene	17.88	105	11186	0.125	ng		98
79) 1,3,5-Trimethylbenzene	17.95	105	9959	0.123	ng		98
80) alpha-Methylstyrene	18.11	118	3943	0.097	ng		93
81) 2-Ethyltoluene	18.15	105	11770	0.128	ng		98
82) 1,2,4-Trimethylbenzene	18.38	105	10049	0.130	ng		98
83) n-Decane	18.50	57	6394	0.150	ng		97
84) Benzyl Chloride	18.51	91	6892	0.120	ng		95
85) 1,3-Dichlorobenzene	18.54	146	5350	0.132	ng		99
86) 1,4-Dichlorobenzene	18.61	146	5522	0.133	ng		100
87) sec-Butylbenzene	18.67	105	13158	0.125	ng		99
88) 4-Isopropyltoluene (p-...	18.83	119	12109	0.125	ng		97
89) 1,2,3-Trimethylbenzene	18.83	105	9456	0.122	ng		98
90) 1,2-Dichlorobenzene	18.97	146	5338	0.137	ng		99
91) d-Limonene	18.99	68	3476	0.110	ng		99
92) 1,2-Dibromo-3-Chloropr...	19.43	157	1501	0.111	ng		88
93) n-Undecane	19.83	57	6317	0.157	ng		97
94) 1,2,4-Trichlorobenzene	20.77	180	3519	0.135	ng		98
95) Naphthalene	20.89	128	10261	0.121	ng		97
96) n-Dodecane	20.92	57	4550	0.159	ng		99
97) Hexachlorobutadiene	21.26	225	2126	0.115	ng		98
98) Cyclohexanone	16.25	55	4654	0.155	ng		98
99) tert-Butylbenzene	18.38	119	9644	0.129	ng		99
100) n-Butylbenzene	19.28	91	10937	0.130	ng		97

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\07\06071903.D
Acq On : 7 Jun 2019 10:04 Operator: SC
Sample : 0.1ng TO-15 ICAL STD
Misc : S31-05131901/S31-05201906 (6/18)
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jun 07 13:45:26 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\07\06071904.D
Acq On : 7 Jun 2019 10:38 Operator: SC
Sample : 0.2ng TO-15 ICAL STD
Misc : S31-05131901/S31-05201906 (6/18)
ALS Vial : 4 Sample Multiplier: 1

6/7/19

Quant Time: Jun 07 13:42:50 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.13	130	187134	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	11.11	114	851299	12.500	ng		-0.01
56) Chlorobenzene-d5 (IS3)	15.46	82	431796	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.91	65	339772	14.389	ng		-0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 115.12%				
57) Toluene-d8 (SS2)	13.55	98	1018998	11.955	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 95.60%				
73) Bromofluorobenzene (SS3)	17.05	174	267645	11.904	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 95.20%				
Target Compounds							Qvalue
2) Propene	3.88	42	6065	0.313	ng		98
3) Dichlorodifluoromethan...	3.98	85	8083	0.234	ng		98
4) Chloromethane	4.17	50	7916	0.278	ng		98
5) 1,2-Dichloro-1,1,2,2-t...	4.34	135	3518	0.214	ng		99
6) Vinyl Chloride	4.45	62	7034	0.264	ng		99
7) 1,3-Butadiene	4.63	54	4819	0.306	ng		99
8) Bromomethane	4.93	94	3770	0.226	ng		98
9) Chloroethane	5.15	64	3476	0.249	ng		96
10) Ethanol	5.33	45	22790	1.563	ng		91
11) Acetonitrile	5.55	41	12189	0.359	ng		99
12) Acrolein	5.70	56	3559	0.310	ng		99
13) Acetone	5.84	58	27421	2.059	ng		92
14) Trichlorofluoromethane	6.03	101	6879	0.248	ng		97
15) 2-Propanol (Isopropanol)	6.15	45	28039	0.611	ng		96
16) Acrylonitrile	6.36	53	6884	0.267	ng		100
17) 1,1-Dichloroethene	6.72	96	4068	0.229	ng		97
18) 2-Methyl-2-Propanol (t...	6.82	59	24198	0.540	ng		98
19) Methylene Chloride	6.85	84	4674	0.238	ng		99
20) 3-Chloro-1-propene (Al...	6.99	41	7999	0.342	ng		95
21) Trichlorotrifluoroethane	7.19	151	3330	0.262	ng		98
22) Carbon Disulfide	7.14	76	18237	0.273	ng		97
23) trans-1,2-Dichloroethene	7.87	61	7025	0.257	ng		98
24) 1,1-Dichloroethane	8.09	63	8184	0.247	ng		99
25) Methyl tert-Butyl Ether	8.19	73	13310	0.232	ng		98
26) Vinyl Acetate	8.28	86	4901	1.276	ng	#	93
27) 2-Butanone (MEK)	8.53	72	3815	0.278	ng	#	89
28) cis-1,2-Dichloroethene	8.97	61	6827	0.262	ng		99
29) Diisopropyl Ether	9.23	87	4664	0.275	ng	#	57
30) Ethyl Acetate	9.22	61	3764	0.580	ng		99
31) n-Hexane	9.22	57	9348	0.278	ng		98
32) Chloroform	9.27	83	7719	0.236	ng		97
34) Tetrahydrofuran (THF)	9.71	72	3464	0.256	ng		96
35) Ethyl tert-Butyl Ether	9.78	87	4740	0.204	ng		98
36) 1,2-Dichloroethane	10.02	62	6081	0.258	ng		98
38) 1,1,1-Trichloroethane	10.29	97	6485	0.228	ng		100
39) Isopropyl Acetate	10.67	61	6021	0.499	ng	#	91
40) 1-Butanol	10.69	56	11513	0.618	ng		98
41) Benzene	10.75	78	22327	0.269	ng		99
42) Carbon Tetrachloride	10.90	117	5459	0.236	ng		97
43) Cyclohexane	11.04	84	14089	0.458	ng		98
44) tert-Amyl Methyl Ether	11.37	73	12159	0.223	ng		95
45) 1,2-Dichloropropane	11.57	63	4986	0.260	ng		98
46) Bromodichloromethane	11.75	83	5956	0.230	ng		100
47) Trichloroethene	11.81	130	4525	0.226	ng		94
48) 1,4-Dioxane	11.80	88	3840	0.240	ng		94
49) 2,2,4-Trimethylpentane...	11.87	57	22232	0.269	ng		99

Data File: I:\MS09\Data\2019_06\07\06071904.D
Acq On : 7 Jun 2019 10:38 Operator: SC
Sample : 0.2ng TO-15 ICAL STD
Misc : S31-05131901/S31-05201906 (6/18)
ALS Vial : 4 Sample Multiplier: 1

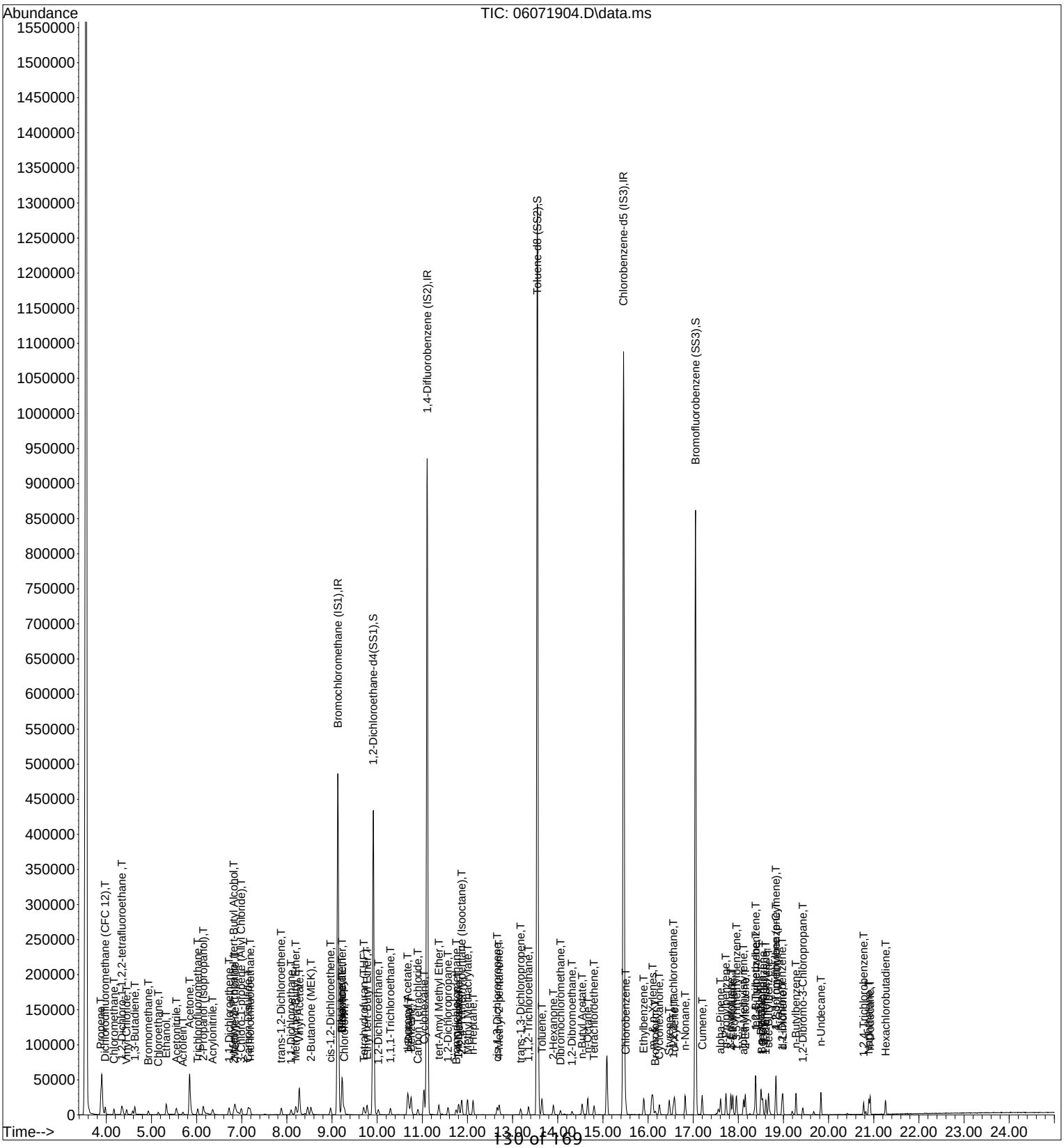
Quant Time: Jun 07 13:42:50 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.00	100	3154	0.414	ng	91
51) n-Heptane	12.12	71	4980	0.240	ng	99
52) cis-1,3-Dichloropropene	12.66	75	7504	0.246	ng	100
53) 4-Methyl-2-pentanone	12.70	58	4546	0.255	ng	92
54) trans-1,3-Dichloropropene	13.18	75	5996	0.231	ng	98
55) 1,1,2-Trichloroethane	13.35	97	4364	0.231	ng	96
58) Toluene	13.65	91	19426	0.218	ng	97
59) 2-Hexanone	13.90	43	12177	0.318	ng	100
60) Dibromochloromethane	14.06	129	4360	0.205	ng	93
61) 1,2-Dibromoethane	14.31	107	4442	0.209	ng	99
62) n-Butyl Acetate	14.54	43	13473	0.320	ng	100
63) n-Octane	14.67	57	4726	0.250	ng	99
64) Tetrachloroethene	14.80	166	4221	0.197	ng	95
65) Chlorobenzene	15.51	112	11622	0.214	ng	97
66) Ethylbenzene	15.90	91	20490	0.205	ng	100
67) m- & p-Xylenes	16.10	91	32365	0.420	ng	100
68) Bromoform	16.16	173	3110	0.189	ng	97
69) Styrene	16.47	104	11601	0.199	ng	99
70) o-Xylene	16.58	91	16191	0.212	ng	99
71) n-Nonane	16.82	43	11608	0.307	ng	98
72) 1,1,2,2-Tetrachloroethane	16.56	83	7875	0.222	ng	97
74) Cumene	17.20	105	20431	0.214	ng	98
75) alpha-Pinene	17.61	93	9476	0.198	ng	92
76) n-Propylbenzene	17.72	91	24826	0.219	ng	98
77) 3-Ethyltoluene	17.83	105	19713	0.213	ng	95
78) 4-Ethyltoluene	17.88	105	18395	0.209	ng	96
79) 1,3,5-Trimethylbenzene	17.96	105	16182	0.203	ng	99
80) alpha-Methylstyrene	18.11	118	6881	0.172	ng	97
81) 2-Ethyltoluene	18.15	105	19646	0.217	ng	100
82) 1,2,4-Trimethylbenzene	18.38	105	16639	0.218	ng	99
83) n-Decane	18.50	57	11256	0.267	ng	97
84) Benzyl Chloride	18.52	91	11887	0.211	ng	100
85) 1,3-Dichlorobenzene	18.54	146	8789	0.220	ng	97
86) 1,4-Dichlorobenzene	18.61	146	9168	0.224	ng	98
87) sec-Butylbenzene	18.67	105	22137	0.214	ng	99
88) 4-Isopropyltoluene (p-...	18.83	119	20173	0.212	ng	98
89) 1,2,3-Trimethylbenzene	18.83	105	16320	0.213	ng	100
90) 1,2-Dichlorobenzene	18.97	146	8442	0.219	ng	97
91) d-Limonene	18.99	68	6199	0.198	ng	98
92) 1,2-Dibromo-3-Chloropr...	19.43	157	2616	0.196	ng	89
93) n-Undecane	19.83	57	11074	0.279	ng	98
94) 1,2,4-Trichlorobenzene	20.77	180	5570	0.217	ng	98
95) Naphthalene	20.89	128	16576	0.198	ng	99
96) n-Dodecane	20.92	57	8145	0.289	ng	99
97) Hexachlorobutadiene	21.26	225	3463	0.190	ng	91
98) Cyclohexanone	16.25	55	7931	0.268	ng	99
99) tert-Butylbenzene	18.38	119	16271	0.222	ng	98
100) n-Butylbenzene	19.27	91	18195	0.219	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2019_06\07\06071904.D
Acq On : 7 Jun 2019 10:38 Operator: SC
Sample : 0.2ng TO-15 ICAL STD
Misc : S31-05131901/S31-05201906 (6/18)
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jun 07 13:42:50 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\07\06071905.D
Acq On : 7 Jun 2019 11:11 Operator: SC
Sample : 0.5ng TO-15 ICAL STD
Misc : S31-05131901/S31-05201906 (6/18)
ALS Vial : 4 Sample Multiplier: 1

6/7/19

Quant Time: Jun 07 13:41:20 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.13	130	175278	12.500	ng		-0.03
37) 1,4-Difluorobenzene (IS2)	11.11	114	801165	12.500	ng		-0.01
56) Chlorobenzene-d5 (IS3)	15.46	82	410704	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.91	65	324088	14.653	ng		-0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 117.20%				
57) Toluene-d8 (SS2)	13.55	98	961760	11.863	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 94.88%				
73) Bromofluorobenzene (SS3)	17.05	174	254399	11.896	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 95.20%				
Target Compounds							Qvalue
2) Propene	3.87	42	13421	0.739	ng		99
3) Dichlorodifluoromethan...	3.98	85	18828	0.582	ng		99
4) Chloromethane	4.17	50	18035	0.676	ng		98
5) 1,2-Dichloro-1,1,2,2-t...	4.33	135	8400	0.546	ng		99
6) Vinyl Chloride	4.45	62	15625	0.627	ng		98
7) 1,3-Butadiene	4.62	54	11380	0.772	ng		99
8) Bromomethane	4.93	94	8213	0.525	ng		99
9) Chloroethane	5.14	64	8178	0.624	ng		98
10) Ethanol	5.33	45	49807	3.647	ng		100
11) Acetonitrile	5.55	41	26739	0.841	ng		99
12) Acrolein	5.69	56	7916	0.736	ng		100
13) Acetone	5.83	58	57024	4.570	ng		96
14) Trichlorofluoromethane	6.02	101	16245	0.624	ng		99
15) 2-Propanol (Isopropanol)	6.14	45	64689	1.504	ng		94
16) Acrylonitrile	6.36	53	16308	0.676	ng		100
17) 1,1-Dichloroethene	6.71	96	9655	0.579	ng		96
18) 2-Methyl-2-Propanol (t...	6.80	59	56237	1.341	ng		99
19) Methylene Chloride	6.85	84	10408	0.566	ng		99
20) 3-Chloro-1-propene (Al...	6.98	41	19241	0.878	ng		98
21) Trichlorotrifluoroethane	7.18	151	7352	0.617	ng		95
22) Carbon Disulfide	7.14	76	39719	0.634	ng		99
23) trans-1,2-Dichloroethene	7.87	61	16470	0.644	ng		100
24) 1,1-Dichloroethane	8.09	63	19091	0.615	ng		98
25) Methyl tert-Butyl Ether	8.19	73	31170	0.581	ng		99
26) Vinyl Acetate	8.27	86	12515	3.478	ng		99
27) 2-Butanone (MEK)	8.52	72	9052	0.705	ng		100
28) cis-1,2-Dichloroethene	8.97	61	15704	0.645	ng		100
29) Diisopropyl Ether	9.22	87	9032	0.568	ng	#	92
30) Ethyl Acetate	9.22	61	8789	1.445	ng		98
31) n-Hexane	9.22	57	20890	0.662	ng		99
32) Chloroform	9.27	83	17498	0.571	ng		100
34) Tetrahydrofuran (THF)	9.69	72	7574	0.597	ng		98
35) Ethyl tert-Butyl Ether	9.77	87	11376	0.524	ng		99
36) 1,2-Dichloroethane	10.02	62	14498	0.657	ng		98
38) 1,1,1-Trichloroethane	10.29	97	15278	0.572	ng		99
39) Isopropyl Acetate	10.67	61	14676	1.292	ng		97
40) 1-Butanol	10.69	56	26415	1.508	ng		97
41) Benzene	10.75	78	45685	0.586	ng		99
42) Carbon Tetrachloride	10.90	117	12310	0.566	ng		99
43) Cyclohexane	11.04	84	32518	1.123	ng		99
44) tert-Amyl Methyl Ether	11.36	73	29057	0.566	ng		96
45) 1,2-Dichloropropane	11.57	63	11788	0.653	ng		99
46) Bromodichloromethane	11.75	83	13578	0.558	ng		100
47) Trichloroethene	11.80	130	10055	0.534	ng		98
48) 1,4-Dioxane	11.79	88	9168	0.608	ng		99
49) 2,2,4-Trimethylpentane...	11.87	57	51155	0.657	ng		98

Data File: I:\MS09\Data\2019_06\07\06071905.D
Acq On : 7 Jun 2019 11:11 Operator: SC
Sample : 0.5ng TO-15 ICAL STD
Misc : S31-05131901/S31-05201906 (6/18)
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jun 07 13:41:20 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

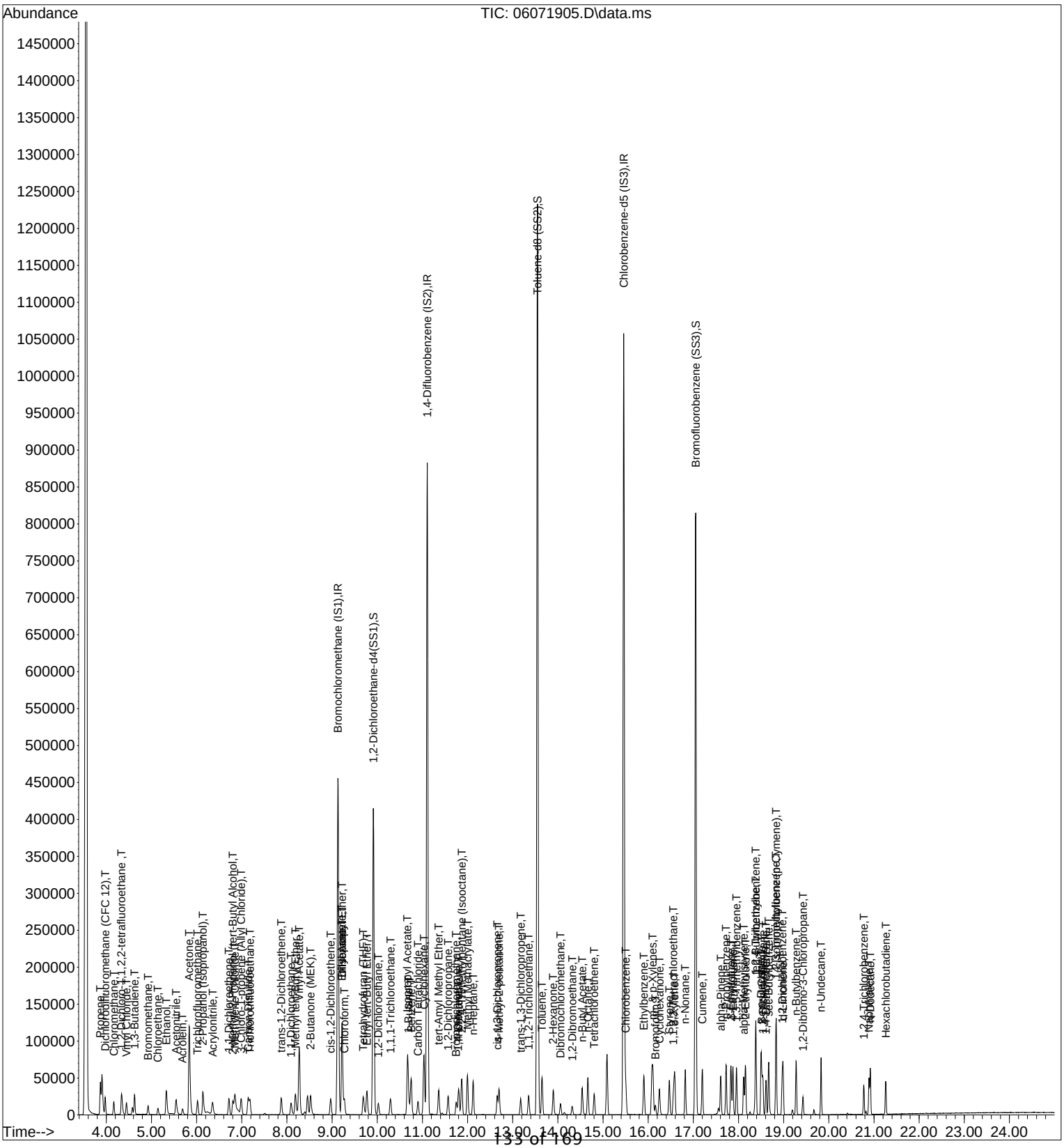
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.00	100	7885	1.100	ng	96
51) n-Heptane	12.12	71	11554	0.591	ng	99
52) cis-1,3-Dichloropropene	12.66	75	17962	0.626	ng	100
53) 4-Methyl-2-pentanone	12.70	58	10928	0.651	ng	93
54) trans-1,3-Dichloropropene	13.18	75	15042	0.615	ng	99
55) 1,1,2-Trichloroethane	13.35	97	9741	0.547	ng	99
58) Toluene	13.65	91	43196	0.510	ng	99
59) 2-Hexanone	13.90	43	29152	0.799	ng	99
60) Dibromochloromethane	14.06	129	10148	0.501	ng	97
61) 1,2-Dibromoethane	14.32	107	10416	0.516	ng	100
62) n-Butyl Acetate	14.54	43	32572	0.813	ng	100
63) n-Octane	14.67	57	10386	0.577	ng	100
64) Tetrachloroethene	14.80	166	10057	0.493	ng	96
65) Chlorobenzene	15.50	112	26092	0.505	ng	99
66) Ethylbenzene	15.90	91	46717	0.492	ng	100
67) m- & p-Xylenes	16.10	91	74115	1.012	ng	99
68) Bromoform	16.16	173	7246	0.464	ng	96
69) Styrene	16.47	104	26577	0.479	ng	100
70) o-Xylene	16.58	91	36636	0.505	ng	99
71) n-Nonane	16.82	43	26508	0.737	ng	99
72) 1,1,2,2-Tetrachloroethane	16.56	83	18026	0.534	ng	99
74) Cumene	17.20	105	45719	0.504	ng	99
75) alpha-Pinene	17.61	93	22620	0.496	ng	97
76) n-Propylbenzene	17.72	91	57460	0.532	ng	99
77) 3-Ethyltoluene	17.83	105	45309	0.514	ng	97
78) 4-Ethyltoluene	17.88	105	42796	0.512	ng	95
79) 1,3,5-Trimethylbenzene	17.95	105	37894	0.500	ng	99
80) alpha-Methylstyrene	18.12	118	16938	0.445	ng	99
81) 2-Ethyltoluene	18.15	105	45109	0.523	ng	100
82) 1,2,4-Trimethylbenzene	18.38	105	37711	0.519	ng	99
83) n-Decane	18.50	57	25920	0.648	ng	97
84) Benzyl Chloride	18.51	91	29151	0.544	ng	99
85) 1,3-Dichlorobenzene	18.54	146	20480	0.539	ng	99
86) 1,4-Dichlorobenzene	18.61	146	20121	0.516	ng	99
87) sec-Butylbenzene	18.67	105	51635	0.525	ng	99
88) 4-Isopropyltoluene (p-...	18.83	119	46632	0.514	ng	98
89) 1,2,3-Trimethylbenzene	18.83	105	37627	0.517	ng	100
90) 1,2-Dichlorobenzene	18.97	146	19849	0.542	ng	99
91) d-Limonene	18.99	68	15059	0.507	ng	99
92) 1,2-Dibromo-3-Chloropr...	19.43	157	6521	0.513	ng	92
93) n-Undecane	19.83	57	25297	0.671	ng	99
94) 1,2,4-Trichlorobenzene	20.77	180	12655	0.519	ng	100
95) Naphthalene	20.89	128	38375	0.482	ng	99
96) n-Dodecane	20.92	57	19531	0.729	ng	98
97) Hexachlorobutadiene	21.26	225	8625	0.498	ng	100
98) Cyclohexanone	16.25	55	18517	0.659	ng	99
99) tert-Butylbenzene	18.38	119	36740	0.526	ng	99
100) n-Butylbenzene	19.28	91	43752	0.555	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\07\06071905.D
Acq On : 7 Jun 2019 11:11 Operator: SC
Sample : 0.5ng TO-15 ICAL STD
Misc : S31-05131901/S31-05201906 (6/18)
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jun 07 13:41:20 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\07\06071906.D
Acq On : 7 Jun 2019 11:45 Operator: SC
Sample : 1.0ng TO-15 ICAL STD
Misc : S31-05131901/S31-05201906 (6/18)
ALS Vial : 4 Sample Multiplier: 1

6/7/19

Quant Time: Jun 07 13:39:58 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.13	130	174431	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	11.11	114	796471	12.500	ng		-0.01
56) Chlorobenzene-d5 (IS3)	15.46	82	412311	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.92	65	325951	14.809	ng		-0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 118.48%				
57) Toluene-d8 (SS2)	13.55	98	959641	11.791	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 94.32%				
73) Bromofluorobenzene (SS3)	17.05	174	255793	11.915	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 95.28%				
Target Compounds							Qvalue
2) Propene	3.87	42	23875	1.320	ng		99
3) Dichlorodifluoromethan...	3.98	85	35060	1.090	ng		99
4) Chloromethane	4.16	50	30819	1.161	ng		99
5) 1,2-Dichloro-1,1,2,2-t...	4.34	135	15131	0.988	ng		99
6) Vinyl Chloride	4.45	62	28818	1.162	ng		98
7) 1,3-Butadiene	4.62	54	20688	1.411	ng		99
8) Bromomethane	4.93	94	14071	0.904	ng		99
9) Chloroethane	5.14	64	14382	1.103	ng		98
10) Ethanol	5.33	45	89905	6.615	ng		99
11) Acetonitrile	5.55	41	49119	1.552	ng		100
12) Acrolein	5.69	56	14143	1.322	ng		98
13) Acetone	5.83	58	102635	8.266	ng		97
14) Trichlorofluoromethane	6.02	101	29998	1.158	ng		99
15) 2-Propanol (Isopropanol)	6.14	45	120637	2.819	ng		96
16) Acrylonitrile	6.35	53	30253	1.259	ng		100
17) 1,1-Dichloroethene	6.71	96	17422	1.050	ng		99
18) 2-Methyl-2-Propanol (t...	6.80	59	106016	2.540	ng		99
19) Methylene Chloride	6.85	84	19182	1.048	ng		100
20) 3-Chloro-1-propene (Al...	6.99	41	36776	1.687	ng		96
21) Trichlorotrifluoroethane	7.18	151	13849	1.168	ng		99
22) Carbon Disulfide	7.14	76	72976	1.170	ng		100
23) trans-1,2-Dichloroethene	7.88	61	29938	1.176	ng		100
24) 1,1-Dichloroethane	8.09	63	35658	1.155	ng		100
25) Methyl tert-Butyl Ether	8.18	73	57845	1.083	ng		99
26) Vinyl Acetate	8.28	86	23276	6.500	ng	#	96
27) 2-Butanone (MEK)	8.52	72	16559	1.295	ng		100
28) cis-1,2-Dichloroethene	8.97	61	28723	1.185	ng		99
29) Diisopropyl Ether	9.22	87	15950	1.007	ng	#	95
30) Ethyl Acetate	9.22	61	16354	2.702	ng		97
31) n-Hexane	9.22	57	38693	1.233	ng		99
32) Chloroform	9.28	83	31987	1.048	ng		98
34) Tetrahydrofuran (THF)	9.68	72	13961	1.106	ng		93
35) Ethyl tert-Butyl Ether	9.77	87	21133	0.977	ng		99
36) 1,2-Dichloroethane	10.02	62	26241	1.195	ng		98
38) 1,1,1-Trichloroethane	10.29	97	27817	1.047	ng		99
39) Isopropyl Acetate	10.67	61	26990	2.390	ng	#	92
40) 1-Butanol	10.68	56	49950	2.868	ng		98
41) Benzene	10.75	78	81221	1.048	ng		100
42) Carbon Tetrachloride	10.90	117	23682	1.095	ng		98
43) Cyclohexane	11.04	84	59089	2.053	ng		98
44) tert-Amyl Methyl Ether	11.36	73	52575	1.030	ng		96
45) 1,2-Dichloropropane	11.57	63	21702	1.210	ng		99
46) Bromodichloromethane	11.75	83	25209	1.042	ng		99
47) Trichloroethene	11.81	130	18271	0.977	ng		99
48) 1,4-Dioxane	11.79	88	16610	1.108	ng		99
49) 2,2,4-Trimethylpentane...	11.87	57	95186	1.230	ng		100

Data File: I:\MS09\Data\2019_06\07\06071906.D
Acq On : 7 Jun 2019 11:45 Operator: SC
Sample : 1.0ng TO-15 ICAL STD
Misc : S31-05131901/S31-05201906 (6/18)
ALS Vial : 4 Sample Multiplier: 1

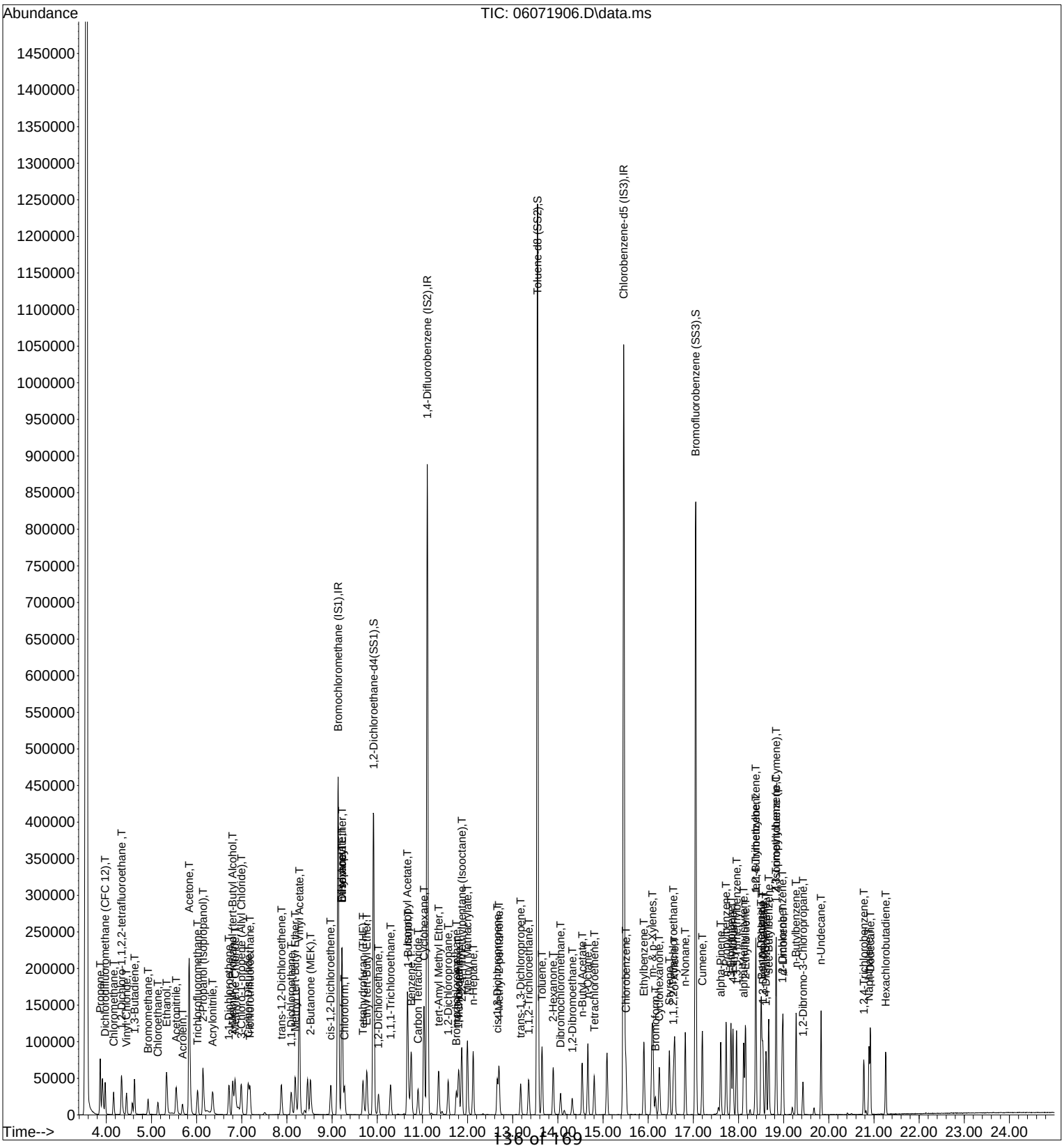
Quant Time: Jun 07 13:39:58 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.00	100	14548	2.042	ng	98
51) n-Heptane	12.12	71	21117	1.086	ng	100
52) cis-1,3-Dichloropropene	12.66	75	33271	1.167	ng	99
53) 4-Methyl-2-pentanone	12.70	58	20950	1.256	ng	97
54) trans-1,3-Dichloropropene	13.18	75	28516	1.173	ng	99
55) 1,1,2-Trichloroethane	13.35	97	17811	1.006	ng	100
58) Toluene	13.65	91	77652	0.913	ng	99
59) 2-Hexanone	13.90	43	55337	1.511	ng	99
60) Dibromochloromethane	14.06	129	18866	0.928	ng	98
61) 1,2-Dibromoethane	14.32	107	19096	0.942	ng	99
62) n-Butyl Acetate	14.54	43	61744	1.535	ng	100
63) n-Octane	14.67	57	19415	1.075	ng	98
64) Tetrachloroethene	14.81	166	18030	0.881	ng	99
65) Chlorobenzene	15.51	112	48907	0.944	ng	99
66) Ethylbenzene	15.90	91	87587	0.918	ng	99
67) m- & p-Xylenes	16.10	91	136565	1.858	ng	100
68) Bromoform	16.16	173	13709	0.875	ng	99
69) Styrene	16.47	104	49555	0.889	ng	99
70) o-Xylene	16.58	91	67950	0.934	ng	99
71) n-Nonane	16.82	43	49528	1.372	ng	99
72) 1,1,2,2-Tetrachloroethane	16.56	83	33759	0.996	ng	99
74) Cumene	17.20	105	84837	0.932	ng	99
75) alpha-Pinene	17.61	93	42724	0.933	ng	99
76) n-Propylbenzene	17.72	91	108701	1.003	ng	98
77) 3-Ethyltoluene	17.83	105	84273	0.952	ng	96
78) 4-Ethyltoluene	17.88	105	80522	0.959	ng	96
79) 1,3,5-Trimethylbenzene	17.96	105	70051	0.921	ng	99
80) alpha-Methylstyrene	18.11	118	31425	0.823	ng	98
81) 2-Ethyltoluene	18.15	105	84039	0.971	ng	99
82) 1,2,4-Trimethylbenzene	18.38	105	71204	0.977	ng	100
83) n-Decane	18.50	57	47854	1.191	ng	100
84) Benzyl Chloride	18.51	91	56931	1.058	ng	98
85) 1,3-Dichlorobenzene	18.54	146	37373	0.980	ng	99
86) 1,4-Dichlorobenzene	18.61	146	36916	0.943	ng	99
87) sec-Butylbenzene	18.67	105	96723	0.979	ng	100
88) 4-Isopropyltoluene (p-...	18.83	119	86022	0.945	ng	99
89) 1,2,3-Trimethylbenzene	18.83	105	70459	0.965	ng	99
90) 1,2-Dichlorobenzene	18.97	146	36569	0.995	ng	99
91) d-Limonene	18.99	68	28339	0.950	ng	100
92) 1,2-Dibromo-3-Chloropr...	19.43	157	12180	0.955	ng	93
93) n-Undecane	19.83	57	48525	1.282	ng	99
94) 1,2,4-Trichlorobenzene	20.77	180	23019	0.941	ng	99
95) Naphthalene	20.89	128	71153	0.890	ng	100
96) n-Dodecane	20.92	57	37000	1.375	ng	100
97) Hexachlorobutadiene	21.26	225	15776	0.908	ng	98
98) Cyclohexanone	16.24	55	34808	1.234	ng	99
99) tert-Butylbenzene	18.38	119	67704	0.966	ng	100
100) n-Butylbenzene	19.27	91	81496	1.029	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2019_06\07\06071906.D
Acq On : 7 Jun 2019 11:45 Operator: SC
Sample : 1.0ng TO-15 ICAL STD
Misc : S31-05131901/S31-05201906 (6/18)
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jun 07 13:39:58 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\07\06071907.D
Acq On : 7 Jun 2019 12:18 Operator: SC
Sample : 5.0ng TO-15 ICAL STD
Misc : S31-05131901/S31-06061905 (7/4)
ALS Vial : 8 Sample Multiplier: 1

6/7/19

Quant Time: Jun 07 13:38:47 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.14	130	173473	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	11.11	114	787446	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	15.46	82	413665	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.92	65	324959	14.845	ng		-0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 118.80%				
57) Toluene-d8 (SS2)	13.55	98	954900	11.694	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 93.52%				
73) Bromofluorobenzene (SS3)	17.05	174	257227	11.942	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 95.52%				
Target Compounds							Qvalue
2) Propene	3.85	42	99206	5.516	ng		99
3) Dichlorodifluoromethan...	3.96	85	139656	4.364	ng		100
4) Chloromethane	4.15	50	125587	4.758	ng		99
5) 1,2-Dichloro-1,1,2,2-t...	4.32	135	59303	3.893	ng		99
6) Vinyl Chloride	4.44	62	116716	4.732	ng		100
7) 1,3-Butadiene	4.61	54	87887	6.028	ng		100
8) Bromomethane	4.92	94	60089	3.880	ng		100
9) Chloroethane	5.14	64	57498	4.436	ng		99
10) Ethanol	5.34	45	351944	26.038	ng		99
11) Acetonitrile	5.55	41	187150	5.948	ng		99
12) Acrolein	5.69	56	56725	5.330	ng		100
13) Acetone	5.83	58	334116	27.058	ng		98
14) Trichlorofluoromethane	6.02	101	117899	4.576	ng		100
15) 2-Propanol (Isopropanol)	6.14	45	480534	11.290	ng		98
16) Acrylonitrile	6.36	53	120611	5.048	ng		100
17) 1,1-Dichloroethene	6.71	96	69908	4.238	ng		100
18) 2-Methyl-2-Propanol (t...	6.80	59	420878	10.140	ng		99
19) Methylene Chloride	6.86	84	75407	4.141	ng		98
20) 3-Chloro-1-propene (Al...	6.99	41	140983	6.503	ng		100
21) Trichlorotrifluoroethane	7.18	151	53936	4.575	ng		99
22) Carbon Disulfide	7.14	76	287993	4.644	ng		100
23) trans-1,2-Dichloroethene	7.88	61	120506	4.759	ng		100
24) 1,1-Dichloroethane	8.10	63	144063	4.692	ng		99
25) Methyl tert-Butyl Ether	8.17	73	233201	4.388	ng		99
26) Vinyl Acetate	8.28	86	90154	25.316	ng	#	87
27) 2-Butanone (MEK)	8.51	72	55448	4.361	ng		96
28) cis-1,2-Dichloroethene	8.97	61	115091	4.773	ng		98
29) Diisopropyl Ether	9.21	87	62072	3.941	ng	#	82
30) Ethyl Acetate	9.21	61	69016	11.466	ng		98
31) n-Hexane	9.22	57	153827	4.928	ng		100
32) Chloroform	9.28	83	129030	4.251	ng		100
34) Tetrahydrofuran (THF)	9.67	72	54522	4.342	ng		99
35) Ethyl tert-Butyl Ether	9.76	87	83124	3.866	ng		98
36) 1,2-Dichloroethane	10.03	62	104866	4.801	ng		100
38) 1,1,1-Trichloroethane	10.30	97	112242	4.273	ng		99
39) Isopropyl Acetate	10.66	61	109216	9.781	ng		96
40) 1-Butanol	10.67	56	193880	11.259	ng		98
41) Benzene	10.76	78	315391	4.115	ng		99
42) Carbon Tetrachloride	10.90	117	93547	4.377	ng		100
43) Cyclohexane	11.04	84	240493	8.451	ng		100
44) tert-Amyl Methyl Ether	11.35	73	211387	4.191	ng		99
45) 1,2-Dichloropropane	11.57	63	85311	4.811	ng		99
46) Bromodichloromethane	11.75	83	102919	4.303	ng		99
47) Trichloroethene	11.81	130	71302	3.855	ng		99
48) 1,4-Dioxane	11.78	88	62480	4.214	ng		100
49) 2,2,4-Trimethylpentane...	11.87	57	378035	4.941	ng		100

Data File: I:\MS09\Data\2019_06\07\06071907.D
Acq On : 7 Jun 2019 12:18 Operator: SC
Sample : 5.0ng TO-15 ICAL STD
Misc : S31-05131901/S31-06061905 (7/4)
ALS Vial : 8 Sample Multiplier: 1

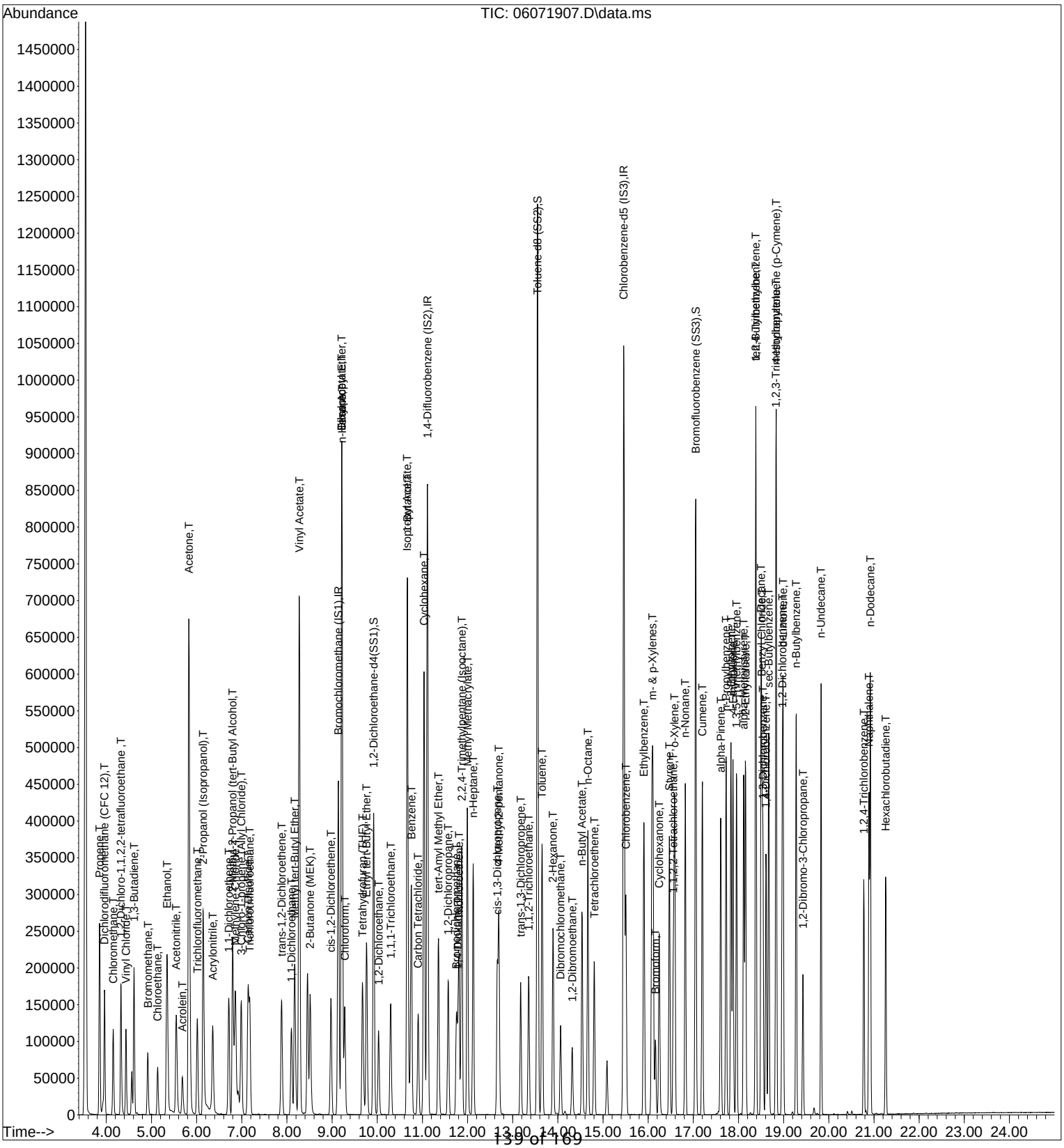
Quant Time: Jun 07 13:38:47 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.00	100	59173	8.402	ng	96
51) n-Heptane	12.12	71	84431	4.392	ng	100
52) cis-1,3-Dichloropropene	12.66	75	139151	4.936	ng	99
53) 4-Methyl-2-pentanone	12.69	58	84373	5.114	ng	97
54) trans-1,3-Dichloropropene	13.18	75	119070	4.955	ng	99
55) 1,1,2-Trichloroethane	13.35	97	71286	4.073	ng	99
58) Toluene	13.65	91	315685	3.699	ng	99
59) 2-Hexanone	13.89	43	216831	5.902	ng	98
60) Dibromochloromethane	14.06	129	77693	3.809	ng	98
61) 1,2-Dibromoethane	14.32	107	77409	3.806	ng	99
62) n-Butyl Acetate	14.53	43	245396	6.081	ng	99
63) n-Octane	14.67	57	78057	4.306	ng	98
64) Tetrachloroethene	14.81	166	71275	3.470	ng	99
65) Chlorobenzene	15.51	112	193406	3.719	ng	99
66) Ethylbenzene	15.90	91	353534	3.693	ng	99
67) m- & p-Xylenes	16.10	91	558535	7.574	ng	99
68) Bromoform	16.16	173	57696	3.669	ng	99
69) Styrene	16.47	104	211126	3.774	ng	100
70) o-Xylene	16.58	91	274159	3.755	ng	100
71) n-Nonane	16.82	43	198838	5.491	ng	99
72) 1,1,2,2-Tetrachloroethane	16.56	83	135987	4.001	ng	100
74) Cumene	17.20	105	339931	3.724	ng	99
75) alpha-Pinene	17.61	93	180232	3.922	ng	99
76) n-Propylbenzene	17.72	91	429913	3.952	ng	99
77) 3-Ethyltoluene	17.83	105	341144	3.840	ng	96
78) 4-Ethyltoluene	17.88	105	320390	3.804	ng	97
79) 1,3,5-Trimethylbenzene	17.95	105	278552	3.652	ng	100
80) alpha-Methylstyrene	18.11	118	150911	3.938	ng	99
81) 2-Ethyltoluene	18.15	105	335127	3.860	ng	99
82) 1,2,4-Trimethylbenzene	18.38	105	283950	3.882	ng	100
83) n-Decane	18.50	57	191817	4.758	ng	99
84) Benzyl Chloride	18.51	91	256663	4.754	ng	99
85) 1,3-Dichlorobenzene	18.54	146	150509	3.932	ng	100
86) 1,4-Dichlorobenzene	18.61	146	150495	3.830	ng	100
87) sec-Butylbenzene	18.67	105	383691	3.870	ng	99
88) 4-Isopropyltoluene (p-...	18.83	119	342880	3.755	ng	99
89) 1,2,3-Trimethylbenzene	18.83	105	280662	3.831	ng	100
90) 1,2-Dichlorobenzene	18.97	146	146176	3.964	ng	100
91) d-Limonene	18.99	68	130059	4.346	ng	100
92) 1,2-Dibromo-3-Chloropr...	19.43	157	50826	3.972	ng	96
93) n-Undecane	19.83	57	198845	5.236	ng	99
94) 1,2,4-Trichlorobenzene	20.77	180	97067	3.955	ng	100
95) Naphthalene	20.89	128	337057	4.201	ng	99
96) n-Dodecane	20.92	57	188397	6.979	ng	99
97) Hexachlorobutadiene	21.26	225	61255	3.514	ng	100
98) Cyclohexanone	16.24	55	129619	4.580	ng	99
99) tert-Butylbenzene	18.38	119	271426	3.861	ng	99
100) n-Butylbenzene	19.28	91	326319	4.106	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2019_06\07\06071907.D
Acq On : 7 Jun 2019 12:18 Operator: SC
Sample : 5.0ng TO-15 ICAL STD
Misc : S31-05131901/S31-06061905 (7/4)
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Jun 07 13:38:47 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\07\06071908.D
Acq On : 7 Jun 2019 12:52 Operator: SC
Sample : 25ng TO-15 ICAL STD
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

6/7/19

Quant Time: Jun 07 13:36:30 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 08:36:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.16	130	187330	12.500	ng		0.00
37) 1,4-Difluorobenzene (IS2)	11.12	114	845421	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	15.46	82	448978	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.94	65	346572	14.661	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 117.28%				
57) Toluene-d8 (SS2)	13.55	98	1035276	11.681	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 93.44%				
73) Bromofluorobenzene (SS3)	17.05	174	281921	12.059	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 96.48%				
Target Compounds							Qvalue
2) Propene	3.84	42	638777	32.891	ng		100
3) Dichlorodifluoromethan...	3.96	85	889825	25.749	ng		100
4) Chloromethane	4.16	50	838993	29.432	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.32	135	387994	23.583	ng		100
6) Vinyl Chloride	4.44	62	756314	28.398	ng		100
7) 1,3-Butadiene	4.62	54	596932	37.914	ng		98
8) Bromomethane	4.93	94	388498	23.230	ng		99
9) Chloroethane	5.15	64	374674	26.767	ng		100
10) Ethanol	5.39	45	2284146	156.487	ng		100
11) Acetonitrile	5.58	41	1190213	35.027	ng		100
12) Acrolein	5.71	56	351887	30.619	ng		99
13) Acetone	5.86	58	2095109	157.120	ng		94
14) Trichlorofluoromethane	6.02	101	754729	27.128	ng		100
15) 2-Propanol (Isopropanol)	6.18	45	3103572	67.521	ng		99
16) Acrylonitrile	6.38	53	784587	30.410	ng		100
17) 1,1-Dichloroethene	6.72	96	452836	25.419	ng		95
18) 2-Methyl-2-Propanol (t...	6.83	59	2765540	61.701	ng		99
19) Methylene Chloride	6.88	84	486852	24.758	ng		95
20) 3-Chloro-1-propene (Al...	7.01	41	939472	40.126	ng		98
21) Trichlorotrifluoroethane	7.19	151	352791	27.709	ng		98
22) Carbon Disulfide	7.15	76	1882267	28.110	ng		100
23) trans-1,2-Dichloroethene	7.90	61	783810	28.667	ng		98
24) 1,1-Dichloroethane	8.12	63	925611	27.916	ng		100
25) Methyl tert-Butyl Ether	8.18	73	1511964	26.347	ng		100
26) Vinyl Acetate	8.29	86	598518	155.636	ng	#	88
27) 2-Butanone (MEK)	8.52	72	362568	26.405	ng		94
28) cis-1,2-Dichloroethene	8.99	61	746864	28.685	ng		97
29) Diisopropyl Ether	9.22	87	408953	24.046	ng	#	89
30) Ethyl Acetate	9.23	61	425545	65.469	ng		98
31) n-Hexane	9.23	57	986137	29.256	ng		100
32) Chloroform	9.30	83	833880	25.441	ng		100
34) Tetrahydrofuran (THF)	9.68	72	355918	26.246	ng		97
35) Ethyl tert-Butyl Ether	9.77	87	553945	23.858	ng		97
36) 1,2-Dichloroethane	10.04	62	677432	28.723	ng		100
38) 1,1,1-Trichloroethane	10.30	97	735819	26.089	ng		99
39) Isopropyl Acetate	10.67	61	713720	59.536	ng		94
40) 1-Butanol	10.68	56	1267990	68.585	ng		98
41) Benzene	10.76	78	2003643	24.349	ng		100
42) Carbon Tetrachloride	10.91	117	618172	26.939	ng		100
43) Cyclohexane	11.04	84	1557641	50.981	ng		98
44) tert-Amyl Methyl Ether	11.36	73	1392620	25.715	ng		99
45) 1,2-Dichloropropane	11.58	63	557062	29.259	ng		100
46) Bromodichloromethane	11.76	83	674929	26.281	ng		100
47) Trichloroethene	11.82	130	470174	23.676	ng		99
48) 1,4-Dioxane	11.78	88	418835	26.310	ng		98
49) 2,2,4-Trimethylpentane...	11.88	57	2413106	29.374	ng		99

Data File: I:\MS09\Data\2019_06\07\06071908.D
Acq On : 7 Jun 2019 12:52 Operator: SC
Sample : 25ng TO-15 ICAL STD
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

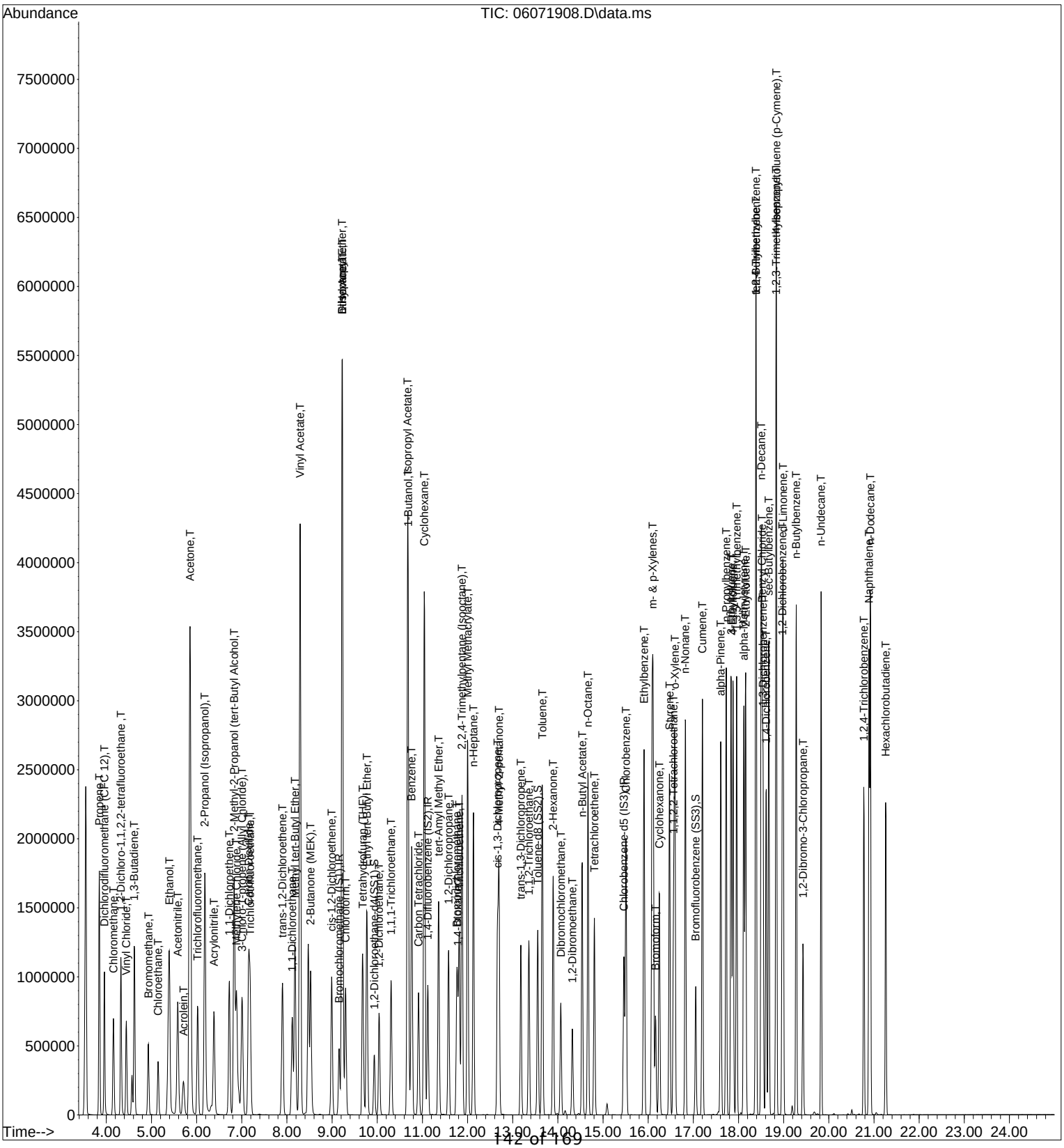
Quant Time: Jun 07 13:36:30 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 08:36:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.00	100	394989	52.241	ng	96
51) n-Heptane	12.13	71	546878	26.499	ng	99
52) cis-1,3-Dichloropropene	12.66	75	930324	30.736	ng	100
53) 4-Methyl-2-pentanone	12.70	58	550981	31.108	ng	97
54) trans-1,3-Dichloropropene	13.18	75	807381	31.295	ng	100
55) 1,1,2-Trichloroethane	13.36	97	471561	25.098	ng	100
58) Toluene	13.65	91	2030868	21.925	ng	100
59) 2-Hexanone	13.90	43	1404769	35.231	ng	99
60) Dibromochloromethane	14.07	129	525310	23.728	ng	100
61) 1,2-Dibromoethane	14.32	107	520212	23.565	ng	99
62) n-Butyl Acetate	14.54	43	1591224	36.332	ng	99
63) n-Octane	14.67	57	507629	25.802	ng	98
64) Tetrachloroethene	14.81	166	479360	21.505	ng	100
65) Chlorobenzene	15.51	112	1271976	22.536	ng	99
66) Ethylbenzene	15.91	91	2315384	22.287	ng	99
67) m- & p-Xylenes	16.10	91	3671212	45.869	ng	100
68) Bromoform	16.16	173	408375	23.926	ng	99
69) Styrene	16.47	104	1407154	23.178	ng	100
70) o-Xylene	16.59	91	1797673	22.684	ng	100
71) n-Nonane	16.82	43	1270087	32.316	ng	98
72) 1,1,2,2-Tetrachloroethane	16.56	83	901925	24.447	ng	100
74) Cumene	17.20	105	2225864	22.466	ng	100
75) alpha-Pinene	17.61	93	1188383	23.827	ng	100
76) n-Propylbenzene	17.73	91	2810504	23.803	ng	100
77) 3-Ethyltoluene	17.84	105	2192667	22.741	ng	97
78) 4-Ethyltoluene	17.88	105	2176339	23.806	ng	97
79) 1,3,5-Trimethylbenzene	17.96	105	1835721	22.172	ng	100
80) alpha-Methylstyrene	18.12	118	967722	23.265	ng	98
81) 2-Ethyltoluene	18.16	105	2187695	23.218	ng	100
82) 1,2,4-Trimethylbenzene	18.39	105	1925885	24.261	ng	100
83) n-Decane	18.50	57	1246075	28.478	ng	100
84) Benzyl Chloride	18.52	91	1825827	31.156	ng	100
85) 1,3-Dichlorobenzene	18.54	146	1008563	24.275	ng	100
86) 1,4-Dichlorobenzene	18.61	146	1022241	23.971	ng	100
87) sec-Butylbenzene	18.67	105	2483675	23.080	ng	100
88) 4-Isopropyltoluene (p-...	18.84	119	2279403	22.997	ng	100
89) 1,2,3-Trimethylbenzene	18.83	105	1895370	23.840	ng	100
90) 1,2-Dichlorobenzene	18.97	146	976916	24.406	ng	100
91) d-Limonene	18.99	68	851003	26.201	ng	100
92) 1,2-Dibromo-3-Chloropr...	19.43	157	349987	25.202	ng	98
93) n-Undecane	19.83	57	1305375	31.670	ng	99
94) 1,2,4-Trichlorobenzene	20.77	180	727119	27.294	ng	100
95) Naphthalene	20.89	128	2551762	29.303	ng	100
96) n-Dodecane	20.92	57	1223943	41.776	ng	100
97) Hexachlorobutadiene	21.26	225	436487	23.070	ng	99
98) Cyclohexanone	16.25	55	833869	27.145	ng	99
99) tert-Butylbenzene	18.39	119	1799212	23.579	ng	100
100) n-Butylbenzene	19.28	91	2140021	24.810	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Data File: I:\MS09\Data\2019_06\07\06071908.D
Acq On : 7 Jun 2019 12:52 Operator: SC
Sample : 25ng TO-15 ICAL STD
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 07 13:36:30 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 08:36:10 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\07\06071909.D
Acq On : 7 Jun 2019 13:25 Operator: SC
Sample : 50ng TO-15 ICAL STD
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

6/7/19

Quant Time: Jun 07 13:52:32 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.16	130	199764	12.500	ng		0.00
37) 1,4-Difluorobenzene (IS2)	11.12	114	894771	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	15.46	82	468531	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.94	65	358029	14.203	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 113.60%				
57) Toluene-d8 (SS2)	13.55	98	1091106	11.797	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 94.40%				
73) Bromofluorobenzene (SS3)	17.05	174	296262	12.144	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.12%				
Target Compounds							Qvalue
2) Propene	3.84	42	1224550	59.128	ng		100
3) Dichlorodifluoromethan...	3.96	85	1733545	47.041	ng		100
4) Chloromethane	4.16	50	1546255	50.867	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.32	135	787487	44.886	ng		99
6) Vinyl Chloride	4.44	62	1492352	52.546	ng		100
7) 1,3-Butadiene	4.62	54	1174896	69.979	ng		98
8) Bromomethane	4.93	94	768159	43.072	ng		100
9) Chloroethane	5.15	64	735407	49.268	ng		100
10) Ethanol	5.41	45	4335769	278.554	ng		100
11) Acetonitrile	5.59	41	2290663	63.217	ng		100
12) Acrolein	5.72	56	675127	55.088	ng		99
13) Acetone	5.86	58	3958034	278.353	ng		95
14) Trichlorofluoromethane	6.03	101	1473406	49.664	ng		100
15) 2-Propanol (Isopropanol)	6.20	45	5917703	120.731	ng		100
16) Acrylonitrile	6.39	53	1529530	55.593	ng		99
17) 1,1-Dichloroethene	6.72	96	905279	47.653	ng		97
18) 2-Methyl-2-Propanol (t...	6.85	59	5411520	113.220	ng		99
19) Methylene Chloride	6.89	84	966805	46.105	ng		96
20) 3-Chloro-1-propene (Al...	7.01	41	1798262	72.026	ng		98
21) Trichlorotrifluoroethane	7.19	151	711207	52.384	ng		99
22) Carbon Disulfide	7.15	76	3715860	52.039	ng		100
23) trans-1,2-Dichloroethene	7.91	61	1532756	52.570	ng		98
24) 1,1-Dichloroethane	8.12	63	1802734	50.986	ng		100
25) Methyl tert-Butyl Ether	8.18	73	2980782	48.709	ng		99
26) Vinyl Acetate	8.30	86	1196027	291.652	ng	#	80
27) 2-Butanone (MEK)	8.53	72	721898	49.302	ng		93
28) cis-1,2-Dichloroethene	9.00	61	1462366	52.669	ng		99
29) Diisopropyl Ether	9.23	87	814063	44.887	ng	#	84
30) Ethyl Acetate	9.23	61	824438	118.943	ng		98
31) n-Hexane	9.23	57	1882903	52.383	ng		99
32) Chloroform	9.30	83	1637210	46.840	ng		100
34) Tetrahydrofuran (THF)	9.68	72	706431	48.851	ng		96
35) Ethyl tert-Butyl Ether	9.77	87	1105406	44.645	ng		97
36) 1,2-Dichloroethane	10.05	62	1308288	52.018	ng		99
38) 1,1,1-Trichloroethane	10.31	97	1450085	48.579	ng		99
39) Isopropyl Acetate	10.67	61	1400292	110.365	ng	#	92
40) 1-Butanol	10.70	56	2480666	126.778	ng		97
41) Benzene	10.77	78	3948486	45.337	ng		100
42) Carbon Tetrachloride	10.91	117	1223490	50.377	ng		100
43) Cyclohexane	11.05	84	3080929	95.275	ng		97
44) tert-Amyl Methyl Ether	11.36	73	2761173	48.173	ng		99
45) 1,2-Dichloropropane	11.58	63	1089391	54.063	ng		100
46) Bromodichloromethane	11.77	83	1337118	49.194	ng		100
47) Trichloroethene	11.82	130	950412	45.219	ng		99
48) 1,4-Dioxane	11.79	88	837796	49.725	ng		99
49) 2,2,4-Trimethylpentane...	11.88	57	4656145	53.553	ng		99

Data File: I:\MS09\Data\2019_06\07\06071909.D
Acq On : 7 Jun 2019 13:25 Operator: SC
Sample : 50ng TO-15 ICAL STD
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 07 13:52:32 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

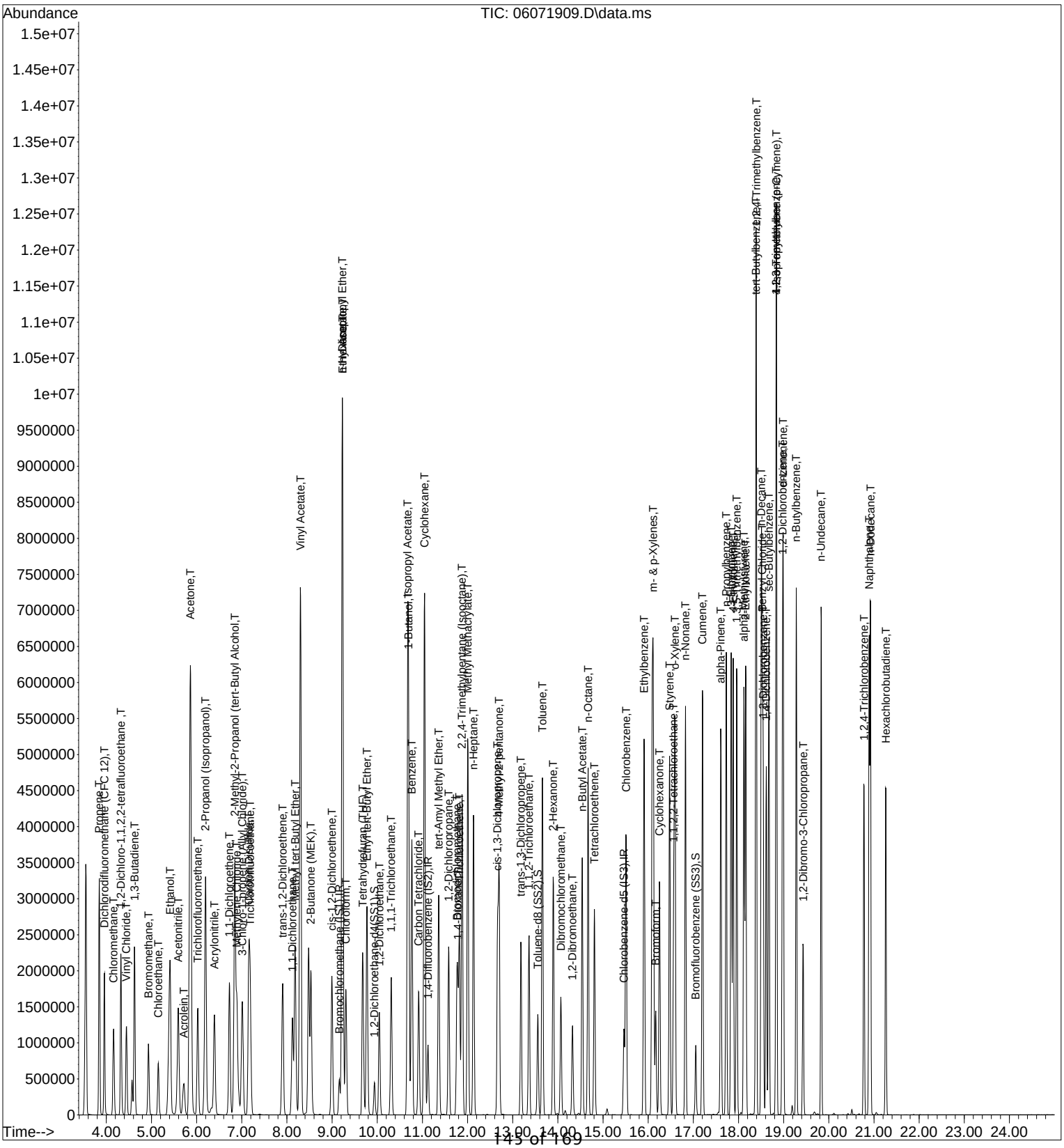
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.00	100	797291	99.633	ng	96
51) n-Heptane	12.13	71	1080107	49.451	ng	98
52) cis-1,3-Dichloropropene	12.66	75	1836326	57.322	ng	100
53) 4-Methyl-2-pentanone	12.70	58	1073722	57.278	ng	96
54) trans-1,3-Dichloropropene	13.18	75	1597585	58.508	ng	100
55) 1,1,2-Trichloroethane	13.36	97	941190	47.330	ng	99
58) Toluene	13.66	91	4032461	41.718	ng	100
59) 2-Hexanone	13.90	43	2691870	64.693	ng	98
60) Dibromochloromethane	14.07	129	1058006	45.795	ng	100
61) 1,2-Dibromoethane	14.32	107	1037310	45.027	ng	100
62) n-Butyl Acetate	14.54	43	3054037	66.822	ng	99
63) n-Octane	14.67	57	992345	48.334	ng	98
64) Tetrachloroethene	14.81	166	972921	41.825	ng	100
65) Chlorobenzene	15.51	112	2547609	43.253	ng	100
66) Ethylbenzene	15.91	91	4604501	42.471	ng	100
67) m- & p-Xylenes	16.11	91	7313565	87.564	ng	99
68) Bromoform	16.17	173	834674	46.862	ng	99
69) Styrene	16.47	104	2816792	44.461	ng	100
70) o-Xylene	16.59	91	3570160	43.169	ng	99
71) n-Nonane	16.83	43	2404365	58.623	ng	98
72) 1,1,2,2-Tetrachloroethane	16.56	83	1791517	46.533	ng	100
74) Cumene	17.20	105	4412758	42.679	ng	99
75) alpha-Pinene	17.61	93	2374347	45.619	ng	99
76) n-Propylbenzene	17.73	91	5523885	44.832	ng	99
77) 3-Ethyltoluene	17.84	105	4488604	44.610	ng	97
78) 4-Ethyltoluene	17.88	105	4147265	43.472	ng	96
79) 1,3,5-Trimethylbenzene	17.96	105	3636110	42.085	ng	100
80) alpha-Methylstyrene	18.12	118	1932423	44.519	ng	99
81) 2-Ethyltoluene	18.16	105	4308024	43.812	ng	99
82) 1,2,4-Trimethylbenzene	18.39	105	3833183	46.272	ng	100
83) n-Decane	18.50	57	2382266	52.173	ng	98
84) Benzyl Chloride	18.53	91	3667365	59.969	ng	99
85) 1,3-Dichlorobenzene	18.55	146	2013420	46.438	ng	100
86) 1,4-Dichlorobenzene	18.61	146	2023202	45.463	ng	99
87) sec-Butylbenzene	18.67	105	4849354	43.182	ng	100
88) 4-Isopropyltoluene (p-...	18.84	119	4481990	43.331	ng	99
89) 1,2,3-Trimethylbenzene	18.83	105	3750499	45.204	ng	100
90) 1,2-Dichlorobenzene	18.98	146	1954548	46.792	ng	99
91) d-Limonene	18.99	68	1649972	48.680	ng	98
92) 1,2-Dibromo-3-Chloropr...	19.43	157	697432	48.125	ng	97
93) n-Undecane	19.83	57	2493398	57.968	ng	99
94) 1,2,4-Trichlorobenzene	20.78	180	1468912	52.837	ng	100
95) Naphthalene	20.90	128	5037220	55.431	ng	100
96) n-Dodecane	20.92	57	2337291	76.448	ng	98
97) Hexachlorobutadiene	21.26	225	887775	44.965	ng	99
98) Cyclohexanone	16.25	55	1637646	51.085	ng	98
99) tert-Butylbenzene	18.39	119	3569197	44.824	ng	99
100) n-Butylbenzene	19.28	91	4160918	46.226	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\07\06071909.D
Acq On : 7 Jun 2019 13:25 Operator: SC
Sample : 50ng TO-15 ICAL STD
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 07 13:52:32 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\07\06071910.D
Acq On : 7 Jun 2019 13:59 Operator: SC
Sample : 100ng TO-15 ICAL STD
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

6/7/19

Quant Time: Jun 07 14:25:04 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.17	130	207427	12.500	ng		0.02
37) 1,4-Difluorobenzene (IS2)	11.13	114	919348	12.500	ng		0.01
56) Chlorobenzene-d5 (IS3)	15.46	82	483454	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.95	65	361249	13.802	ng		0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 110.40%				
57) Toluene-d8 (SS2)	13.56	98	1120954	11.746	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 94.00%				
73) Bromofluorobenzene (SS3)	17.06	174	306939	12.193	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.52%				
Target Compounds							Qvalue
2) Propene	3.84	42	2694270	125.289	ng		100
3) Dichlorodifluoromethan...	3.96	85	3426501	89.546	ng		99
4) Chloromethane	4.16	50	2540207	80.478	ng		99
5) 1,2-Dichloro-1,1,2,2-t...	4.33	135	1610196	88.389	ng		99
6) Vinyl Chloride	4.45	62	2945515	99.882	ng		99
7) 1,3-Butadiene	4.63	54	2337743	134.096	ng		97
8) Bromomethane	4.94	94	1506297	81.340	ng		99
9) Chloroethane	5.16	64	1466279	94.604	ng		99
10) Ethanol	5.44	45	8297697	513.397	ng		100
11) Acetonitrile	5.61	41	4490566	119.350	ng		100
12) Acrolein	5.73	56	1348110	105.938	ng		99
13) Acetone	5.88	58	7481550	506.710	ng		88
14) Trichlorofluoromethane	6.03	101	2946660	95.654	ng		100
15) 2-Propanol (Isopropanol)	6.22	45	10227931	200.958	ng		100
16) Acrylonitrile	6.41	53	3039539	106.396	ng		100
17) 1,1-Dichloroethene	6.74	96	1838119	93.181	ng		93
18) 2-Methyl-2-Propanol (t...	6.87	59	10687446	215.343	ng		99
19) Methylene Chloride	6.90	84	1957264	89.891	ng		92
20) 3-Chloro-1-propene (Al...	7.02	41	3514095	135.551	ng		96
21) Trichlorotrifluoroethane	7.19	151	1462233	103.721	ng		97
22) Carbon Disulfide	7.16	76	7430890	100.221	ng		100
23) trans-1,2-Dichloroethene	7.91	61	3051529	100.794	ng		96
24) 1,1-Dichloroethane	8.13	63	3568575	97.199	ng		99
25) Methyl tert-Butyl Ether	8.19	73	5982618	94.150	ng		99
26) Vinyl Acetate	8.31	86	2389038	561.046	ng	#	46
27) 2-Butanone (MEK)	8.54	72	1442530	94.877	ng	#	88
28) cis-1,2-Dichloroethene	9.00	61	2901866	100.654	ng		97
29) Diisopropyl Ether	9.23	87	1634101	86.774	ng	#	60
30) Ethyl Acetate	9.24	61	1544978	214.662	ng		93
31) n-Hexane	9.23	57	3492555	93.574	ng		99
32) Chloroform	9.32	83	3257746	89.760	ng		100
34) Tetrahydrofuran (THF)	9.68	72	1409125	93.845	ng		92
35) Ethyl tert-Butyl Ether	9.78	87	2245972	87.359	ng		94
36) 1,2-Dichloroethane	10.05	62	2576784	98.669	ng		99
38) 1,1,1-Trichloroethane	10.32	97	2905109	94.722	ng		99
39) Isopropyl Acetate	10.68	61	2712493	208.071	ng	#	83
40) 1-Butanol	10.72	56	4797495	238.628	ng		94
41) Benzene	10.77	78	7835272	87.560	ng		99
42) Carbon Tetrachloride	10.92	117	2462486	98.682	ng		100
43) Cyclohexane	11.05	84	6117604	184.125	ng		94
44) tert-Amyl Methyl Ether	11.37	73	5517597	93.690	ng		98
45) 1,2-Dichloropropane	11.59	63	2154241	104.051	ng		100
46) Bromodichloromethane	11.77	83	2677696	95.881	ng		100
47) Trichloroethene	11.82	130	1930015	89.371	ng		99
48) 1,4-Dioxane	11.79	88	1693135	97.806	ng		97
49) 2,2,4-Trimethylpentane...	11.88	57	8955455	100.248	ng		99

Data File: I:\MS09\Data\2019_06\07\06071910.D
Acq On : 7 Jun 2019 13:59 Operator: SC
Sample : 100ng TO-15 ICAL STD
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 07 14:25:04 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

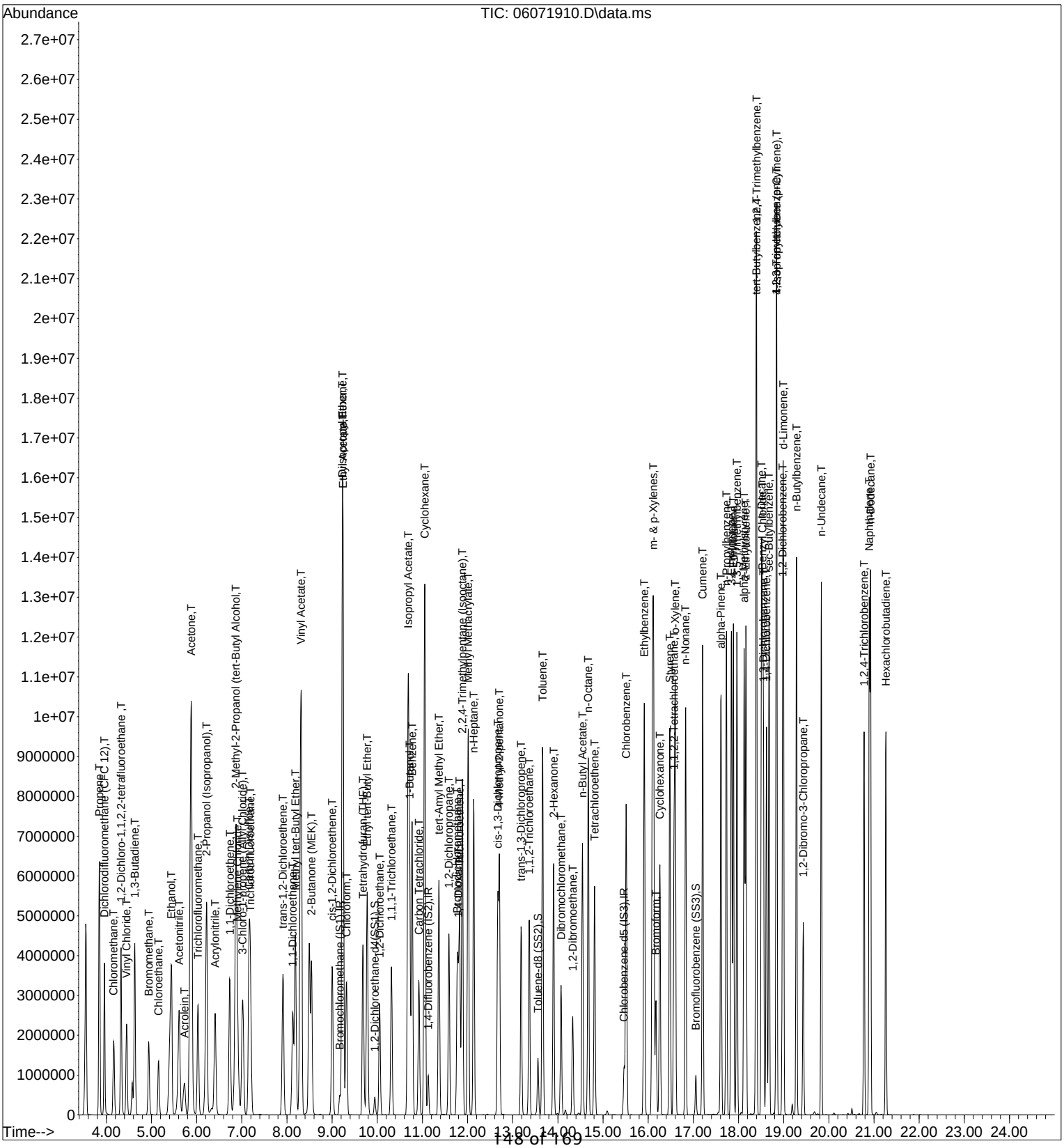
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.01	100	1607856	195.553	ng	92
51) n-Heptane	12.14	71	2145835	95.617	ng	97
52) cis-1,3-Dichloropropene	12.67	75	3652483	110.966	ng	99
53) 4-Methyl-2-pentanone	12.70	58	2111458	109.625	ng	92
54) trans-1,3-Dichloropropene	13.19	75	3188627	113.655	ng	100
55) 1,1,2-Trichloroethane	13.37	97	1898780	92.933	ng	99
58) Toluene	13.66	91	8013010	80.340	ng	99
59) 2-Hexanone	13.91	43	5155110	120.068	ng	96
60) Dibromochloromethane	14.07	129	2146537	90.044	ng	100
61) 1,2-Dibromoethane	14.33	107	2103524	88.490	ng	100
62) n-Butyl Acetate	14.54	43	5831029	123.644	ng	97
63) n-Octane	14.67	57	1938787	91.518	ng	96
64) Tetrachloroethene	14.81	166	1996618	83.184	ng	100
65) Chlorobenzene	15.51	112	5144325	84.644	ng	99
66) Ethylbenzene	15.91	91	9134554	81.655	ng	98
67) m- & p-Xylenes	16.11	91	14497266	168.216	ng	98
68) Bromoform	16.17	173	1724046	93.807	ng	99
69) Styrene	16.48	104	5669245	86.722	ng	99
70) o-Xylene	16.60	91	7115846	83.387	ng	98
71) n-Nonane	16.83	43	4481835	105.903	ng	94
72) 1,1,2,2-Tetrachloroethane	16.57	83	3595424	90.505	ng	100
74) Cumene	17.21	105	8733066	81.858	ng	98
75) alpha-Pinene	17.61	93	4752567	88.493	ng	100
76) n-Propylbenzene	17.73	91	10711283	84.250	ng	98
77) 3-Ethyltoluene	17.84	105	9000418	86.689	ng	98
78) 4-Ethyltoluene	17.89	105	8014618	81.417	ng	95
79) 1,3,5-Trimethylbenzene	17.96	105	7221640	81.005	ng	99
80) alpha-Methylstyrene	18.12	118	3905547	87.198	ng	98
81) 2-Ethyltoluene	18.16	105	8480594	83.584	ng	98
82) 1,2,4-Trimethylbenzene	18.40	105	7458454	87.256	ng	99
83) n-Decane	18.51	57	4430161	94.029	ng	95
84) Benzyl Chloride	18.53	91	7251585	114.917	ng	97
85) 1,3-Dichlorobenzene	18.55	146	4085387	91.318	ng	100
86) 1,4-Dichlorobenzene	18.62	146	4078305	88.815	ng	99
87) sec-Butylbenzene	18.67	105	9376451	80.917	ng	98
88) 4-Isopropyltoluene (p-...	18.84	119	8478428	79.438	ng	98
89) 1,2,3-Trimethylbenzene	18.84	105	7259917	84.802	ng	100
90) 1,2-Dichlorobenzene	18.98	146	3940874	91.432	ng	100
91) d-Limonene	18.99	68	3139327	89.762	ng	94
92) 1,2-Dibromo-3-Chloropr...	19.43	157	1413430	94.521	ng	95
93) n-Undecane	19.83	57	4693480	105.748	ng	96
94) 1,2,4-Trichlorobenzene	20.78	180	3006863	104.819	ng	99
95) Naphthalene	20.90	128	9775966	104.256	ng	98
96) n-Dodecane	20.92	57	4392602	139.238	ng	95
97) Hexachlorobutadiene	21.26	225	1849494	90.784	ng	99
98) Cyclohexanone	16.26	55	3203768	96.855	ng	97
99) tert-Butylbenzene	18.39	119	6961686	84.730	ng	98
100) n-Butylbenzene	19.28	91	8052719	86.701	ng	98

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\07\06071910.D
Acq On : 7 Jun 2019 13:59 Operator: SC
Sample : 100ng TO-15 ICAL STD
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 07 14:25:04 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 13:38:27 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\07\06071912.D
Acq On : 7 Jun 2019 15:06 Operator: SC
Sample : 25ng TO-15 ICV STD
Misc : S31-05131901/S31-05241901 (6/22)
ALS Vial : 2 Sample Multiplier: 1

6/7/19

Quant Time: Jun 07 15:32:01 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.16	130	208446	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	11.12	114	932547	12.500	ng		0.00
56) Chlorobenzene-d5 (IS3)	15.46	82	480512	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.94	65	355450	11.701	ng		-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 93.60%				
57) Toluene-d8 (SS2)	13.55	98	1125126	12.553	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.40%				
73) Bromofluorobenzene (SS3)	17.05	174	312903	13.014	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 104.08%				
Target Compounds							Qvalue
2) Propene	3.85	42	651204	24.362	ng		99
3) Dichlorodifluoromethan...	3.96	85	929200	23.725	ng		100
4) Chloromethane	4.16	50	877276	24.847	ng		100
5) 1,2-Dichloro-1,1,2,2-t...	4.33	135	449121	25.335	ng		100
6) Vinyl Chloride	4.45	62	831980	25.114	ng		100
7) 1,3-Butadiene	4.62	54	632034	25.999	ng		97
8) Bromomethane	4.93	94	458788	25.681	ng		100
9) Chloroethane	5.15	64	418129	24.820	ng		100
10) Ethanol	5.39	45	2368268	114.532	ng		100
11) Acetonitrile	5.59	41	1200032	23.750	ng		99
12) Acrolein	5.71	56	369807	22.668	ng		99
13) Acetone	5.86	58	2206187	120.560	ng		93
14) Trichlorofluoromethane	6.03	101	808809	24.584	ng		100
15) 2-Propanol (Isopropanol)	6.19	45	3175338	47.222	ng		100
16) Acrylonitrile	6.39	53	818986	24.015	ng		99
17) 1,1-Dichloroethene	6.72	96	500049	25.456	ng		93
18) 2-Methyl-2-Propanol (t...	6.83	59	2892320	50.079	ng		99
19) Methylene Chloride	6.88	84	536422	25.161	ng		92
20) 3-Chloro-1-propene (Al...	7.01	41	976650	24.852	ng		95
21) Trichlorotrifluoroethane	7.19	151	400639	26.079	ng		96
22) Carbon Disulfide	7.15	76	2024502	24.534	ng		100
23) trans-1,2-Dichloroethene	7.90	61	822111	24.477	ng		96
24) 1,1-Dichloroethane	8.12	63	1003175	24.674	ng		99
25) Methyl tert-Butyl Ether	8.18	73	1604869	25.594	ng		99
26) Vinyl Acetate	8.29	86	657615	128.821	ng	#	80
27) 2-Butanone (MEK)	8.53	72	394659	22.404	ng	#	89
28) cis-1,2-Dichloroethene	8.99	61	775064	23.861	ng		96
29) Diisopropyl Ether	9.22	87	448014	27.139	ng	#	82
30) Ethyl Acetate	9.23	61	447738	51.022	ng		97
31) n-Hexane	9.23	57	1033979	24.716	ng		100
32) Chloroform	9.30	83	881679	24.845	ng		100
34) Tetrahydrofuran (THF)	9.68	72	382840	24.404	ng		92
35) Ethyl tert-Butyl Ether	9.77	87	599125	25.602	ng		95
36) 1,2-Dichloroethane	10.04	62	696393	23.958	ng		100
38) 1,1,1-Trichloroethane	10.31	97	763105	25.028	ng		99
39) Isopropyl Acetate	10.67	61	756711	50.047	ng	#	91
40) 1-Butanol	10.68	56	1375902	49.512	ng		94
41) Benzene	10.77	78	2188623	22.882	ng		100
42) Carbon Tetrachloride	10.91	117	656436	24.783	ng		99
43) Cyclohexane	11.05	84	1695524	50.139	ng		96
44) tert-Amyl Methyl Ether	11.36	73	1483290	25.621	ng		98
45) 1,2-Dichloropropane	11.58	63	584449	24.998	ng		100
46) Bromodichloromethane	11.76	83	717106	25.678	ng		100
47) Trichloroethene	11.82	130	533649	25.753	ng		99
48) 1,4-Dioxane	11.78	88	452929	25.122	ng		97
49) 2,2,4-Trimethylpentane...	11.88	57	2517845	24.338	ng		98

Data File: I:\MS09\Data\2019_06\07\06071912.D
Acq On : 7 Jun 2019 15:06 Operator: SC
Sample : 25ng TO-15 ICV STD
Misc : S31-05131901/S31-05241901 (6/22)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 07 15:32:01 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

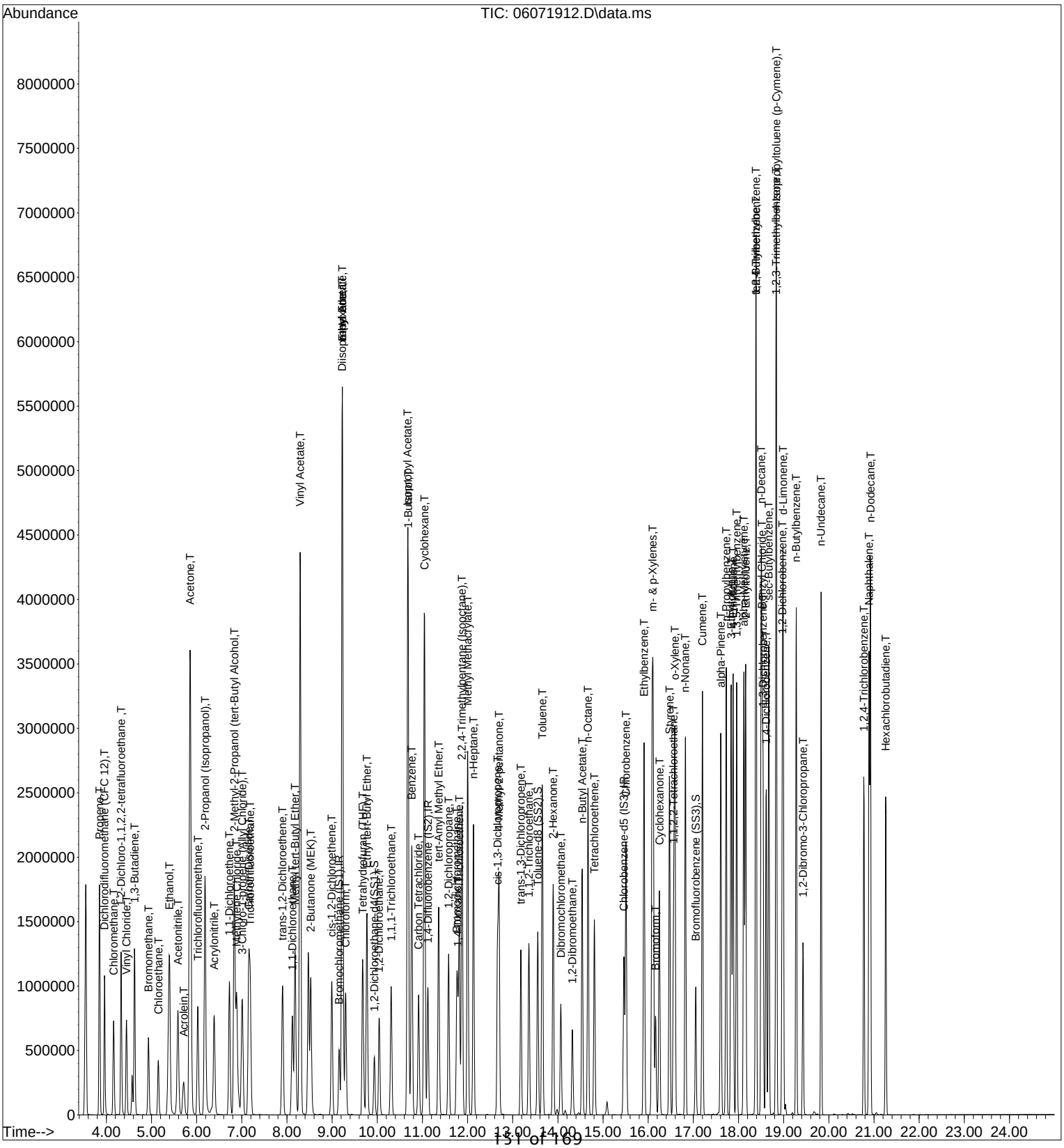
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.00	100	438876	55.053	ng	94
51) n-Heptane	12.13	71	587470	25.420	ng	98
52) cis-1,3-Dichloropropene	12.66	75	930458	26.107	ng	100
53) 4-Methyl-2-pentanone	12.70	58	579625	25.696	ng	94
54) trans-1,3-Dichloropropene	13.18	75	848439	26.628	ng	100
55) 1,1,2-Trichloroethane	13.36	97	509928	25.857	ng	99
58) Toluene	13.65	91	2197692	24.609	ng	100
59) 2-Hexanone	13.90	43	1429306	24.788	ng	97
60) Dibromochloromethane	14.07	129	569855	27.015	ng	100
61) 1,2-Dibromoethane	14.32	107	564411	26.460	ng	100
62) n-Butyl Acetate	14.54	43	1634281	25.619	ng	98
63) n-Octane	14.67	57	530485	24.917	ng	97
64) Tetrachloroethene	14.81	166	533826	26.213	ng	100
65) Chlorobenzene	15.51	112	1397030	25.757	ng	100
66) Ethylbenzene	15.91	91	2503054	24.979	ng	100
67) m- & p-Xylenes	16.10	91	3955184	51.237	ng	99
68) Bromoform	16.16	173	445161	28.102	ng	99
69) Styrene	16.47	104	1546841	27.252	ng	99
70) o-Xylene	16.59	91	1950082	25.645	ng	99
71) n-Nonane	16.82	43	1287565	24.368	ng	97
72) 1,1,2,2-Tetrachloroethane	16.56	83	936562	25.038	ng	100
74) Cumene	17.20	105	2445863	25.799	ng	100
75) alpha-Pinene	17.61	93	1310307	26.808	ng	99
76) n-Propylbenzene	17.73	91	3044104	26.082	ng	99
77) 3-Ethyltoluene	17.84	105	2477608	26.394	ng	97
78) 4-Ethyltoluene	17.88	105	2308278	26.078	ng	96
79) 1,3,5-Trimethylbenzene	17.96	105	1996655	25.612	ng	100
80) alpha-Methylstyrene	18.12	118	1124469	30.434	ng	99
81) 2-Ethyltoluene	18.16	105	2376136	25.925	ng	99
82) 1,2,4-Trimethylbenzene	18.39	105	2071384	26.213	ng	99
83) n-Decane	18.50	57	1307314	25.578	ng	99
84) Benzyl Chloride	18.52	91	1956142	29.299	ng	99
85) 1,3-Dichlorobenzene	18.54	146	1101176	26.495	ng	99
86) 1,4-Dichlorobenzene	18.61	146	1110979	26.510	ng	100
87) sec-Butylbenzene	18.67	105	2703151	25.854	ng	99
88) 4-Isopropyltoluene (p-...	18.84	119	2525216	26.058	ng	99
89) 1,2,3-Trimethylbenzene	18.83	105	2118360	26.752	ng	100
90) 1,2-Dichlorobenzene	18.97	146	1072511	26.726	ng	99
91) d-Limonene	18.99	68	948597	28.121	ng	98
92) 1,2-Dibromo-3-Chloropr...	19.43	157	392229	28.281	ng	94
93) n-Undecane	19.83	57	1386000	26.249	ng	99
94) 1,2,4-Trichlorobenzene	20.77	180	809409	28.742	ng	99
95) Naphthalene	20.89	128	2745466	29.410	ng	100
96) n-Dodecane	20.92	57	1414280	31.375	ng	98
97) Hexachlorobutadiene	21.26	225	480488	26.867	ng	99
98) Cyclohexanone	16.25	55	897571	22.724	ng	97
99) tert-Butylbenzene	18.39	119	1961954	26.020	ng	100
100) n-Butylbenzene	19.28	91	2281708	25.850	ng	99

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\07\06071912.D
Acq On : 7 Jun 2019 15:06 Operator: SC
Sample : 25ng TO-15 ICV STD
Misc : S31-05131901/S31-05241901 (6/22)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 07 15:32:01 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: **06071912.D** Acq. Method File: **TO15.M** 6/7/19

Data File Path: **I:\MS09\Data\2019_06\07** Sample Name: **25ng TO-15 ICV STD**

Operator: **SC** Misc Info: **S31-05131901/S31-05241901 (**

Date Acquired: **6/7/19** **15:06** Instrument Name: **MS09**

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
2)	**Propene**	**3.85**	**24.4**	26.43	92	**53**	**112**	*	*
3)	**Dichlorodifluoromethane (CFC 1**	**3.96**	**23.7**	**26.30**	90	**62**	**103**	*	*
4)	**Chloromethane**	**4.16**	**24.8**	**26.38**	94	**51**	**121**	*	*
5)	**1,2-Dichloro-1,1,2,2-tetrafluoroet**	**4.33**	**25.3**	**26.38**	96	**56**	**111**	*	*
6)	**Vinyl Chloride**	**4.45**	**25.1**	**26.73**	94	**57**	**117**	*	*
7)	**1,3-Butadiene**	**4.62**	**26.0**	**26.28**	99	**53**	**134**	*	*
8)	**Bromomethane**	**4.93**	**25.7**	**26.48**	97	**65**	**110**	*	*
9)	**Chloroethane**	**5.15**	**24.8**	**26.75**	93	**64**	**111**	*	*
10)	**Ethanol**	**5.39**	**115**	**128.10**	90	**57**	**124**	*	*
11)	**Acetonitrile**	**5.59**	**23.7**	**25.73**	92	**57**	**126**	*	*
12)	**Acrolein**	**5.71**	**22.7**	**25.63**	89	**62**	**121**	*	*
13)	**Acetone**	**5.86**	**121**	**132.33**	91	**60**	**113**	*	*
14)	**Trichlorofluoromethane**	**6.03**	**24.6**	**26.40**	93	**63**	**104**	*	*
15)	**2-Propanol (Isopropanol)**	**6.19**	**47.2**	**51.60**	91	**60**	**124**	*	*
16)	**Acrylonitrile**	**6.39**	**24.0**	**25.88**	93	**66**	**125**	*	*
17)	**1,1-Dichloroethene**	**6.72**	**25.5**	**27.23**	94	**68**	**107**	*	*
18)	2-Methyl-2-Propanol (tert-Butyl Alc	6.83	50.1	54.25	92	64	114	*	*
19)	**Methylene Chloride**	**6.88**	**25.2**	**27.08**	93	**66**	**105**	*	*
20)	**3-Chloro-1-propene (Allyl Chloric**	**7.01**	**24.9**	**27.00**	92	**63**	**127**	*	*
21)	**Trichlorotrifluoroethane**	**7.19**	**26.1**	**26.95**	97	**59**	**109**	*	*
22)	**Carbon Disulfide**	**7.15**	**24.5**	**27.20**	90	**67**	**109**	*	*
23)	**trans-1,2-Dichloroethene**	**7.90**	**24.5**	**26.73**	92	**70**	**115**	*	*
24)	**1,1-Dichloroethane**	**8.12**	**24.7**	**26.95**	92	**66**	**106**	*	*
25)	**Methyl tert-Butyl Ether**	**8.18**	**25.6**	**26.80**	96	**67**	**109**	*	*
26)	**Vinyl Acetate**	**8.29**	**129**	**133.03**	97	**68**	**136**	*	*
27)	**2-Butanone (MEK)**	**8.53**	**22.4**	**25.95**	86	**71**	**116**	*	*
28)	**cis-1,2-Dichloroethene**	**8.99**	**23.9**	**26.35**	91	**67**	**110**	*	*
29)	Diisopropyl Ether	9.22	27.1	27.18	100	62	109	*	*
30)	**Ethyl Acetate**	**9.23**	**51.0**	**54.45**	94	**64**	**127**	*	*
31)	**n-Hexane**	**9.23**	**24.7**	**26.95**	92	**60**	**115**	*	*
32)	**Chloroform**	**9.30**	**24.8**	**27.08**	92	**66**	**105**	*	*
34)	**Tetrahydrofuran (THF)**	**9.68**	**24.4**	**27.00**	90	**65**	**110**	*	*
35)	Ethyl tert-Butyl Ether	9.77	25.6	26.80	96	69	109	*	*
36)	**1,2-Dichloroethane**	**10.04**	**24.0**	**26.85**	89	**60**	**110**	*	*
38)	**1,1,1-Trichloroethane**	**10.31**	**25.0**	**26.90**	93	**64**	**108**	*	*
39)	Isopropyl Acetate	10.67	50.0	51.55	97	66	119	*	*
40)	1-Butanol	10.68	49.5	51.58	96	54	143	*	*
41)	**Benzene**	**10.77**	**22.9**	**26.38**	87	**67**	**106**	*	*
42)	**Carbon Tetrachloride**	**10.91**	**24.8**	**26.45**	94	**64**	**112**	*	*
43)	**Cyclohexane**	**11.05**	**50.1**	**52.05**	96	**67**	**110**	*	*
44)	tert-Amyl Methyl Ether	11.36	25.6	**27.08**	95	68	112	*	*
45)	**1,2-Dichloropropane**	**11.58**	**25.0**	**26.98**	93	**66**	**112**	*	*
46)	**Bromodichloromethane**	**11.76**	**25.7**	**26.83**	96	**67**	**113**	*	*
47)	**Trichloroethene**	**11.82**	**25.8**	**26.68**	97	**66**	**108**	*	*
48)	**1,4-Dioxane**	**11.78**	**25.1**	**26.73**	94	**70**	**116**	*	*
49)	2,2,4-Trimethylpentane (Isooctane)	11.88	24.3	26.65	91	64	113	*	*

Initial Calibration Verification/LABORATORY CONTROL SAMPLE CHECK SHEET

Data File Name: **06071912.D** **TO15.M**
Data File Path: **I:\MS09\Data\2019_06\07** Sample Name: **25ng TO-15 ICV STD**
Operator: **SC** Misc Info: **S31-05131901/S31-05241901 (**
Date Acquired: **6/7/19** **15:06** Instrument Name: **MS09**

#	Compound Name	Ret. Time	Amt. (ng)	Spike Amt.(ng)	% Rec.	Lower Limit	Upper Limit	* OR Fail	ICV/AZ 70-130%
50)	**Methyl Methacrylate**	**12.00**	**55.1**	**53.88**	102	**73**	**118**	*	*
51)	**n-Heptane**	**12.13**	**25.4**	**26.90**	94	**66**	**110**	*	*
52)	**cis-1,3-Dichloropropene**	**12.66**	**26.1**	**26.78**	97	**75**	**120**	*	*
53)	**4-Methyl-2-pentanone**	**12.70**	**25.7**	**26.15**	98	**65**	**124**	*	*
54)	**trans-1,3-Dichloropropene**	**13.18**	**26.6**	**26.60**	100	**77**	**123**	*	*
55)	**1,1,2-Trichloroethane**	**13.36**	**25.9**	**26.85**	96	**68**	**112**	*	*
58)	**Toluene**	**13.65**	**24.6**	**26.50**	93	**62**	**111**	*	*
59)	**2-Hexanone**	**13.90**	**24.8**	**26.78**	93	**59**	**128**	*	*
60)	**Dibromochloromethane**	**14.07**	**27.0**	**26.60**	102	**67**	**123**	*	*
61)	**1,2-Dibromoethane**	**14.32**	**26.5**	**27.03**	98	**66**	**122**	*	*
62)	**n-Butyl Acetate**	**14.54**	**25.6**	**27.35**	94	**64**	**128**	*	*
63)	**n-Octane**	**14.67**	**24.9**	**27.13**	92	**65**	**114**	*	*
64)	**Tetrachloroethene**	**14.81**	**26.2**	**26.60**	98	**55**	**120**	*	*
65)	**Chlorobenzene**	**15.51**	**25.8**	**26.83**	96	**61**	**114**	*	*
66)	**Ethylbenzene**	**15.91**	**25.0**	**26.53**	94	**64**	**113**	*	*
67)	**m- & p-Xylenes**	**16.10**	**51.2**	**53.28**	96	**64**	**114**	*	*
68)	**Bromoform**	**16.16**	**28.1**	**26.68**	105	**65**	**132**	*	*
69)	**Styrene**	**16.47**	**27.3**	**26.50**	103	**67**	**124**	*	*
70)	**o-Xylene**	**16.59**	**25.6**	**26.75**	96	**65**	**114**	*	*
71)	**n-Nonane**	**16.82**	**24.4**	**26.83**	91	**64**	**117**	*	*
72)	**1,1,2,2-Tetrachloroethane**	**16.56**	**25.0**	**26.80**	93	**66**	**119**	*	*
74)	**Cumene**	**17.20**	**25.8**	**26.80**	96	**61**	**116**	*	*
75)	**alpha-Pinene**	**17.61**	**26.8**	**26.40**	102	**65**	**120**	*	*
76)	**n-Propylbenzene**	**17.73**	**26.1**	**27.23**	96	**63**	**117**	*	*
77)	3-Ethyltoluene	17.84	26.4	26.83	98	60	117	*	*
78)	**4-Ethyltoluene**	**17.88**	**26.1**	**26.80**	**97**	**63**	**124**	*	*
79)	**1,3,5-Trimethylbenzene**	**17.96**	**25.6**	**26.73**	**96**	**60**	**117**	*	*
80)	alpha-Methylstyrene	18.12	30.4	26.75	**114**	64	131	*	*
81)	2-Ethyltoluene	18.16	25.9	27.08	**96**	62	116	*	*
82)	**1,2,4-Trimethylbenzene**	**18.39**	**26.2**	**26.90**	**97**	**61**	**122**	*	*
83)	n-Decane	18.50	25.6	26.88	**95**	67	120	*	*
84)	**Benzyl Chloride**	**18.52**	**29.3**	**27.08**	**108**	**77**	**142**	*	*
85)	**1,3-Dichlorobenzene**	**18.54**	**26.5**	**26.98**	**98**	**61**	**125**	*	*
86)	**1,4-Dichlorobenzene**	**18.61**	**26.5**	**27.00**	**98**	**59**	**123**	*	*
87)	sec-Butylbenzene	18.67	25.9	26.55	**98**	62	117	*	*
88)	4-Isopropyltoluene (p-Cymene)	18.84	26.1	26.95	**97**	58	122	*	*
89)	1,2,3-Trimethylbenzene	18.83	26.8	26.95	**99**	62	124	*	*
90)	**1,2-Dichlorobenzene**	**18.97**	**26.7**	**26.95**	**99**	**61**	**126**	*	*
91)	**d-Limonene**	**18.99**	**28.1**	**26.38**	**107**	**66**	**124**	*	*
92)	**1,2-Dibromo-3-Chloropropane**	**19.43**	**28.3**	**26.15**	**108**	**67**	**138**	*	*
93)	n-Undecane	19.83	26.2	27.03	**97**	68	127	*	*
94)	**1,2,4-Trichlorobenzene**	**20.77**	**28.7**	**26.78**	**107**	**62**	**141**	*	*
95)	**Naphthalene**	**20.89**	**29.4**	**25.38**	**116**	**62**	**145**	*	*
96)	n-Dodecane	20.92	31.4	25.63	**123**	64	152	*	*
97)	**Hexachlorobutadiene**	**21.26**	**26.9**	**26.13**	**103**	49	131	*	*
98)	Cyclohexanone	16.25	22.7	24.45	93	61	127	*	*
99)	tert-Butylbenzene	18.39	26.0	26.88	97	58	122	*	*
100)	n-Butylbenzene	19.28	25.9	27.00	96	64	121	*	*

Bold = 75 Compound List

*** = Pass**

00942957

Data File: I:\MS09\Data\2019_06\12\06121902.D
Acq On : 12 Jun 2019 6:14 Operator: SC
Sample : CCV R9061219_25ng
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

6/12/19

Quant Time: Jun 12 08:50:03 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	IR	Bromochloromethane (IS1)	1.000	1.000	0.0	108	-0.02
2	T	Propene	1.603	1.570	2.1	103	0.00
3	T	Dichlorodifluoromethane (CF	2.349	2.147	8.6	102	0.00
4	T	Chloromethane	2.117	2.141	-1.1	104	-0.01
5	T	1,2-Dichloro-1,1,2,2-tetraf	1.063	0.964	9.3	103	-0.01
6	T	Vinyl Chloride	1.987	1.853	6.7	104	-0.01
7	T	1,3-Butadiene	1.458	1.500	-2.9	107	-0.02
8	T	Bromomethane	1.071	1.001	6.5	105	-0.01
9	T	Chloroethane	1.010	0.940	6.9	104	-0.02
10	T	Ethanol	1.240	1.122	9.5	102	-0.06
11	T	Acetonitrile	3.030	2.896	4.4	102	-0.04
12	T	Acrolein	0.978	0.880	10.0	104	-0.03
13	T	Acetone	1.097	0.995	9.3	103	-0.03
14	T	Trichlorofluoromethane	1.973	1.802	8.7	102	-0.02
15	T	2-Propanol (Isopropanol)	4.032	3.787	6.1	102	-0.04
16	T	Acrylonitrile	2.045	1.929	5.7	103	-0.03
17	T	1,1-Dichloroethene	1.178	1.077	8.6	103	-0.02
18	T	2-Methyl-2-Propanol (tert-B	3.463	3.321	4.1	104	-0.04
19	T	Methylene Chloride	1.278	1.166	8.8	104	-0.02
20	T	3-Chloro-1-propene (Allyl C	2.357	2.188	7.2	101	-0.02
21	T	Trichlorotrifluoroethane	0.921	0.845	8.3	103	-0.01
22	T	Carbon Disulfide	4.948	4.452	10.0	103	-0.01
23	T	trans-1,2-Dichloroethene	2.014	1.876	6.9	103	-0.02
24	T	1,1-Dichloroethane	2.438	2.281	6.4	103	-0.01
25	T	Methyl tert-Butyl Ether	3.760	3.573	5.0	104	-0.02
26	T	Vinyl Acetate	0.306	0.294	3.9	104	-0.03
27	T	2-Butanone (MEK)	1.056	0.904	14.4	104	-0.03
28	T	cis-1,2-Dichloroethene	1.948	1.791	8.1	102	-0.02
29	T	Diisopropyl Ether	0.990	0.973	1.7	104	0.00
30	T	Ethyl Acetate	0.526	0.501	4.8	103	-0.02
31	T	n-Hexane	2.509	2.320	7.5	103	0.00
32	T	Chloroform	2.128	1.960	7.9	102	-0.03
33	S	1,2-Dichloroethane-d4(SS1)	1.822	1.826	-0.2	107	-0.02
34	T	Tetrahydrofuran (THF)	0.941	0.857	8.9	104	-0.01
35	T	Ethyl tert-Butyl Ether	1.403	1.352	3.6	105	-0.01
36	T	1,2-Dichloroethane	1.743	1.596	8.4	101	-0.01
37	IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	109	-0.01
38	T	1,1,1-Trichloroethane	0.409	0.378	7.6	102	-0.01
39	T	Isopropyl Acetate	0.203	0.194	4.4	103	-0.02
40	T	1-Butanol	0.372	0.345	7.3	103	-0.03
41	T	Benzene	1.282	1.090	15.0	103	-0.01
42	T	Carbon Tetrachloride	0.355	0.331	6.8	102	-0.01
43	T	Cyclohexane	0.453	0.421	7.1	103	-0.01
44	T	tert-Amyl Methyl Ether	0.776	0.740	4.6	105	-0.01
45	T	1,2-Dichloropropane	0.313	0.290	7.3	102	-0.01
46	T	Bromodichloromethane	0.374	0.352	5.9	102	-0.01
47	T	Trichloroethene	0.278	0.249	10.4	103	-0.01
48	T	1,4-Dioxane	0.242	0.221	8.7	103	-0.01
49	T	2,2,4-Trimethylpentane (Iso	1.387	1.268	8.6	102	-0.01
50	T	Methyl Methacrylate	0.107	0.105	1.9	104	-0.02
51	T	n-Heptane	0.310	0.285	8.1	103	0.00
52	T	cis-1,3-Dichloropropene	0.478	0.463	3.1	102	0.00
53	T	4-Methyl-2-pentanone	0.302	0.290	4.0	102	-0.01
54	T	trans-1,3-Dichloropropene	0.427	0.426	0.2	102	0.00

Data File: I:\MS09\Data\2019_06\12\06121902.D
Acq On : 12 Jun 2019 6:14 Operator: SC
Sample : CCV R9061219_25ng
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 12 08:50:03 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
55	T	1,1,2-Trichloroethane	0.264	0.246	6.8	103	-0.01
56	IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	109	0.00
57	S	Toluene-d8 (SS2)	2.332	2.289	1.8	108	0.00
58	T	Toluene	2.323	2.026	12.8	103	0.00
59	T	2-Hexanone	1.500	1.345	10.3	101	-0.02
60	T	Dibromochloromethane	0.549	0.509	7.3	102	0.00
61	T	1,2-Dibromoethane	0.555	0.503	9.4	102	-0.01
62	T	n-Butyl Acetate	1.659	1.516	8.6	101	0.00
63	T	n-Octane	0.554	0.494	10.8	103	0.00
64	T	Tetrachloroethene	0.530	0.473	10.8	102	0.00
65	T	Chlorobenzene	1.411	1.252	11.3	103	0.00
66	T	Ethylbenzene	2.607	2.339	10.3	102	0.00
67	T	m- & p-Xylenes	2.008	1.805	10.1	102	-0.01
68	T	Bromoform	0.412	0.398	3.4	101	-0.01
69	T	Styrene	1.477	1.370	7.2	101	-0.01
70	T	o-Xylene	1.978	1.764	10.8	102	0.00
71	T	n-Nonane	1.375	1.223	11.1	101	0.00
72	T	1,1,2,2-Tetrachloroethane	0.973	0.881	9.5	102	-0.01
73	S	Bromofluorobenzene (SS3)	0.625	0.625	0.0	109	0.00
74	T	Cumene	2.466	2.189	11.2	102	0.00
75	T	alpha-Pinene	1.271	1.190	6.4	102	0.00
76	T	n-Propylbenzene	3.036	2.710	10.7	102	0.00
77	T	3-Ethyltoluene	2.442	2.146	12.1	102	-0.01
78	T	4-Ethyltoluene	2.303	2.119	8.0	101	-0.01
79	T	1,3,5-Trimethylbenzene	2.028	1.804	11.0	102	0.00
80	T	alpha-Methylstyrene	0.961	0.929	3.3	100	0.00
81	T	2-Ethyltoluene	2.384	2.101	11.9	101	0.00
82	T	1,2,4-Trimethylbenzene	2.056	1.858	9.6	101	-0.01
83	T	n-Decane	1.330	1.195	10.2	101	0.00
84	T	Benzyl Chloride	1.737	1.784	-2.7	101	-0.01
85	T	1,3-Dichlorobenzene	1.081	0.958	11.4	101	-0.01
86	T	1,4-Dichlorobenzene	1.090	0.967	11.3	100	0.00
87	T	sec-Butylbenzene	2.720	2.409	11.4	101	0.00
88	T	4-Isopropyltoluene (p-Cymen	2.521	2.246	10.9	101	0.00
89	T	1,2,3-Trimethylbenzene	2.060	1.864	9.5	100	0.00
90	T	1,2-Dichlorobenzene	1.044	0.920	11.9	101	0.00
91	T	d-Limonene	0.878	0.856	2.5	100	0.00
92	T	1,2-Dibromo-3-Chloropropane	0.361	0.342	5.3	100	0.00
93	T	n-Undecane	1.374	1.265	7.9	100	0.00
94	T	1,2,4-Trichlorobenzene	0.733	0.685	6.5	98	0.00
95	T	Naphthalene	2.428	2.483	-2.3	98	0.00
96	T	n-Dodecane	1.173	1.219	-3.9	101	0.00
97	T	Hexachlorobutadiene	0.465	0.415	10.8	98	0.00
98	T	Cyclohexanone	1.028	0.877	14.7	101	-0.02
99	T	tert-Butylbenzene	1.962	1.738	11.4	101	0.00
100	T	n-Butylbenzene	2.296	2.053	10.6	100	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\12\06121902.D
Acq On : 12 Jun 2019 6:14 Operator: SC
Sample : CCV R9061219_25ng
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

6/12/19

Quant Time: Jun 12 08:50:03 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units		Dev(Min)
1) Bromochloromethane (IS1)	9.15	130	202233	12.500	ng		-0.02
37) 1,4-Difluorobenzene (IS2)	11.12	114	917369	12.500	ng		-0.01
56) Chlorobenzene-d5 (IS3)	15.46	82	490228	12.500	ng		0.00
System Monitoring Compounds							
33) 1,2-Dichloroethane-d4(...	9.93	65	369297	12.530	ng		-0.02
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.24%				
57) Toluene-d8 (SS2)	13.55	98	1122310	12.274	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.16%				
73) Bromofluorobenzene (SS3)	17.05	174	306522	12.496	ng		0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 100.00%				
Target Compounds							Qvalue
2) Propene	3.84	42	654807	25.249	ng		100
3) Dichlorodifluoromethan...	3.95	85	907285	23.878	ng		100
4) Chloromethane	4.15	50	873067	25.487	ng		99
5) 1,2-Dichloro-1,1,2,2-t...	4.32	135	400913	23.310	ng		100
6) Vinyl Chloride	4.44	62	787694	24.508	ng		100
7) 1,3-Butadiene	4.61	54	636377	26.982	ng		99
8) Bromomethane	4.93	94	408648	23.577	ng		100
9) Chloroethane	5.14	64	388371	23.762	ng		100
10) Ethanol	5.38	45	2331645	116.225	ng		100
11) Acetonitrile	5.58	41	1209798	24.678	ng		100
12) Acrolein	5.70	56	365789	23.111	ng		100
13) Acetone	5.84	58	2162063	121.779	ng		97
14) Trichlorofluoromethane	6.02	101	772378	24.198	ng		100
15) 2-Propanol (Isopropanol)	6.17	45	3159885	48.436	ng		100
16) Acrylonitrile	6.38	53	806739	24.382	ng		100
17) 1,1-Dichloroethene	6.72	96	467831	24.548	ng		98
18) 2-Methyl-2-Propanol (t...	6.82	59	2879706	51.393	ng		99
19) Methylene Chloride	6.88	84	504578	24.395	ng		98
20) 3-Chloro-1-propene (Al...	7.00	41	944412	24.770	ng		98
21) Trichlorotrifluoroethane	7.18	151	363878	24.414	ng		100
22) Carbon Disulfide	7.15	76	1935528	24.177	ng		100
23) trans-1,2-Dichloroethene	7.90	61	805922	24.732	ng		99
24) 1,1-Dichloroethane	8.12	63	950306	24.092	ng		100
25) Methyl tert-Butyl Ether	8.17	73	1573904	25.871	ng		100
26) Vinyl Acetate	8.29	86	623802	125.952	ng	#	93
27) 2-Butanone (MEK)	8.52	72	375484	21.970	ng		96
28) cis-1,2-Dichloroethene	8.98	61	763400	24.224	ng		100
29) Diisopropyl Ether	9.22	87	425299	26.554	ng	#	94
30) Ethyl Acetate	9.22	61	438738	51.533	ng		99
31) n-Hexane	9.23	57	1015300	25.015	ng		100
32) Chloroform	9.29	83	853815	24.799	ng		100
34) Tetrahydrofuran (THF)	9.67	72	370383	24.336	ng		97
35) Ethyl tert-Butyl Ether	9.77	87	579632	25.530	ng		99
36) 1,2-Dichloroethane	10.04	62	685115	24.294	ng		100
38) 1,1,1-Trichloroethane	10.30	97	750541	25.024	ng		100
39) Isopropyl Acetate	10.67	61	737010	49.550	ng		96
40) 1-Butanol	10.68	56	1306873	47.806	ng		98
41) Benzene	10.76	78	2065985	21.957	ng		100
42) Carbon Tetrachloride	10.91	117	629574	24.162	ng		100
43) Cyclohexane	11.04	84	1610917	48.425	ng		99
44) tert-Amyl Methyl Ether	11.35	73	1459109	25.620	ng		100
45) 1,2-Dichloropropane	11.57	63	570759	24.817	ng		100
46) Bromodichloromethane	11.76	83	690441	25.132	ng		100
47) Trichloroethene	11.81	130	485126	23.799	ng		99
48) 1,4-Dioxane	11.78	88	431824	24.347	ng		100
49) 2,2,4-Trimethylpentane...	11.87	57	2469152	24.263	ng		99

Data File: I:\MS09\Data\2019_06\12\06121902.D
Acq On : 12 Jun 2019 6:14 Operator: SC
Sample : CCV R9061219_25ng
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 12 08:50:03 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

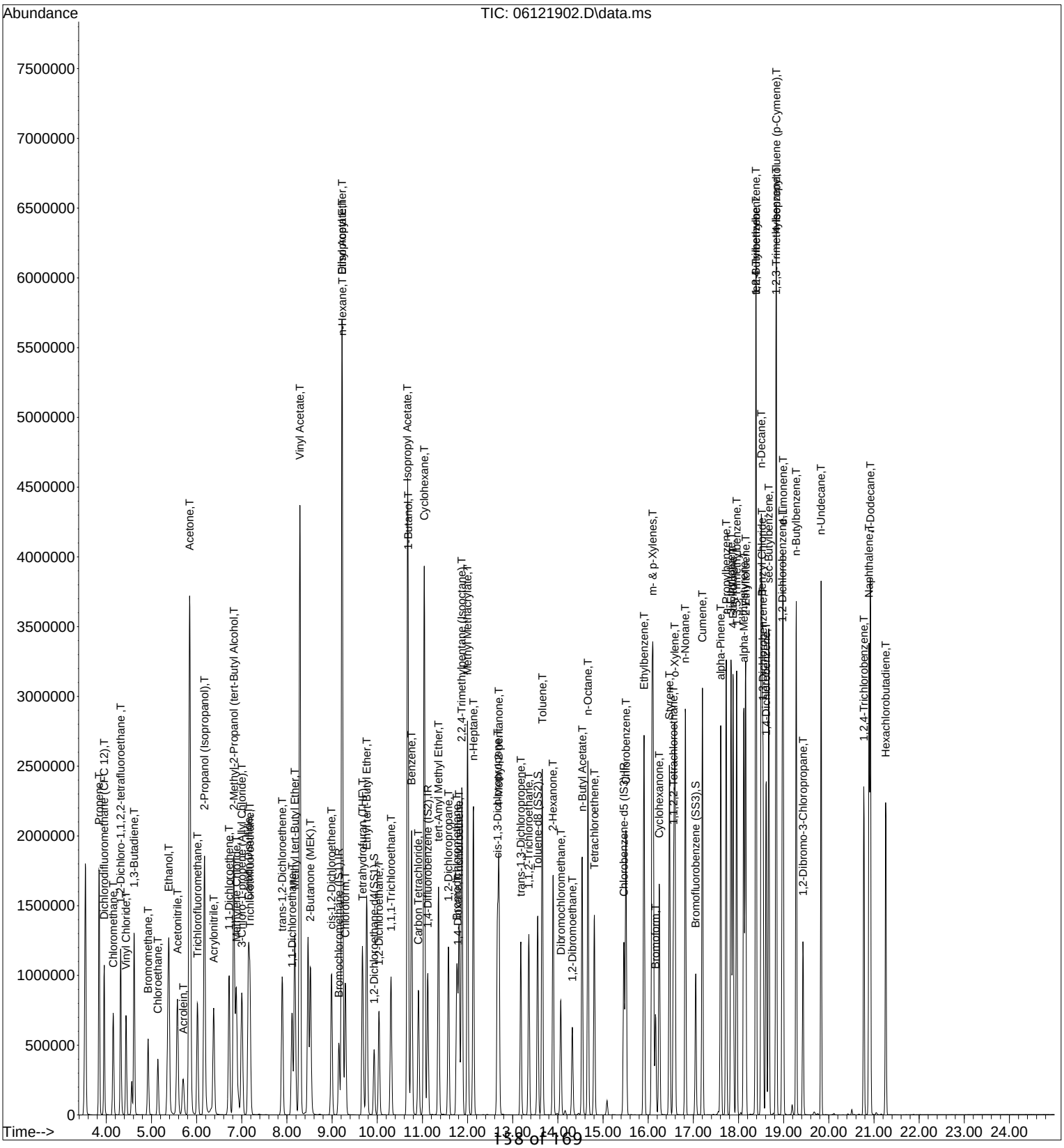
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.00	100	411384	52.458	ng	98
51) n-Heptane	12.13	71	562687	24.751	ng	100
52) cis-1,3-Dichloropropene	12.66	75	951149	27.129	ng	100
53) 4-Methyl-2-pentanone	12.69	58	563655	25.402	ng	98
54) trans-1,3-Dichloropropene	13.18	75	824653	26.310	ng	99
55) 1,1,2-Trichloroethane	13.36	97	484710	24.985	ng	99
58) Toluene	13.65	91	2089564	22.934	ng	100
59) 2-Hexanone	13.89	43	1416617	24.081	ng	99
60) Dibromochloromethane	14.07	129	536769	24.942	ng	100
61) 1,2-Dibromoethane	14.32	107	530458	24.375	ng	100
62) n-Butyl Acetate	14.54	43	1612282	24.774	ng	100
63) n-Octane	14.67	57	520991	23.986	ng	100
64) Tetrachloroethene	14.81	166	490804	23.623	ng	100
65) Chlorobenzene	15.51	112	1308522	23.647	ng	100
66) Ethylbenzene	15.91	91	2368672	23.169	ng	100
67) m- & p-Xylenes	16.10	91	3756873	47.703	ng	100
68) Bromoform	16.16	173	414320	25.637	ng	99
69) Styrene	16.47	104	1424197	24.594	ng	100
70) o-Xylene	16.59	91	1836962	23.679	ng	100
71) n-Nonane	16.82	43	1284123	23.821	ng	99
72) 1,1,2,2-Tetrachloroethane	16.56	83	919407	24.092	ng	100
74) Cumene	17.20	105	2268846	23.458	ng	100
75) alpha-Pinene	17.61	93	1207641	24.218	ng	100
76) n-Propylbenzene	17.73	91	2858900	24.010	ng	100
77) 3-Ethyltoluene	17.83	105	2234450	23.332	ng	100
78) 4-Ethyltoluene	17.88	105	2204202	24.408	ng	100
79) 1,3,5-Trimethylbenzene	17.96	105	1869759	23.509	ng	99
80) alpha-Methylstyrene	18.12	118	963566	25.563	ng	100
81) 2-Ethyltoluene	18.16	105	2208712	23.621	ng	100
82) 1,2,4-Trimethylbenzene	18.39	105	1946025	24.138	ng	100
83) n-Decane	18.50	57	1260422	24.172	ng	100
84) Benzyl Chloride	18.52	91	1837955	26.983	ng	100
85) 1,3-Dichlorobenzene	18.54	146	1014237	23.920	ng	100
86) 1,4-Dichlorobenzene	18.61	146	1025227	23.979	ng	100
87) sec-Butylbenzene	18.67	105	2511218	23.542	ng	100
88) 4-Isopropyltoluene (p-...	18.84	119	2294988	23.213	ng	100
89) 1,2,3-Trimethylbenzene	18.83	105	1904076	23.570	ng	100
90) 1,2-Dichlorobenzene	18.97	146	981938	23.984	ng	100
91) d-Limonene	18.99	68	847339	24.621	ng	100
92) 1,2-Dibromo-3-Chloropr...	19.43	157	349535	24.703	ng	100
93) n-Undecane	19.83	57	1310779	24.332	ng	100
94) 1,2,4-Trichlorobenzene	20.77	180	714326	24.863	ng	100
95) Naphthalene	20.89	128	2495247	26.199	ng	100
96) n-Dodecane	20.92	57	1232252	26.795	ng	100
97) Hexachlorobutadiene	21.26	225	428703	23.496	ng	99
98) Cyclohexanone	16.24	55	844267	20.951	ng	99
99) tert-Butylbenzene	18.39	119	1817690	23.629	ng	100
100) n-Butylbenzene	19.28	91	2141741	23.783	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\12\06121902.D
Acq On : 12 Jun 2019 6:14 Operator: SC
Sample : CCV R9061219_25ng
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 12 08:50:03 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



00942962

Data File: I:\MS09\Data\2019_06\13\06131902.D
Acq On : 13 Jun 2019 6:14 Operator: SC
Sample : CCV R9061319_25ng
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

6/13/19

Quant Time: Jun 13 09:29:34 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
1	IR	Bromochloromethane (IS1)	1.000	1.000	0.0	101	-0.02
2	T	Propene	1.603	1.652	-3.1	101	0.00
3	T	Dichlorodifluoromethane (CF	2.349	2.205	6.1	98	0.00
4	T	Chloromethane	2.117	2.223	-5.0	101	0.00
5	T	1,2-Dichloro-1,1,2,2-tetraf	1.063	0.965	9.2	97	0.00
6	T	Vinyl Chloride	1.987	1.891	4.8	99	0.00
7	T	1,3-Butadiene	1.458	1.520	-4.3	101	0.00
8	T	Bromomethane	1.071	1.016	5.1	100	0.00
9	T	Chloroethane	1.010	0.963	4.7	99	-0.01
10	T	Ethanol	1.240	1.161	6.4	99	-0.04
11	T	Acetonitrile	3.030	3.009	0.7	99	-0.03
12	T	Acrolein	0.978	0.894	8.6	99	-0.02
13	T	Acetone	1.097	1.019	7.1	99	-0.02
14	T	Trichlorofluoromethane	1.973	1.844	6.5	98	-0.01
15	T	2-Propanol (Isopropanol)	4.032	3.922	2.7	98	-0.03
16	T	Acrylonitrile	2.045	1.982	3.1	99	-0.03
17	T	1,1-Dichloroethene	1.178	1.086	7.8	97	-0.01
18	T	2-Methyl-2-Propanol (tert-B	3.463	3.406	1.6	100	-0.04
19	T	Methylene Chloride	1.278	1.178	7.8	98	-0.02
20	T	3-Chloro-1-propene (Allyl C	2.357	2.290	2.8	98	-0.01
21	T	Trichlorotrifluoroethane	0.921	0.840	8.8	96	0.00
22	T	Carbon Disulfide	4.948	4.530	8.4	98	0.00
23	T	trans-1,2-Dichloroethene	2.014	1.919	4.7	98	-0.01
24	T	1,1-Dichloroethane	2.438	2.334	4.3	98	-0.01
25	T	Methyl tert-Butyl Ether	3.760	3.647	3.0	99	-0.01
26	T	Vinyl Acetate	0.306	0.295	3.6	98	-0.02
27	T	2-Butanone (MEK)	1.056	0.917	13.2	98	-0.02
28	T	cis-1,2-Dichloroethene	1.948	1.843	5.4	98	-0.01
29	T	Diisopropyl Ether	0.990	0.980	1.0	98	0.00
30	T	Ethyl Acetate	0.526	0.511	2.9	98	-0.02
31	T	n-Hexane	2.509	2.378	5.2	98	0.00
32	T	Chloroform	2.128	1.995	6.3	97	-0.02
33	S	1,2-Dichloroethane-d4(SS1)	1.822	1.894	-4.0	103	-0.01
34	T	Tetrahydrofuran (THF)	0.941	0.870	7.5	98	0.00
35	T	Ethyl tert-Butyl Ether	1.403	1.374	2.1	99	0.00
36	T	1,2-Dichloroethane	1.743	1.657	4.9	98	-0.01
37	IR	1,4-Difluorobenzene (IS2)	1.000	1.000	0.0	102	-0.01
38	T	1,1,1-Trichloroethane	0.409	0.380	7.1	97	-0.01
39	T	Isopropyl Acetate	0.203	0.196	3.4	98	-0.01
40	T	1-Butanol	0.372	0.349	6.2	98	-0.03
41	T	Benzene	1.282	1.094	14.7	98	-0.01
42	T	Carbon Tetrachloride	0.355	0.333	6.2	96	0.00
43	T	Cyclohexane	0.453	0.419	7.5	97	-0.01
44	T	tert-Amyl Methyl Ether	0.776	0.748	3.6	100	-0.01
45	T	1,2-Dichloropropane	0.313	0.293	6.4	98	0.00
46	T	Bromodichloromethane	0.374	0.357	4.5	98	-0.01
47	T	Trichloroethene	0.278	0.247	11.2	96	0.00
48	T	1,4-Dioxane	0.242	0.220	9.1	97	-0.01
49	T	2,2,4-Trimethylpentane (Iso	1.387	1.291	6.9	98	0.00
50	T	Methyl Methacrylate	0.107	0.103	3.7	97	-0.01
51	T	n-Heptane	0.310	0.288	7.1	98	0.00
52	T	cis-1,3-Dichloropropene	0.478	0.466	2.5	97	0.00
53	T	4-Methyl-2-pentanone	0.302	0.296	2.0	98	0.00
54	T	trans-1,3-Dichloropropene	0.427	0.430	-0.7	97	0.00

Data File: I:\MS09\Data\2019_06\13\06131902.D
Acq On : 13 Jun 2019 6:14 Operator: SC
Sample : CCV R9061319_25ng
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 13 09:29:34 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Min. RRF : 0.000 Min. Rel. Area : 50% Max. R.T. Dev 0.33min
Max. RRF Dev : 30% Max. Rel. Area : 200%

		Compound	AvgRF	CCRF	%Dev	Area%	Dev(min)
55	T	1,1,2-Trichloroethane	0.264	0.244	7.6	96	-0.01
56	IR	Chlorobenzene-d5 (IS3)	1.000	1.000	0.0	104	0.00
57	S	Toluene-d8 (SS2)	2.332	2.272	2.6	102	0.00
58	T	Toluene	2.323	2.011	13.4	97	0.00
59	T	2-Hexanone	1.500	1.375	8.3	98	-0.01
60	T	Dibromochloromethane	0.549	0.505	8.0	96	0.00
61	T	1,2-Dibromoethane	0.555	0.499	10.1	96	-0.01
62	T	n-Butyl Acetate	1.659	1.550	6.6	98	0.00
63	T	n-Octane	0.554	0.500	9.7	99	0.00
64	T	Tetrachloroethene	0.530	0.463	12.6	95	0.00
65	T	Chlorobenzene	1.411	1.234	12.5	96	0.00
66	T	Ethylbenzene	2.607	2.331	10.6	97	0.00
67	T	m- & p-Xylenes	2.008	1.797	10.5	97	-0.01
68	T	Bromoform	0.412	0.394	4.4	95	-0.01
69	T	Styrene	1.477	1.363	7.7	95	0.00
70	T	o-Xylene	1.978	1.758	11.1	97	0.00
71	T	n-Nonane	1.375	1.255	8.7	98	0.00
72	T	1,1,2,2-Tetrachloroethane	0.973	0.883	9.2	97	-0.01
73	S	Bromofluorobenzene (SS3)	0.625	0.617	1.3	102	0.00
74	T	Cumene	2.466	2.181	11.6	96	0.00
75	T	alpha-Pinene	1.271	1.188	6.5	96	0.00
76	T	n-Propylbenzene	3.036	2.716	10.5	97	0.00
77	T	3-Ethyltoluene	2.442	2.260	7.5	102	0.00
78	T	4-Ethyltoluene	2.303	1.993	13.5	90	-0.01
79	T	1,3,5-Trimethylbenzene	2.028	1.792	11.6	96	0.00
80	T	alpha-Methylstyrene	0.961	0.921	4.2	94	0.00
81	T	2-Ethyltoluene	2.384	2.101	11.9	96	0.00
82	T	1,2,4-Trimethylbenzene	2.056	1.855	9.8	96	-0.01
83	T	n-Decane	1.330	1.213	8.8	97	0.00
84	T	Benzyl Chloride	1.737	1.787	-2.9	96	-0.01
85	T	1,3-Dichlorobenzene	1.081	0.948	12.3	94	-0.01
86	T	1,4-Dichlorobenzene	1.090	0.957	12.2	94	0.00
87	T	sec-Butylbenzene	2.720	2.405	11.6	96	0.00
88	T	4-Isopropyltoluene (p-Cymen	2.521	2.240	11.1	95	0.00
89	T	1,2,3-Trimethylbenzene	2.060	1.863	9.6	95	0.00
90	T	1,2-Dichlorobenzene	1.044	0.913	12.5	95	0.00
91	T	d-Limonene	0.878	0.862	1.8	95	0.00
92	T	1,2-Dibromo-3-Chloropropane	0.361	0.340	5.8	94	0.00
93	T	n-Undecane	1.374	1.289	6.2	97	0.00
94	T	1,2,4-Trichlorobenzene	0.733	0.678	7.5	92	0.00
95	T	Naphthalene	2.428	2.485	-2.3	93	0.00
96	T	n-Dodecane	1.173	1.236	-5.4	97	0.00
97	T	Hexachlorobutadiene	0.465	0.411	11.6	92	0.00
98	T	Cyclohexanone	1.028	0.891	13.3	98	-0.02
99	T	tert-Butylbenzene	1.962	1.733	11.7	96	0.00
100	T	n-Butylbenzene	2.296	2.060	10.3	95	0.00

(#) = Out of Range SPCC's out = 0 CCC's out = 0

Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\13\06131902.D
Acq On : 13 Jun 2019 6:14 Operator: SC
Sample : CCV R9061319_25ng
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

6/13/19

Quant Time: Jun 13 09:29:34 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
1) Bromochloromethane (IS1)	9.16	130	188687	12.500	ng	-0.02
37) 1,4-Difluorobenzene (IS2)	11.12	114	865051	12.500	ng	-0.01
56) Chlorobenzene-d5 (IS3)	15.46	82	464814	12.500	ng	0.00
System Monitoring Compounds						
33) 1,2-Dichloroethane-d4(...	9.94	65	357306	12.993	ng	-0.01
Spiked Amount 12.500	Range 70 - 130		Recovery = 103.92%			
57) Toluene-d8 (SS2)	13.55	98	1056155	12.182	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 97.44%			
73) Bromofluorobenzene (SS3)	17.05	174	286844	12.333	ng	0.00
Spiked Amount 12.500	Range 70 - 130		Recovery = 98.64%			
Target Compounds						Qvalue
2) Propene	3.84	42	642647	26.559	ng	100
3) Dichlorodifluoromethan...	3.96	85	869438	24.524	ng	100
4) Chloromethane	4.16	50	845501	26.454	ng	100
5) 1,2-Dichloro-1,1,2,2-t...	4.32	135	374535	23.340	ng	100
6) Vinyl Chloride	4.44	62	750181	25.017	ng	100
7) 1,3-Butadiene	4.62	54	601532	27.335	ng	99
8) Bromomethane	4.93	94	386961	23.929	ng	99
9) Chloroethane	5.15	64	371404	24.355	ng	100
10) Ethanol	5.39	45	2252359	120.333	ng	100
11) Acetonitrile	5.58	41	1172958	25.645	ng	100
12) Acrolein	5.71	56	346628	23.472	ng	99
13) Acetone	5.86	58	2065209	124.674	ng	100
14) Trichlorofluoromethane	6.02	101	737491	24.764	ng	100
15) 2-Propanol (Isopropanol)	6.19	45	3053730	50.169	ng	100
16) Acrylonitrile	6.38	53	773464	25.055	ng	100
17) 1,1-Dichloroethene	6.72	96	440176	24.755	ng	99
18) 2-Methyl-2-Propanol (t...	6.83	59	2755603	52.709	ng	100
19) Methylene Chloride	6.88	84	475478	24.638	ng	99
20) 3-Chloro-1-propene (Al...	7.01	41	921902	25.915	ng	100
21) Trichlorotrifluoroethane	7.19	151	337797	24.291	ng	99
22) Carbon Disulfide	7.15	76	1837828	24.604	ng	100
23) trans-1,2-Dichloroethene	7.90	61	768942	25.291	ng	99
24) 1,1-Dichloroethane	8.12	63	907129	24.648	ng	100
25) Methyl tert-Butyl Ether	8.18	73	1498853	26.406	ng	100
26) Vinyl Acetate	8.29	86	584590	126.508	ng	97
27) 2-Butanone (MEK)	8.53	72	355412	22.288	ng	100
28) cis-1,2-Dichloroethene	8.99	61	732887	24.925	ng	99
29) Diisopropyl Ether	9.22	87	399728	26.750	ng	99
30) Ethyl Acetate	9.23	61	417704	52.584	ng	100
31) n-Hexane	9.23	57	971058	25.642	ng	100
32) Chloroform	9.30	83	810680	25.237	ng	100
34) Tetrahydrofuran (THF)	9.68	72	350557	24.686	ng	99
35) Ethyl tert-Butyl Ether	9.77	87	549702	25.950	ng	99
36) 1,2-Dichloroethane	10.04	62	663519	25.218	ng	100
38) 1,1,1-Trichloroethane	10.30	97	710954	25.137	ng	100
39) Isopropyl Acetate	10.67	61	701461	50.012	ng	100
40) 1-Butanol	10.68	56	1247163	48.381	ng	100
41) Benzene	10.76	78	1954616	22.030	ng	100
42) Carbon Tetrachloride	10.92	117	596449	24.275	ng	100
43) Cyclohexane	11.04	84	1514407	48.277	ng	99
44) tert-Amyl Methyl Ether	11.35	73	1390252	25.887	ng	100
45) 1,2-Dichloropropane	11.58	63	544703	25.116	ng	100
46) Bromodichloromethane	11.76	83	659090	25.442	ng	100
47) Trichloroethene	11.82	130	453201	23.577	ng	99
48) 1,4-Dioxane	11.78	88	404597	24.192	ng	99
49) 2,2,4-Trimethylpentane...	11.88	57	2370106	24.698	ng	100

Data File: I:\MS09\Data\2019_06\13\06131902.D
Acq On : 13 Jun 2019 6:14 Operator: SC
Sample : CCV R9061319_25ng
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 13 09:29:34 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M

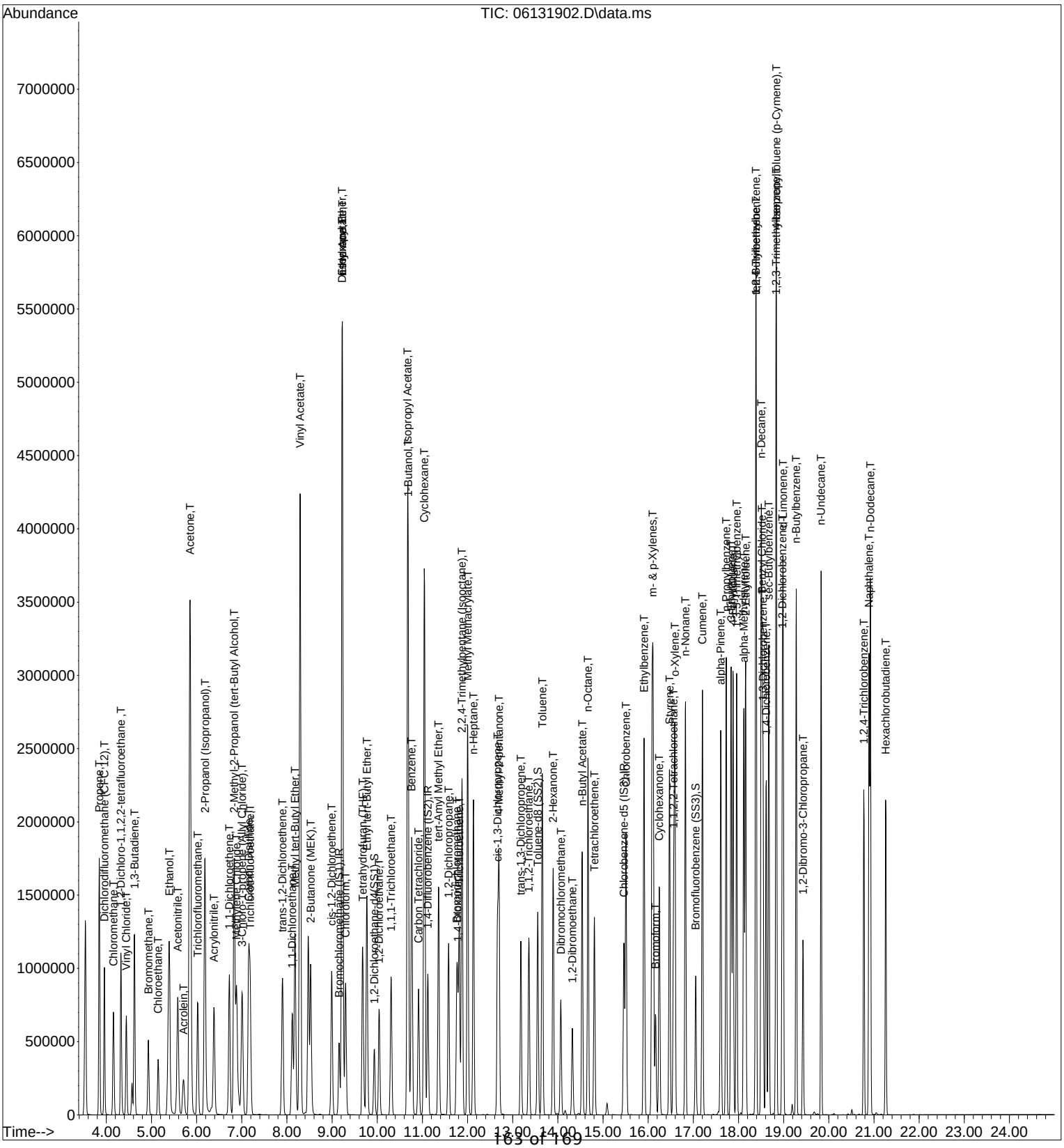
Internal Standards	R.T.	QIon	Response	Conc	Units	Dev(Min)
50) Methyl Methacrylate	12.00	100	381850	51.637	ng	99
51) n-Heptane	12.13	71	535357	24.973	ng	99
52) cis-1,3-Dichloropropene	12.66	75	903653	27.333	ng	100
53) 4-Methyl-2-pentanone	12.70	58	542029	25.904	ng	99
54) trans-1,3-Dichloropropene	13.18	75	784216	26.533	ng	100
55) 1,1,2-Trichloroethane	13.36	97	454386	24.839	ng	100
58) Toluene	13.65	91	1966578	22.764	ng	100
59) 2-Hexanone	13.90	43	1373315	24.622	ng	100
60) Dibromochloromethane	14.07	129	504783	24.739	ng	100
61) 1,2-Dibromoethane	14.32	107	498659	24.167	ng	100
62) n-Butyl Acetate	14.54	43	1563151	25.332	ng	100
63) n-Octane	14.67	57	500101	24.283	ng	99
64) Tetrachloroethene	14.81	166	454903	23.092	ng	100
65) Chlorobenzene	15.51	112	1223275	23.315	ng	100
66) Ethylbenzene	15.91	91	2238080	23.089	ng	99
67) m- & p-Xylenes	16.10	91	3546536	47.494	ng	100
68) Bromoform	16.16	173	389020	25.387	ng	99
69) Styrene	16.47	104	1343586	24.470	ng	100
70) o-Xylene	16.59	91	1735950	23.600	ng	100
71) n-Nonane	16.83	43	1249179	24.440	ng	99
72) 1,1,2,2-Tetrachloroethane	16.56	83	873618	24.144	ng	100
74) Cumene	17.20	105	2143087	23.369	ng	100
75) alpha-Pinene	17.61	93	1142701	24.169	ng	100
76) n-Propylbenzene	17.73	91	2716323	24.060	ng	99
77) 3-Ethyltoluene	17.84	105	2230858	24.568	ng	96
78) 4-Ethyltoluene	17.88	105	1965745	22.958	ng	97
79) 1,3,5-Trimethylbenzene	17.96	105	1761078	23.353	ng	99
80) alpha-Methylstyrene	18.12	118	905920	25.347	ng	100
81) 2-Ethyltoluene	18.16	105	2093446	23.612	ng	100
82) 1,2,4-Trimethylbenzene	18.39	105	1841727	24.094	ng	100
83) n-Decane	18.50	57	1213096	24.536	ng	100
84) Benzyl Chloride	18.52	91	1746330	27.040	ng	99
85) 1,3-Dichlorobenzene	18.54	146	951372	23.664	ng	100
86) 1,4-Dichlorobenzene	18.61	146	961647	23.721	ng	100
87) sec-Butylbenzene	18.67	105	2376366	23.496	ng	100
88) 4-Isopropyltoluene (p-...	18.84	119	2170146	23.150	ng	100
89) 1,2,3-Trimethylbenzene	18.83	105	1805093	23.566	ng	100
90) 1,2-Dichlorobenzene	18.97	146	923954	23.802	ng	100
91) d-Limonene	18.99	68	809308	24.802	ng	100
92) 1,2-Dibromo-3-Chloropr...	19.43	157	329739	24.578	ng	97
93) n-Undecane	19.83	57	1266181	24.789	ng	99
94) 1,2,4-Trichlorobenzene	20.77	180	670499	24.613	ng	100
95) Naphthalene	20.89	128	2367799	26.221	ng	100
96) n-Dodecane	20.92	57	1184203	27.158	ng	99
97) Hexachlorobutadiene	21.26	225	402506	23.266	ng	100
98) Cyclohexanone	16.24	55	813500	21.291	ng	100
99) tert-Butylbenzene	18.39	119	1718768	23.564	ng	100
100) n-Butylbenzene	19.28	91	2037107	23.858	ng	100

(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data File: I:\MS09\Data\2019_06\13\06131902.D
Acq On : 13 Jun 2019 6:14 Operator: SC
Sample : CCV R9061319_25ng
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Jun 13 09:29:34 2019
Quant Method : I:\MS09\Methods\R9060719.M
Quant Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
QLast Update : Fri Jun 07 14:29:19 2019
Response via : Initial Calibration
DataAcq Meth:TO15.M



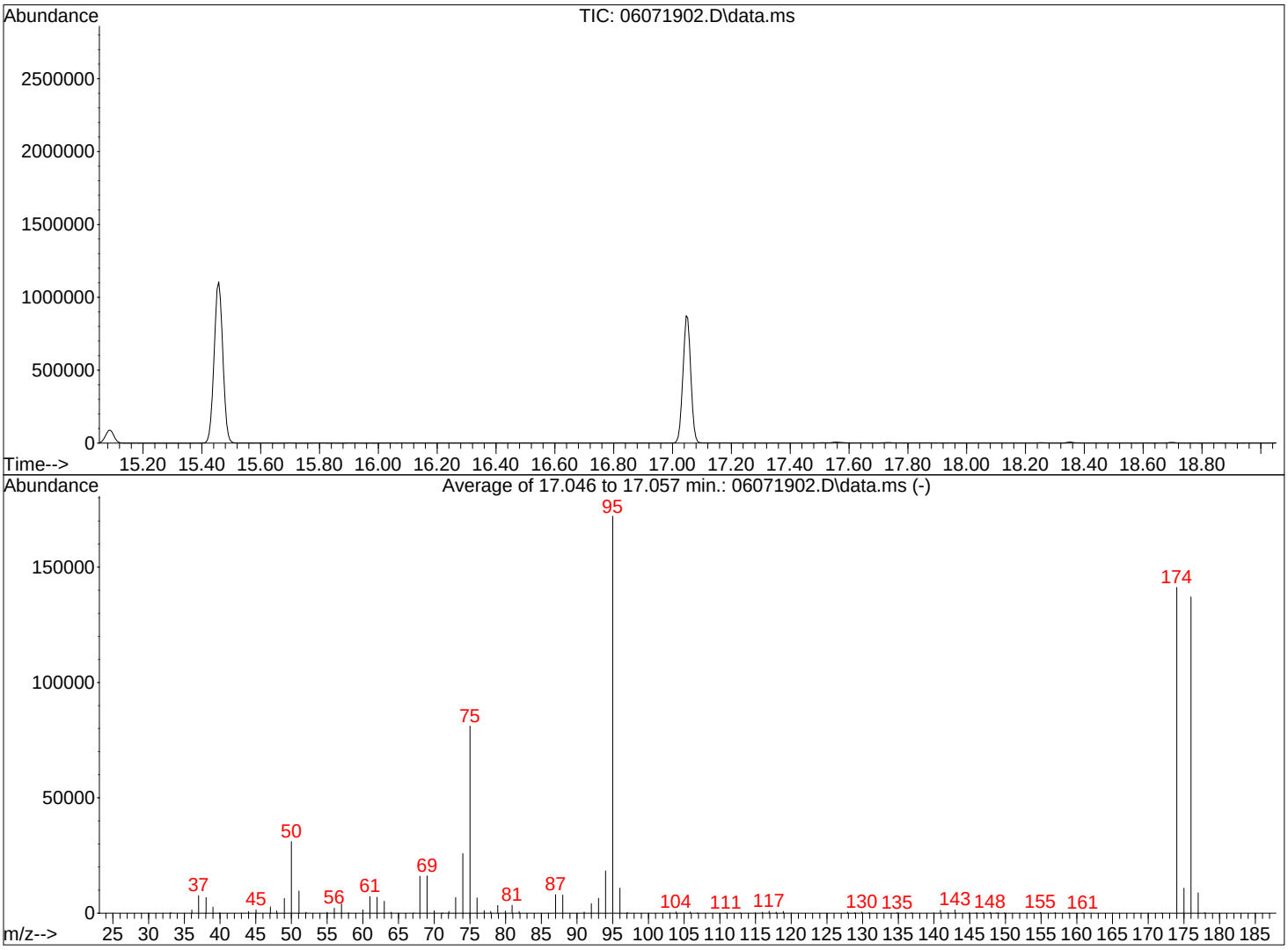
00942967

Data Path : I:\MS09\Data\2019_06\07\
Data File : 06071902.D
Acq On : 7 Jun 2019 9:31
Operator : SC
Sample : 12.5ng TO-15 BFB STD
Misc : S31-05131901
ALS Vial : 2 Sample Multiplier: 1

6/7/19

Integration File: LSCINT.P

Method : I:\MS09\Methods\R9060719.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Fri Jun 07 13:38:27 2019



AutoFind: Scans 2485, 2486, 2487; Background Corrected with Scan 2476

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	18.0	31024	PASS
75	95	30	66	47.1	81109	PASS
95	95	100	100	100.0	172075	PASS
96	95	5	9	6.3	10880	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	82.1	141224	PASS
175	174	4	9	7.7	10846	PASS
176	174	93	101	97.1	137061	PASS
177	176	5	9	6.5	8841	PASS

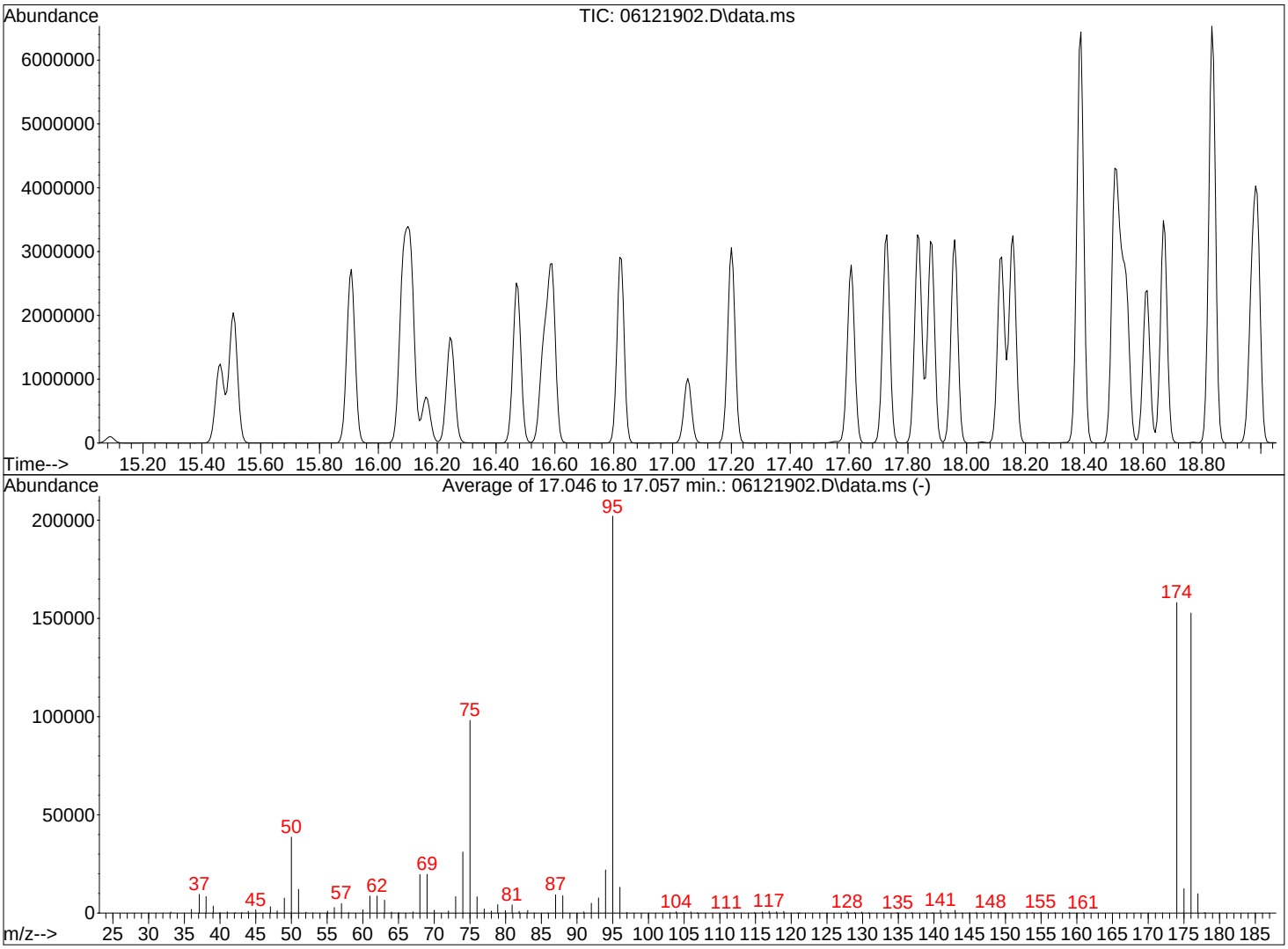
00942968

Data Path : I:\MS09\Data\2019_06\12\
Data File : 06121902.D
Acq On : 12 Jun 2019 6:14
Operator : SC
Sample : CCV R9061219_25ng
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

6/12/19

Integration File: LSCINT.P

Method : I:\MS09\Methods\R9060719.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Fri Jun 07 14:29:19 2019



AutoFind: Scans 2485, 2486, 2487; Background Corrected with Scan 2476

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	19.1	38667	PASS
75	95	30	66	48.5	98069	PASS
95	95	100	100	100.0	202091	PASS
96	95	5	9	6.5	13190	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	78.2	158101	PASS
175	174	4	9	7.8	12389	PASS
176	174	93	101	96.6	152725	PASS
177	176	5	9	6.5	9924	PASS

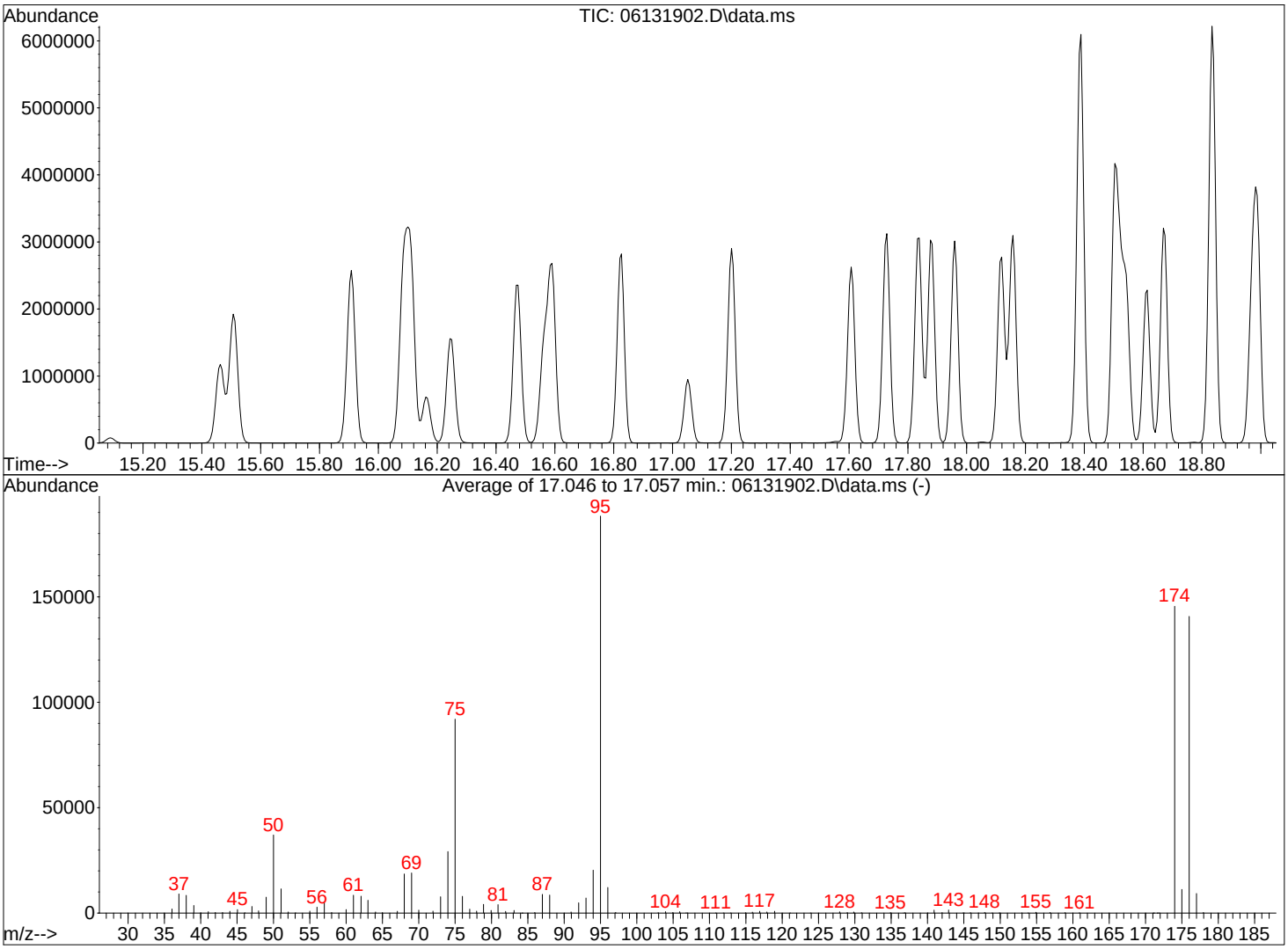
00942969

Data Path : I:\MS09\Data\2019_06\13\
Data File : 06131902.D
Acq On : 13 Jun 2019 6:14
Operator : SC
Sample : CCV R9061319_25ng
Misc : S31-05131901/S31-05311906 (6/29)
ALS Vial : 2 Sample Multiplier: 1

6/13/19

Integration File: LSCINT.P

Method : I:\MS09\Methods\R9060719.M
Title : EPA TO-15 per SOP VOA-TO15 (CASS TO-15/GC-MS)
Last Update : Fri Jun 07 14:29:19 2019



AutoFind: Scans 2485, 2486, 2487; Background Corrected with Scan 2476

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	19.7	37019	PASS
75	95	30	66	48.8	91944	PASS
95	95	100	100	100.0	188288	PASS
96	95	5	9	6.5	12165	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	77.3	145515	PASS
175	174	4	9	7.7	11185	PASS
176	174	93	101	96.7	140709	PASS
177	176	5	9	6.6	9284	PASS

Injection Log

Directory: J:\MS09\Data\2019_06\07\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	6/7/19 8:57	06071901.D	Blank (100mL)	S31-05131901	SC	2	
2	6/7/19 9:31	06071902.D	12.5ng TO-15 BFB STD	S31-05131901	SC	2	pass
3	6/7/19 10:04	06071903.D	0.1ng TO-15 ICAL STD	S31-05131901/S31-05201906 (6/18)	SC	4	
4	6/7/19 10:38	06071904.D	0.2ng TO-15 ICAL STD	S31-05131901/S31-05201906 (6/18)	SC	4	
5	6/7/19 11:11	06071905.D	0.5ng TO-15 ICAL STD	S31-05131901/S31-05201906 (6/18)	SC	4	
6	6/7/19 11:45	06071906.D	1.0ng TO-15 ICAL STD	S31-05131901/S31-05201906 (6/18)	SC	4	
7	6/7/19 12:18	06071907.D	5.0ng TO-15 ICAL STD	S31-05131901/S31-06061905 (7/4)	SC	8	
8	6/7/19 12:52	06071908.D	25ng TO-15 ICAL STD	S31-05131901/S31-05311906 (6/29)	SC	2	
9	6/7/19 13:25	06071909.D	50ng TO-15 ICAL STD	S31-05131901/S31-05311906 (6/29)	SC	2	
10	6/7/19 13:59	06071910.D	100ng TO-15 ICAL STD	S31-05131901/S31-05311906 (6/29)	SC	2	
11	6/7/19 14:33	06071911.D	Blank (100mL)	S31-05131901	SC	2	
12	6/7/19 15:06	06071912.D	25ng TO-15 ICV STD	S31-05131901/S31-05241901 (6/22)	SC	2	pass
38							
39							
40							6/11/19
41							
42							
43							
44							
45							

Injection Log

00942971

Directory: I:\MS09\Data\2019_06\12\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	6/12/19 5:40	06121901.D	CCV C9061219_25ng	S31-05131901/S31-05151909 (6/13)	SC	3	pass
2	6/12/19 6:14	06121902.D	CCV R9061219_25ng	S31-05131901/S31-05311906 (6/29)	SC	2	pass
3	6/12/19 6:48	06121903.D	Blank (100mL)	S31-05131901	SC	2	
4	6/12/19 7:21	06121904.D	MB R9061219_ 1000mL	S31-05131901/AC00463	SC	2	pass
5	6/12/19 7:54	06121905.D	LCS R9061219_25ng	S31-05131901/S31-05241901 (6/22)	SC	2	pass
6	6/12/19 8:28	06121906.D	LCSD R9061219_25ng	S31-05131901/S31-05241901 (6/22)	SC	2	pass
7	6/12/19 9:06	06121907.D	Blank (100mL)	S31-05131901	SC	1	
8	6/12/19 9:39	06121908.D	P1903279-001Dil (40mL)	S31-05131901	SC	6	
9	6/12/19 10:13	06121909.D	P1903109-001 (400mL)	S31-05131901	SC	15	
10	6/12/19 10:47	06121910.D	P1903109-002 (400mL)	S31-05131901	SC	16	
11	6/12/19 11:20	06121911.D	P1903225-003Dil (100mL)	S31-05131901	SC	11	
12	6/12/19 12:03	06121912.D	P1903197-001 (10mL)	S31-05131901	SC	1	
13	6/12/19 12:39	06121913.D	P1903373-001 (0.1mL)	S31-05131901	SC	1	
14	6/12/19 13:12	06121914.D	P1903119-001Dil (15mL)	S31-05131901	SC	5	
15	6/12/19 13:45	06121915.D	P1903119-002 (15mL)	S31-05131901	SC	6	
16	6/12/19 14:19	06121916.D	P1903119-003 (100mL)	S31-05131901	SC	7	
17	6/12/19 14:52	06121917.D	P1903119-001 (100mL)	S31-05131901	SC	5	
18	6/12/19 15:26	06121918.D	P1903119-002 (60mL)	S31-05131901	SC	6	
19	6/12/19 15:59	06121919.D	P1903119-003 (400mL)	S31-05131901	SC	7	
20	6/12/19 16:51	06121920.D	P1903177-001 (8.0mL)	S31-05131901	SC	1	
21	6/12/19 17:25	06121921.D	P1903177-002 (8.0mL)	S31-05131901	SC	1	
22	6/12/19 17:58	06121922.D	P1903375-001 (400mL)	S31-05131901	SC	8	
23	6/12/19 18:32	06121923.D	P1903177-003 (1000mL)	S31-05131901	SC	9	
24	6/12/19 19:05	06121924.D	P1903177-003Dil (100mL)	S31-05131901	SC	9	
25	6/12/19 19:39	06121925.D	P1903177-004 (1000mL)	S31-05131901	SC	10	
26	6/12/19 20:12	06121926.D	P1903177-004Dil (100mL)	S31-05131901	SC	10	
27	6/12/19 20:46	06121927.D	P1903313-001 (1000mL)	S31-05131901	SC	11	
28	6/12/19 21:20	06121928.D	P1903313-002 (1000mL)	S31-05131901	SC	12	
29	6/12/19 21:53	06121929.D	P1903313-003 (1000mL)	S31-05131901	SC	13	
30	6/12/19 22:27	06121930.D	P1903313-004 (1000mL)	S31-05131901	SC	14	
31	6/12/19 23:00	06121931.D	P1903313-005 (1000mL)	S31-05131901	SC	15	
32	6/12/19 23:34	06121932.D	P1903313-006 (1000mL)	S31-05131901	SC	16	
33	6/13/19 0:08	06121933.D	P1903313-006dup (1000mL)	S31-05131901	SC	16	pass
							6/13/19

Injection Log

00942972

Directory: I:\MS09\Data\2019_06\13\

	Date/Time	File Name	Sample ID	Misc Info	Operator	Vial	Comment
1	6/13/19 5:40	06131901.D	CCV C9061319_25ng	S31-05131901/S31-05151909 (6/13)	SC	3	pass
2	6/13/19 6:14	06131902.D	CCV R9061319_25ng	S31-05131901/S31-05311906 (6/29)	SC	2	pass
3	6/13/19 6:47	06131903.D	Blank (100mL)	S31-05131901	SC	2	
4	6/13/19 7:21	06131904.D	MB R9061319_ 1000mL	S31-05131901/AC00463	SC	2	pass
5	6/13/19 7:55	06131905.D	LCS R9061319_25ng	S31-05131901/S31-05241901 (6/22)	SC	2	pass
6	6/13/19 8:28	06131906.D	LCSD R9061319_25ng	S31-05131901/S31-05241901 (6/22)	SC	2	pass
7	6/13/19 9:02	06131907.D	Blank (100mL)	S31-05131901	SC	1	
8	6/13/19 10:00	06131908.D	P1903177-001Dil (4.0mL)	S31-05131901	SC	1	
9	6/13/19 10:33	06131909.D	P1903177-002Dil (4.0mL)	S31-05131901	SC	1	
10	6/13/19 11:24	06131910.D	P1903377-001 (10mL)	S31-05131901	SC	1	
11	6/13/19 12:08	06131911.D	P1903377-005 (10mL)	S31-05131901	SC	1	
12	6/13/19 12:42	06131912.D	P1903377-003 (25mL)	S31-05131901	SC	5	
13	6/13/19 13:41	06131913.D	P1903346-001 (1000mL)	S31-05131901	SC	6	
14	6/13/19 14:14	06131914.D	P1903397-001 (25mL)	S31-05131901	SC	7	
15	6/13/19 14:48	06131915.D	P1903399-001 (100mL)	S31-05131901	SC	8	
16	6/13/19 15:21	06131916.D	P1903397-001Dil (2.5mL)	S31-05131901	SC	1	
17	6/13/19 16:05	06131917.D	P1903399-001Dil (25mL)	S31-05131901	SC	8	
18	6/13/19 16:49	06131918.D	P1903187-001 (1000mL)PF2	S31-05131901	SC	16	
19	6/13/19 17:26	06131919.D	P1903377-005Dil (5.0mL)	S31-05131901	SC	1	
20	6/13/19 18:00	06131920.D	P1903326-001 (1000mL)	S31-05131901	SC	9	
21	6/13/19 18:33	06131921.D	P1903326-002 (1000mL)	S31-05131901	SC	10	
22	6/13/19 19:07	06131922.D	P1903326-003 (1000mL)	S31-05131901	SC	11	
23	6/13/19 19:44	06131923.D	P1903326-004 (1000mL)	S31-05131901	SC	12	
24	6/13/19 20:18	06131924.D	P1903326-005 (1000mL)	S31-05131901	SC	13	
25	6/13/19 20:51	06131925.D	P1903326-006 (1000mL)	S31-05131901	SC	14	
26	6/13/19 21:25	06131926.D	P1903341-001 (1000mL)	S31-05131901	SC	15	
27	6/13/19 21:59	06131927.D	P1903342-001 (1000mL)	S31-05131901	SC	5	
28	6/13/19 22:32	06131928.D	P1903342-002 (1000mL)	S31-05131901	SC	6	
29	6/13/19 23:06	06131929.D	P1903342-002dup (1000mL)	S31-05131901	SC	6	pass
30	6/13/19 23:40	06131930.D	P1901814-001 0.3ng	S31-05131901/S31-05311904 (6/29)	SC	7	
31	6/14/19 0:13	06131931.D	P1901814-001 0.5ng	S31-05131901/S31-05311904 (6/29)	SC	7	
							6/14/19

APPENDIX I
PROTOCOL FOR DISCHARGING GWTP EFFLUENT

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MEMORANDUM

DATE: August 28, 2017

PROJECT NAME: Remediation of Multiple Sites, Longhorn Army Ammunition Plant, Karnack, TX

TO:	Richard Mayer	Senior Project Engineer US Environmental Protection Agency Federal Facilities Section (6PD-F)
	April Palmie	Project and Grant Manager Superfund Section, Remediation Division Texas Commission on Environmental Quality
FROM:	Rose M. Zeiler, Ph.D.	Longhorn AAP Site Manager

SUBJECT: **Protocol for Discharging GWTP Effluent**
Longhorn Army Ammunition Plant, Karnack, TX
(Contract: W912DY-09-D-0059, Task Order DS01)

INTRODUCTION

The purpose of this memo is to document the protocol for discharging Longhorn Army Ammunition Plant groundwater treatment plant (GWTP) effluent to Harrison Bayou, the INF-Pond, or LHAAP-18/24.

The GWTP is designed to:

- Extract groundwater from LHAAP-18/24 and LHAAP-16 for hydraulic control;
- Remove metals by pH adjustment, polymer addition, and gravity separation;
- Remove volatile organic compounds (VOCs) by air stripping;
- Remove perchlorate in a fluidized bed reactor (FBR) and an ion exchange scavenger system; and
- Discharge the effluent continuously.

DISCHARGE CRITERIA

The discharge criteria established for discharge to Harrison Bayou are:

Parameter	Discharge Criteria (µg/L)	
	Daily Average	Daily Maximum
Volatiles		
1,1,1-Trichloroethane	3,417	7,230
1,1,2-Trichloroethane	102.5	216.9
1,1-Dichloroethane	6,633	14,032
1,1-Dichloroethene	119	253
1,2-Dichloroethane	85	181
Acetone	1,132	2,395
Benzene	85	181
Carbon Tetrachloride	85	181
Chlorobenzene	22,300	47,180
Chloroform	1,708	3,615
Ethylbenzene	26,954	57,025
Xylenes	39.5	83.6
Methylene Chloride	803	1,699
Styrene	2,829	5,987
Tetrachloroethene	85.4	180.7
Toluene	1,980	4,189
Trichloroethene	85	181
Vinyl Chloride	34	72
Anions		
Chloride	*	*
Sulfate	*	*
Perchlorate**	278	589
Metals		
Aluminum	777	1,644
Arsenic	365	772
Barium	1,000	2,000
Cadmium	1.6	3.4
Chromium, Total	355	752
Chromium, Hexavalent	58	124
Cobalt	5,433	11,495
Iron	1,132	2,395
Lead	2.2	4.6
Nickel	87	184
Manganese	7,323	15,494
Silver	1.4	3
Selenium	5.7	12
Vanadium	1,698	3,592
Zinc	146	310
Other		
Hexachlorobenzene	0.22	0.47
1,4-Dioxane		134.2
Oil and Grease		15
Chemical Oxygen Demand		200

* - Based upon flow in Harrison Bayou

** - Discharge criteria, when diverted to the INF Pond, is 17 µg/L

PROTOCOL FOR DISCHARGING GWTP EFFLUENT

In accordance with the *Sampling and Analysis Plan, Groundwater Treatment Plant and Well Fields* (SAP) Table 2-2, indicator parameters for the FBR, such as temperature, pH and oxidation reduction potential (ORP), are monitored in real time to predict FBR performance and perchlorate removal. Based upon these indicator parameters, the operator of the GWTP can make adjustments such as:

- Bring the ion exchange system online;
- Increase or decrease the addition rate of electron donor (acetic acid);
- Increase or decrease the nutrient addition rate (urea or phosphoric acid); or
- Increase or decrease the FBR recirculation rate

Samples of the GWTP effluent are collected weekly, analyzed for perchlorate, nutrients (ammonia-nitrogen and ortho-phosphate), total organic carbon (TOC), chloride, and sulfate, with the results received from the laboratory 14 days later. Other parameters (e.g. Record of Decision metals and volatiles) are collected and analyzed in GWTP effluent samples according to the frequencies listed in Table 2-1 of the SAP.

As shown in Figure 1, groundwater is continuously extracted, treated, and discharged. If Harrison Bayou is flowing and indicator parameters are within their historical optimal ranges, then the ion exchange vessels can be bypassed and the GWTP effluent sample will be collected after the FBR. If Harrison Bayou is not flowing or the indicator parameters are not within historical optimal ranges, then the ion exchange vessels will be put on line, and the GWTP effluent sample will be collected between the lead and lag ion exchange vessel. Professional judgement may also be used as to when to bring the ion exchange vessels online, such as after a power outage or during anticipated cold temperatures when the FBR has historically not performed optimally.

If a parameter is measured in the effluent at a concentration above the discharge criteria, then a confirmation sample and an effluent sample after the lag ion exchange vessel will be collected and analyzed for the parameter with a 24-hour turnaround time. Corrective measures (e.g. increased nutrient or electron donor addition rates, bring ion exchange vessels on line) will be implemented as appropriate to bring the parameter back within the discharge criteria. ***If an upset condition in the FBR leads to high concentrations of perchlorate going into the lead ion exchange vessel and breaking through at the sample location between the vessels, the lag vessel will still remove perchlorate before it is discharged to Harrison Bayou, the INF Pond, or LHAAP-18/24.*** It is estimated that the lag ion exchange vessel can remove all of the perchlorate from two weeks of typical groundwater extraction at a concentration of 920 µg/L. If the residual perchlorate concentration after the FBR and lead ion exchange vessel is only 600 µg/L, the lag ion exchange vessel could last almost 2.5 years before perchlorate would be detected in the discharged effluent.

If a parameter exceeds the discharge criteria by more than 40% (see Appendix A-2, SAP, Section 7c of Monitoring and Reporting Requirements) or reaches 920 µg/L of perchlorate, then the GWTP will be put into full recycle mode (no discharge) until the parameter is below the discharge criteria again. Appendix A-2 of the SAP requires GWTP data to be provided to TCEQ monthly including a list of noncompliance(s), if applicable.

Discharge to Harrison Bayou

As shown in Figure 1, the GWTP effluent will be discharged to Harrison Bayou as long as it has a measurable flow. The flowrate in Harrison Bayou is estimated by measuring the height of water with a staff gauge and velocity in feet/sec at intervals along the width as described in the Installation-Wide Work Plan, Standard Operating Procedures, Attachment 18 – Water Depth and Velocity Measurements (AECOM, July 2014).

The allowable flow rate of GWTP effluent that can be discharged to Harrison Bayou is given by:

$$QE \leq \frac{QS\ (CC - CA)}{(CE - CC)}$$

where Q_E = GWTP effluent flow Q_S = Harrison Bayou flow

C_C = Criteria concentration (100 mg/L for chloride, 50 mg/L for sulfate)

C_A = Ambient concentration = 10 mg/L

C_E = Chloride or sulfate concentration in GWTP effluent

The allowable GWTP effluent flow will be the lower of the calculated values given the measured concentrations of chloride and sulfate in the discharge stream. For each day that GWTP effluent is discharged to Harrison Bayou, the measured Harrison Bayou flow, the allowable effluent flow, and the actual effluent flow are recorded.

Discharge to INF Pond

If Harrison Bayou is not flowing, then GWTP effluent will be discharged to the Intermediate-Range Nuclear Forces (INF) Pond for temporary storage until Harrison Bayou flow resumes. Perchlorate concentration detected in the effluent must be 17 µg/L or less, when this occurs.

The INF Pond has a flexible membrane liner protected by a soil cover with a gravity discharge pipe (and valve) to Harrison Bayou. The INF Pond has a nominal capacity of 3 million gallons with a staff gage to measure the height of water stored in the pond. The GWTP operator maintains the INF Pond by visually inspecting for erosion, vegetative growth including tree growth along the anchor trench, and liner integrity and making necessary repairs. Periodically, accumulated debris must be removed from the influent and effluent piping to the INF Pond.

Prior to discharging to the INF Pond, a lead and lag ion exchange vessel will be brought online. The GWTP Operator will also confirm that the discharge valve is closed, will record the reading on the effluent totalizer, and will record the height of water using the staff gage. The GWTP Operator will then configure valves and pumps to direct GWTP effluent to the INF Pond. The height of water in the INF Pond and totalizer reading will be recorded at the beginning and end of each shift for the duration of active discharge. When the height of water in the pond reaches 3 feet below the height of the berm (freeboard), the GWTP Operator will stop discharging to the INF Pond and TCEQ will be notified. After the TCEQ acknowledges the INF Pond level, GWTP effluent may be discharged to the INF Pond again until 2 feet of freeboard is reached. The GWTP Operator will stop discharging to the INF Pond and TCEQ will be notified again. After the TCEQ acknowledges 2 feet of freeboard in the INF Pond,GWTP effluent may be discharged again until 1 foot of freeboard remains. No additional GWTP effluent can be accepted at the INF Pond until greater than 1 foot of freeboard is measured.

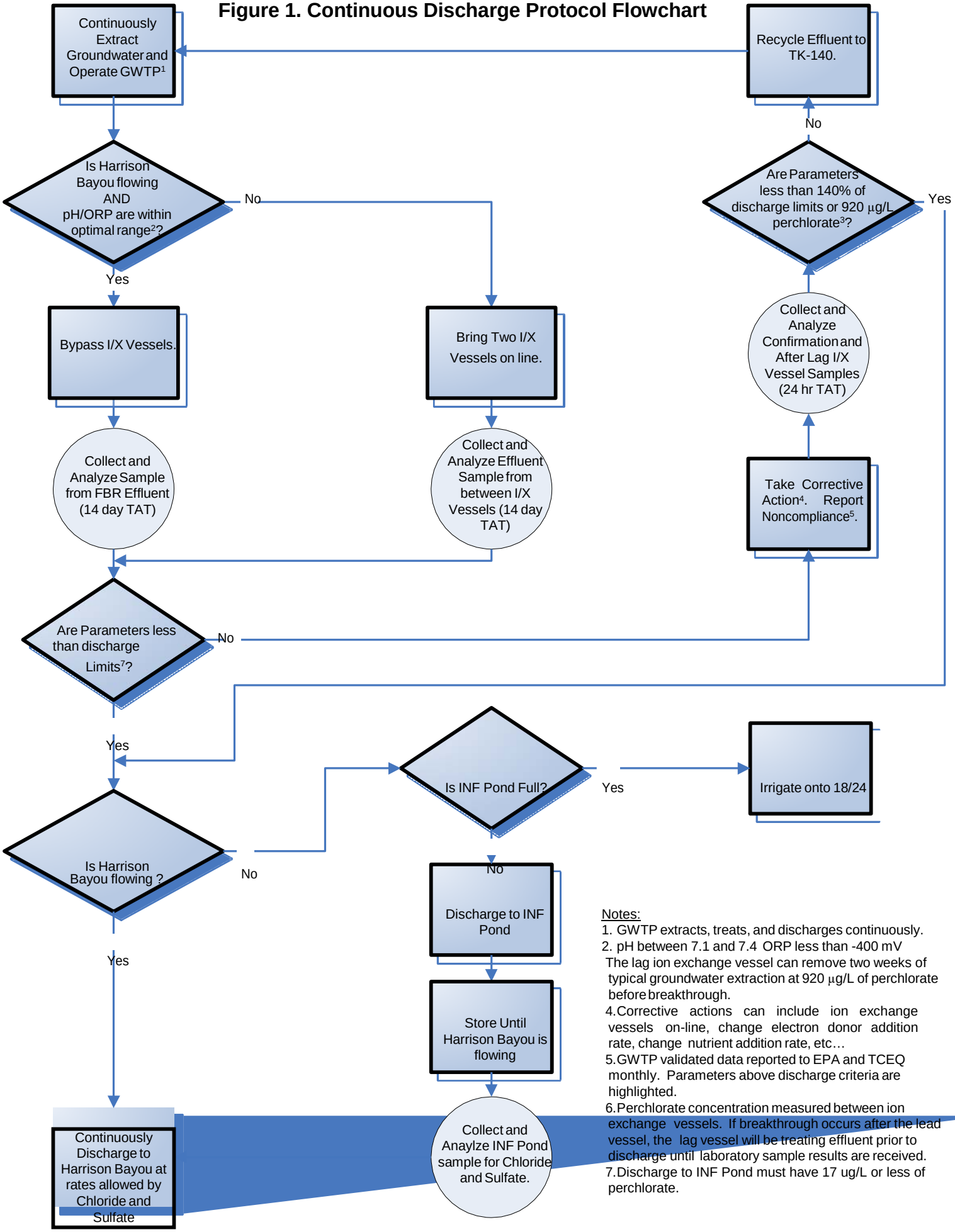
As soon as flow in Harrison Bayou returns, stored GWTP effluent from the INF Pond will be discharged. As with direct discharges from the GWTP to Harrison Bayou, the allowable flowrate of effluent from the INF Pond is calculated based upon the chloride and sulfate concentrations in the pond and the flow in Harrison Bayou. If effluent from the INF Pond and the GWTP are discharged simultaneously, total flow of both streams together should not exceed the calculated discharge level for either discharge location. For each day that INF Pond contents are discharged to Harrison Bayou, the measured Harrison Bayou flow, the allowable effluent flow, and the actual effluent flow are recorded.

Irrigation onto LHAAP-18/24

If Harrison Bayou is not flowing and the INF Pond has less than 1 foot of freeboard, then GWTP effluent will be irrigated onto LHAAP-18/24 using one of the three main sprinkler lines. To avoid pooling and runoff of irrigation water, only one line will be used for half a day at a time, with a separate line being used the second half of the day. If needed, the irrigation will occur 5 days a week for 8 hours each day (using 3 sprinklers in each line). If conditions are wet due to rain events, irrigation will not be conducted to avoid ponding and potential runoff, the GWTP will be put into recycle mode, and groundwater extraction will be interrupted if storage space is not available.

While irrigating, site inspections will be performed to ensure pooling and runoff are not occurring. During the irrigation activities, inspections will be performed twice a day, once approximately three hours and again approximately six hours into the 8-hour irrigation shift. The system will be inspected to ensure that the sprinkler heads are operating properly and not leaking large amounts of water. If ponding or runoff is observed, irrigation at that sprinkler line will cease, and irrigation at another sprinkler line will be started if possible. Volumes of GWTP effluent and twice daily inspections will be recorded daily and reported monthly until flow resumes in Harrison Bayou or greater than 1 foot of freeboard is available in the INF Pond.

Figure 1. Continuous Discharge Protocol Flowchart



Notes:

1. GWTP extracts, treats, and discharges continuously.
2. pH between 7.1 and 7.4 ORP less than -400 mV
   The lag ion exchange vessel can remove two weeks of typical groundwater extraction at 920 µg/L of perchlorate before breakthrough.
4. Corrective actions can include ion exchange vessels on-line, change electron donor addition rate, change nutrient addition rate, etc…
5. GWTP validated data reported to EPA and TCEQ monthly. Parameters above discharge criteria are highlighted.
6. Perchlorate concentration measured between ion exchange vessels. If breakthrough occurs after the lead vessel, the lag vessel will be treating effluent prior to discharge until laboratory sample results are received.
7. Discharge to INF Pond must have 17 ug/L or less of perchlorate.

APPENDIX J
AIR DATA TABLES, PID READINGS, AND CALIBRATION LOGS

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Table 1. Ambient Air Data - May 2019
Longhorn Army Ammunition Plant
Groundwater Treatment Plant

Pollutant	CAS #	Short Term ESL March 2012	AMCVs (ST Health)	GWTP Ambient Air Concentrations (1)		Status (3)	Downwind Ambient Air Concentrations (2)		Status (3)
		µg/m^3	µg/m^3	µg/m^3			µg/m^3		
1,1-Dichloroethane	75-34-3	4,000	4,047	0.76	U	PASS	0.64	U	PASS
1,1-Dichloroethene	75-35-4	210	714	0.79	U	PASS	0.66	U	PASS
1,2-Dichloroethane	107-06-2	160	162	0.78	U	PASS	**1.50**		PASS
Acetone	67-64-1	5,900	NA	**11.0**		PASS	**33.0**		PASS
Benzene	71-43-2	170	575	0.76	U	PASS	**1.7**		PASS
Carbon disulfide	75-15-0	30	NA	1.6	U	PASS	**3.2**		PASS
Chloroform	67-66-3	100	98	0.79	U	PASS	**0.74**		PASS
cis-1,2-Dichloroethene	156-59-2	7,900	NA	**4.2**		PASS	0.65	U	PASS
Methylene chloride	75-09-2	3,600	12,158	**2.1**		PASS	0.66	U	PASS
Tetrachloroethene	127-18-4	2,000	6,782	0.78	U	PASS	**2.70**		PASS
trans-1,2-Dichloroethene	156-60-5	7,900	NA	0.78	U	PASS	0.65	U	PASS
Trichloroethene	79-01-6	540	537	**12.0**		PASS	0.65	U	PASS
Vinyl chloride	75-01-4	20,000	66,460	0.78	U	PASS	0.65	U	PASS
n-Hexane	110-54-3	5,300	6,336	**0.86**		PASS	**8.90**		PASS
Styrene	100-42-5	110	21,725	0.78	U	PASS	**0.87**		PASS
Toluene	108-88-3	640	15,074	**3.6**		PASS	**30.0**		PASS
Ethylbenzene	100-41-4	740	86,844	0.76	U	PASS	**3.10**		PASS
m,p-Xylenes	179601-23-1	180	7,382	**1.6**		PASS	**9.9**		PASS
o-Xylene	95-47-6	1,600	7,382	0.78	U	PASS	**3.50**		PASS
1,3-Dichlorobenzene	541-73-1	720	NA	0.79	U	PASS	0.66	U	PASS
Propene (C3 H6)	115-07-1	Asphyxiant	Asphyxiant	**1.60**		NA	**3.90**		NA
Dichlorodifluoromethane (CCl2F2)	75-71-8	50,000	49,452	**2.7**		PASS	**14.0**		PASS
Ethanol	64-17-5	18,800	NA	**8.6**		PASS	**38.0**		PASS
Trichlorofluoromethane (CCl3F)	75-69-4	28,000	56,184	**1.6**		PASS	**13**		PASS
Trichlorotrifluoroethane (C2Cl3F3)	76-13-1	38,000	NA	**23**		PASS	**0.67**		PASS
alpha-Pinene	80-56-8	60	3,499	**1.60**		PASS	**2.20**		PASS
d-Limonene	5989-27-5	1,100	NA	0.75	U	PASS	**1.30**		PASS

Notes:

(1) Sample collected over an 8-hour period on May 29, 2019, between 8 AM and 4 PM

(2) Sample collected over a 24-hour period beginning on May 29, 2019, at 7:00 AM and ending on May 30, 2019 at 7:00 AM

(3) Status based on comparison of air sample result to Air Monitoring Comparison Values (AMCVs). When there is no AMCV value for a chemical, the air sample concentration is compared to the short-term Effects Screening Level (ESL).

CAS # = Chemcial Abstracts Service Number

GWTP = Groundwater Treatment Plant

J = estimated value

U = non-detect

µg/m^3 = micrograms per cubic meter

Table 2. Emission Stack Air Data - May 2019
Longhorn Army Ammunition Plant
Groundwater Treatment Plant

Pollutant	CAS #	Measured Air Stripper Stack Concentrations (1)		Air Stripper Emission Rates (2)		Air Stripper Emission Rates (2a)		Allowable Annual Emission (3)	Status (4)	TLV (L)	TLV Reference	Compliance section	Distance Downwind to nearest off-site Receptor (D)	(K) conversion value	Allowable Maximum Hourly Emission Limit at Nearest off-site Receptor [6][7] (E) = L/K	Status (8)
		µg/m^3		lb/hr		tpy		tpy		mg/m^3			feet		lb/hr	
1,1-Dichloroethane	75-34-3	81	U	6.64E-04	U	4.32E-04	U	5	PASS	405	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
1,1-Dichloroethene	75-35-4	**190**		3.12E-03		2.02E-03		5	PASS	20	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.4	PASS
1,2-Dichloroethane	107-06-2	**180**		2.95E-03		1.92E-03		5	PASS	40	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	2.9	PASS
Acetone	67-64-1	840	U	6.89E-03	U	4.48E-03	U	5	PASS	590	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Benzene	71-43-2	81	U	6.64E-04	U	4.32E-04	U	5	PASS	3	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	0.21	PASS
Carbon disulfide	75-15-0	170	U	1.39E-03	U	9.06E-04	U	5	PASS	31	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	2.2	PASS
Chloroform	67-66-3	84	U	6.89E-04	U	4.48E-04	U	5	PASS	10	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	0.71	PASS
cis-1,2-Dichloroethene	156-59-2	**9,200**		1.51E-01		9.80E-02		5	PASS	793	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Methylene chloride	75-09-2	**7,200**		1.18E-01		7.67E-02		5	PASS	26	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.9	PASS
Tetrachloroethene	127-18-4	**150**		2.46E-03		1.60E-03		5	PASS	33.5	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	2.4	PASS
trans-1,2-Dichloroethene	156-60-5	83	U	6.80E-04	U	4.42E-04	U	5	PASS	793	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Trichloroethene	79-01-6	**21,000**		3.44E-01		2.24E-01		5	PASS	135	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	6.0	PASS
Vinyl chloride	75-01-4	**120**		1.97E-03		1.28E-03		5	PASS	2	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	0.14	PASS
n-Hexane	110-54-3	84	U	6.89E-04	U	4.48E-04	U	5	PASS	1,800	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Styrene	100-42-5	83	U	6.80E-04	U	4.42E-04	U	5	PASS	21	106.262 List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.5	PASS
Toluene	108-88-3	83	U	6.80E-04	U	4.42E-04	U	5	PASS	188	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	6.0	PASS
Ethylbenzene	100-41-4	81	U	6.64E-04	U	4.32E-04	U	5	PASS	434	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
m,p-Xylenes	179601-23-1	170	U	1.39E-03	U	9.06E-04	U	5	PASS	434	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
o-Xylene	95-47-6	83	U	6.80E-04	U	4.42E-04	U	5	PASS	434	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
1,3-Dichlorobenzene	541-73-1	84	U	6.89E-04	U	4.48E-04	U	5	PASS	(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	1.0	PASS
Propene (C3 H6)	115-07-1	81	U	6.64E-04	U	4.32E-04	U	5	PASS	(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	6.0	PASS
Dichlorodifluoromethane (CCl2F2)	75-71-8	81	U	6.64E-04	U	4.32E-04	U	5	PASS	4,950	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Ethanol	64-17-5	800	U	6.56E-03	U	4.26E-03	U	5	PASS	1,880	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Trichlorofluoromethane (CCl3F)	75-69-4	83	U	6.80E-04	U	4.42E-04	U	5	PASS	5,620	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
Trichlorotrifluoroethane (C2Cl3F3)	76-13-1	**16,000**		2.62E-01		1.71E-01		5	PASS	7,670	ACGIH List	30 TAC 106.533(f)(1)(A)(ii)	2,000	14	1.0	PASS
alpha-Pinene	80-56-8	81	U	6.64E-04	U	4.32E-04	U	5	PASS	(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	1.0	PASS
d-Limonene	5989-27-5	80	U	6.56E-04	U	4.26E-04	U	5	PASS	(5)	--	30 TAC 106.533(f)(1)(A)(i)	2,000	14	1.0	PASS
		TOTAL		0.912												

Notes:

(1) Sample collected on May 29, 2019. The higher value of the sample or duplicate is reported.

(2) Based on a blower flow rate of 4,390 cubic feet per minute (cfm). Note that plant operations is less than or equal to 25 hours per week. 1/2 of detection limit was used for estimating mass rate

(2a) Based on operation of 25 hours per week, 52 weeks per year.

(3) Per 30 Texas Administrative Code (TAC) 106.533(f)(1)(B)

(4) Based on comparing the calculated air stripper stack sample emission rate in tons per year (tpy) to the allowable annual emission limit per chemical of 5 tpy.

(5) No Threshold Limit Values (TLVs) for these chemicals

(6) The maximum hourly limit allowed by 30 TAC 106.262, per pollutant, is 6 pounds per hour (lb/hr) per "Figure 1: 30 TAC 106.262(a)". The E value was overridden with 6 lb/hr when the calculated E was higher.

(7) The maximum hourly emission rate allowed by 30 TAC 106.261(a)(3) for chemicals with a limit value (L) greater than 200 mg/m^3 is 1 lb/hr.

(8) Based on comparing the calculated air stripper stack sample emission rate in lb/hr to the allowable maximum emission limit per chemical based on distance downwind to nearest off-site receptor.

CAS # = Chemical Abstracts Service Number

mg/m^3 = milligrams per cubic meter

µg/m^3 = micrograms per cubic meter

U = non-detect

Table 3. PID Readings - 2nd Quarter 2019
Longhorn Army Ammunition Plant
Groundwater Treatment Plant

Date	Time	Location	Air Flow Rate at Blower	Instrument ID	Person Collecting	PID Reading	Weather Conditions
4/3/2019	8:00	Outside GWTP Office	3802 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 46 degrees
4/3/2019	8:00	Downwind	3802 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 46 degrees
4/3/2019	8:00	Stripper	3802 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.7 ppm Steady State 7.4 ppm	Clear 46 degrees
4/3/2019	14:00	Outside GWTP Office	3705 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 74 degrees
4/3/2019	14:00	Downwind	3705 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 74 degrees
4/3/2019	14:00	Stripper	3705 ACFM	MiniRAE 3000	Scott Beesinger	Max. 24.3 ppm Steady State 8.2 ppm	Clear 74 degrees
4/9/2019	8:00	Outside GWTP Office	3769 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 53 degrees
4/9/2019	8:00	Downwind	3769 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 53 degrees
4/9/2019	8:00	Stripper	3769 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.4 ppm Steady State 4.9 ppm	Clear 53 degrees
4/9/2019	14:00	Outside GWTP Office	3678 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 81 degrees
4/9/2019	14:00	Downwind	3678 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 81 degrees
4/9/2019	14:00	Stripper	3678 ACFM	MiniRAE 3000	Scott Beesinger	Max. 22.9 ppm Steady State 6.1 ppm	Clear 81 degrees
4/15/2019	8:00	Outside GWTP Office	3847 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 49 degrees
4/15/2019	8:00	Downwind	3847 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 49 degrees
4/15/2019	8:00	Stripper	3847 ACFM	MiniRAE 3000	Kennie Moore	Max. 19.7 ppm Steady State 4.5 ppm	Clear 49 degrees
4/15/2019	14:00	Outside GWTP Office	3685 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 77 degrees
4/15/2019	14:00	Downwind	3685 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 77 degrees
4/15/2019	14:00	Stripper	3685 ACFM	MiniRAE 3000	Scott Beesinger	Max. 22.0 ppm Steady State 6.2 ppm	Clear 77 degrees
4/30/2019	8:00	Outside GWTP Office	3735 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 74 degrees
4/30/2019	8:00	Downwind	3735 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 74 degrees
4/30/2019	8:00	Stripper	3735 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.4 ppm Steady State 5.9 ppm	Cloudy 74 degrees
4/30/2019	14:00	Outside GWTP Office	3689 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 83 degrees
4/30/2019	14:00	Downwind	3689 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 83 degrees
4/30/2019	14:00	Stripper	3689 ACFM	MiniRAE 3000	Scott Beesinger	Max. 21.9 ppm Steady State 5.0 ppm	Clear 83 degrees
5/6/2019	8:00	Outside GWTP Office	3845 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 67 degrees
5/6/2019	8:00	Downwind	3845 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 67 degrees
5/6/2019	8:00	Stripper	3845 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.6 ppm Steady State 7.8 ppm	Clear 67 degrees
5/6/2019	14:00	Outside GWTP Office	3671 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 85 degrees
5/6/2019	14:00	Downwind	3671 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 85 degrees
5/6/2019	14:00	Stripper	3671 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.1 ppm Steady State 8.3 ppm	Clear 85 degrees
5/13/2019	8:00	Outside GWTP Office	3841 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 58 degrees
5/13/2019	8:00	Downwind	3841 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 58 degrees
5/13/2019	8:00	Stripper	3841 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.9 ppm Steady State 5.3 ppm	Clear 58 degrees
5/13/2019	14:00	Outside GWTP Office	3670 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 80 degrees
5/13/2019	14:00	Downwind	3670 ACFM	MiniRAE 3000	Scott Beesinger	0.0 ppm	Clear 80 degrees
5/13/2019	14:00	Stripper	3670 ACFM	MiniRAE 3000	Scott Beesinger	Max. 20.2 ppm Steady State 4.9 ppm	Clear 80 degrees
5/20/2019	8:00	Outside GWTP Office	3875 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 73 degrees
5/20/2019	8:00	Downwind	3875 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 73 degrees
5/20/2019	8:00	Stripper	3875 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.7 ppm Steady State 7.6 ppm	Cloudy 73 degrees

Table 3. PID Readings - 2nd Quarter 2019
Longhorn Army Ammunition Plant
Groundwater Treatment Plant

Date	Time	Location	Air Flow Rate at Blower	Instrument ID	Person Collecting	PID Reading	Weather Conditions
5/20/2019	14:00	Outside GWTP Office	3602 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 86 degrees
5/20/2019	14:00	Downwind	3602 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Cloudy 86 degrees
5/20/2019	14:00	Stripper	3602 ACFM	MiniRAE 3000	Kennie Moore	Max. 23.4 ppm Steady State 8.1 ppm	Cloudy 86 degrees
5/23/2019	8:00	Outside GWTP Office	3860 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75 degrees
5/23/2019	8:00	Downwind	3860 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75 degrees
5/23/2019	8:00	Stripper	3860 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.6 ppm Steady State 6.7 ppm	Clear 75 degrees
5/23/2019	13:00	Outside GWTP Office	3700 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 88 degrees
5/23/2019	13:00	Downwind	3700 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 88 degrees
5/23/2019	13:00	Stripper	3700 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.2 ppm Steady State 7.1 ppm	Clear 88 degrees
5/28/2019	8:00	Outside GWTP Office	3685 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 77 degrees
5/28/2019	8:00	Downwind	3685 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 77 degrees
5/28/2019	8:00	Stripper	3685 ACFM	MiniRAE 3000	Kennie Moore	Max. 19.9 ppm Steady State 5.8 ppm	Clear 77 degrees
5/28/2019	14:00	Outside GWTP Office	3660 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 89 degrees
5/28/2019	14:00	Downwind	3660 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 89 degrees
5/28/2019	14:00	Stripper	3660 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.5 ppm Steady State 6.2 ppm	Clear 89 degrees
5/30/2019	8:00	Outside GWTP Office	3734 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 74°F
5/30/2019	8:00	Downwind	3734 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 74°F
5/30/2019	8:00	Stripper	3734 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.9 ppm Steady State 4.8 ppm	Clear 74°F
5/30/2019	12:00	Outside GWTP Office	3671 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 83°F
5/30/2019	12:00	Downwind	3671 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 83°F
5/30/2019	12:00	Stripper	3671 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.5 ppm Steady State 6.1 ppm	Clear 83°F
6/3/2019	8:00	Outside GWTP Office	3875 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 76°F
6/3/2019	8:00	Downwind	3875 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 76°F
6/3/2019	8:00	Stripper	3875 ACFM	MiniRAE 3000	Kennie Moore	Max. 19.8 ppm Steady State 7.5 ppm	Clear 76°F
6/3/2019	14:00	Outside GWTP Office	3732 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 90°F
6/3/2019	14:00	Downwind	3732 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 90°F
6/3/2019	14:00	Stripper	3732 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.7 ppm Steady State 8.2 ppm	Clear 90°F
6/6/2019	8:00	Outside GWTP Office	3780 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 74°F
6/6/2019	8:00	Downwind	3780 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 74°F
6/6/2019	8:00	Stripper	3780 ACFM	MiniRAE 3000	Kennie Moore	Max. 19.7 ppm Steady State 6.2 ppm	Clear 74°F
6/6/2019	12:00	Outside GWTP Office	3625 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 80°F
6/6/2019	12:00	Downwind	3625 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 80°F
6/6/2019	12:00	Stripper	3625 ACFM	MiniRAE 3000	Kennie Moore	Max. 21.3 ppm Steady State 5.7 ppm	Clear 80°F
6/10/2019	8:00	Outside GWTP Office	3860 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75°F
6/10/2019	8:00	Downwind	3860 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 75°F
6/10/2019	8:00	Stripper	3860 ACFM	MiniRAE 3000	Kennie Moore	Max. 20.2 ppm Steady State 7.6 ppm	Clear 75°F
6/10/2019	14:00	Outside GWTP Office	3700 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 85°F
6/10/2019	14:00	Downwind	3700 ACFM	MiniRAE 3000	Kennie Moore	0.0 ppm	Clear 85°F
6/10/2019	14:00	Stripper	3700 ACFM	MiniRAE 3000	Kennie Moore	Max. 22.2 ppm Steady State 8.7 ppm	Clear 85°F

00942987

EQUIPMENT CALIBRATION DAILY LOG

Date: 4/3/19

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott BEESINGER

PID

Model: Mini Rae 3000 Bulb: ~~10.6~~ 11.7 meV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 0630	Time:	Time:
First Point Calibration					Initials: SB	Initials:	Initials:
	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	SBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
First Point Calibration					Initials:	Initials:	Initials:
	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
First Point Calibration (Auto)					Initials:	Initials:	Initials:
	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00942988

EQUIPMENT CALIBRATION DAILY LOG

Date: 4/9/19 | Project Name: LHAAP - GWTP

Project Number: NWD1312.0150 | Recorded By: Scott BEESINGER

PID

Model: Mini Rae 3000 | Bulb: ~~10.6~~ 11.7 meV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 0645	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	SBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00942989

EQUIPMENT CALIBRATION DAILY LOG

Date: 4/15/19

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott BEESINGER

PID

Model: MiniRAE 3000 Bulb: ~~10.6~~ 11.7 meV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 0640	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	SBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00942990

EQUIPMENT CALIBRATION DAILY LOG

Date: 4/30/19

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

						Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
PID	Model: Mini Rae 3000		Bulb: ~~10.6~~ 11.7 meV					
	Equipment ID #: PGM 7320							
	Parameter	Standard	Exp. Date	Lot #		Time: 0625	Time:	Time:
						Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA		Value: To zero SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	SBH-248-100-19		Value: SB	Value:	Value:

						Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
COMB. GAS/O_2 METER	Model:							
	Equipment ID #:							
	Parameter	Standard	Exp. Date	Lot #		Time:	Time:	Time:
						Initials:	Initials:	Initials:
First Point Calibration	O2 (%)					Value:	Value:	Value:
	% LEL Pentane					Value:	Value:	Value:

						Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
WATER QUALITY METER	Model:							
	Equipment ID #:							
	Parameter	Standard	Exp. Date	Lot #		Time:	Time:	Time:
						Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00				Value:	Value:	Value:
	Conductivity (mS/cm)	4.49				Value:	Value:	Value:
	Turbidity (NTU)	0				Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA		Value:	Value:	Value:
Second Point Calibration	pH	6.86				Value:	Value:	Value:
	Conductivity (mS/cm)	53.7				Value:	Value:	Value:
	Turbidity (NTU)	100				Value:	Value:	Value:
Third Point Calibration	pH	9.18				Value:	Value:	Value:
	Conductivity (mS/cm)	53.7				Value:	Value:	Value:
	Turbidity (NTU)	100				Value:	Value:	Value:

Additional Remarks:

00942991

EQUIPMENT CALIBRATION DAILY LOG

Date: 5/6/19

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott BEESINGER

PID

Model: Mini RAE 3000 Bulb: ~~10.6~~ 11.7 meV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 0630	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	SBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00942992

EQUIPMENT CALIBRATION DAILY LOG

Date: 5/13/19

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott BEESINGER

PID

Model: Mini RAE 3000 Bulb: ~~10.6~~ 11.7 meV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 0645	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	SBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00942993

EQUIPMENT CALIBRATION DAILY LOG

Date: 5/20/19

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott BEESINGER

					Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
PID	Model: MiniRAE 3000		Bulb: ~~10.6~~ 11.7 meV				
	Equipment ID #: PGM 7320						
	Parameter	Standard	Exp. Date	Lot #	Time: 0650	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	SBH-248-100-19	Value: SB	Value:	Value:

					Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
COMB. GAS/O_2 METER	Model:						
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

					Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
WATER QUALITY METER	Model:						
	Equipment ID #:						
	Parameter	Standard	Exp. Date	Lot #	Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00942994

EQUIPMENT CALIBRATION DAILY LOG

Date: 5/23/19

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: Mini Rae 3000 Bulb: ~~10.6~~ 11.7 meV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 0725	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: To zero SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	SBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00942995

EQUIPMENT CALIBRATION DAILY LOG

Date: 5/28/19

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott Beesinger

PID

Model: MiniRAE 3000 Bulb: ~~10.6~~ 11.7 meV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 0630	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	SBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00942996

EQUIPMENT CALIBRATION DAILY LOG

Date: 5/30/19

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott BEESINGER

PID

Model: Mini RAE 3000 Bulb: ~~10.6~~ 11.7 meV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 0730	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	SBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00942997

EQUIPMENT CALIBRATION DAILY LOG

Date: 6/3/19

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott BEESINGER

PID

Model: MiniRAE 3000 Bulb: ~~10.6~~ 11.7 meV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 0630	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	SBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00942998

EQUIPMENT CALIBRATION DAILY LOG

Date: 6/6/19

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott BEESINGER

PID

Model: Mini RAE 3000 Bulb: ~~10.6~~ 11.7 meV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 0720	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	SBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

00942999

EQUIPMENT CALIBRATION DAILY LOG

Date: 6/10/19

Project Number: NW01312.0150

Project Name: LHAAP - GWTP

Recorded By: Scott BEESINGER

PID

Model: Mini Rae 3000 Bulb: ~~10.6~~ 11.7 meV

Equipment ID #: PGM 7320

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time: 0625	Time:	Time:
					Initials: SB	Initials:	Initials:
First Point Calibration	Vapor conc. (ppm)	0.0 (ambient air)	NA	NA	Value: TO ZERO SB	Value:	Value:
Second Point Calibration	Vapor conc. (ppm)	100 ppm (isobutylene)	10/5/21	SBH-248-100-19	Value: SB	Value:	Value:

COMB. GAS/O_2 METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration	Evening Check	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration	O2 (%)				Value:	Value:	Value:
	% LEL Pentane				Value:	Value:	Value:

WATER QUALITY METER

Model:

Equipment ID #:

	Parameter	Standard	Exp. Date	Lot #	Morning Calibration/Check	Evening Check (one point only)	Additional Calib./Check (if necessary)
					Time:	Time:	Time:
					Initials:	Initials:	Initials:
First Point Calibration (Auto)	pH	4.00			Value:	Value:	Value:
	Conductivity (mS/cm)	4.49			Value:	Value:	Value:
	Turbidity (NTU)	0			Value:	Value:	Value:
	DO (mg/L)	8.9-9.1 (ambient air)	NA	NA	Value:	Value:	Value:
Second Point Calibration	pH	6.86			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:
Third Point Calibration	pH	9.18			Value:	Value:	Value:
	Conductivity (mS/cm)	53.7			Value:	Value:	Value:
	Turbidity (NTU)	100			Value:	Value:	Value:

Additional Remarks:

DEPARTMENT OF THE ARMY
LONGHORN ARMY AMMUNITION PLANT
POST OFFICE BOX 220
RATCLIFF, AR 72951

November 14, 2019

DAIM-ODB-LO

Mr. Rich Mayer
US Environmental Protection Agency, R6
1201 Elm Street, Suite 500
Dallas, Texas 75270-2102

Ms. April Palmie
Texas Commission on Environmental Quality Superfund Section, MC-136
12100 Park 35 Circle, Bldg D
Austin, TX 78753

Re: FY2019 Update of the Comprehensive Land Use Control (LUC) Management Plan, Longhorn Army Ammunition Plant, Karnack, Texas, 4 October 2019

Dear Mr. Mayer and Ms. Palmie,

In accordance with the Comprehensive LUC Management Plan, the FY2018 Plan has been revised to include LHAAP-04 and LHAAP-17 as well as the notice for LHAAP-001-R-01 and LHAAP-003-R-01. The 4 October 2019 draft document was approved by EPA and TCEQ without comment and is resubmitted as Final.

The document was revised by Bhate Environmental Associates, Inc., (Bhate) on behalf of the Army as part of Bhate's Performance Based Remediation contract for the facility. I ask that Kim Nemmers, Bhate's Project Manager, be copied on any communications related to the project.

The point of contact for this action is the undersigned. I may be contacted at 479-635-0110, or by email at rose.m.zeiler.civ@mail.mil.

Sincerely,

Rose M. Zeiler, Ph.D.
Longhorn AAP Site Manager

Enclosures: Changed/Added pages

Copies furnished W/O Enclosures:
P. Bruckwicki, Caddo Lake NWR, TX
A. Williams, USACE, Fort Worth District, Located in Tulsa, OK
A. Sherman. USAEC, San Antonio, TX
K. Nemmers, Bhate, Lakewood, CO (for project files)